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U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

SCREW-THREAD STANDARDS FOR FEDERAL SERVICES 1957

Amends in part H28 (1944) (and in part its 1950 Supplement)

HANDBOOK H28 (1957)—Part I

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U. S. DEPARTMENT OF COMMERCE
Sinclair Weeks, Secretary

NATIONAL BUREAU OF STANDARDS
A. V. Astin, Director

The National Bureau of Standards

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The functions of the National Bureau of Standards are set forth in the Act of Congress, March 3, 1901, as amended by Congress in Public Law 619, 1950. These include the development and maintenance of the national standards of measurement and the provision of means and methods for making measurements consistent with these standards; the determination of physical constants and properties of materials; the development of methods and instruments for testing materials, devices, and structures; advisory services to Government Agencies on scientific and technical problems; invention and development of devices to serve special needs of the Government; and the development of standard practices, codes, and specifications. The work includes basic and applied research, development, engineering, instrumentation, testing, evaluation, calibration services, and various consultation and information services. A major portion of the Bureau's work is performed for other Government Agencies, particularly the Department of Defense and the Atomic Energy Commission. The scope of activities is suggested by the listing of divisions and sections on the inside of the back cover.

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UNITED STATES DEPARTMENT OF CO IR WEEKS, *Secretary*
NATIONAL BUREAU OF STANDARDS • tor

NATIONAL BUREAU OF STANDARDS HANDBOOK H28 (1957)

SCREW-THREAD STANDARDS FOR FEDERAL SERVICES
1957

PART I

UNIFIED, AMERICAN, AMERICAN NATIONAL, AND NATIONAL MINIATURE THREADS

Amends in part H28 (1944) (and in part its 1950 Supplement)

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Pages 9, 12, 18, 20, 29, 30, 35, 51, 61, 69, 80 to 91, 99, 107, 109, 112, 117 to 119, 129, 163, 182 to 185, 187, 190, and 191 of this reprint contain corrections to the previous (March 1958) reprint. These corrections are shown by a double dagger. Single asterisks indicate corrections to the original printing as shown in the 1958 reprint. These corrections are shown on pages 39, 49, 105, 157, 183, 187, 190, and 193. On page 114, table VI.2, column 13; also the first paragraph of text, and the footnote 16 have been corrected.

The corrections on page 99 occur within the two blocks in which the daggers are placed. The corrections on pages 80 through 91 occur in the line when the daggers occur in the "number of pitches column," otherwise, the correction only pertains to the daggered value. The correction on page 107 is in the daggered line. The correction on page 109 is in the daggered paragraph. On page 112, the formula in the upper right-hand corner of figure VI.2 has been revised to read:

$$\text{“}\frac{3}{8}H-(0.060\sqrt[3]{p^2}+0.017p)/2\text{”; the “}\rightarrow\left|\frac{p}{8}\right|\leftarrow\text{”}$$

has been deleted from the upper part of the right-hand view in figure VI.3.

Foreword

The Interdepartmental Screw Thread Committee has been established by the Departments of Defense, Army, Navy, Air Force, and Commerce to promote uniformity in screw-thread standards in the Departments concerned.

The Committee is charged: (1) With the development of standards for screw threads; (2) the standardization of gages, dies, and taps; and (3) the standardization of dimensions of nuts, bolt heads, wrenches, and other items associated with the manufacture and use of interchangeable threaded parts. Standards developed by the Committee, when approved by the Departments concerned, are to be published together with a joint order making their use mandatory in the Departments of Defense and Commerce, except where a need for deviations therefrom is shown. Standards thus established are subject to such extension and revision as the Committee may find desirable.

The basis for this Handbook is the 1933 report, and preceding reports, of the National Screw Thread Commission, and Handbooks H25 dated 1939, and H28 dated 1942 and 1944, which superseded those reports and which this Handbook supersedes, together with pertinent standards approved and promulgated by the American Standards Association.

The current Handbook is to be issued in three volumes or parts, of which this volume constitutes Part I, superseding sections I, II, III, IV, V, XV, and XVI and appendixes 1, 2, 6, and 8 of Handbook H28 (1944). Sections XI, XII, XIII, XIV, and XVII and appendix 7 of H28 (1944) are superseded by Federal Specifications listed in appendix 6 herein. Part II will include standards for hose-coupling, pipe, and gas cylinder threads, and will be issued when the revised standards have been completely formulated. This will be followed by Part III, to include Acme, Stub-Acme, Buttress, and miscellaneous standard threads.

The standardization of bolts, nuts, screws, and related items, for purposes of procurement by the Federal Government, is covered by several pertinent Federal Specifications which are listed in the Index of Federal Specifications and Standards, available on a subscription basis from the Superintendent of Documents.

ARCHIBALD T. MCPHERSON, *Chairman.*

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APPROVAL BY THE SECRETARIES OF DEFENSE AND COMMERCE

The accompanying Handbook H28 (1957), Part I, on screw-thread standards for Federal Services, submitted by the Interdepartmental Screw Thread Committee, is hereby approved for use by the Departments of Defense and Commerce.

Perkins McGuire
For the
Secretary of Defense

Sinclair Weeks
Secretary of Commerce

Contents

Page
Foreword iii
Approval by the Secretaries of Defense and Commerce v
Section I. Introduction 1
1. Purpose of Federal standards for threaded products 1
2. Personnel of the Committee 1
Section II. Nomenclature, definitions, and letter symbols 1
1. Introductory 1
2. Definitions of terms 2
(a) Terms relating to types of screw threads 2
(b) Terms relating to size and fit 2
(c) Terms relating to geometrical elements of screw threads 3
(d) Terms relating to dimensions of screw threads 4
(e) Terms relating only to taper screw threads 6
3. Letter symbols and abbreviations 7
(a) Dimensional symbols 7
(b) Identification designations 8
Section III. Unified thread form and thread series for bolts, machine screws, nuts, tapped holes, and general applications 10
1. Introduction 10
2. The Unified form of thread 12
3. Thread series, symbols, and suggested applications 13
4. Classification and tolerances 18
(a) General 18
(b) Screw-thread classes 23
5. Method of designating a screw thread 26
6. Limits of size, standard thread series, table III.10 26
7. Limits of size of gages 38
8. Sizes of tap drills 68
Section IV. Unified threads of special diameters, pitches, and lengths of engagement 74
1. Introduction 74
2. Unified form of thread 75
3. Preferred diameters and pitches 75
4. Classification and tolerances 75
(a) General 75
(b) Screw-thread classes 79
5. Method of designating 98
6. Directions for determining limits of size of special threads 100
7. Gages 100
Section V. National Miniature screw threads 100
1. Introduction 100
2. Form of thread 101
3. National Miniature thread series 104
4. Classification and tolerances 104
5. Thread designations 105
6. Limits of size 105
7. Gages and gaging 107
Section VI. Gages and gaging for Unified, American, and American National threads 107
1. Introduction 107
2. Fundamentals 108
3. Specifications for gage elements 109
(a) General design 109
(b) Specifications for thread form 110

Section VI—Continued

Page
(c) Specifications for thread length 114
(d) Marking of gages 116
4. Gage tolerances and wear allowances 117
5. Recommended gage practices 118
Appendix 1. American National form of thread and thread series for bolts, machine screws, nuts, tapped holes, and general applications 121
1. Introduction 121
2. American National form of thread 121
(a) Specifications 121
(b) Illustration 121
(c) Basic thread data 121
3. Thread series 122
(a) American National coarse-thread series 122
(b) American National fine-thread series 122
(c) American National extra-fine thread series 123
(d) American National 8-thread series 123
(e) American National 12-thread series 123
(f) American National 16-thread series 124
4. Classification and tolerances 124
(a) General specifications 125
(b) Screw-thread classes 130
5. Method of designating an American National thread 132
6. Limits of size of gages 145
Appendix 2. American National screw threads of special diameters, pitches, and lengths of engagement 179
1. Form of thread 179
2. Standard pitches 179
3. Classification and tolerances 179
(a) General specifications 179
(b) Classification of threads 179
4. Tables of dimensions 180
5. Gages 186
Appendix 3. Hole-size limits 186
Appendix 4. Wire methods of measurement of pitch diameter of 60° threads 194
1. Size of wires 195
2. Methods of measuring and using wires 195
3. Standard specification for wires and standard practice in measurement of wires 196
4. General formula for measurement of pitch diameter 196
5. Measurement of pitch diameter of Unified, American, and American National straight threads 197
6. Measurement of pitch diameter of American Standard taper threads 197
7. Measurement of pitch diameter of thread ring gages 200
Appendix 5. Design of special threads 200
1. General 200
2. Eccentricity of assembly and cross threading 201
3. Strength factors 201
4. Thread proportions in relation to tapping 204
5. Examples of thread design 204
Appendix 6. References 205
Index 207

Tables

Page
Table II.1.—General symbols (see figs. II.2 and II.3) 9
Table II.2.—Pipe-thread symbols (see fig. II.4) 9
Table II.3.—Identification designations 10
Table III.1.—Thread data, Unified thread form (see fig. III.2) 12
Table III.2.—Unified and American, screw thread standard series 15
Table III.3.—Coarse thread series, basic dimensions, UNC and NC 16
Table III.4.—Fine thread series, basic dimensions, UNF and NF 16
Table III.5.—Extra-fine thread series, basic dimensions, UNEF and NEF 17
Table III.6.—8-thread series, basic dimensions, 8UN and 8N 17
Table III.7.—12-thread series, basic dimensions, 12UN and 12N 18
Table III.8.—16-thread series, basic dimensions, 16UN and 16N 19
Table III.9.—Increments in pitch-diameter tolerance formula 20
Table III.10.—Standard series limits of size—Unified and American screw threads 27–32
Table III.11.—Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified and American screw threads 32–38
Table III.12.—Gages for standard thread series, Unified and American screw threads 39–55
Table III.13.—Setting plug gages, Unified and American screw threads 56–68
Table III.14.—Tap drill sizes, Unified and American screw threads, classes 1B and 2B 69–71
Table III.15.—Tap drill sizes, Unified and American screw threads, class 3B 72–74
Table IV.1.—Thread data, Unified and American thread form 76
Table IV.2.—Allowances for external threads of special diameters and pitches, classes 1A and 2A 77
Table IV.2A.—Allowances, class 1AR 77
Table IV.3.—Major diameter tolerances for external threads of special diameters, pitches, and lengths of engagement, classes 1A, 1AR, 2A, and 3A 78
Table IV.4.—Pitch diameter tolerances for external threads of special diameters, pitches, and lengths of engagement, classes 1A and 1AR 80, 81
Table IV.5.—Pitch diameter tolerances for external threads of special diameters, pitches, and lengths of engagement, class 2A 82, 83
Table IV.6.—Pitch diameter tolerances for external threads of special diameters, pitches, and lengths of engagement, class 3A 84, 85
Table IV.7.—Pitch diameter tolerances for internal threads of special diameters, pitches, and lengths of engagement, class 1B 86, 87
Table IV.8.—Pitch diameter tolerances for internal threads of special diameters, pitches, and lengths of engagement, class 2B 88, 89
Table IV.9.—Pitch diameter tolerances for internal threads of special diameters, pitches, and lengths of engagement, class 3B 90, 91
Table IV.10.—Minor diameter tolerances for internal special screw threads, classes 1B and 2B 92, 93
Table IV.11.—Minor diameter tolerances for internal special screw threads, class 3B 94–97
Table IV.12.—Unified special diameter-pitch combinations 99
Table IV.13.—Consolidated method for the calculation of dimensions of special threads 99
Table V.1.—Thread form data, National Miniature screw threads 102
Table V.2.—Basic and design sizes, National Miniature thread series 104
Table V.3.—Limits of size and tolerances, National Miniature thread series 105
Table VI.1.—Specifications and format for tables of limits of size of threaded and plain gages for Unified, American, and American National external and internal threads 113
Table VI.2.—Specifications and format for tables of limits of size of threaded setting plug gages for Unified, American, and American National external threads 114
Table VI.3.—Constants for computing thread gage dimensions 115
Table VI.4.—Lengths of standard taperlock and trilock thread plug gage blanks 115
Table VI.5.—Lengths of standard thread ring gage blanks and total thread lengths of standard truncated setting plug gage blanks 115
Table VI.6.—Tolerances for W "go" and "not go" thread gages 117
Table VI.7.—Tolerances for X "go" and "not go" thread gages 118
Table VI.8.—Tolerances for Y "go" thread gages for classes 1, 1A, 1B, 2A, and 2B, NS and UNS threads only 119
Table VI.9.—Tolerances for plain gages 119
Table 1.1.—Basic thread data, American National form of thread 127
Table 1.2.—American National coarse-thread series, NC 128
Table 1.3.—American National fine-thread series, NF 129
Table 1.4.—American National extra-fine-thread series, NEF 129
Table 1.5.—American National 8-thread series, 8N 130
Table 1.6.—American National 12-thread series, 12N 131
Table 1.7.—American National 16-thread series, 16N 132
Table 1.8.—Limits of size and tolerances, classes 1, 2, 3, and 4, American National coarse-thread series, NC 133, 134
Table 1.9.—Limits of size and tolerances, classes 1, 2, 3, and 4, American National fine thread series, NF 135, 136
Table 1.10.—Limits of size and tolerances, classes 2 and 3, American National extra-fine-thread series, NEF 137
Table 1.11.—Limits of size and tolerances, classes 2 and 3, American National 8-thread series, 8N 138, 139
Table 1.12.—Limits of size and tolerances, classes 2 and 3, American National 12-thread series, 12N 140–142

Tables—*Continued*

Page
Table 1.13.—Limits of size and tolerances, classes 2 and 3, American National 16-thread series, 16N 143, 144
Table 1.14.—Allowances and tolerances, classes 1 and 2 145
Table 1.15.—Allowances and tolerances, classes 3 and 4 145
Table 1.16.—Gages for standard thread series, American National screw threads 146–163
Table 1.17.—Setting plug gages, American National screw threads 164–178
Table 2.1.—Thread data for recommended pitches for threads of special diameters, pitches, and lengths of engagement 180
Table 2.2.—Schedule of tolerance increments for threads of special diameters, pitches, and lengths of engagement 180
Table 2.3.—Values for obtaining thread dimensions of screw threads of special diameters, pitches, and lengths of engagement, classes 1, 2, 3, and 4 181
Table 2.4.—Pitch diameter tolerances for screw threads of special diameters, pitches, and lengths of engagement, class 1 182
Table 2.5.—Pitch diameter tolerances for screw threads of special diameters, pitches, and lengths of engagement, class 2 183
Table 2.6.—Pitch diameter tolerances for screw threads of special diameters, pitches, and lengths of engagement, class 3 184
Table 2.7.—Pitch diameter tolerances for screw threads of special diameters, pitches, and lengths of engagement, class 4 185
Table 3.1.—Recommended hole size limits before threading for different lengths of engagement, UNC, UNF, UNEF, UN, UNS, NC, NF, NEF, and N series, classes 1B and 2B 187–189
Table 3.2.—Recommended hole size limits before threading for different lengths of engagement, UNC, UNF, UNEF, UN, UNS, NC, NF, NEF, and N series, class 3B 190–193
Table 3.3.—Recommended hole size limits before threading for different lengths of engagement, National Miniature thread series 193
Table 4.1.—Wire sizes and constants, Unified and American, American National, hose-coupling, and pipe threads (60°) 195
Table 4.2.—Relation of best wire diameters and pitches—wires for Unified and American, American National, hose-coupling, and pipe threads (60°) 196
Table 5.1.—Data for determining strength factors in special thread design 203

Figures

Figure II.1.—Blunt start 4
Figure II.2 —General screw thread symbols 6
Figure II.3.—General screw thread symbols 7
Figure II.4.—Pipe thread symbols 8
Figure III.1.—Unified internal and external screw thread design forms (maximum material condition) 11
Figure III.2.—Symbols for thread data in table III.1 13
Figure III.3.—Disposition of tolerances, allowances, and crest clearances for classes 1A, 2A, 1B, and 2B 24
Figure III.4.—Disposition of tolerances and crest clearances for classes 3A and 3B 25
Figure IV.1.—Thread dimensions to be determined for a special thread 99
Figure V.1.—Basic thread form, National Miniature threads 101
Figure V.2.—National Miniature internal and external screw thread design forms (maximum material condition) 103
Figure V.3.—Disposition of tolerances and crest clearances, National Miniature threads 106
Figure V.4.—Suggested chart for projection inspection of external National Miniature threads 107
Figure VI.1.—Thread form of gages for external and internal threads 110
Figure VI.2.—Thread form of truncated thread setting plug gages 112
Figure VI.3.—Thread form of basic-crest thread setting plug gages 112
Figure 1.1.—American National form of thread 121
Figure 1.2.—Disposition of tolerances, allowance (neutral space), and crest clearances for class 1 122
Figure 1.3.—Disposition of tolerances and crest clearances for class 2 123
Figure 1.4.—Disposition of tolerances and crest clearances for class 3 124
Figure 1.5.—Disposition of tolerances, allowance (interference), and crest clearances for class 4 125
Figure 1.6.—Relation of maximum and minimum pitch diameters of classes 1, 2, 3, and 4 to basic pitch diameters 126
Figure 3.1.—Distribution of hole size limits before tapping, Unified and American threads 186
Figure 3.2.—Distribution of hole size limits before tapping, National Miniature threads 186
Figure 4.1.—Three-wire method of measuring pitch diameter of thread plug gages 194
Figure 4.2.—Measurement of pitch diameter of taper thread gages by the 2-wire method 198
Figure 4.3.—Measurement of pitch diameter of taper thread gages by the 3-wire method 199
Figure 4.4.—Measurement of pitch diameter of taper thread gages by the 4-wire method 200
Figure 5.1.—Critical sections in a thread assembly 201
Figure 5.2.—Chart for determining minimum length of thread engagement 202

1957 HANDBOOK OF SCREW-THREAD STANDARDS FOR FEDERAL SERVICES

As Approved 1957

SECTION I. INTRODUCTION

1. PURPOSE OF FEDERAL STANDARDS FOR THREADED PRODUCTS

The purpose of this Handbook is to present complete dimensional data upon which specifications may be based for threaded products for Government requirements. So far as practicable, these data are intended to conform to generally accepted commercial practice, although certain special requirements of the Government necessitate the inclusion of some standards not generally applicable outside of the Government services. References are cited throughout the text to the standards promulgated by the American Standards Association, and to such other published standards as are in agreement with the specifications herein.

There are included in the body of the Handbook specifications for threaded products and gages, embodying sufficient information to permit the writing of definite and complete specifications for the purchase of screw-thread products. In the appendixes there is arranged supplementary information of both a general and a technical nature, including such specifications as are not intended to be mandatory.

2. PERSONNEL OF THE COMMITTEE

The personnel of the Interdepartmental Screw Thread Committee is as follows:

Representing the Department of Defense:

Mr. Spencer B. Terry, Standardization Division, Supply and Logistics, Office of the Assistant Secretary of Defense, Washington 25, D. C.

Representing the Department of the Army:

Mr. Eugene Von Loesch, Research and Development Division, Office of the Chief of Engineers, Department of the Army, Washington 25, D. C.

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Representing the Department of Commerce:

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Liaison Representatives of Sectional Committees Organized Under the Procedure of the American Standards Association and Sponsored by The American Society of Mechanical Engineers and the Society of Automotive Engineers or the American Gas Association:

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Mr. F. F. Jacobs, Bureau of Aeronautics, Department of the Navy, Washington 25, D. C.

Mr. Jack Ratzkin, Design Department, U. S. Naval Gun Factory, Washington 25, D. C.

Mr. J. E. Watson, National Control Division, Gage Laboratory, Frankford Arsenal, Ordnance Corps, Department of the Army, Philadelphia 37, Pa.

SECTION II. NOMENCLATURE, DEFINITIONS, AND LETTER SYMBOLS

1. INTRODUCTORY

The purposes of this section [1] are to establish uniform practices with regard to: (1) Screw-thread nomenclature, and (2) letter symbols for designating dimensions of screw threads for use on drawings, in tables of dimensions which set forth dimensional standards, and in other records, and for expressing mathematical relationships.

---

[1] This standard is in general agreement with American Standard ASA B1.7, "Nomenclature, Definitions, and Letter Symbols for Screw Threads," published by The American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y. The latest revision should be consulted when referring to such standards.

The section consists of a glossary of terms, two tables of screw-thread dimensional symbols, three illustrations showing the application of dimensional symbols, and one table of identification designations.

Typography.—In accordance with the usual practice in published text, letter symbols and letter subscripts, whether upper or lower case, should be printed in italic type. An exception is Greek letters; Greek capital letters are always vertical, and lower case always resemble italics. In manuscripts this is indicated by underlining each symbol to be italicized. Coefficients, numeral subscripts, and exponents should be printed in vertical Arabic numerals. Standard mathematical notation should be followed.

2. DEFINITION OF TERMS

The terms commonly applied to screw threads may be classified in five general groups, namely: (1) Those relating to types of screw threads; (2) those relating to size and fit of mechanical parts in general; (3) those relating to geometrical elements of both straight and taper screw threads; (4) those relating to dimensions of screw threads; and (5) those relating only to taper screw threads.

The definitions presented herein apply to theoretically correct thread forms unless otherwise indicated.

(*a*) TERMS RELATING TO TYPES OF SCREW THREADS.—Screw threads and the terms generally applied to designate the types of screw threads are defined as follows:

1. *Screw thread.*—A screw thread (hereinafter referred to as a thread), is a ridge of uniform section in the form of a helix on the external or internal surface of a cylinder, or in the form of a conical spiral on the external or internal surface of a cone or frustum of a cone. A thread formed on a cylinder is known as a *straight* or *parallel* thread, to distinguish it from a *taper* thread which is formed on a cone or frustum of a cone.

2. *External thread.*—An external thread is a thread on the external surface of a cylinder or cone.

3. *Internal thread.*—An internal thread is a thread on the internal surface of a hollow cylinder or cone.

4. *Right-hand thread.*—A thread is a right-hand thread if, when viewed axially, it winds in a clockwise and receding direction.

5. *Left-hand thread.*—A thread is a left-hand thread if, when viewed axially, it winds in a counterclockwise and receding direction. All left-hand threads are designated *LH*.

6. *Single thread.*—A single (single-start) thread is one having lead equal to the pitch. (See (*d*) 1 and (*d*) 2, p. 4.)

7. *Multiple thread.*—A multiple (multiple-start) thread is one in which the lead is an integral multiple of the pitch. (See (*d*) 1 and (*d*) 2.)

8. *Classes of threads.*—Classes of threads are distinguished from each other by the amount of tolerance or tolerance and allowance specified.

(*b*) TERMS RELATING TO SIZE AND FIT.—Terms relating to the size and fit of parts, which are generally applicable to mechanical parts, including threads, are defined as follows:

1. *Nominal size.*—The nominal size is the designation which is used for the purpose of general identification.

2. *Dimension.*—A dimension is a geometrical characteristic such as diameter, length, angle, or center distance.

3. *Size.*—Size is a designation of magnitude. When a value is assigned to a dimension it is referred to hereinafter as the size of that dimension.

NOTE. *It is recognized that the words "dimension" and "size" are both used at times to convey the meaning of magnitude.*

4. *Allowance.*—An allowance is an intentional difference between the maximum material limits of mating parts. It is the minimum clearance (positive allowance) or maximum interference (negative allowance) between such parts. (See definition of "Fit.")

5. *Tolerance.*—A tolerance is the total permissible variation of a size. The tolerance is the difference between the limits of size.

6. *Basic size.*—The basic size is that size from which the limits of size are derived by the application of allowances and tolerances.

7. *Design size.*—The design size is that size from which the limits of size are derived by the application of tolerances. When there is no allowance the design size is the same as the basic size.

8. *Actual size.*—An actual size is a measured size.

9. *Limits of size.*—The limits of size are the applicable maximum and minimum sizes.

10. *Maximum material limit.*—A maximum material limit is the maximum limit of size of an external dimension or the minimum limit of size of an internal dimension.

11. *Minimum material limit.*—A minimum material limit is the minimum limit of size of an external dimension or the maximum limit of size of an internal dimension.

12. *Tolerance limit.*—A tolerance limit is the variation, positive or negative, by which a size is permitted to depart from the design size.

13. *Unilateral tolerance.*—A unilateral tolerance is a tolerance in which variation is permitted only in one direction from the design size.

14. *Bilateral tolerance.*—A bilateral tolerance is a tolerance in which variation is permitted in both directions from the design size.

15. *Unilateral tolerance system.*—A design plan which uses only unilateral tolerances is known as a Unilateral Tolerance System.

16. *Bilateral tolerance system.*—A design plan which uses only bilateral tolerances is known as a Bilateral Tolerance System.

17. *Fit.*—Fit is the general term used to signify the range of tightness which may result from the application of a specific combination of allowances and tolerances in the design of mating parts.

18. *Actual fit.*—The actual fit between two mating parts is the relation existing between them with respect to the amount of clearance or interference that is present when they are assembled.

NOTE. *Fits are of three general types: clearance, transition, and interference.*

19. *Clearance fit.*—A clearance fit is one having limits of size so prescribed that a clearance always results when mating parts are assembled.

20. *Interference fit.*—An interference fit is one having limits of size so prescribed that an interference always results when mating parts are assembled.

21. *Transition fit.*—A transition fit is one having limits of size so prescribed that either a clearance or an interference may result when mating parts are assembled.

22. *Basic hole system.*—A basic hole system is a system of fits in which the design size of the hole is the basic size and the allowance is applied to the shaft.

23.—*Basic shaft system.*—A basic shaft system is a system of fits in which the design size of the shaft is the basic size and the allowance is applied to the hole.

(*c*) TERMS RELATING TO GEOMETRICAL ELEMENTS OF SCREW THREADS.—Terms relating to geometrical elements of both straight and taper threads are defined as follows:

1. *Axis.*—The axis of a thread is the axis of its pitch cylinder or cone.

2. *Pitch line.*—The pitch line is a generator of the cylinder or cone specified in the definition of pitch diameter.

3. *Form.*—The form of thread is its profile in an axial plane for a length of one pitch.

4. *Basic form of thread.*—The basic form of a thread is the theoretical profile of the thread for a length of one pitch in an axial plane, on which the design forms of the threads for both the external and internal threads are based.

5. *Design forms of thread.*—The design forms for a thread are the maximum material forms permitted for the external and internal threads.

6. *Fundamental triangle.*—The fundamental triangle is the triangle whose corners coincide with three consecutive intersections of the extended flanks of the basic form.

7. *Flank.*—The flank (or side) of a thread is either surface connecting the crest with the root, the intersection of which, with an axial plane, is theoretically a straight line.

8. *Leading flank.*—The leading flank of a thread is the one which, when the thread is about to be assembled with a mating thread, faces the mating thread.

9. *Following flank.*—The following flank of a thread is the one that is opposite to the leading flank.

10. *Pressure flank.*—The pressure flank is that which takes the thrust or load in an assembly. The term is used particularly in relation to buttress and other similar threads.

11. *Clearance (or trailing) flank.*—The clearance flank is that which does not take the thrust or load in an assembly.

12. *Crest.*—The crest is that surface of the thread that joins the flanks of the thread and is farthest from the cylinder or cone from which the thread projects.

13. *Root.*—The root is that surface of the thread that joins the flanks of adjacent thread forms and is identical with or immediately adjacent to the cylinder or cone from which the thread projects.

14. *Sharp crest (or crest apex).*—The sharp crest is the apex formed by the intersection of the flanks of a thread when extended, if necessary, beyond the crest.

15. *Sharp root (or root apex).*—The sharp root is the apex formed by the intersection of the flanks of adjacent thread forms when extended, if necessary, beyond the root.

16. *Base.*—The base of a thread is that section of the thread that coincides with the cylinder or cone from which the thread projects.

17. *Major cylinder or cone.*—See "major diameter" and "major cone."

18. *Minor cylinder or cone.*—See "minor diameter" and "minor cone."

19. *Pitch cylinder or cone.*—See "pitch diameter" and "pitch cone."

20. *Complete thread.*—The complete (or full) thread is that part of the thread having full form at both crest and root. When there is a chamfer at the start of the thread, not exceeding two pitches in length on an external thread or one pitch in length on an internal thread, it is included within the length of complete thread. When designing threaded products, it is necessary to take cognizance of: (1) Such permissible length of chamfer and (2) the first three threads which by virtue of "not go" gaging practice may exceed the product limits and which may be included within the length of complete thread. However, when the application is such as to require a minimum number of turns engagement, the specification shall so state and shall specify the minimum number of turns required.

21. *Incomplete thread.*—This is also known as the vanish or washout thread. On straight threads, the incomplete thread is that portion at the end having roots not fully formed by the lead or chamfer on threading tools.

On taper threads, the crest at the end may also be not fully formed due to the intersection of the major cone of an external thread, or the minor cone of an internal thread, with the cylindrical surface of the work.

22. *Effective thread.*—The effective (or useful) thread includes the complete thread and that portion of the incomplete thread having fully formed roots but having crests not fully formed.

23. *Total thread.* The total thread includes the complete or effective thread and the incomplete thread.

24. *Vanish cone.*—The vanish cone is a cone, the surface of which would pass through the roots of the incomplete thread formed by the lead or chamfer of the threading tool.

25. *Vanish point.*—The vanish point of an external thread is the intersection of a generator of the vanish cone with a generator of the cylinder of the largest major diameter of the thread.

26. *Blunt start.*—"Blunt start" designates the removal of the partial thread at the entering end of thread. This is a feature of threaded parts that are repeatedly assembled by hand, such as hose couplings and thread plug gages, to prevent cutting of hands and crossing of threads, and which was formerly known as a *Higbee cut.* (See fig. II.1.)

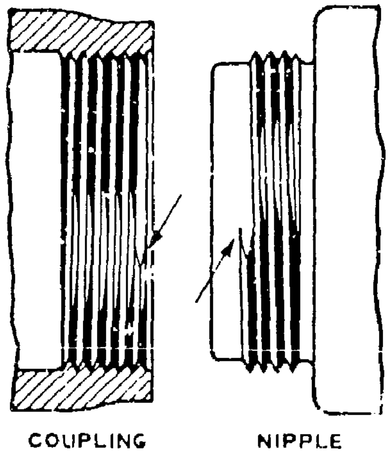


FIGURE II.1.—*Blunt start.*

(*d*) TERMS RELATING TO DIMENSIONS OF SCREW THREADS.—Terms relating to dimensions of both straight and taper threads are defined as follows:

1. *Pitch.*—The pitch of a thread is the distance, measured parallel to its axis, between corresponding points on adjacent thread forms in the same axial plane and on the same side of the axis.

2. *Lead.*—The lead is the distance a threaded part moves axially, with respect to a fixed mating part, in one complete rotation.

3. *Threads per inch.*—The number of threads per inch is the reciprocal of the pitch in inches.

4. *Turns per inch.*—The number of turns per inch is the reciprocal of the lead in inches.

5. *Included angle.*—The included angle of a thread (or angle of thread) is the angle between the flanks of the thread measured in an axial plane.

6. *Flank angle.*—The flank angles are the angles between the individual flanks and the perpendicular to the axis of the thread, measured in an axial plane. A flank angle of a symmetrical thread is commonly termed the *half-angle of thread.*

7. *Lead angle.*—On a straight thread the lead angle is the angle made by the helix of the thread at the pitch line with a plane perpendicular to the axis. On a taper thread, the lead angle at a given axial position is the angle made by the conical spiral of the thread at the pitch line with the plane perpendicular to the axis at that position.

8. *Thickness of thread.*—The thickness of thread is the distance between the flanks of the thread measured at a specified position and parallel to the axis.

9. *Height of fundamental triangle.*—The height of the fundamental triangle of a thread, or the height of a sharp-V thread, is the distance, measured perpendicular to the axis, between the sharp major and minor cylinders or cones, respectively.

10. *Height of thread.*—The height (or depth) of thread is the distance, measured perpendicular to the axis, between the major and minor cylinders or cones, respectively.

11. *Addendum.*—The addendum of an external thread is the distance, measured perpendicular to the axis, between the major and pitch cylinders or cones, respectively. The addendum of an internal thread is the distance, measured perpendicular to the axis, between the minor and pitch cylinders or cones, respectively.

12. *Dedendum.*—The dedendum of an external thread is the distance, measured perpendicular to the axis, between the pitch and minor cylinders or cones, respectively. The dedendum of an internal thread is the distance, measured perpendicular to the axis, between the major and pitch cylinders or cones, respectively.

13. *Crest truncation.*—The crest truncation of a thread is the distance, measured perpendicular to the axis, between the sharp crest (or crest apex) and the cylinder or cone that would bound the crest.

14. *Root truncation.*—The root truncation of a thread is the distance, measured perpendicular to the axis, between the sharp root (or root apex) and the cylinder or cone that would bound the root.

15. *Major diameter.*—On a straight thread, the major diameter is the diameter of the coaxial cylinder that would bound the crest of an external thread or the root of an internal thread.

On a taper thread, the major diameter, at a given position on the thread axis, is the diameter of the major cone at that position.

16. *Minor diameter.*—On a straight thread, the minor diameter is the diameter of the coaxial cylinder that would bound the root of an external thread or the crest of an internal thread.

On a taper thread, the minor diameter, at a given position on the thread axis, is the diameter of the minor cone at that position.

17. *Pitch diameter (simple effective diameter).*—On a straight thread, the pitch diameter is the diameter of the coaxial cylinder, the surface of which would pass through the thread profiles at such points as to make the width of the groove equal to one-half of the basic pitch. On a perfect thread this occurs at the points where the widths of the thread and groove are equal.

On a taper thread, the pitch diameter at a given position on the thread axis is the diameter of the pitch cone at that position.

18. *Virtual diameter* (*or effective size*).—The virtual diameter of an external or internal thread is the diameter derived by adding to the pitch diameter in the case of an external thread, or subtracting from the pitch diameter in the case of an internal thread, the cumulative effects of deviations from specified profile, including variations in lead, in uniformity of helix, in flank angle, taper, out-of-roundness, and surface defects.

19. *Depth of thread engagement.*—The depth (or height) of thread engagement between two mating threads is the distance, measured perpendicular to the axis, by which their thread forms overlap each other.

20. *Length of thread engagement.*—The length of thread engagement of two mating threads is the distance between the extreme points of contact on the pitch cylinders or cones, measured parallel to the axis.

21. *Crest clearance.*—The crest clearance in a thread assembly is the distance, measured perpendicular to the axis, between the crest of a thread and the root of its mating thread.

22. *Tensile stress area.*—The tensile stress area is the assumed area of an external threaded part that is used for the purpose of computing the tensile strength.

Tabulated stress areas in section III and appendix 1, applicable to steel parts, are computed from the following formula:

$$A_s=3.1416\left(\frac{E}{2}-\frac{3H}{16}\right)^2$$

or $$A_s=0.7854\,(D-0.9743/n)^2,$$

where E=basic pitch diameter
D=basic major diameter
n=threads per inch

For $\frac{3H}{16}$, see table III.1.

This formula correlates with test results for steels up to 100,000 psi ultimate strength.

For steels having ultimate strengths greater than 100,000 psi, it is recommended that the following formula be used to determine the stress area:

$$A_s=3.1416\left(\frac{E_{min}}{2}-\frac{3H}{16}\right)^2,$$

where E_{min} equals minimum pitch diameter of the class of thread specified.

23. *Thread shear area.*—The thread shear area of the external thread is the effective area at a diameter equal to the maximum minor diameter of the internal thread. The thread shear area of the internal thread is the effective area at a diameter equal to the minimum major diameter of the external thread. The formula for shear area of the external thread at a diameter equal to the maximum minor diameter of the internal thread (AS_s) is as follows:

$$AS_s=$$

$$3.1416nL_eK_n\max\left[\frac{1}{2n}+0.57735(E_s\min-K_n\max)\right]$$

The formula for shear area of the internal thread at a diameter equal to the minimum major diameter of the external thread (AS_n) is as follows:

$$AS_n=$$

$$3.1416nL_eD_s\min\left[\frac{1}{2n}+0.57735(D_s\min-E_n\max)\right]$$

where n = number of threads per inch
L_e = length of engagement
K_n max = maximum minor diameter of internal thread
E_s min = minimum pitch diameter of external thread
D_s min = minimum major diameter of external thread
E_n max = maximum pitch diameter of internal thread.

As materials bearing the same name vary greatly in ultimate strength and in other essential characteristics, the formulas given below are included in order that a safe length of external thread mating with internal threads may be calculated. It is desirable that the length of internal thread and the dimensions of this thread, particularly its minor diameter, be such that, taking into account a possible difference in strength of material of the internal and external threads, the threaded portion of the external thread will break before either the external or internal threads strip. For this reason, the shearing strength of the assembled unit should be taken as ½ the tensile strength, which gives a small factor of safety.

The length of engagement of a threaded unit, that will develop maximum strength of an assembled threaded unit with external and internal threads manufactured of materials of equal tensile strength, is computed from the following formula:

$$L_e=\frac{2\times\text{Stress area}}{3.1416nK_n\max\left[\frac{1}{2n}+0.57735(E_s\min-K_n\max)\right]}$$

This formula has the factor "½" for relation of shearing strength to tensile strength incorporated therein. The formula, while given for steel external and internal threads, may be used for brass external and internal threads and provides an additional safety factor.

Where the external and internal threads are manufactured of materials of different tensile strengths, the factor J for the relative strength in shear of external threads with respect to internal threads must be considered. The factor J is computed from the following formula:

$$J=\frac{AS_s\times \text{Tensile strength of external thread}}{AS_n\times \text{Tensile strength of internal thread}}$$

The length of engagement of a threaded unit adjusted to obtain proper relation of strength to cause breakage of the bolt before threads will shear is Q and is computed from the following formulas:

If J is less than 1, $Q=L_e$

If J is greater than 1, $Q=J\times L_e$.

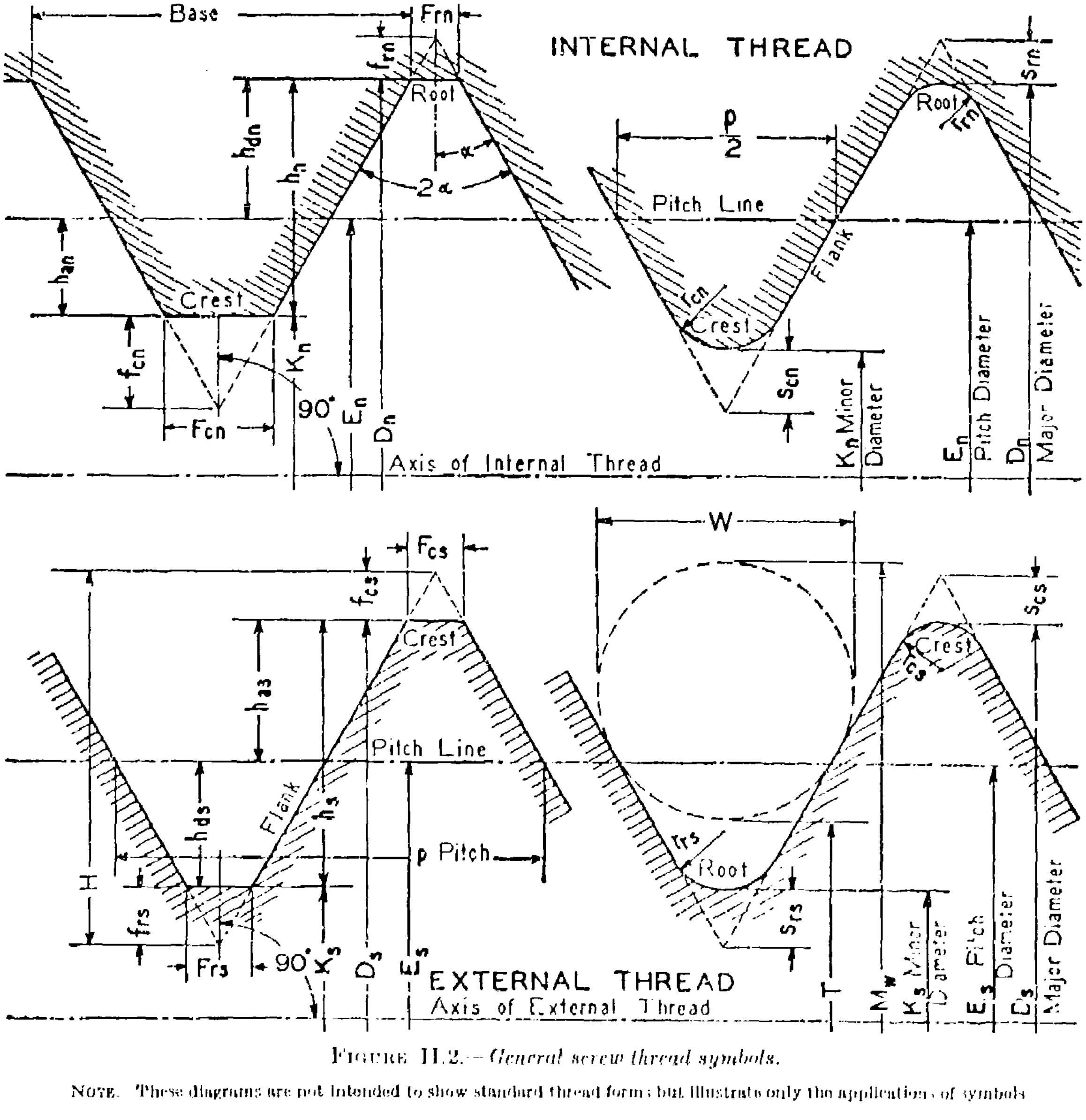
(e) TERMS RELATING ONLY TO TAPER SCREW THREADS.—Terms relating only to taper threads are defined as follows:

1. *Pitch cone.*—The pitch cone is a cone, the surface of which would pass through the thread profiles at such points as to make the width of the groove equal to one half of the basic pitch. On a perfect thread this occurs at the point where the widths of the thread and groove are equal.

2. *Major cone.*—The major cone is a cone having an apex angle equal to that of the pitch cone, the surface of which would bound the crest of an external thread or the root of an internal thread.

3. *Sharp major cone.*—The sharp major cone is a cone having an apex angle equal to that of the pitch cone, the surface of which would pass through the sharp crest of an external thread or the sharp root of an internal thread.

4. *Minor cone.*—The minor cone is a cone having an apex angle equal to that of the pitch cone, the surface of which would bound the root of an external thread or the crest of an internal thread.



Base
Frn
frn
INTERNAL THREAD
Root
hdn
hn
α
2α
p/2
Root
rrn
Srn
Pitch Line
Flank
han
Crest
rcn
Crest
fcn
Kn
Scn
90°
En
Dn
Fcn
Axis of Internal Thread
Kn Minor Diameter
En Pitch Diameter
Dn Major Diameter
W
Fcs
fcs
Scs
Crest
Crest
rcs
has
Pitch Line
Flank
hs
hds
p Pitch
H
rrs
Root
frs
Srs
Frs
90°
Xs
Ds
Es
EXTERNAL THREAD
Axis of External Thread
T
Mw
Ks Minor Diameter
Es Pitch Diameter
Ds Major Diameter

FIGURE II.2.—*General screw thread symbols.*

NOTE. These diagrams are not intended to show standard thread forms but illustrate only the application of symbols

5. *Sharp minor cone.*—The sharp minor cone is a cone having an apex angle equal to that of the pitch cone, the surface of which would pass through the sharp root of an external thread or the sharp crest of an internal thread.

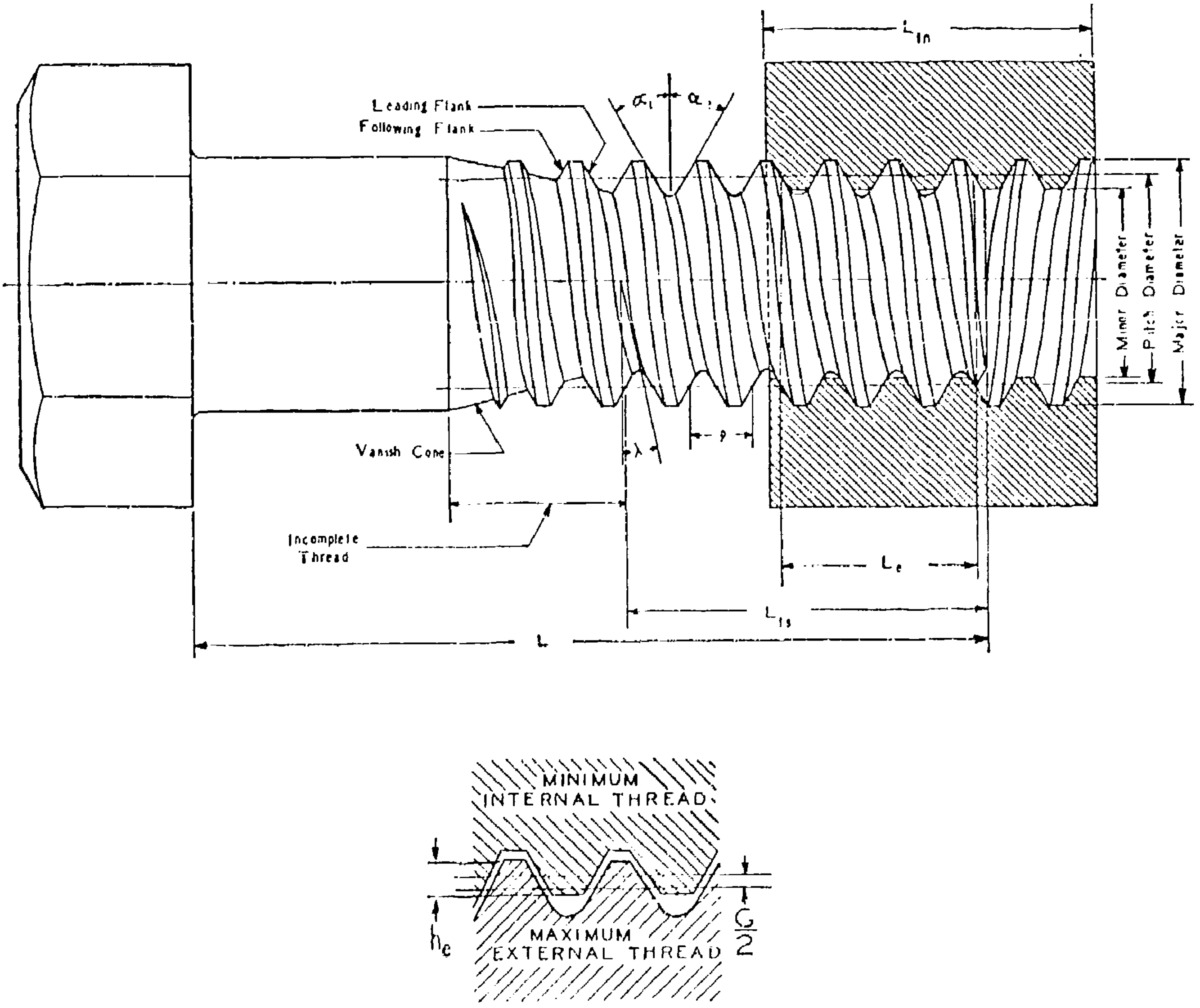
6. *Standoff.*—The standoff is the axial distance between specified reference points on external and internal taper threaded members or gages, when assembled with a specified torque or under other specified conditions.

7. *Bottom of chamfer.*—On a chamfered internal taper thread the bottom of the chamfer is defined as the intersection of the chamfer cone and the pitch cone of the thread.

3. LETTER SYMBOLS AND ABBREVIATIONS

Symbols associated with screw threads are of two kinds: (1) Letter symbols for designating dimensions of screw threads and threaded products; and (2) abbreviations used as designations for various standard thread forms and thread series.

(a) DIMENSIONAL SYMBOLS.—Standard letter symbols to designate the dimensions of screw threads are given in tables II.1 and II.2. General symbols are given in table II.1 and pipe-thread symbols in table II.2. The application of general symbols is illustrated in figures II.2 and II.3, inclusive, and pipe-thread symbols in figure II.4.



L_{in}
α_1
α_2
Leading Flank
Following Flank
Minor Diameter
Pitch Diameter
Major Diameter
Vanish Cone
λ
p
Incomplete Thread
L_e
L_{ts}
L
MINIMUM INTERNAL THREAD
h_e
$\frac{G}{2}$
MAXIMUM EXTERNAL THREAD

FIGURE II.3.—*General screw thread symbols.*

(b) IDENTIFICATION DESIGNATIONS.—Identification designations are capital letter abbreviations of names used to designate various forms of thread and thread series, and commonly consist of combinations of such abbreviations. There are assembled in table II.3 the names and abbreviations which are now in use, together with references to standards in which they occur, of various standard threads. See also p. 26.

The method of designating a screw thread is by the use of the initial letters of the thread series, preceded by the diameter in inches (or the screw number) and number of threads per inch, all in Arabic characters, and followed by the classification of allowance and tolerance in Arabic numerals. The designation applicable to each thread series is stated in the section where such series is presented, together with examples. If the thread is left hand, the symbol "*LH*" shall follow the class. No symbol is used to distinguish right hand threads. The number of threads per inch shall be indicated in all cases, irrespective of whether it is the standard number of threads for that particular size of threaded part, or special. Tools and gages for standard thread diameters and pitches shall bear standard identification designations, and special marking of such items shall be avoided.

Multiple threads shall be designated by showing both the pitch and the lead in accordance with examples given in the section on Acme threads.

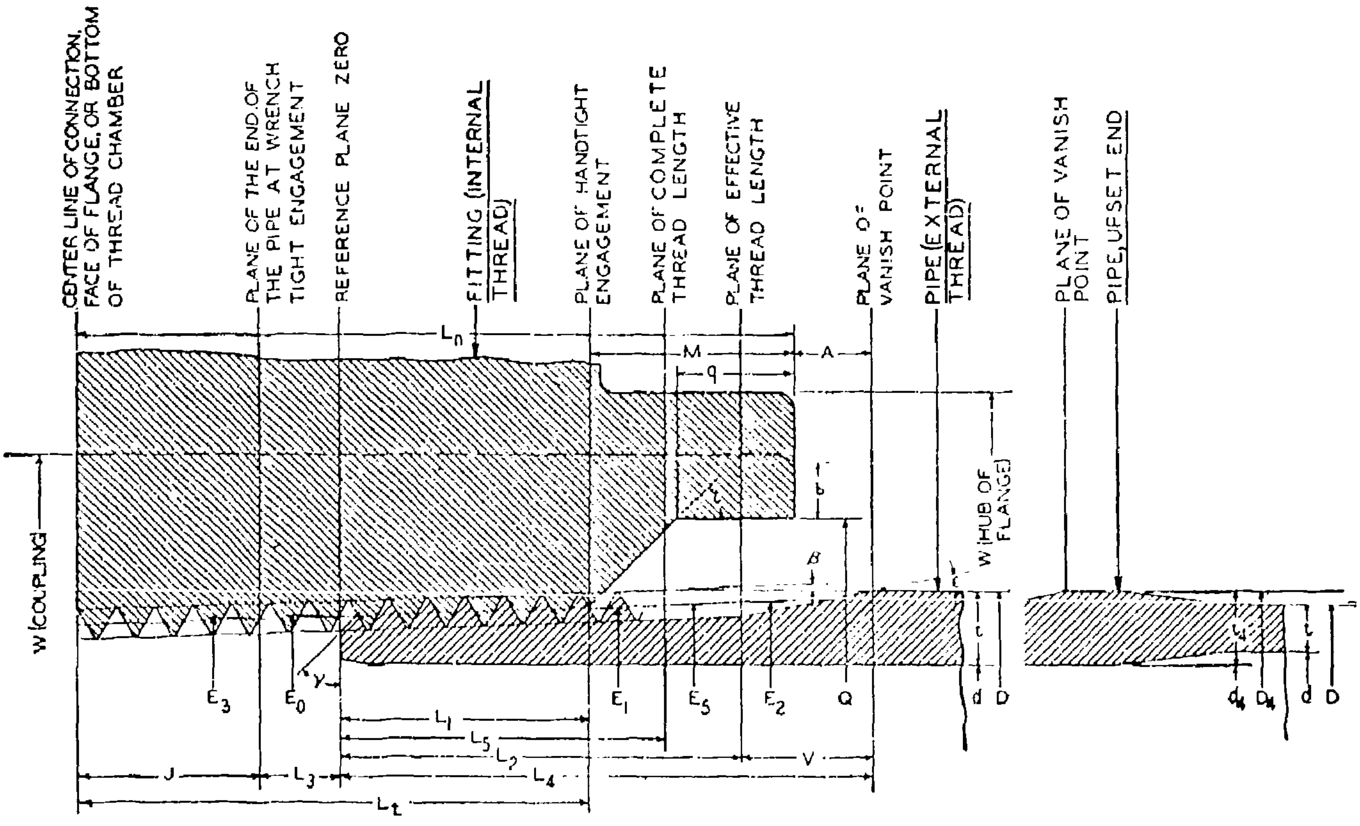

CENTER LINE OF CONNECTION, FACE OF FLANGE, OR BOTTOM OF THREAD CHAMBER
PLANE OF THE END OF THE PIPE AT WRENCH TIGHT ENGAGEMENT
REFERENCE PLANE ZERO
FITTING (INTERNAL THREAD)
PLANE OF HANDTIGHT ENGAGEMENT
PLANE OF COMPLETE THREAD LENGTH
PLANE OF EFFECTIVE THREAD LENGTH
PLANE OF VANISH POINT
PIPE (EXTERNAL THREAD)
PLANE OF VANISH POINT
PIPE, UPSET END
W(COUPLING)
W(HUB OF FLANGE)
L_n
M
A
q
B
b
t
E_3
E_0
Y
E_1
E_5
E_2
Q
d
D
d_4
D_4
d
D
L_1
L_5
L_2
L_4
V
J
L_3
L_t

FIGURE II.4.—*Pipe thread symbols.*

TABLE II.1.—*General symbols (see figs. II.2 and II.3)*

Symbols	Dimensions	Remarks
D	Major diameter	*Exception:* B is used for basic major diameter when this differs from the nominal major diameter. Subscripts s or n, indicating external or internal thread, may be used if necessary.
E	Pitch diameter	Subscripts s or n, indicating external or internal thread, may be used if necessary.
K	Minor diameter	
p	Pitch	Equals $1/n$.
l	Lead	Equals $1/N$
n	Number of threads per unit of length (per inch).	Equals $1/p$.
N	Number of turns per unit of length (per inch).	Equals $1/l$.
H	Height of fundamental triangle.	
h	Height of thread	Subscripts s or n, indicating external or internal thread, may be used if necessary.
h_a	Addendum.	
h_d	Dedendum.	
h_b	Equals $2h_a$ of basic external thread.	
h_e	Depth of thread engagement.	
α (alpha)	Half-angle of symmetrical thread.	
α_1	Angle between leading flank of thread and normal to axis of thread.	
α_2	Angle between following flank of thread and normal to axis of thread.	
λ (lambda)	Lead angle	$\operatorname{Tan} \lambda=\frac{l}{\pi E}$.
r	Radius of rounding at crest, or radius of rounding at root.	Subscripts c or r indicating crest or root, and s or n indicating external or internal thread may be used if necessary.
	Depth from apex of fundamental triangle to adjacent root or crest of thread:	
s	(1) If rounded.	
‡f	(2) If flat.	
	Depth from apex of fundamental triangle to:	
‡f_{cs}	(1) Flat at crest of external thread.	
f_{rs}	(2) Flat at root of external thread.	
f_{cn}	(3) Flat at crest of internal thread.	
f_{rn}	(4) Flat at root of internal thread.	
	Width of:	
F	(1) Flat (general).	
F_{cs}	(2) Flat at crest of external thread.	
F_{rs}	(3) Flat at root of external thread.	
F_{cn}	(4) Flat at crest of internal thread.	
F_{rn}	(5) Flat at root of internal thread.	
L	Length of bolt or screw.	
L_t	Length of full thread	Subscripts s or n may be used.
L_e	Length of thread engagement.	
w	Diameter of measuring wires.	
M_w	Measurement over wires.	
T	Measurement under wires.	
C	Correction to measurement over wires to give pitch diameter.	$E=M_w-C-c$. $C=w(1+\operatorname{cosec}\alpha)-(\cot\alpha)/2n$
P	Correction to measurement under wires to give pitch diameter.	$E=T+P-c$. $P=1/2p\cot\alpha-(\operatorname{cosec}\alpha-1)w$.
λ'	Wire angle	See NPL "Gauging and Measuring Screw Threads," 1951, p. 23, or NBS Handbook H28 (1957), p. 197
c	Wire angle correction	
Prefix symbol with δ (delta).	Deviation in any dimension.	*Examples:* Deviation in pitch, δp; deviation in half-angle, $\delta\alpha_1$ or $\delta\alpha_2$.
δE_α (delta E_α).	Pitch-diameter equivalent of deviations in flank angles.	
δE_p (delta E_p).	Pitch diameter equivalent of deviation in pitch.	
G	Allowance at pitch diameter.	

TABLE II.2.—*Pipe-thread symbols (see fig. II.4)*

Symbols	Dimensions	Remarks
D	Outside diameter of pipe	Subscript 4 is used for dimensions in plane of vanish point when these differ from D, d, or t, respectively.
d	Inside diameter of pipe	
t	Wall thickness of pipe	
D_x	Major diameter	Subscript x denotes plane containing the diameter. For axial positions of planes see foot of this table. Subscripts s or n designating screw or nut may also be used if necessary.
E_x	Pitch diameter	
K_x	Minor diameter	
L_x	Length of thread from plane of pipe end to plane containing basic diameter D_x, E_x, or K_x.	For axial position of plane containing basic diameter, see foot of this table.
V	Length of washout (vanish cone) threads.	
β (beta)	Half apex angle of pitch cone of taper thread.	
γ (gamma)	Angle of chamfer at end of pipe measured from a plane normal to the axis.	
A	Handtight standoff of face of coupling from plane containing vanish point on pipe.	
M	Length from plane of handtight engagement to the face of coupling on internally threaded member.	
S	Distance of gaging step of plug gage from face of ring gage for handtight engagement.	
L_n	Length from center line of coupling, face of flange, or bottom of internal thread chamber to face of fitting.	
b	Width of bearing face on coupling.	
τ (tau)	Angle of chamfer at bottom of recess or counterbore measured from the axis.	
ϵ (epsilon)	Halfapex angle of vanish cone.	
J	Length from center line of coupling, face of flange, or bottom of internal thread chamber to end of pipe, wrenched engagement.	
L_t	(1) Length of straight full thread (see table II.1). (2) Length from plane of handtight engagement to small end of full internal taper thread.	
Q	Diameter of recess or counterbore in fitting.	
q	Depth of recess or counterbore in fitting.	
W	Outside diameter of coupling or hub of fitting.	

DEFINITION OF PLANES DENOTED BY SUBSCRIPT x

$x=0$	Plane of pipe end	
$x=1$	Plane of handtight engagement or plane at mouth of coupling (excluding recess, if present). On British pipe threads this is designated the "gauge plane," and the major diameter in this plane is designated the "gauge diameter."	
$x=2$	Plane at which washout threads on pipe commence.	
$x=3$	Plane in coupling reached by end of pipe in wrenched condition. (L_3 is measured from plane containing pipe end in position of handtight engagement.)	
$x=4$	Plane containing vanish point of thread on pipe.	
$x=5$	Plane at which major diameter cone of thread intersects outside diameter of pipe.	

NOTE.—Additional special subscripts are as follows: Plane $x=6$ is the plane of the pipe end for railing joints. Plane $x=7$ is the plane of the API gage point at a specified length from the plane of vanish point. Plane $x=8$ is the plane of the large end of the "L_8 thread ring gage" for the compressed-gas cylinder valve inlet connection thread. Plane $x=9$ is the plane of the small end of the "L_9 thread plug gage" for the compressed-gas cylinder inlet thread.

TABLE II.3.—*Identification designations* [1] [2]

Designation	Thread series	References	
		ASA Standards	Handbook H28 (1957), section No.
Acme-C	Acme threads, centralizing	B1.5	XII.
Acme-G	Acme threads, general purpose	B1.5	XII.
Stub Acme	Stub Acme thread	B1.8	XIII.
AMO	American Standard microscope objective thread		
N. Butt	National Buttress thread	B1.9	XIV.
NC	American National coarse thread series	B1.1	Appendix 1.
NF	American National fine thread series	B1.1	Appendix 1.
NEF	American National extra-fine thread series	B1.1	Appendix 1.
8N	American National 8-thread series	B1.1	Appendix 1.
12N	American National 12-thread series	B1.1	Appendix 1.
16N	American National 16-thread series	B1.1	Appendix 1.
NH	American National hose coupling and fire hose coupling threads	B26, B33.1	X.
NGO	American National gas outlet thread	B57.1	IX.
NM	National Miniature thread series	B1.4	V.
NS	Special threads of American National form	B1.1	Appendix 2.
NC	American Standard coarse thread series	B1.1	III.
NF	American Standard fine thread series	B1.1	III.
NPT	American Standard taper pipe thread	B2.1	VII.
NPTF	American Standard taper pipe thread (dryseal)	B2.2	VIII.
NPTR	American Standard taper pipe thread for railing fittings	B2.1	VII.
NPS	American Standard straight pipe thread	B2.1	VII.
NPSC	American Standard straight pipe thread in couplings	B2.1	VII.
NPSF	American Standard internal straight pipe thread (dryseal)	B2.2	VIII.
NPSI	American Standard intermediate internal straight pipe thread (dryseal)	B2.2	VIII.
NPSM	American Standard straight pipe thread for mechanical joints	B2.1	VII.
NPSL	American Standard straight pipe thread for locknuts and locknut pipe threads	B2.1	VII.
NPSH	American Standard straight pipe thread for hose couplings and nipples	B2.1, B33.1	X.
ANPT	Aeronautical taper pipe thread	(3)	(3).
RMS	American Standard surveying instrument mounting thread	Under development	
UNC	Unified coarse thread series	B1.1	III.
UNEF	Unified selected diameter-pitch combinations of the extra-fine thread series	B1.1	III.
UNF	Unified fine thread series	B1.1	III.
UN	Unified selected diameter-pitch combinations of the 8-, 12-, and 16-thread series	B1.1	III.
UNS	Unified threads of selected special diameters, pitches, and lengths of engagement	B1.1	IV.

[1] Methods of designating multiple threads are shown in ASA B1.5 Acme Screw Threads, and Part III of Handbook H28 (1957).

[2] All threads, except NGO, are right hand, unless otherwise designated. For NGO threads, designations "RH" or "LH" are required.

[3] Military Specification MIL-P-7105, Pipe Threads, Taper, Aeronautical National Form.

SECTION III. UNIFIED THREAD FORM AND THREAD SERIES FOR BOLTS, MACHINE SCREWS, NUTS, TAPPED HOLES, AND GENERAL APPLICATIONS

1. INTRODUCTION

The Unified thread standards,[2] which have been agreed upon by standards bodies of Canada, the United Kingdom, and the United States, constitute the basic American standards for fastening screw threads. They are a complete and integrated system of threads for fastening purposes in mechanisms and structures. Their outstanding characteristic is general interchangeability of threads achieved through the standardization of thread form, diameter-pitch combinations, and limits of size.

The standards have as their original basis the work done about a century ago by William Sellers in the United States and Sir Joseph Whitworth in Great Britain. Throughout the intervening years there have been many further developments and revisions, culminating in the system of Unified Threads approved and adopted for use by all inch-using countries.

Unification of screw thread standards received its impetus from the need for interchangeability among the billions of fasteners used in the complex equipment of modern warfare which was, and continues to be made in different countries. Equally important, however, are international trade in mechanisms of all kinds and the servicing of transportation equipment which moves from country to country. These have made unification not only highly advantageous but practically essential. In sizes ¼ in. and larger, complete unification of certain thread series and six tolerance classes was signalized by the signing of an accord on November 18, 1948. Since that time a limited unification of seven sizes only for attachment purposes has been extended into smaller sizes. Although thread sizes less than ¼ in. have not been unified, the tolerances and allowances based on Unified formulation are applied to these sizes in the United States and Canada, and they are known as American Standard threads.

In relation to previous American practice, as covered by appendixes 1 and 2 of this Handbook, Unified threads have substantially the same thread form and are mechanically interchangeable with American National threads of the same diameter and pitch.

The principal differences between the two systems relate to the application of allowances, the variation of tolerances with size, difference in amount of pitch diameter tolerance on external and internal threads, and differences in thread designations. Under the Unified system an allow-

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[2] The Unified thread standards presented in this section are in general agreement with ASA B1.1, "Unified and American Screw Threads," published by the ASME, 29 West 39th Street, New York 18, N. Y.; also with CSA B1.1, "Standard for Unified and American Screw Threads," published by the Canadian Standards Association, Ottawa, Canada; and with British Standard 1580, "Unified Screw Threads," published by the British Standards Institution, 2 Park Street, London, W. 1. The latest revision should be consulted when referring to such standards.

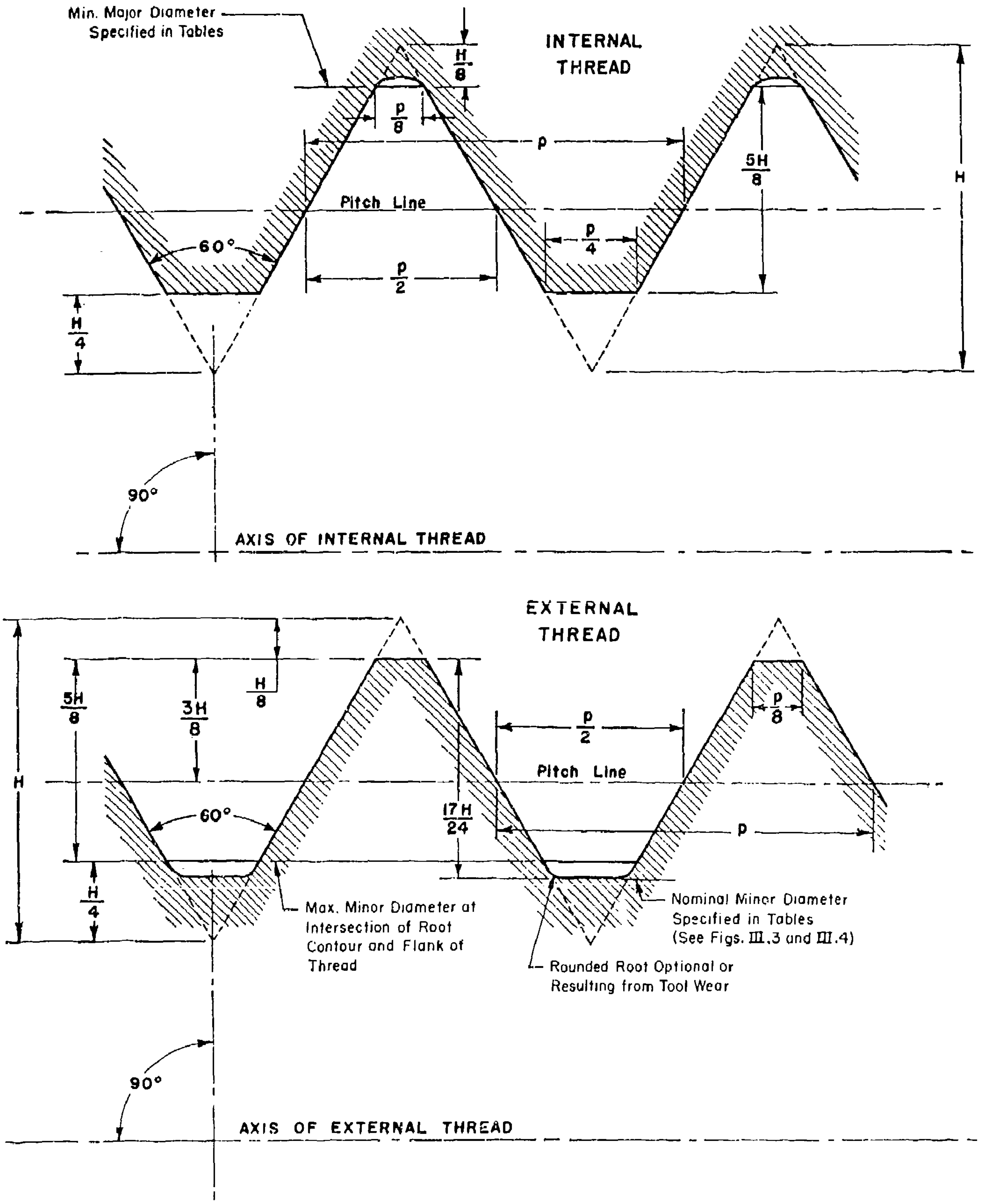

Min. Major Diameter
Specified in Tables
H/8
INTERNAL
THREAD
p/8
p
5H/8
H
Pitch Line
60°
p/4
p/2
H/4
90°
AXIS OF INTERNAL THREAD
EXTERNAL
THREAD
H/8
5H/8
3H/8
p/8
p/2
Pitch Line
H
60°
17H/24
p
H/4
Max. Minor Diameter at
Intersection of Root
Contour and Flank of
Thread
Nominal Minor Diameter
Specified in Tables
(See Figs. III.3 and III.4)
Rounded Root Optional or
Resulting from Tool Wear
90°
AXIS OF EXTERNAL THREAD

FIGURE III.1.—*Unified internal and external screw thread design forms (maximum material condition).*

NOTE.—See table III.1 for numerical values. In practice the crests of external threads may be rounded.

ance is provided on both the classes 1A and 2A external threads, whereas under the American National system only the class 1 external thread has an allowance. Under the Unified system, the pitch diameter tolerance of an internal thread is 30 percent greater than that of the external thread, but such tolerances are equal under the American National system. Unified tolerances and allowances for both standard and special diameter-pitch combinations are derived from the same formula, but American National tolerances for special threads have a different basis from that for some standard threads.

2. THE UNIFIED FORM OF THREAD

1. ANGLE OF THREAD.—The basic angle of thread between the flanks of the thread, measured in an axial plane, is 60°. The line bisecting this 60° angle is perpendicular to the axis of the screw thread.

2. FORM OF CREST.—The form of the crest of external threads is flat. The crest of the basic thread form of the external thread shall be truncated from the sharp crest an amount equal to $H/8$, where H is the depth of the fundamental triangle. The form of the crest of internal threads is flat and the crest shall be truncated from the sharp crest an amount equal to $H/4$.

3. FORM OF ROOT.—The crest clearances allowed are such as to permit rounded root forms in both the external and internal threads. Rounded roots are required in some applications and are made by tools that are purposely rounded. Otherwise, rounded roots may be the result of tool wear.

4. CLEARANCE AT MINOR DIAMETER.—A clearance is provided at the minor diameter of the internal thread by truncating from the sharp crest an amount equal to $H/4$.

5. CLEARANCE AT MAJOR DIAMETER.—A clearance is provided at the major diameter of the internal thread by making the thread form at the root such that its width is less than $p/8$.

6. ILLUSTRATIONS.—Figure III.1 shows the design forms (maximum material condition) of the external and internal threads of the Unified form of thread.

7. BASIC THREAD DATA.—The basic thread data for all standard pitches of the Unified form of thread are given in table III.1.

TABLE III.1.—*Thread data, Unified thread form (see fig. III.2)*

Threads per inch, n	Pitch, p	Flat at internal thread crest, $F_{cn} = p/4 = 0.25p$	Flat at internal thread root and external thread crest, $F_{rn} = F_{cs} = p/8 = 0.125p$	Height of sharp V-thread, $H = 0.866025p$	Truncation of internal thread root and external thread crest, $f_{rn} = f_{cs} = H/8 = 0.10825p$	Truncation of external thread root, $s_{rs} = H/6 = 0.14434p$	Half addendum of external thread, $^{3}/_{16}H = 0.16238p$	Truncation of internal thread crest, $f_{cn} = H/4 = 0.21651p$	Addendum of external thread, $h_{as} = ^{3}/_{8}H = 0.32476p$	Height of internal thread and depth of thread engagement, $h_n = h_e = ^{5}/_{8}H = 0.54127p$	Height of external thread, $h_s = ^{17}/_{24}H = 0.61343p$	Twice the external thread addendum[a], $h_b = 2h_{as} = ^{3}/_{4}H = 0.649519p$	Difference between max. major and pitch diameters of internal thread, $^{11}/_{12}H = 0.79386p$	Double height of internal thread, $2h_n = 1^{1}/_{4}H = 1.08253p$	Double height of external thread, $1^{5}/_{12}H = 1.22687p$
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	0.012500	0.00312	0.00156	0.010825	0.00135	0.00180	0.00203	0.00271	0.00406	0.00677	0.00767	0.008119	0.00992	0.01353	0.01534
72	.013889	.00347	.00174	.012028	.00150	.00200	.00226	.00301	.00451	.00752	.00852	.009021	.01103	.01504	.01704
64	.015625	.00391	.00195	.013532	.00169	.00226	.00254	.00338	.00507	.00846	.00958	.010149	.01240	.01691	.01917
56	.017857	.00446	.00223	.015465	.00193	.00258	.00290	.00387	.00580	.00967	.01095	.011599	.01418	.01933	.02191
48	.020833	.00521	.00260	.018042	.00226	.00301	.00338	.00451	.00677	.01128	.01278	.013532	.01654	.02255	.02556
44	.022727	.00568	.00284	.019682	.00246	.00328	.00369	.00492	.00738	.01230	.01394	.014762	.01804	.02460	.02788
40	.025000	.00625	.00312	.021651	.00271	.00361	.00406	.00541	.00812	.01353	.01534	.016238	.01985	.02706	.03067
36	.027778	.00694	.00347	.024056	.00301	.00401	.00451	.00601	.00902	.01504	.01704	.018042	.02205	.03007	.03408
32	.031250	.00781	.00391	.027063	.00338	.00451	.00507	.00677	.01015	.01691	.01917	.020297	.02481	.03383	.03834
28	.035714	.00893	.00446	.030929	.00387	.00515	.00580	.00773	.01160	.01933	.02191	.023197	.02835	.03866	.04382
27	.037037	.00926	.00463	.032075	.00401	.00535	.00601	.00802	.01203	.02005	.02272	.024056	.02940	.04009	.04544
24	.041667	.01042	.00521	.036084	.00451	.00601	.00677	.00902	.01353	.02255	.02556	.027063	.03308	.04511	.05112
20	.050000	.01250	.00625	.043301	.00541	.00722	.00812	.01083	.01624	.02706	.03067	.032476	.03969	.05413	.06134
18	.055556	.01389	.00694	.048113	.00601	.00802	.00902	.01203	.01804	.03007	.03408	.036084	.04410	.06014	.06816
16	.062500	.01562	.00781	.054127	.00677	.00902	.01015	.01353	.02030	.03383	.03834	.040595	.04962	.06766	.07668
14	.071429	.01786	.00893	.061859	.00773	.01031	.01160	.01546	.02320	.03866	.04382	.046394	.05670	.07732	.08763
13	.076923	.01923	.00962	.066617	.00833	.01110	.01249	.01665	.02498	.04164	.04719	.049963	.06107	.08327	.09437
12	.083333	.02083	.01042	.072169	.00902	.01203	.01353	.01804	.02706	.04511	.05112	.054127	.06615	.09021	.10224
11½	.086957	.02174	.01087	.075307	.00941	.01255	.01412	.01883	.02824	.04707	.05334	.056480	.06903	.09413	.10668
11	.090909	.02273	.01136	.078730	.00984	.01312	.01476	.01968	.02952	.04921	.05577	.059047	.07217	.09841	.11153
10	.100000	.02500	.01250	.086603	.01083	.01443	.01624	.02165	.03248	.05413	.06134	.064952	.07939	.10825	.12269
9	.111111	.02778	.01389	.096225	.01203	.01604	.01804	.02406	.03608	.06014	.06816	.072169	.08821	.12028	.13632
8	.125000	.03125	.01562	.108253	.01353	.01804	.02030	.02706	.04059	.06766	.07668	.081190	.09923	.13532	.15336
7	.142857	.03571	.01786	.123718	.01546	.02062	.02320	.03093	.04639	.07732	.08763	.092788	.11341	.15465	.17527
6	.166667	.04167	.02083	.144338	.01804	.02406	.02706	.03608	.05413	.09021	.10224	.108253	.13231	.18042	.20448
5	.200000	.05000	.02500	.173205	.02165	.02887	.03248	.04330	.06495	.10825	.12269	.129904	.15877	.21651	.24537
4½	.222222	.05556	.02778	.192450	.02406	.03208	.03608	.04811	.07217	.12028	.13632	.144338	.17641	.24056	.27264
4	.250000	.06250	.03125	.216506	.02706	.03608	.04059	.05413	.08119	.13532	.15336	.162380	.19846	.27063	.30672

[a] Equivalent to the "basic height" h of the original American National form.

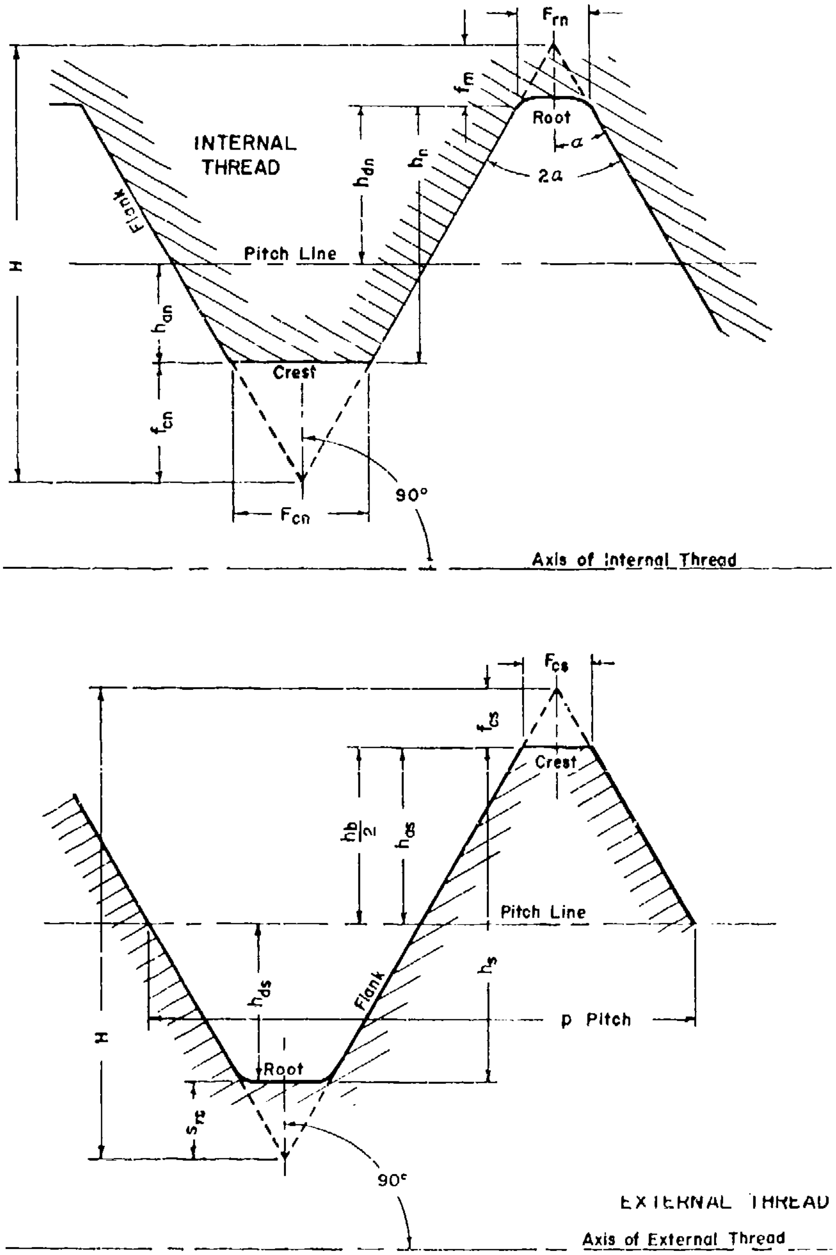
NOTE.—$h_{an} - f_{rn} = \frac{H}{4}$.

$h_{dn} = h_{as} = \frac{3}{8}H$.

3. THREAD SERIES, SYMBOLS, AND SUGGESTED APPLICATIONS

1. Thread Series Definition.—Thread series are groups of diameter-pitch combinations distinguished from each other by the number of threads per inch applied to a specific diameter. The various diameter-pitch combinations of the six standard series are shown in table III.2, and the designations for the various thread series are shown in the dimensional tables.

2. Coarse-Thread Series.—The basic dimensions of the coarse-thread series, including both Unified thread sizes and additional American standard thread sizes, are given in table III.3. The limits of size, allowances, and tolerances for the Unified classes, based on a length of engagement of one diameter, are given in table III.10. Thread sizes of the coarse-thread series that are recognized as Unified are designated by the symbol "UNC". See footnote b, p. 16. All others are designated by "NC" with the Unified class designations to indicate their conformance to the Unified thread formulation.



F_{rn}
f_{rn}
Root
a
$2a$
INTERNAL THREAD
h_{dn}
h_n
Flank
Pitch Line
H
h_{an}
f_{cn}
Crest
90°
F_{cn}
Axis of Internal Thread
F_{cs}
f_{cs}
Crest
$\frac{h_b}{2}$
h_{ds}
Pitch Line
h_s
Flank
p Pitch
H
h_{as}
Root
f_{rs}
90°
EXTERNAL THREAD
Axis of External Thread

Figure III.2.—*Symbols for thread data in table III.1.*

The coarse-thread series is suitable for bolts, screws, nuts, and general use where the wall thickness will accommodate the thread dimensions. It is particularly advantageous for applications requiring rapid assembly or disassembly or for threading into lower-strength materials, such as castings, soft metals, and plastics.

3. Fine-Thread Series.—The basic dimensions of the fine-thread series, including both Unified thread sizes and additional American standard thread sizes, are given in table III.4. The limits of size, allowances, and tolerances for the Unified classes, based on a length of engagement of one diameter, are given in table III.10. Thread sizes of the fine-thread series which are recognized as Unified are designated by the symbol "UNF". See footnote c, p. 16. All others are designated "NF" with the Unified class designations to indicate their conformance to the Unified thread formulation.

The fine thread series is suitable for bolts, screws, and nuts, and other applications where a closer ratio is desired between the static strengths of the bolt and thread, where length of engagement is limited, where a smaller lead angle is desired, or where the wall thickness requires a smaller thread. Caution should be observed when using this series in castings, soft metals, plastics, and similar lower-strength materials.

4. Extra-Fine Thread Series.—The extra-fine-thread series is applicable where (1) thin-walled material is to be threaded, (2) thread height of nuts clearing ferrules, coupling flanges, etc., must be held to a minimum, and (3) a maximum practicable number of threads is required within a given thread length. The basic dimensions of the extra-fine-thread series are given in table III.5. The limits of size, allowances, and tolerances for the Unified classes, based on a length of engagement of 9 pitches, are given in table III.10. Thread sizes of the extra-fine-thread series which are recognized as Unified are designated by the symbol "UNEF". All others are designated by "NEF" with the Unified class designations to indicate their conformance to the Unified thread formulation.

5. 8-Thread Series.—The 8-thread series is a uniform-pitch series for large diameters. Although originally intended for high-pressure-joint bolts and nuts, it is now widely used as a substitute for the coarse-thread series for diameters larger than 1 in. It is used particularly on bolts for high-pressure pipe flanges, cylinder-head studs, and similar fasteners against pressure. The basic dimensions of the 8-thread series are given in table III.6. In American practice, the limits of size of this series are customarily based on a length of engagement of one diameter, as given in table III.10. Such threads are designated "8N" with the Unified class designations to indicate their conformance to the Unified thread formulation. Sizes of the 8-thread series[3] larger than 1½ in. in even ⅛ in. are recognized as Unified sizes when limits of size are based on a length of engagement of 9 pitches, or 1⅛ in.

6. 12-Thread Series.—The 12-thread series is a uniform-pitch series for large diameters requiring threads of medium-fine pitch. It is widely used in machine construction for thin nuts on shafts and sleeves. It also allows the specification of shoulder diameters in steps of ⅛ in., as from the standpoints of good design and simplification of practice it is desirable to limit shoulder diameters to ⅛-in. steps. Twelve threads per inch is the coarsest pitch in general use which will permit a threaded collar, which screws onto a threaded shoulder, to slip over a shaft, the difference in diameter between shoulder and shaft being ⅛ in. Sizes of the 12-thread series from ½ in. to and including 1¾ in. are used in boiler practice, which requires that worn stud holes be retapped with a tap of the next larger size, the increment being 1/16 in. throughout most of the range. The 12-thread series also provides continuation of the fine-thread series for diameters larger than 1½ in.

The basic dimensions of the 12-thread series are given in table III.7. The limits of size, allowances, and tolerances for the Unified classes, based on a length of engagement of 9 pitches or ¾ in., are given in table III.10. Thread sizes of the 12-thread series which are recognized as Unified are designated by the symbol "12UN." All others are designated "12N" with the Unified class designations to indicate their conformance to the Unified thread formulation.[3]

7. 16-Thread Series.—The 16-thread series is a uniform-pitch series for large diameters requiring fine-pitch threads. It is suitable for adjusting collars and retaining nuts, and also serves as a continuation of the extra-fine-thread series for diameters larger than 2 in. The basic dimensions of the 16-thread series are given in table III. 8. The limits of size, allowances, and tolerances for the Unified classes, based on a length of engagement of 9 pitches or 9/16 in., are given in table III. 10. Thread sizes of the 16-thread series which are recognized as Unified are designated by the symbol "16UN." All others are designated "16N" with the Unified class designations to indicate their conformance to the Unified thread formulation (see footnote 3).

8. Uniform Pitch Series.—The above 8-, 12-, and 16-thread series have application on parts that are repeatedly assembled and disassembled where it might be advantageous to rethread oversize to recondition the thread portions of the parts in service.

Whenever a thread in the 8-, 12-, and 16-thread series also appears in the UNC, NC, UNF, NF, UNEF or NEF series the designations, tolerances, and limits of size of these standard series are applicable.

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[3] The British designation for Unified sizes in this series is "UNS".

TABLE III.2.—*Unified and American, screw thread standard series*

Size	Basic major diameter	Threads per inch						Size
		Coarse (UNC or NC)	Fine [a] (UNF or NF)	Extra fine [b] (UNEF or NEF)	8-Thread series (N)	12-Thread series (UN or N)	16-Thread series (UN or N)	
0	0.0600		80					0
1	.0730	64	72					1
2	.0860	56	64					2
3	.0990	48	56					3
4	.1120	40	48					4
5	.1250	40	44					5
6	.1380	32	40					6
8	.1640	32	36					8
10	.1900	24	32					10
12	.2160	24	28	32				12
1/4	.2500	20	28	32				1/4
5/16	.3125	18	24	32				5/16
3/8	.3750	16	24	32				3/8
7/16	.4375	14	20	28				7/16
1/2	.5000	13	20	28		12		1/2
9/16	.5625	12	18	24		[c] 12		9/16
5/8	.6250	11	18	24		12		5/8
11/16	.6875			24		12		11/16
3/4	.7500	10	16	20		12	[c] 16	3/4
13/16	.8125			20		12	16	13/16
7/8	.8750	9	14	20		12	16	7/8
15/16	.9375			20		12	16	15/16
1	1.0000		[e] 14					1
1	1.0000	8	12	20	[c] 8	[c] 12	16	1
1 1/16	1.0625			18		12	16	1 1/16
1 1/8	1.1250	7	12	18	[d] 8	[c] 12	16	1 1/8
1 3/16	1.1875			18		12	16	1 3/16
1 1/4	1.2500	7	12	18	[d] 8	[c] 12	16	1 1/4
1 5/16	1.3125			18		12	16	1 5/16
1 3/8	1.3750	6	12	18	8	[c] 12	16	1 3/8
1 7/16	1.4375			18		12	16	1 7/16
1 1/2	1.5000	6	12	18	8	[c] 12	16	1 1/2
1 9/16	1.5625			18			16	1 9/16
1 5/8	1.6250			18	8	12	16	1 5/8
1 11/16	1.6875			18			16	1 11/16
1 3/4	1.7500	5		16	8	12	[c] 16	1 3/4
1 13/16	1.8125						16	1 13/16
1 7/8	1.8750				8	12	16	1 7/8
1 15/16	1.9375						16	1 15/16
2	2.0000	4 1/2		16	8	12	[c] 16	2
2 1/16	2.0625						16	2 1/16
2 1/8	2.1250				8	12	16	2 1/8
2 3/16	2.1875						16	2 3/16
2 1/4	2.2500	4 1/2			8	12	16	2 1/4
2 5/16	2.3125						16	2 5/16
2 3/8	2.3750					12	16	2 3/8
2 7/16	2.4375						16	2 7/16
2 1/2	2.5000	4			8	12	16	2 1/2
2 5/8	2.6250					12	16	2 5/8
2 3/4	2.7500	4			8	12	16	2 3/4
2 7/8	2.8750					12	16	2 7/8
3	3.0000	4			8	12	16	3
3 1/8	3.1250					12	16	3 1/8
3 1/4	3.2500	4			8	12	16	3 1/4
3 3/8	3.3750					12	16	3 3/8
3 1/2	3.5000	4			8	12	16	3 1/2
3 5/8	3.6250					12	16	3 5/8
3 3/4	3.7500	4			8	12	16	3 3/4
3 7/8	3.8750					12	16	3 7/8
4	4.0000	4			8	12	16	4
4 1/4	4.2500				8	12	16	4 1/4
4 1/2	4.5000				8	12	16	4 1/2
4 3/4	4.7500				8	12	16	4 3/4
5	5.0000				8	12	16	5
5 1/4	5.2500				8	12	16	5 1/4
5 1/2	5.5000				8	12	16	5 1/2
5 3/4	5.7500				8	12	16	5 3/4
6	6.0000				8	12	16	6

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[a] For diameters over 1 1/2 in., use 12-thread series.

[b] For diameters over 2 in., use 16-thread series.

[c] For series symbols applying to a particular thread, see table III.10. Where the same thread is in two series, use symbols as explained in par. 8, p. 14.

[d] Designated 8 UNS in the British Standard.

[e] NS. Formerly a standard size of the fine thread series.

TABLE III.3.—*Coarse thread series, basic dimensions*

UNC and NC

Designation: Size		Designation: Threads per inch, n	Designation: Thread symbol	Basic major diameter, D	Basic pitch diameter, E	Minor diameter, external threads, K_s	Minor diameter, internal threads, K_n	Lead angle at basic pitch diameter, λ		Sectional area at minor diameter at $D-2h_b$	Tensile stress area [a], $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
1		2	3	4	5	6	7	8		9	10
No.	*in.*			*in.*	*in.*	*in.*	*in.*	*deg*	*min*	*in.*^{2}	*in.*^{2}
1	(.073)	64	NC	0.0730	0.0629	0.0538	0.0561	4	31	0.00218	0.00263
[b] 2	(.086)	56	NC	.0860	.0744	.0641	.0667	4	22	.00310	.00370
3	(.099)	48	NC	.0990	.0855	.0734	.0764	4	26	.00406	.00487
[b] 4	(.112)	40	NC	.1120	.0958	.0813	.0849	4	45	.00496	.00604
5	(.125)	40	NC	.1250	.1088	.0943	.0979	4	11	.00672	.00796
[b] 6	(.138)	32	NC	.1380	.1177	.0997	.1042	4	50	.00745	.00909
[b] 8	(.164)	32	NC	.1540	.1437	.1257	.1302	3	58	.01196	.0140
[b] 10	(.190)	24	NC	.1900	.1629	.1389	.1449	4	39	01450	.0175
12	(.216)	24	NC	.2160	.1889	.1649	.1709	4	1	.0206	.0242
¼		20	UNC	.2500	.2175	.1887	.1959	4	11	.0269	.0318
5/16		18	UNC	.3125	.2764	.2443	.2524	3	40	.0454	.0524
⅜		16	UNC	.3750	.3344	.2983	.3073	3	24	.0678	.0775
7/16		14	UNC	.4375	.3911	.3499	.3602	3	20	.0933	.1063
½		13	UNC	.5000	.4500	.4056	.4167	3	7	.1257	.1419
9/16		12	UNC	.5625	.5084	.4603	.4723	2	59	.162	.182
⅝		11	UNC	.6250	.5660	.5135	.5266	2	56	.202	.226
¾		10	UNC	.7500	.6850	.6273	.6417	2	40	.302	.334
⅞		9	UNC	.8750	.8028	.7387	.7547	2	31	.419	.462
1		8	UNC	1.0000	.9188	.8466	.8647	2	29	.551	.606
1⅛		7	UNC	1.1250	1.0322	.9497	.9704	2	31	.693	.763
1¼		7	UNC	1.2500	1.1572	1.0747	1.0954	2	15	.890	.969
1⅜		6	UNC	1.3750	1.2667	1.1705	1.1946	2	24	1.054	1.155
1½		6	UNC	1.5000	1.3917	1.2955	1.3196	2	11	1.294	1.405
1¾		5	UNC	1.7500	1.6201	1.5046	1.5335	2	15	1.74	1.90
2		4½	UNC	2.0000	1.8557	1.7274	1.7594	2	11	2.30	2.50
2¼		4½	UNC	2.2500	2.1057	1.9774	2.0094	1	55	3.02	3.25
2½		4	UNC	2.5000	2.3376	2.1933	2.2294	1	57	3.72	4.00
2¾		4	UNC	2.7500	2.5876	2.4433	2.4794	1	46	4.62	4.93
3		4	UNC	3.0000	2.8376	2.6933	2.7294	1	36	5.62	5.97
3¼		4	UNC	3.2500	3.0876	2.9433	2.9794	1	29	6.72	7.10
3½		4	UNC	3.5000	3.3376	3.1933	3.2294	1	22	7.92	8.33
3¾		4	UNC	3.7500	3.5876	3.4433	3.4794	1	16	9.21	9.66
4		4	UNC	4.0000	3.8376	3.6933	3.7294	1	11	10.61	11.08

[a] See formula under definition of tensile stress area in Section II, p. 5.

[b] For attaching purposes only, numbered sizes 2-56, 4-40, 6-32, 8-32, and 10-24 are now included in the Unified thread series, designation NC.

Bold type indicates Unified threads, UNC. See footnote b and table III.10.

TABLE III.4.—*Fine thread series, basic dimensions*

UNF and NF

Designation: Size [a]		Designation: Threads per inch, n	Designation: Thread symbol	Basic major diameter, D	Basic pitch diameter, E	Minor diameter, external threads, K_s	Minor diameter, internal threads, K_n	Lead angle at basic pitch diameter, λ		Sectional area at minor diameter at $D-2h_b$	Tensile stress area [b], $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
1		2	3	4	5	6	7	8		9	10
No.	*in.*			*in.*	*in.*	*in.*	*in.*	*deg*	*min*	*in.*^{2}	*in.*^{2}
[c] 0	(.060)	80	NF	0.0600	0.0519	0.0447	0.0465	4	23	0.00151	0.00180
1	(.073)	72	NF	.0730	.0640	.0560	.0580	3	57	.00237	.00278
2	(.086)	64	NF	.0860	.0759	.0668	.0691	3	45	.00339	.00394
3	(.099)	56	NF	.0990	.0874	.0771	.0797	3	43	.00451	.00523
4	(.112)	48	NF	.1120	.0985	.0864	.0894	3	51	.00566	.00661
5	(.125)	44	NF	.1250	.1102	.0971	.1004	3	45	.00716	.00830
6	(.138)	40	NF	.1380	.1218	.1073	.1109	3	44	.00874	.01015
8	(.164)	36	NF	.1640	.1460	.1299	.1339	3	28	.01285	.01474
[c] 10	(.190)	32	NF	.1900	.1697	.1517	.1562	3	21	.0175	.0200
12	(.216)	28	NF	.2160	.1928	.1722	.1773	3	22	.0226	.0258
¼		28	UNF	.2500	.2268	.2062	.2113	2	52	.0326	.0364
5/16		24	UNF	.3125	.2854	.2614	.2674	2	40	.0524	.0580
⅜		24	UNF	.3750	.3479	.3239	.3299	2	11	.0809	.0878
7/16		20	UNF	.4375	.4050	.3762	.3834	2	15	.1090	.1187
½		20	UNF	.5000	.4675	.4387	.4459	1	57	.1486	.1599
9/16		18	UNF	.5625	.5264	.4943	.5024	1	55	.189	.203
⅝		18	UNF	.6250	.5889	.5568	.5649	1	43	.240	.256
¾		16	UNF	.7500	.7094	.6733	.6823	1	36	.351	.373
⅞		14	UNF	.8750	.8286	.7874	.7977	1	34	.480	.509
1		12	UNF	1.0000	.9459	.8978	.9098	1	36	.625	.663
1⅛		12	UNF	1.1250	1.0709	1.0228	1.0348	1	25	.812	.856
1¼		12	UNF	1.2500	1.1959	1.1478	1.1598	1	16	1.024	1.073
1⅜		12	UNF	1.3750	1.3209	1.2728	1.2848	1	9	1.260	1.315
1½		12	UNF	1.5000	1.4459	1.3978	1.4098	1	3	1.521	1.581

[a] For sizes larger than 1½ in., use the 12-thread series. See table III.7.

[b] See formula under definition of tensile stress area in Section II, p. 5.

[c] For attaching purposes only, numbered sizes 0-80 and 10-32 are now included in the Unified thread series, designation NF.

Bold type indicates Unified threads, UNF. See footnote c and table III.10.

TABLE III.5.—*Extra-fine thread series, basic dimensions*
UNEF and NEF

Designation			Basic major diameter, D	Basic pitch diameter, E	Minor diameter, external threads, K_s	Minor diameter, internal threads, K_n	Lead angle at basic pitch diameter, λ		Sectional area at minor diameter at $D-2h_b$	Tensile stress area [b], $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
Size [a]	Threads per inch, n	Thread symbol								
1	2	3	4	5	6	7	8		9	10
No. *in.*			*in.*	*in.*	*in.*	*in.*	*deg*	*min*	*in.*^{2}	*in.*^{2}
12 (.216)	32	NEF	0.2160	0.1957	0.1777	0.1822	2	55	0.0242	0.0270
¼	32	NEF	.2500	.2297	.2117	.2162	2	29	.0344	.0379
5/16	32	NEF	.3125	.2922	.2742	.2787	1	57	.0581	.0625
⅜	32	NEF	.3750	.3547	.3367	.3412	1	36	.0878	.0932
7/16	**28**	**UNEF**	**.4375**	**.4143**	**.3937**	**.3988**	**1**	**34**	**.1201**	**.1274**
½	**28**	**UNEF**	**.5000**	**.4768**	**.4562**	**.4613**	**1**	**22**	**.162**	**.170**
9/16	24	NEF	.5625	.5354	.5114	.5174	1	25	.203	.214
⅝	24	NEF	.6250	.5979	.5739	.5709	1	16	.256	.268
11/16	24	NEF	.6875	.6604	.6364	.6424	1	9	.315	.329
¾	**20**	**UNEF**	**.7500**	**.7175**	**.6887**	**.6959**	**1**	**16**	**.369**	**.386**
13/16	**20**	**UNEF**	**.8125**	**.7800**	**.7512**	**.7584**	**1**	**10**	**.439**	**.458**
⅞	**20**	**UNEF**	**.8750**	**.8425**	**.8137**	**.8209**	**1**	**5**	**.515**	**.536**
15/16	**20**	**UNEF**	**.9375**	**.9050**	**.8762**	**.8834**	**1**	**0**	**.598**	**.620**
1	**20**	**UNEF**	**1.0000**	**.9675**	**.9387**	**.9459**	**0**	**57**	**.687**	**.711**
1 1/16	18	NEF	1.0625	1.0261	.9943	1.0024	0	59	.770	.799
1⅛	18	NEF	1.1250	1.0889	1.0568	1.0649	0	56	.871	.901
1 3/16	18	NEF	1.1875	1.1514	1.1193	1.1274	0	53	.977	1.009
1¼	18	NEF	1.2500	1.2139	1.1818	1.1899	0	50	1.090	1.123
1 5/16	18	NEF	1.3125	1.2764	1.2443	1.2524	0	48	1.208	1.244
1⅜	18	NEF	1.3750	1.3389	1.3068	1.3149	0	45	1.333	1.370
1 7/16	18	NEF	1.4375	1.4014	1.3693	1.3774	0	43	1.464	1.503
1½	18	NEF	1.5000	1.4639	1.4318	1.4399	0	42	1.60	1.64
1 9/16	18	NEF	1.5625	1.5264	1.4943	1.5024	0	40	1.74	1.79
1⅝	18	NEF	1.6250	1.5889	1.5568	1.5649	0	38	1.89	1.94
1 11/16	18	NEF	1.6875	1.6514	1.6193	1.6274	0	37	2.05	2.10
1¾	**16**	**UNEF**	**1.7500**	**1.7094**	**1.6733**	**1.6823**	**0**	**40**	**2.19**	**2.24**
2	**16**	**UNEF**	**2.0000**	**1.9594**	**1.9233**	**1.9323**	**0**	**35**	**2.89**	**2.95**

[a] For sizes larger than 2 in., use 16-thread series. See table III. 8.

[b] See formula under definition of tensile stress area in section II, p. 5.

Bold type indicates Unified threads, UNEF. See table III. 10.

TABLE III.6.—*8-thread series, basic dimensions*
8UN and 8N [b]

Designation			Basic major diameter, D	Basic pitch diameter, E	Minor diameter, external threads, K_s	Minor diameter, internal threads, K_n	Lead angle at basic pitch diameter, λ		Sectional area at minor diameter at $D-2h_b$	Tensile stress area [c], $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
Size	Threads per inch, n	Thread symbol								
1	2	3	4	5	6	7	8		9	10
in.			*in.*	*in.*	*in.*	*in.*	*deg*	*min*	*in.*^{2}	*in.*^{2}
[a] 1	8	UNC	1.0000	0.9188	0.8466	0.8647	2	29	0.551	0.606
1⅛	8	N	1.1250	1.0438	.9716	.9897	2	11	.728	.790
1¼	8	N	1.2500	1.1688	1.0966	1.1147	1	57	.929	1.000
1⅜	8	N, UNS	1.3750	1.2938	1.2216	1.2397	1	46	1.155	1.233
1½	8	N, UNS	1.5000	1.4188	1.3466	1.3647	1	36	1.405	1.492
1⅝	8	N, UNS	1.6250	1.5438	1.4716	1.4897	1	29	1.68	1.78
1¾	8	N, UNS	1.7500	1.6688	1.5966	1.6147	1	22	1.98	2.08
1⅞	8	N, UNS	1.8750	1.7938	1.7216	1.7397	1	16	2.30	2.41
2	8	N, UNS	2.0000	1.9188	1.8466	1.8647	1	11	2.65	2.77
2⅛	8	N, UNS	2.1250	2.0438	1.9716	1.9897	1	7	3.03	3.15
2¼	8	N, UNS	2.2500	2.1688	2.0966	2.1147	1	3	3.42	3.56
2½	8	N, UNS	2.5000	2.4188	2.3466	2.3647	0	57	4.29	4.44
2¾	8	N, UNS	2.7500	2.6688	2.5966	2.6147	0	51	5.26	5.43
3	8	N, UNS	3.0000	2.9188	2.8466	2.8647	0	47	6.32	6.51
3¼	8	N, UNS	3.2500	3.1688	3.0966	3.1147	0	43	7.49	7.69
3½	8	N, UNS	3.5000	3.4188	3.3466	3.3647	0	40	8.75	8.96
3¾	8	N, UNS	3.7500	3.6688	3.5966	3.6147	0	37	10.11	10.34
4	8	N, UNS	4.0000	3.9188	3.8466	3.8647	0	35	11.57	11.81
4¼	8	N, UNS	4.2500	4.1688	4.0966	4.1147	0	33	13.12	13.38
4½	8	N, UNS	4.5000	4.4188	4.3466	4.3647	0	31	14.78	15.06
4¾	8	N, UNS	4.7500	4.6688	4.5966	4.6147	0	29	16.53	16.82
5	8	N, UNS	5.0000	4.9188	4.8466	4.8647	0	28	18.38	18.69
5¼	8	N, UNS	5.2500	5.1688	5.0966	5.1147	0	26	20.33	20.66
5½	8	N, UNS	5.5000	5.4188	5.3466	5.3647	0	25	22.38	22.72
5¾	8	N, UNS	5.7500	5.6688	5.5966	5.6147	0	24	24.52	24.88
6	8	N, UNS	6.0000	5.9188	5.8466	5.8647	0	23	26.76	27.14

[a] The 1″-8 size is in the coarse thread series, table III, 3, p. 16.

[b] The 8N specified limits for all sizes are shown in table III. 10 in light type, based on a length of engagement equal to the basic major (nominal) diameter. For special applications, where tolerances based on a length of engagement of 9 threads are more suitable than those of the standard 8 thread series (8N), the 8UNS limits for all sizes larger than 1¼ in. may be derived from the tables in section IV. The 1⅛ and 1¼ in. sizes are in table III. 10 and designated N, as the 1 diameter and 9 thread engagements are substantially equal.

[c] See formula under definition of tensile stress area in section II, p. 5.

Bold type indicates Unified threads, UNS.

TABLE III.7.—*12-thread series, basic dimensions*

12UN and 12N

Designation			Basic major diameter, D	Basic pitch diameter, E	Minor diameter, external threads, K_s	Minor diameter, internal threads, K_n	Lead angle at basic pitch diameter, λ		Sectional area at minor diameter at $D-2h_b$	Tensile stress area ᵇ, $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
Size	Threads per inch, n	Thread symbol								
1	2	3	4	5	6	7	8		9	10
in.			*in.*	*in.*	*in.*	*in.*	*deg*	*min*	*in.*²	*in.*²
½	12	N	0.5000	0.4459	0.3978	0.4098	3	24	0.121	0.138
***9/16**	12	UNC	.5625	.5084	.4603	.4723	2	59	.162	.182
⅝	12	N	.6250	.5709	.5228	.5348	2	40	.210	.232
11/16	12	N	.6875	.6334	.5853	.5973	2	24	.264	.289
¾	12	N	.7500	.6959	.6478	.6598	2	11	.323	.351
13/16	12	N	.8125	.7584	.7103	.7223	2	0	.390	.420
⅞	12	N	.8750	.8209	.7728	.7848	1	51	.462	.495
15/16	12	UN	.9375	.8834	.8353	.8473	1	43	.540	.570
***1**	12	UNF	1.0000	.9459	.8978	.9098	1	36	.625	.663
1 1/16	12	UN	1.0625	1.0084	.9605	.9723	1	30	.715	.756
***1⅛**	12	UNF	1.1250	1.0709	1.0228	1.0348	1	25	.812	.856
1 3/16	12	UN	1.1875	1.1334	1.0853	1.0973	1	20	.915	.961
***1¼**	12	UNF	1.2500	1.1959	1.1478	1.1598	1	16	1.024	1.073
1 5/16	12	UN	1.3125	1.2584	1.2103	1.2223	1	12	1.136	1.191
***1⅜**	12	UNF	1.3750	1.3209	1.2728	1.2848	1	9	1.260	1.315
1 7/16	12	UN	1.4375	1.3834	1.3353	1.3473	1	6	1.388	1.445
***1½**	12	UNF	1.5000	1.4459	1.3978	1.4098	1	3	1.52	1.58
1⅝	12	UN	1.6250	1.5709	1.5228	1.5348	0	58	1.81	1.87
1¾	12	UN	1.7500	1.6959	1.6478	1.6598	0	54	2.12	2.19
1⅞	12	UN	1.8750	1.8209	1.7728	1.7848	0	50	2.45	2.53
2	12	UN	2.0000	1.9459	1.8978	1.9098	0	47	2.81	2.89
2⅛	12	UN	2.1250	2.0709	2.0228	2.0348	0	44	3.19	3.28
2¼	12	UN	2.2500	2.1959	2.1478	2.1598	0	42	3.60	3.69
2⅜	12	UN	2.3750	2.3209	2.2728	2.2848	0	39	4.04	4.13
2½	12	UN	2.5000	2.4459	2.3978	2.4098	0	37	4.49	4.60
2⅝	12	UN	2.6250	2.5709	2.5228	2.5348	0	35	4.97	5.08
2¾	12	UN	2.7500	2.6959	2.6478	2.6598	0	34	5.46	5.59
2⅞	12	UN	2.8750	2.8209	2.7728	2.7848	0	32	6.01	6.13
3	12	UN	3.0000	2.9459	2.8978	2.9098	0	31	6.57	6.69
3⅛	12	UN	3.1250	3.0709	3.0228	3.0348	0	30	7.15	7.28
3¼	12	UN	3.2500	3.1959	3.1478	3.1598	0	29	7.75	7.89
3⅜	12	UN	3.3750	3.3209	3.2728	3.2848	0	27	8.38	8.52
3½	12	UN	3.5000	3.4459	3.3978	3.4098	0	26	9.03	9.18
3⅝	12	UN	3.6250	3.5709	3.5228	3.5348	0	26	9.71	9.86
3¾	12	UN	3.7500	3.6959	3.6478	3.6598	0	25	10.42	10.57
3⅞	12	UN	3.8750	3.8209	3.7728	3.7848	0	24	11.14	11.30
4	12	UN	4.0000	3.9459	3.8978	3.9098	0	23	11.90	12.06
4¼	12	UN	4.2500	4.1959	4.1478	4.1598	0	22	13.47	13.65
4½	12	UN	4.5000	4.4459	4.3978	4.4098	0	21	15.1	15.3
4¾	12	UN	4.7500	4.6959	4.6478	4.6598	0	19	16.9	17.1
5	12	UN	5.0000	4.9459	4.8978	4.9098	0	18	18.8	19.0
5¼	12	UN	5.2500	5.1959	5.1478	5.1598	0	18	20.8	21.0
5½	12	UN	5.5000	5.4459	5.3978	5.4098	0	17	22.8	23.1
5¾	12	UN	5.7500	5.6959	5.6478	5.6598	0	16	25.0	25.2
6	12	UN	6.0000	5.9459	5.8978	5.9098	0	15	27.3	27.5

*These are standard sizes of the UNC or UNF series.

ᵇ See formula under definition of tensile stress area in section II, p. 5.

Bold type indicates Unified threads, UN. See table III.10.

9. HIGH-TEMPERATURE, HIGH-STRENGTH APPLICATIONS.—For these applications the coarse-thread series is recommended in sizes from ¼ to 1 in. and the 8-thread series in sizes over 1 in. Limits of size are given in table III.10. Some high-temperature applications involving special physical characteristics or conditions may require modification of dimensions, and it is recommended that when such are necessary, they be applied to the external thread. See par. (b) 2, p. 23.

4. CLASSIFICATION AND TOLERANCES

(a) GENERAL

1. THREAD CLASSES.—Thread classes are distinguished from each other by the amounts of tolerance and allowance. There are established for general use six distinct classes of screw-thread tolerances and allowances. These classes, together with the accompanying specifications, are for the purpose of assuring the interchangeable

TABLE III.8.—*16-thread series, basic dimensions*

16UN and 16N

Designation			Basic major diameter, D	Basic pitch diameter, E	Minor diameter, external threads, K_s	Minor diameter, internal threads, K_n	Lead angle at basic pitch diameter, λ		Sectional area at minor diameter at $D-2h_b$	Tensile stress area[b], $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
Size	Threads per inch, n	Thread symbol								
1	2	3	4	5	6	7	8		9	10
in.			*in.*	*in.*	*in.*	*in.*	*deg*	*min*	*in.*^{2}	*in.*^{2}
[a]3/4	16	UNF	0.7500	0.7094	0.6733	0.6823	1	36	0.351	0.373
13/16	16	UN	.8125	.7719	.7358	.7448	1	29	.420	.444
7/8	16	UN	.8750	.8344	.7983	.8073	1	22	.495	.521
15/16	16	UN	.9375	.8969	.8608	.8698	1	16	.576	.604
1	16	UN	1.0000	.9594	.9233	.9323	1	11	.663	.693
1 1/16	16	UN	1.0625	1.0219	.9858	.9948	1	7	.756	.788
1 1/8	16	UN	1.1250	1.0844	1.0483	1.0573	1	3	.856	.889
1 3/16	16	UN	1.1875	1.1469	1.1108	1.1198	1	0	.961	.997
1 1/4	16	UN	1.2500	1.2094	1.1733	1.1823	0	57	1.073	1.111
1 5/16	76	UN	1.3125	1.2719	1.2358	1.2448	0	54	1.191	1.230
1 3/8	16	UN	1.3750	1.3344	1.2983	1.3073	0	51	1.315	1.356
1 7/16	16	UN	1.4375	1.3969	1.3608	1.3698	0	49	1.445	1.488
1 1/2	16	UN	1.5000	1.4594	1.4233	1.4323	0	47	1.58	1.63
1 9/16	16	N	1.5625	1.5219	1.4858	1.4948	0	45	1.72	1.77
1 5/8	16	UN	1.6250	1.5844	1.5483	1.5573	0	43	1.87	1.92
1 11/16	16	N	1.6875	1.6469	1.6108	1.6198	0	42	2.03	2.08
[a]1 3/4	16	UNEF	1.7500	1.7094	1.6733	1.6823	0	40	2.19	2.24
1 13/16	16	N	1.8125	1.7719	1.7358	1.7448	0	39	2.35	2.41
1 7/8	16	UN	1.8750	1.8344	1.7983	1.8073	0	37	2.53	2.58
1 15/16	16	N	1.9375	1.8969	1.8608	1.8698	0	36	2.71	2.77
[a]2	16	UNEF	2.0000	1.9594	1.9233	1.9323	0	35	2.89	2.95
2 1/16	16	N	2.0625	2.0219	1.9858	1.9948	0	34	3.08	3.15
2 1/8	16	UN	2.1250	2.0844	2.0843	2.0573	0	33	3.28	3.35
2 3/16	16	N	2.1875	2.1469	2.1108	2.1198	0	32	3.48	3.55
2 1/4	16	UN	2.2500	2.2094	2.1733	2.1823	0	31	3.69	3.76
2 5/16	16	N	2.3125	2.2719	2.2358	2.2448	0	30	3.91	3.98
2 3/8	16	UN	2.3750	2.3344	2.2983	2.3073	0	29	4.13	4.21
2 7/16	16	N	2.4375	2.3969	2.3608	2.3698	0	29	4.36	4.44
2 1/2	16	UN	2.5000	2.4594	2.4233	2.4323	0	28	4.60	4.67
2 5/8	16	UN	2.6250	2.5844	2.5483	2.5573	0	26	5.08	5.16
2 3/4	16	UN	2.7500	2.7094	2.6733	2.6823	0	25	5.59	5.68
2 7/8	16	UN	2.8750	2.8344	2.7983	2.8073	0	24	6.13	6.22
3	16	UN	3.0000	2.9594	2.9233	2.9323	0	23	6.69	6.78
3 1/8	16	UN	3.1250	3.0844	3.0483	3.0573	0	22	7.28	7.37
3 1/4	16	UN	3.2500	3.2094	3.1733	3.1823	0	21	7.89	7.99
3 3/8	16	UN	3.3750	3.3344	3.2983	3.3073	0	21	8.52	8.63
3 1/2	16	UN	3.5000	3.4594	3.4233	3.4323	0	20	9.18	9.29
3 5/8	16	UN	3.6250	3.5844	3.5483	3.5573	0	19	9.86	9.98
3 3/4	16	UN	3.7500	3.7094	3.6733	3.6823	0	18	10.57	10.69
3 7/8	16	UN	3.8750	3.8344	3.7983	3.8073	0	18	11.30	11.43
4	16	UN	4.0000	3.9594	3.9233	3.9323	0	17	12.06	12.19
4 1/4	16	UN	4.2500	4.2094	4.1733	4.1823	0	16	13.65	13.78
4 1/2	16	UN	4.5000	4.4594	4.4233	4.4323	0	15	15.34	15.5
4 3/4	16	UN	4.7500	4.7094	4.6733	4.6823	0	15	17.1	17.3
5	16	UN	5.0000	4.9594	4.9233	4.9323	0	14	19.0	19.2
5 1/4	16	UN	5.2500	5.2094	5.1733	5.1823	0	13	21.0	21.1
5 1/2	16	UN	5.5000	5.4594	5.4233	5.4323	0	13	23.1	23.2
5 3/4	16	UN	5.7500	5.7094	5.6733	5.6823	0	12	25.2	25.4
6	16	UN	6.0000	5.9594	5.9233	5.9323	0	11	27.5	27.7

[a] These are standard sizes of the UNF or UNEF series.

[b] See formula under definition of tensile stress area in section II, p. 5.

Bold type indicates Unified threads, UN. See table III.10.

manufacture of screw-thread parts. This standard includes classes 1A, 2A, and 3A, applied to external threads only, and classes 1B, 2B, and 3B applied to internal threads only. The requirements for a screw-thread fit for specific applications can be met by specifying the proper combination of classes for the components. For example, an external thread made to class 2A limits can be used with tapped holes made to classes 1B, 2B, or 3B limits for specific applications. It is not the purpose of this standard to limit applications of the various standard classes.

2. UNIFORM MINIMUM INTERNAL THREAD. The minimum major, pitch, and minor diameters of the internal thread are respectively the same for classes 1B, 2B, and 3B.

3. DIRECTION AND SCOPE OF TOLERANCES.—

(*a*) The tolerance on the internal thread is plus, and is applied from the basic size to above basic size.

(*b*) The tolerance on the external thread is minus, and is applied from the maximum (or design) size to below the maximum size.

(*c*) The tolerances specified represent the extreme variations permitted on the product.

4. BASIC FORMULA FOR ALLOWANCES AND TOLERANCES.—Classes identified by a numeral fol-

TABLE III.9.—*Increments in pitch-diameter tolerance formula*[1]

(PD tolerance $= C(0.0015\sqrt[3]{D}+0.0015\sqrt{L_e}+0.015\sqrt[3]{p^2})$)

Diameter, D				Length of engagement, L_e														
				Based on					Based on					Based on				
D	$0.0015\sqrt[3]{D}$	D	$0.0015\sqrt[3]{D}$	1 D for sizes	9p for tpi	20p for tpi	L_e	$0.0015\times\sqrt{L_e}$	1 D for sizes	9p for tpi	20p for tpi	L_e	$0.0015\times\sqrt{L_e}$	1 D for sizes	9p for tpi	20p for tpi	L_e	$0.0015\times\sqrt{L_e}$
in.	*in.*	*in.*	*in.*				*in.*	*in.*				*in.*	*in.*				*in.*	*in.*
0.0500	0.000553	1.9375	0.001870	#0			0.0600	0.000367	7/16			0.4375	0.000992				3.1250	0.002656
.0625	.000595	2.0000	.001890				.0625	.000375		20		.4500	.001006	3 1/4			3.2500	.002706
.0730	.000627	2.0625	.001909	#1			.0730	.000405			44	.4545	.001011			6	3.3333	.002732
.0860	.000662	2.1250	.001928				.0781	.000419	1/2	18	40	.5000	.001061				3.3750	.002754
.0938	.000682	2.1875	.001947	#2			.0800	.000440			36	.5556	.001118	3 1/2			3.5000	.002809
.0990	.000694	2.2500	.001966				.0938	.000459	9/16	16		.5625	.001125				3.6250	.002856
.1120	.000723	2.3125	.001984	#3			.0990	.000472	5/8		32	.6250	.001186	3 3/4			3.7500	.002905
.1250	.000750	2.3750	.002001				‡.1094	.000495		14		.6429	.001203				3.8750	.002953
.1380	.000775	2.4375	.002019	#4			.1120	.000502				.6875	.001244	4		5	4.0000	.003000
.1640	.000821	2.5000	.002036		80		.1125	.000503			28	.7143	.001268				4.1250	.003047
.1875	.000859	2.6250	.002069	#5	72		.1250	.000530			27	.7407	.001291	4 1/4			4.2500	.003092
.1900	.000862	2.7500	.002102	#6			.1380	.000557	3/4	12		.7500	.001299				4.3750	.003137
.2160	.000900	2.8750	.002133		64		.1406	.000562				.8125	.001352	4 1/2			4.5000	.003182
.2500	.000945	3.0000	.002163				.1563	.000593			24	.8333	.001369				4.6250	.003226
.3125	.001018	3.1250	.002193		56		.1607	.000601	7/8			.8750	.001403	4 3/4			4.7500	.003269
.3750	.001082	3.2500	.002222	#8			.1640	.000607		10		.9000	.001423				4.8750	.003312
.4375	.001139	3.3750	.002250				.1719	.000622				.9375	.001452	5		4	5.0000	.003354
.5000	.001191	3.5000	.002277		48		.1875	.000650	1	9	20	1.0000	.001500				5.1250	.003396
.5625	.001238	3.6250	.002304	#10			.1900	.000654				1.0625	.001546	5 1/4			5.2500	.003437
.6250	.001282	3.7500	.002330				.2031	.000676			18	1.1111	.001581				5.3750	.003478
.6875	.001324	3.8750	.002356		44		.2045	.000678	1 1/8	8		1.1250	.001591	5 1/2			5.5000	.003518
.7500	.001353	4.0000	.002381	#12			.2160	.000697				1.1875	.001635				5.6250	.003558
.8125	.001400	4.2500	.002430				.2188	.000702	1 1/4		16	1.2500	.001677	5 3/4			5.7500	.003597
.8750	.001435	4.5000	.002476		40		.2250	.000712				1.3125	.001718				5.8750	.003636
.9375	.001468	4.7500	.002521				.2344	.000726	1 3/8			1.3750	.001759	6			6.0000	.003674
1.0000	.001500	5.0000	.002565	1/4	36	80	.2500	.000750			14	1.4286	.001793				6.5000	.003824
1.0625	.001531	5.2500	.002607				.2656	.000773				1.4375	.001798				7.0000	.003969
1.1250	.001560	5.5000	.002648			72	.2778	.000791	1 1/2	6		1.5000	.001837				7.5000	.004108
1.1875	.001588	5.7500	.002687		32		.2812	.000795	1 5/8			1.6250	.001912				8.0000	.004243
1.2500	.001616	6.0000	.002726				.2969	.000817			12	1.6667	.001936				8.5000	.004373
1.3125	.001642	7.0000	.002869	5/16		64	.3125	.000839	1 3/4			1.7500	.001984				9.0000	.004500
1.3750	.001668	8.0000	.003000		28		.3214	.000850	1 7/8			1.8750	.002054				9.5000	.004623
1.4375	.001693	9.0000	.003120				.3281	.000859	2	4 1/2	10	2.0000	.002121				10.0000	.004743
1.5000	.001717	10.0000	.003232		27	60	.3333	.000866	2 1/8			2.1250	.002187				10.5000	.004861
1.5625	.001741	12.0000	.003434				.3438	.000880	2 1/4	4		2.2500	.002250				11.0000	.004975
1.6250	.001764	14.0000	.003615			56	.3571	.000896				2.3750	.002312				11.5000	.005087
1.6875	.001786	16.0000	.003780				.3594	.000899	2 1/2		8	2.5000	.002372				12.0000	.005196
1.7500	.001808	18.0000	.003931	3/8	24		.3750	.000919				2.6250	.002430					
1.8125	.001829	20.0000	.004072				.3906	.000937	2 3/4			2.7500	.002487					
1.8750	.001850	24.0000	.004327				.4063	.000956				2.8750	.002543					
						48	.4167	.000968	3			3.0000	.002598					
							.4219	.000974										

Pitch, p													
Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$	Threads per inch	$0.015\sqrt[3]{p^2}$
	in.		*in.*		*in.*		*in.*		*in.*		*in.*		*in.*
80	0.000808	50	0.001105	36	0.001376	27	0.001667	18	0.002184	11 1/2	0.002944	7	0.004099
72	.000867	48	.001136	34	.001429	26	.001709	16	.002362	11	.003033	6	.004543
64	.000938	44	.001204	32	.001488	24	.001803	14	.002582	10	.003232	5 1/2	.004814
60	.000979	42	.001241	30	.001554	22	.001910	13	.002713	9	.003467	5	.005130
56	.001025	40	.001282	28	.001627	20	.002036	12	.002862	8	.003750	4 1/2	.005503
												4	.005953

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[1] For class 2A, $C=1$. For other classes, values of C are given in the text, pp. 21 and 22.

lowed by the letters A and B are derived from Unified formulas in which the pitch diameter tolerances are based on increments of the basic major (nominal) diameter, the pitch, and the length of engagement. These formulas and the class designations apply to all of the threads specified in section III.

The basic formula, from which allowances on all diameters and tolerances on pitch diameter are derived, is:

$$\text{Tolerance (or allowance)} = C(0.0015\sqrt[3]{D}+0.0015\sqrt{L_e}+0.015\sqrt[3]{p^2}),$$

where

C = a factor which differs for the allowance or tolerance for each class
D = basic major diameter
L_e = length of engagement
p = pitch.

This formula is based on the accuracy of present-day threading practice, and is applicable to all reasonable combinations of diameter, pitch, and length of engagement. Numerical values o the increments in the formula for standard diameters, pitches, and lengths of engagement are given in table III. 9.

5. ALLOWANCES.—Allowances are applied only to external threads. The values of the factor C (par. 4 above) for allowances are as follows:

Class	Factor C
1A	0. 300
2A	. 300
3A	. 000

6. MAJOR DIAMETER TOLERANCES.—(*a*) *External threads.*—The tolerance on major diameter for class 1A is equal to $0.090\sqrt[3]{p^2}$ and for classes 2A and 3A is equal to $0.060\sqrt[3]{p^2}$. Tolerances equal to $0.090\sqrt[3]{p^2}$ are provided for class 2A coarse and 8-thread series threads of unfinished, hot-rolled material.

(*b*) *Internal threads.*—The tolerance on major diameter of internal threads is equal to $H/6$ plus the pitch diameter tolerance of the class of thread involved. The maximum major diameter of the internal thread may be determined by adding $0.7939p(=11H/12$, table III.1) to the maximum pitch diameter of the internal thread. In dimensioning internal threads the maximum major diameter is not specified, being established by the crest of an unworn tool. In practice, the major diameter of an internal thread is satisfactory when accepted by a gage or gaging method that represents the maximum material condition of an external thread which has no allowance.

7. MINOR DIAMETER TOLERANCES.—(*a*) *External threads.*—The tolerance on minor diameter of external threads is for reference only. At the nominal minor diameter, that is at the intersection of the rounded root with its center line (see fig. III.1) it equals the pitch diameter tolerance plus $H/12$ and applies only where the rounded root is a requirement of the design. Otherwise the tolerance shall be $H/4$ plus the pitch diameter tolerance. The minimum minor diameter of the external thread may be determined by subtracting $0.6495p(=3H/4$, table III.1) from the minimum pitch diameter of the external thread. In dimensioning external threads the minimum minor diameter is not specified, being established by the crest of an unworn tool. In practice, the minor diameter of an external thread is satisfactory when accepted by a gage or gaging method that represents the maximum material condition of the internal thread less the allowance, if any.

(*b*) *Internal threads.*—Internal thread minor diameter tolerances specified in the dimensional tables are based on the use of materials of equal tensile strength for screw or bolt and nut or tapped hole and a length of engagement equal to the nominal diameter. See p. 5. For general applications these tolerances are suitable for lengths of engagement up to 1½ diameters. They are based on formulas as follows:

Classes 1B and 2B:

All thread series in sizes less than ¼ inch, tolerance$=[0.05\sqrt[3]{p^2}+0.03p/D]-0.002$ in., within the following limitations:

Tolerances shall not be greater than $0.394p$. (This corresponds to 53 percent of the basic thread height and applies in the range of the smallest number sizes of the NC and NF thread series.)

Tolerances shall not be less than $0.25p-0.4p^2$. (This corresponds to a thread height of 65 percent for 80 to 24 threads per inch.)

The formulas are suitable for general applications having lengths of engagement up to 1½ D. However, some thread applications require lengths of engagement which are greater than 1½ D or less than D. For such applications it may be advantageous to increase or decrease tolerances, respectively, as explained in section IV or to use recommended hole size limits for different lengths of engagement, appendix 3, table 3.1, p. 187.

All thread series ¼ in. and larger,[4] tolerance$=0.25p-0.4p^2$.
(This corresponds to a thread height of 64.5 percent for 32 threads per inch graduating to 71.8 percent for 4 threads per inch.)

Class 3B, all thread series:

Tolerance $=0.05\sqrt[3]{p^2}+0.03p/D-0.002$ in., within the following limitations:

Tolerance shall not be greater than $0.394p$. (This corresponds to 53 percent of the basic thread height and applies in the range of the smallest numbered sizes of the UNC, UNF, NC, and NF thread series.)

Tolerance shall not be less than:

For 80 to 13 threads per inch, inclusive, $0.23p-1.5p^2$. (This corresponds to a thread height of 67 percent for 80 threads per inch, graduating to 74 percent for 13 threads per inch.)

For 12 threads per inch and coarser, $0.120p$. (This corresponds to a thread height of 74 percent and is the tolerance for all sizes, 12 threads and coarser and 1 in. and larger.)

The formulas are suitable for general applications having lengths of engagement up to 1½ D. However, some thread applications require lengths of engagement which are greater than 1½ D or less than D. For such applications it may be advantageous to increase or decrease tolerances, respectively, as explained in section IV or to use recommended hole size limits for different lengths of engagement, appendix 3, table 3.2, p. 190.

8. PITCH DIAMETER[5] TOLERANCES.—(*a*) *Values of factor C.*—The values of the factor C (par. 4

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[4] The formula is not applicable to threads coarser that 4 tpi. For such threads use tolerance=$0.15p$.

[5] The British designation for "pitch diameter" is "effective diameter."

above) for pitch diameter tolerances are as follows:

Class	Factor C
1A	1. 500
1B	1. 950
2A	1. 000
2B	1. 300
3A	0. 750
3B	. 975

It will be noted that the factor C is 30 percent greater for internal than for external threads of a given class number on account of the relative difficulties of manufacture.

(*b*) *Length of engagement.*—The tolerances on pitch diameter, and the allowances on all diameters, for the coarse-, fine-, and 8-thread series are based on a length of engagement equal to the basic major (nominal) diameter and are applicable to lengths of engagement up to 1½ diameters. For the extra-fine-, 12-, and 16-thread series they are based on a length of engagement of 9 pitches and are applicable to lengths of engagement from 5 to 15 pitches. Where the length of engagement exceeds that for which the tolerances are applicable, tolerances and allowances should be obtained from the tabulated tolerances or increments for special threads, if applicable, or computed from the formulas.

(*c*) *Limits of size.*[5a]—With respect to the pitch diameter limits of size, it is intended, except as hereinafter qualified, that no portion of the complete thread be permitted to project beyond the envelope defined by the maximum-metal limits on the one hand, or beyond that defined by the minimum-metal limits on the other, and thus be outside of the tolerance zone as illustrated in figures III.3 and III.4.[5b] Also, the diameter equivalent of the variation in any given element except pitch diameter shall not exceed one-half of the pitch diameter tolerance. Deviations from specified size and profile include variations in lead, uniformity of helix, flank angle, taper, out-of-roundness, and surface defects. Accordingly, values are given in table III.11, for the standard thread series and classes, of one-half of the pitch diameter tolerances and the deviations in lead and flank angle which are equivalent thereto. Flank angle equivalents are based on a depth of thread engagement of $5H/8$.

The diameter equivalents of variations in lead, uniformity of helix, and flank angle are always in the direction toward maximum material, that is, they increase the virtual diameter of the external thread and decrease that of the internal thread. Thus, the maximum-material pitch diameter limits are a limitation of the virtual diameter (effective size) *and are so specified herein for all thread classes.*

Variations in taper and roundness of the pitch diameter, together with variations of the pitch diameter as a whole, may be in the direction of minimum material, and thus the minimum-material pitch diameter limit may be specified as a limitation of the pitch diameter as a single element. However, in view of the interrelation of the pitch diameter, variation in lead and flank angle, etc., together with practical considerations relating to established production processes, product application, and inspection procedures, it is customary to interpret the minimum pitch diameter of the external thread and the maximum pitch diameter of the internal thread as virtual diameters (effective sizes) in classes 1A, 2A, 1B, 2B, and 3B, for application to various mass-produced bolts, nuts, screws, and other similar threaded fasteners, and to some custom threaded parts where design requirements are fulfilled. See "Limit gages" and "Acceptability of threads," section VI, pp. 108 and 118.

(1) *Diameter equivalent of angle deviation.*—The general formula expressing the relation between deviation in the half angle of thread and its diameter equivalent—that is, the amount of the pitch diameter tolerance absorbed by such a deviation is:

$$\cot \delta\alpha = \frac{h_e}{\delta E \sin \alpha \cos \alpha} \pm \cot \alpha,$$

in which

δE = pitch diameter increment due to deviation in half angle

h_e = depth of thread engagement
α = basic half angle of thread
$\delta\alpha$ = error in half angle of thread.

In solving for δE the average value of $\delta\alpha$ for two sides of the thread, regardless of their sign, should be taken. The sign of $\cot \alpha$ is plus when the half angle of thread is less than basic, minus when the half angle is greater than basic. By omitting $\pm \cot \alpha$ from the formula an approximate mean value for $\delta\alpha$ or δE is obtained which differs very little from either extreme value. The Committee has, therefore, adopted for general use the formula

$$\cot \delta\alpha = \frac{h_e}{\delta E \sin \alpha \cos \alpha}.$$

For threads of Unified, American, or American National form, where $h_e = 5H/8$, this formula reduces to

$$\cot \delta\alpha = \frac{5p}{4\delta E}, \text{ or } \delta E = 1.25p \tan \delta\alpha.$$

[5a] For aeronautical applications, practice may deviate from those here specified. See Military Specification MIL-S-7742.

[5b] The full tolerance cannot, therefore, be used on pitch diameter unless deviations in all other thread elements are zero.

(2) *Diameter equivalent of lead deviations.*—The formula expressing the relation between lead deviation between any two threads within the length of engagement, and its diameter equivalent is as follows:

$$\delta E = (\pm \delta p) \cot \alpha,$$

in which

δE = pitch diameter increment due to lead deviation
δp = the maximum pitch deviation between any two of the threads engaged
α = half angle of thread.

The quantity δE is always added to the measured pitch diameter in the case of an external thread, and it is always subtracted in the case of an internal thread, regardless of the sign introduced by the lead deviation δp.

For threads of Unified, American, or American National form, the above formula reduces to

$$\delta E = 1.7321\ \delta p.$$

(b) SCREW-THREAD CLASSES

1 CLASSES 1A AND 1B. (*a*) *Definition.*—Classes 1A and 1B threads replace class 1 for new designs. These classes are intended for ordnance and other special uses. They are used on threaded components where quick and easy assembly is necessary and where a liberal allowance is required to permit ready assembly, even with slightly bruised or dirty threads.

Maximum diameters of class 1A (external) threads are less than basic by the amount of the same allowance as applied to class 2A. For the intended applications in American practice the allowance is not available for plating or coating. Where the thread is plated or coated, special provisions are necessary. The minimum diameters of class 1B (internal) threads, whether or not plated or coated, are basic, affording no allowance or clearance for assembly with maximum metal external thread components having maximum diameters which are basic.

(*b*) *Allowances and tolerances.* Allowances and tolerances for the respective thread series are specified in tables and their application is shown in figure III.3.

2. CLASSES 2A AND 2B. (*a*) *Definition.* Class 2A for external threads and 2B for internal threads are the most commonly used thread standards for general applications, including production of bolts, screws, nuts, and similar threaded fasteners.

The maximum diameters of class 2A (external) uncoated threads are less than basic by the amount of the allowance. The allowance minimizes galling and seizing in high-cycle wrench assembly, or it can be used to accommodate plated finishes or other coating. However, for threads with additive finish, the maximum diameters of class 2A may be exceeded by the amount of the allowance; i.e., the 2A maximum diameters apply to an unplated part or to a part before plating whereas the basic diameters (the 2A maximum diameter plus allowance) apply to a part after plating. The minimum diameters of class 2B (internal) threads, whether or not plated or coated, are basic, affording no allowance or clearance in assembly at maximum metal limits. See par. 9, p. 18.

Certain applications require an allowance to permit application of the proper lubricant when making up the assembly, particularly with pressure vessels and steel pipe flanges, fittings, and valves for high-temperature, high-pressure service. For such applications class 2A, which has an allowance, and class 2B are recommended, replacing class 7 which was previously established for such applications but which has been discontinued as an American Standard. See par. 9, p. 18. In this application, when the thread is coated, the 2A allowance may not be consumed by such coating.

(*b*) *Allowances and tolerances.* Allowances and tolerances for the respective thread series are specified in tables and their application is shown in figure III.3.

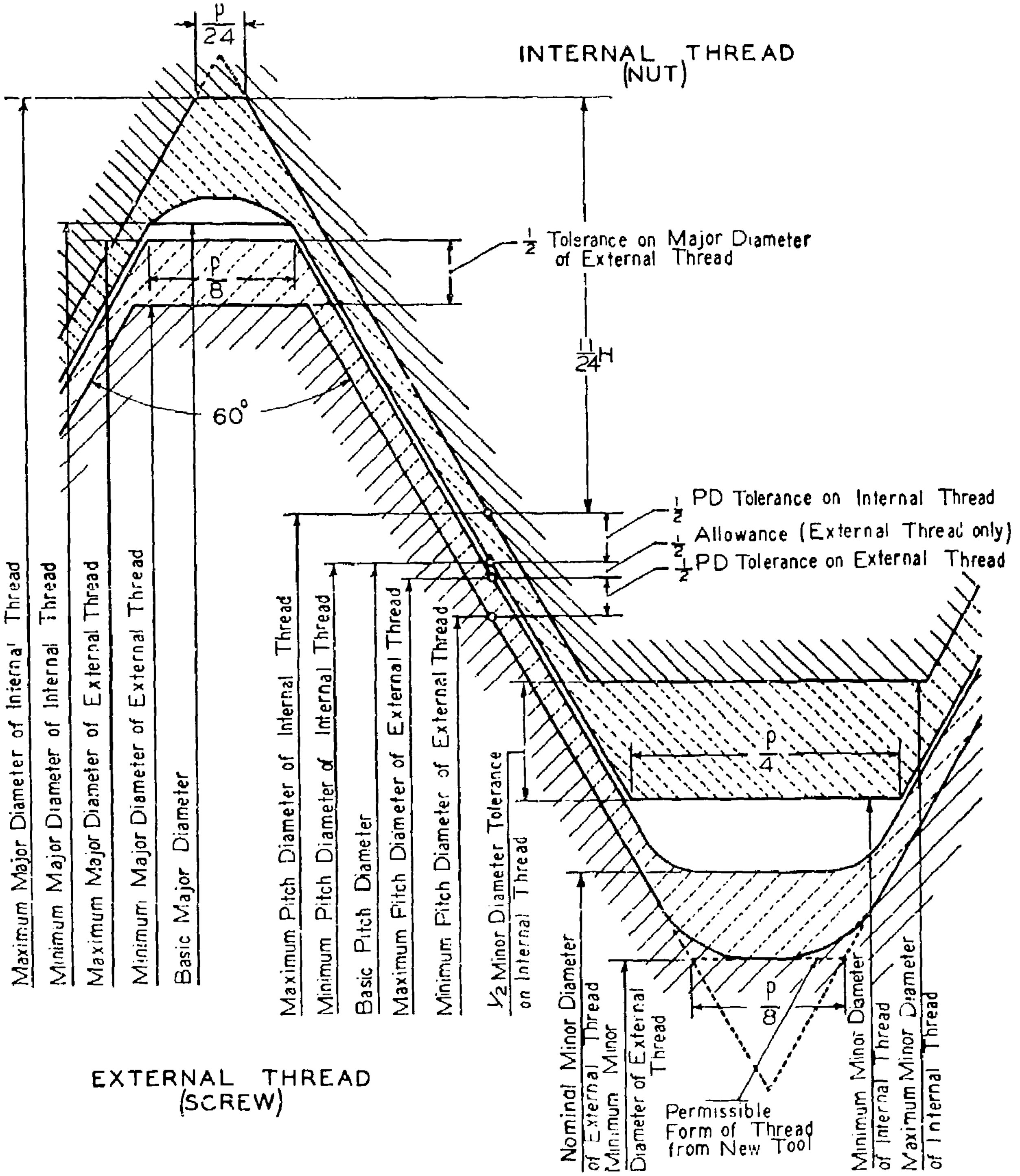
3. CLASSES 3A AND 3B.—(*a*) *Definition.*—Class 3A for external threads and class 3B for internal threads provide for applications where closeness of fit and accuracy of lead and angle of thread are important. They are obtainable consistently only by the use of high quality production equipment supported by a very efficient system of gaging and inspection. The maximum diameters of class 3A (external) threads and the minimum diameters of class 3B (internal) threads, whether or not plated or coated, are basic, affording no allowance or clearance for assembly of maximum-material components.

(*b*) *Allowances and tolerances.*—No allowance is provided, but since the tolerances on "go" gages are within the limits of size of the product, the gages will assure a slight clearance between product made to the maximum material limits. Tolerances for the respective thread series are specified in tables and their application is shown in figure III.4.

4. COATED THREADS. It is not within the scope of this standard to make recommendations for thicknesses of, or to specify limits for, coatings. However, it will aid mechanical interchangeability if certain principles are followed wherever conditions permit.

It is desirable that the finished threads be within the limits of size established herein. To that end, external threads should not exceed the basic size after plating and internal threads should not be below the basic size after plating. It is recognized that there are some commonly used processes, such as hot-dip galvanizing, which are firmly established, and threads coated by such processes do not fall within the scope of this recommendation.

Class 2A provides both a tolerance and an allowance. Many requirements for coatings are such as those deposited by electroplating processes. In



p/24
INTERNAL THREAD (NUT)
1/2 Tolerance on Major Diameter of External Thread
p/8
11/24 H
60°
1/2 PD Tolerance on Internal Thread
1/2 Allowance (External Thread only)
1/2 PD Tolerance on External Thread
p/4
p/8
Maximum Major Diameter of Internal Thread
Minimum Major Diameter of Internal Thread
Maximum Major Diameter of External Thread
Minimum Major Diameter of External Thread
Basic Major Diameter
Maximum Pitch Diameter of Internal Thread
Minimum Pitch Diameter of Internal Thread
Basic Pitch Diameter
Maximum Pitch Diameter of External Thread
Minimum Pitch Diameter of External Thread
1/2 Minor Diameter Tolerance on Internal Thread
Nominal Minor Diameter of External Thread
Minimum Minor Diameter of External Thread
Permissible Form of Thread from New Tool
Minimum Minor Diameter of Internal Thread
Maximum Minor Diameter of Internal Thread
EXTERNAL THREAD (SCREW)

FIGURE III.3.—*Disposition of tolerances, allowances, and crest clearances for classes 1A, 2A, 1B, and 2B.*

NOTE: "Nominal minor diameter of screw" is that specified in tables.

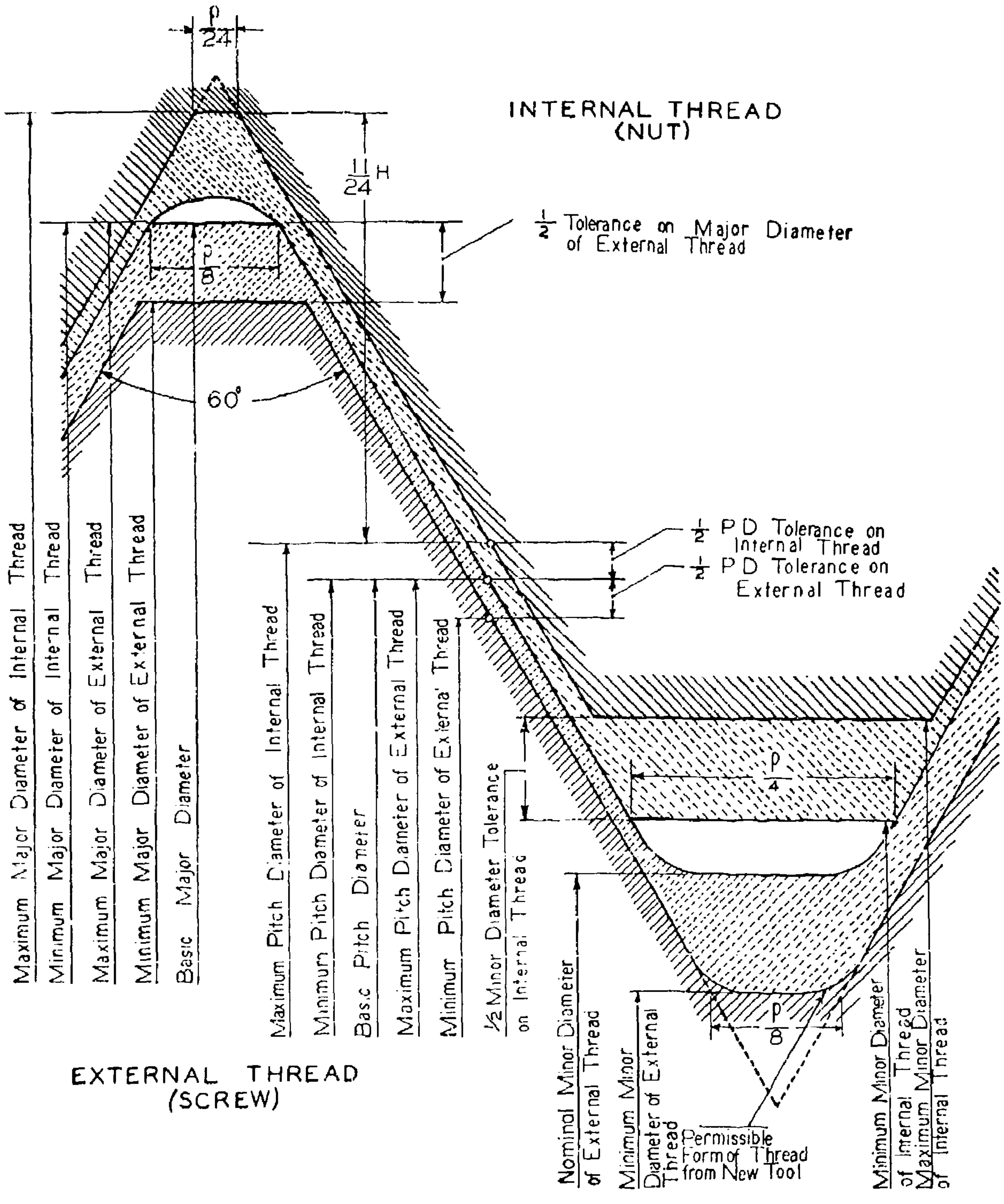

P/24
INTERNAL THREAD (NUT)
11/24 H
1/2 Tolerance on Major Diameter of External Thread
P/8
60°
1/2 P D Tolerance on Internal Thread
1/2 P D Tolerance on External Thread
P/4
P/8
Permissible Form of Thread from New Tool
EXTERNAL THREAD (SCREW)
Maximum Major Diameter of Internal Thread
Minimum Major Diameter of Internal Thread
Maximum Major Diameter of External Thread
Minimum Major Diameter of External Thread
Basic Major Diameter
Maximum Pitch Diameter of Internal Thread
Minimum Pitch Diameter of Internal Thread
Basic Pitch Diameter
Maximum Pitch Diameter of External Thread
Minimum Pitch Diameter of External Thread
1/2 Minor Diameter Tolerance on Internal Thread
Nominal Minor Diameter of External Thread
Minimum Minor Diameter of External Thread
Minimum Minor Diameter of Internal Thread
Maximum Minor Diameter of Internal Thread

FIGURE III.4.—*Disposition of tolerances and crest clearances for classes 3A and 3B.*

NOTE: "Nominal minor diameter of screw" is that specified in tables.

general the 2A allowance provides adequate undercut for such coatings. See par. 2 above. There are variables in thickness of coating and symmetry of coating resulting from commercial processes. It should be stressed that threads after plating should be accepted by a basic size "go" thread ring gage or equivalent functional gage. Class 1A provides an allowance, but in this case the allowance is maintained for both coated and uncoated product.

Some tolerance classes do not include an allowance, i. e., class 3A. It is suggested that the limits of size before plating be reduced by the amount of the 2A allowance wherever that allowance is adequate.

No provision is made for overcutting internal threads, as coatings on such threads are not generally required. Further, it is very difficult to deposit a significant thickness of coating on the flanks of internal threads. Where a specific thickness of coating is required in an internal thread, it is suggested that the thread be overcut so that the thread as coated will be accepted by a "go" thread plug gage of basic size.

5. METHOD OF DESIGNATING A SCREW THREAD

1. Standard Method of Designating.—The standard method of designating a screw thread is by specifying in sequence the nominal size, number of threads per inch, thread series symbol, and thread class symbol, supplemented optionally by pitch diameter and its tolerance or pitch-diameter limits of size.

An example of an external thread designation and its meaning is given below:

```
Example: ¼—20 UNC—3A
         |   |   |   |_Thread class desig-
         |   |   |       nation
         |   |   |___Thread series designation
         |   |         (see dimensional tables)
         |   | Number of threads per inch
         |_Nominal size (fractional diameter or
              screw number)
```

PD 0.2175-0.2147—(*Specification of PD optional*)

Where this, or a thread of a class other than 2A, is to be coated, the designation may, unless otherwise specified in procurement documents, be followed by the words "after coating," thus:

¼—20 UNC-3A

PD 0.2175-0.2147 AFTER COATING (*Specification of PD optional*)

¼—20 UNC—2A

PD 0.2164-0.2127 (*Specification of PD optional when uncoated*)

PD 0.2164-0.2127 BEFORE COATING }
PD 0.2175 MAX. AFTER COATING } (*Required when coated except on stock items.*)

Unless otherwise specified, threads are right hand; a left-hand thread shall be designated "*LH*" as follows:

¼—20 UNC—3A—LH

2. Application of Standard Designations.—The standard series designations listed in table III.10, col. 2, are applicable to the corresponding standard thread sizes when limits of size conform to those listed in table III.10 or when thread crests are modified in accordance with par. 3 below. The designation "NS" applies to all threads of the standard series for which limits of size are computed from step tables (section IV), increment tables, or Unified and American formulations for all elements.

3. Modified Threads.—It is occasionally necessary to modify the limits of size of the major diameter of an external thread or the minor diameter of an internal thread from the limits established for standard series threads in order to fit a specific purpose but without change in class of thread or pitch diameter limits. Such threads should be specified with the established thread designation followed by a statement of the modified diameter limits and the designation "MOD."

Examples:

External thread:
⅜—24 UNF—3A MOD.
Major diameter 0.3720–0.3648 MOD.
Internal thread:
⅜—24 NF—2B MOD.
Minor diameter 0.330-0.336 MOD.

4. Threads Otherwise Altered.—See section IV, p. 100.

5. Unified Thread Symbol Designations.—Where a thread series symbol in a designation of a screw thread starts with "U", it indicates that this series or diameter-pitch combination corresponds in all respects, including tolerances and allowances (if any), with the British and Canadian thread of the same designation. However, where the U does not appear in a thread designation of classes 1A, 2A, 3A, 1B, 2B, or 3B, all thread elements conform to the principle on which Unified threads are based.

6. LIMITS OF SIZE, STANDARD THREAD SERIES, TABLE III.10

The limits of size, allowances, and tolerances for the Unified classes are given in table III.10. See "3. Thread Series, Symbols, and Suggested Applications", p. 13.

The maximum-material pitch diameter limits (maximum external and minimum internal threads) are a limitation of the virtual diameter (effective size) for all thread classes. The minimum pitch diameter limits are to be interpreted in accordance with par. 8c, p. 22.

TABLE III.10.—*Standard series limits of size—Unified and American screw threads*

Nominal size and threads per inch	Series designation	External [a]									Internal [a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter [d]	Class	Minor diameter limits [e]		Pitch diameter limits			Major diameter
				Max [b]	Min	Min [c]	Max [b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
0-80	NF	2A	0.0005	0.0595	0.0563	....	0.0514	0.0496	0.0018	0.0442	2B	0.0465	0.0514	0.0519	0.0542	0.0023	0.0600
		3A	.0000	.0600	.0568	....	.0519	.0506	.0013	.0447	3B	.0465	.0514	.0519	.0536	.0017	.0600
1-64	NC	2A	.0006	.0724	.0686	....	.0623	.0603	.0020	.0532	2B	.0561	.0623	.0629	.0655	.0026	.0730
		3A	.0000	.0730	.0692	....	.0629	.0614	.0015	.0538	3B	.0561	.0623	.0629	.0648	.0019	.0730
1-72	NF	2A	.0006	.0724	.0689	....	.0634	.0615	.0019	.0554	2B	.0580	.0635	.0640	.0665	.0025	.0730
		3A	.0000	.0730	.0695	....	.0640	.0626	.0014	.0560	3B	.0580	.0635	.0640	.0659	.0019	.0730
2-56	NC	2A	.0006	.0854	.0813	....	.0738	.0717	.0021	.0635	2B	.0667	.0737	.0744	.0772	.0028	.0860
		3A	.0000	.0860	.0819	....	.0744	.0728	.0016	.0641	3B	.0667	.0737	.0744	.0765	.0021	.0860
2-64	NF	2A	.0006	.0854	.0816	....	.0753	.0733	.0020	.0662	2B	.0691	.0753	.0759	.0786	.0027	.0860
		3A	.0000	.0860	.0822	....	.0759	.0744	.0015	.0668	3B	.0691	.0753	.0759	.0779	.0020	.0860
3-48	NC	2A	.0007	.0983	.0938	....	.0848	.0825	.0023	.0727	2B	.0764	.0845	.0855	.0885	.0030	.0990
		3A	.0000	.0990	.0945	....	.0855	.0838	.0017	.0734	3B	.0764	.0845	.0855	.0877	.0022	.0990
3-56	NF	2A	.0007	.0983	.0942	....	.0867	.0845	.0022	.0764	2B	.0797	.0865	.0874	.0902	.0028	.0990
		3A	.0000	.0990	.0949	....	.0874	.0858	.0016	.0771	3B	.0797	.0865	.0874	.0895	.0021	.0990
4-40	NC	2A	.0008	.1112	.1061	....	.0950	.0925	.0025	.0805	2B	.0849	.0939	.0958	.0991	.0033	.1120
		3A	.0000	.1120	.1069	....	.0958	.0939	.0019	.0813	3B	.0849	.0939	.0958	.0982	.0024	.1120
4-48	NF	2A	.0007	.1113	.1068	....	.0978	.0954	.0024	.0857	2B	.0894	.0968	.0985	.1016	.0031	.1120
		3A	.0000	.1120	.1075	....	.0985	.0967	.0018	.0864	3B	.0894	.0968	.0985	.1008	.0023	.1120
5-40	NC	2A	.0008	.1242	.1191	....	.1080	.1054	.0026	.0935	2B	.0979	.1062	.1088	.1121	.0033	.1250
		3A	.0000	.1250	.1199	....	.1088	.1069	.0019	.0943	3B	.0979	.1062	.1088	.1113	.0025	.1250
5-44	NF	2A	.0007	.1243	.1195	....	.1095	.1070	.0025	.0964	2B	.1004	.1079	.1102	.1134	.0032	.1250
		3A	.0000	.1250	.1202	....	.1102	.1083	.0019	.0971	3B	.1004	.1079	.1102	.1126	.0024	.1250
6-32	NC	2A	.0008	.1372	.1312	....	.1169	.1141	.0028	.0989	2B	.104	.114	.1177	.1214	.0037	.1380
		3A	.0000	.1380	.1320	....	.1177	.1156	.0021	.0997	3B	.1040	.1140	.1177	.1204	.0027	.1380
6-40	NF	2A	.0008	.1372	.1321	....	.1210	.1184	.0026	.1065	2B	.111	.119	.1218	.1252	.0034	.1380
		3A	.0000	.1380	.1329	....	.1218	.1198	.0020	.1073	3B	.1110	.1186	.1218	.1243	.0025	.1380
8-32	NC	2A	.0009	.1631	.1571	....	.1428	.1399	.0029	.1248	2B	.130	.139	.1437	.1475	.0038	.1640
		3A	.0000	.1640	.1580	....	.1437	.1415	.0022	.1257	3B	.1300	.1389	.1437	.1465	.0028	.1640
8-36	NF	2A	.0008	.1632	.1577	....	.1452	.1424	.0028	.1291	2B	.134	.142	.1460	.1496	.0036	.1640
		3A	.0000	.1640	.1585	....	.1460	.1439	.0021	.1299	3B	.1340	.1416	.1460	.1487	.0027	.1640
10-24	NC	2A	.0010	.1890	.1818	....	.1619	.1586	.0033	.1379	2B	.145	.156	.1629	.1672	.0043	.1900
		3A	.0000	.1900	.1828	....	.1629	.1604	.0025	.1389	3B	.1450	.1555	.1629	.1661	.0032	.1900
10-32	NF	2A	.0009	.1891	.1831	....	.1688	.1658	.0030	.1508	2B	.156	.164	.1697	.1736	.0039	.1900
		3A	.0000	.1900	.1840	....	.1697	.1674	.0023	.1517	3B	.1560	.1641	.1697	.1726	.0029	.1900
12-24	NC	2A	.0010	.2150	.2078	....	.1879	.1845	.0034	.1639	2B	.171	.181	.1889	.1933	.0044	.2160
		3A	.0000	.2160	.2088	....	.1889	.1863	.0026	.1649	3B	.1710	.1807	.1889	.1922	.0033	.2160
12-28	NF	2A	.0010	.2150	.2085	....	.1918	.1886	.0032	.1712	2B	.177	.186	.1928	.1970	.0042	.2160
		3A	.0000	.2160	.2095	....	.1928	.1904	.0024	.1722	3B	.1770	.1857	.1928	.1959	.0031	.2160
12-32	NEF	2A	.0009	.2151	.2091	....	.1948	.1917	.0031	.1768	2B	.182	.190	.1957	.1998	.0041	.2160
		3A	.0000	.2160	.2100	....	.1957	.1933	.0024	.1777	3B	.1820	.1895	.1957	.1988	.0031	.2160
¼-20	UNC	1A	.0011	.2489	.2367	....	.2164	.2108	.0056	.1876	1B	.196	.207	.2175	.2248	.0073	.2500
		2A	.0011	.2489	.2408	0.2367	.2164	.2127	.0037	.1876	2B	.196	.207	.2175	.2223	.0048	.2500
		3A	.0000	.2500	.2419	....	.2175	.2147	.0028	.1887	3B	.1960	.2067	.2175	.2211	.0036	.2500
¼-28	UNF	1A	.0010	.2490	.2392	....	.2258	.2208	.0050	.2052	1B	.211	.220	.2268	.2333	.0065	.2500
		2A	.0010	.2490	.2425	....	.2258	.2225	.0033	.2052	2B	.211	.220	.2268	.2311	.0043	.2500
		3A	.0000	.2500	.2435	....	.2268	.2243	.0025	.2062	3B	.2110	.2190	.2268	.2300	.0032	.2500
¼-32	NEF	2A	.0010	.2490	.2430	....	.2287	.2255	.0032	.2107	2B	.216	.224	.2297	.2339	.0042	.2500
		3A	.0000	.2500	.2440	....	.2297	.2273	.0024	.2117	3B	.2160	.2229	.2297	.2328	.0031	.2500
5/16-18	UNC	1A	.0012	.3113	.2982	....	.2752	.2691	.0061	.2431	1B	.252	.265	.2764	.2843	.0079	.3125
		2A	.0012	.3113	.3026	.2982	.2752	.2712	.0040	.2431	2B	.252	.265	.2764	.2817	.0053	.3125
		3A	.0000	.3125	.3038	....	.2764	.2731	.0030	.2443	3B	.2520	.2630	.2764	.2803	.0039	.3125
5/16-24	UNF	1A	.0011	.3114	.3006	....	.2843	.2788	.0055	.2603	1B	.267	.277	.2854	.2925	.0071	.3125
		2A	.0011	.3114	.3042	....	.2843	.2806	.0037	.2603	2B	.267	.277	.2854	.2902	.0048	.3125
		3A	.0000	.3125	.3053	....	.2854	.2827	.0027	.2614	3B	.2670	.2754	.2854	.2890	.0036	.3125
5/16-32	NEF	2A	.0010	.3115	.3055	....	.2912	.2880	.0032	.2732	2B	.279	.286	.2922	.2964	.0042	.3125
		3A	.0000	.3125	.3065	....	.2922	.2898	.0024	.2742	3B	.2790	.2847	.2922	.2953	.0031	.3125
3/8-16	UNC	1A	.0013	.3737	.3595	....	.3331	.3266	.0065	.2970	1B	.307	.321	.3344	.3129	.0085	.3750
		2A	.0013	.3737	.3643	.3595	.3331	.3287	.0044	.2970	2B	.307	.321	.3344	.3401	.0057	.3750
		3A	.0000	.3750	.3656	....	.3344	.3311	.0033	.2983	3B	.3070	.3182	.3344	.3387	.0043	.3750
3/8-24	UNF	1A	.0011	.3739	.3631	....	.3468	.3411	.0057	.3228	1B	.330	.340	.3479	.3553	.0074	.3750
		2A	.0011	.3739	.3667	....	.3468	.3430	.0038	.3228	2B	.330	.340	.3479	.3528	.0049	.3750
		3A	.0000	.3750	.3678	....	.3479	.3450	.0029	.3239	3B	.3300	.3372	.3479	.3516	.0037	.3750
3/8-32	NEF	2A	.0010	.3740	.3680	....	.3537	.3503	.0034	.3357	2B	.341	.349	.3547	.3591	.0044	.3750
		3A	.0000	.3750	.3690	....	.3547	.3522	.0025	.3367	3B	.3410	.3469	.3547	.3580	.0033	.3750
7/16-14	UNC	1A	.0014	.4361	.4206	....	.3897	.3826	.0071	.3485	1B	.360	.376	.3911	.4003	.0092	.4375
		2A	.0014	.4361	.4258	.4206	.3897	.3850	.0047	.3485	2B	.360	.376	.3911	.3972	.0061	.4375
		3A	.0000	.4375	.4272	....	.3911	.3876	.0035	.3499	3B	.3600	.3717	.3911	.3957	.0046	.4375
7/16-20	UNF	1A	.0013	.4362	.4240	....	.4037	.3975	.0062	.3749	1B	.383	.395	.4050	.4131	.0081	.4375
		2A	.0013	.4362	.4281	....	.4037	.3995	.0042	.3749	2B	.383	.395	.4050	.4104	.0054	.4375
		3A	.0000	.4375	.4294	....	.4050	.4019	.0031	.3762	3B	.3830	.3916	.4050	.4091	.0041	.4375
7/16-28	UNEF	2A	.0011	.4364	.4299	....	.4132	.4096	.0036	.3926	2B	.399	.407	.4143	.4189	.0046	.4375
		3A	.0000	.4375	.4319	....	.4143	.4116	.0027	.3937	3B	.3990	.4051	.4143	.4178	.0035	.4375
½-12	N	2A	.0016	.4984	.4870	....	.4443	.4389	.0054	.3962	2B	.410	.428	.4459	.4529	.0070	.5000
		3A	.0000	.5000	.4886	....	.4459	.4419	.0040	.3978	3B	.4100	.4223	.4459	.4511	.0052	.5000
½-13	UNC	1A	.0015	.4985	.4822	....	.4485	.4411	.0074	.4041	1B	.417	.434	.4500	.4597	.0097	.5000
		2A	.0015	.4985	.4876	.4822	.4485	.4435	.0050	.4041	2B	.417	.434	.4500	.4565	.0065	.5000
		3A	.0000	.5000	.4891	....	.4500	.4463	.0037	.4056	3B	.4170	.4234	.4500	.4548	.0048	.5000

NOTE. The following seven sizes have been standardized as between American, Canadian, and British military services or industry for purposes of attachment, e. g., an instrument or accessory to a panel: 0-80 NF, 2-56 NC, 4-40 NC, 6-32 NC, 8-32 NC, 10-24 NC, and 10-32 NF, with 10-32 preferred over 10-24.

See footnotes at end of table.

TABLE III.10.—*Standard series limits of size—Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	External a									Internal a						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter d	Class	Minor diameter limits e		Pitch diameter limits			Major diameter
				Max b	Min	Min c	Max b	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
			in.	in.	in.	in.	in.	in.	in.	in.		in.	in.	in.	in.	in.	in.
½ 20	UNF	1A	0.0013	0.4987	0.4865	......	0.4662	0.4598	0.0064	0.4374	1B	0.446	0.457	0.4675	0.4759	0.0084	0.5000
		2A	.0013	.4987	.4906	......	.4662	.4619	.0043	.4374	2B	.446	.457	.4675	.4731	.0056	.5000
		3A	.0000	.5000	.4919	......	.4675	.4643	.0032	.4387	3B	.4460	.4537	.4675	.4717	.0042	.5000
½ 28	UNEF	2A	.0011	.4989	.4924	......	.4757	.4720	.0037	.4551	2B	.461	.470	.4768	.4816	.0048	.5000
		3A	.0000	.5000	.4935	......	.4768	.4740	.0028	.4562	3B	.4610	.4676	.4768	.4804	.0036	.5000
9/16-12	UNC	1A	.0016	.5609	.5437	......	.5068	.4990	.0078	.4587	1B	.472	.490	.5084	.5186	.0102	.5625
		2A	.0016	.5609	.5495	0.5437	.5068	.5016	.0052	.4587	2B	.472	.490	.5084	.5152	.0068	.5625
		3A	.0000	.5625	.5511	......	.5084	.5045	.0039	.4603	3B	.4720	.4843	.5084	.5135	.0051	.5625
9/16-18	UNF	1A	.0014	.5611	.5480	......	.5250	.5182	.0068	.4929	1B	.502	.515	.5264	.5353	.0089	.5625
		2A	.0014	.5611	.5524	......	.5250	.5205	.0045	.4929	2B	.502	.515	.5264	.5323	.0059	.5625
		3A	.0000	.5625	.5538	......	.5264	.5230	.0034	.49[illegible]	3B	.5020	.5106	.5264	.5308	.0044	.5625
9/16-24	NEF	2A	.0012	.5613	.5541	......	.5342	.5303	.0039	.5102	2B	.517	.527	.5354	.5405	.0051	.5625
		3A	.0000	.5625	.5553	......	.5354	.5325	.0029	.5114	3B	.5170	.5244	.5354	.5392	.0038	.5625
⅝-11	UNC	1A	.0016	.6234	.6052	......	.5644	.5561	.0083	.5119	1B	.527	.546	.5660	.5767	.0107	.6250
		2A	.0016	.6234	.6113	.6052	.5644	.5589	.0055	.5119	2B	.527	.546	.5660	.5732	.0072	.6250
		3A	.0000	.6250	.6129	......	.5660	.5619	.0041	.5135	3B	.5270	.5394	.5660	.5714	.0054	.6250
⅝-12	N	2A	.0016	.6234	.6120	......	.5693	.5639	.0054	.5212	2B	.535	.553	.5709	.5780	.0071	.6250
		3A	.0000	.6250	.6136	......	.5709	.5668	.0041	.5228	3B	.5350	.5463	.5709	.5762	.0053	.6250
⅝-18	UNF	1A	.0014	.6236	.6105	......	.5875	.5805	.0070	.5554	1B	.565	.578	.5889	.5980	.0091	.6250
		2A	.0014	.6236	.6149	......	.5875	.5828	.0047	.5554	2B	.565	.578	.5889	.5549	.0060	.6250
		3A	.0000	.6250	.6163	......	.5889	.5854	.0035	.5568	3B	.5650	.5730	.5889	.5934	.0045	.6250
⅝-24	NEF	2A	.0012	.6238	.6166	......	.5967	.5927	.0040	.5727	2B	.580	.590	.5979	.6031	.0052	.6250
		3A	.0000	.6250	.6178	......	.5979	.5949	.0030	.5739	3B	.5800	.5869	.5979	.6018	.0039	.6250
11/16-12	N	2A	.0016	.6859	.6745	......	.6318	.6264	.0054	.5837	2B	.597	.615	.6334	.6405	.0071	.6875
		3A	.0000	.6875	.6761	......	.6334	.6293	.0041	.5853	3B	.5970	.6085	.6334	.6387	.0053	.6875
11/16-24	NEF	2A	.0012	.6863	.6791	......	.6592	.6552	.0040	.6352	2B	.642	.652	.6604	.6656	.0052	.6875
		3A	.0000	.6875	.6803	......	.6604	.6574	.0030	.6364	3B	.6420	.6494	.6604	.6643	.0039	.6875
¾-10	UNC	1A	.0018	.7482	.7288	......	.6832	.6744	.0088	.6255	1B	.642	.663	.6850	.6965	.0115	.7500
		2A	.0018	.7182	.7353	.7288	.6832	.6773	.0059	.6255	2B	.642	.663	.6850	.6927	.0077	.7500
		3A	.0000	.7500	.7371	......	.6850	.6806	.0044	.6273	3B	.6420	.6545	.6850	.6907	.0057	.7500
¾-12	N	2A	.0017	.7483	.7369	......	.6942	.6887	.0055	.6461	2B	.660	.678	.6959	.7031	.0072	.7500
		3A	.0000	.7500	.7386	......	.6959	.6918	.0041	.6478	3B	.6600	.6707	.6959	.7013	.0054	.7500
¾-16	UNF	1A	.0015	.7485	.7343	......	.7079	.7004	.0075	.6718	1B	.682	.696	.7094	.7192	.0098	.7500
		2A	.0015	.7485	.7391	......	.7079	.7029	.0050	.6718	2B	.682	.696	.7094	.7159	.0065	.7500
		3A	.0000	.7500	.7406	......	.7094	.7056	.0038	.6733	3B	.6820	.6908	.7094	.7143	.0049	.7500
¾-20	UNEF	2A	.0013	.7487	.7406	......	.7162	.7118	.0044	.6874	2B	.696	.707	.7175	.7232	.0057	.7500
		3A	.0000	.7500	.7419	......	.7175	.7142	.0033	.6887	3B	.6960	.7037	.7175	.7218	.0043	.7500
13/16-12	N	2A	.0017	.8108	.7994	......	.7567	.7512	.0055	.7086	2B	.722	.740	.7584	.7656	.0072	.8125
		3A	.0000	.8125	.8011	......	.7584	.7543	.0041	.7103	3B	.7220	.7329	.7584	.7638	.0054	.8125
13/16-16	UN	2A	.0015	.8110	.8016	......	.7704	.7655	.0049	.7343	2B	.745	.759	.7719	.7782	.0063	.8125
		3A	.0000	.8125	.8031	......	.7719	.7683	.0036	.7358	3B	.7450	.7533	.7719	.7766	.0047	.8125
13/16-20	UNEF	2A	.0013	.8112	.8031	......	.7787	.7743	.0044	.7498	2B	.758	.770	.7800	.7857	.0057	.8125
		3A	.0000	.8125	.8044	......	.7800	.7767	.0033	.7512	3B	.7580	.7662	.7800	.7843	.0043	.8125
⅞-9	UNC	1A	.0019	.8731	.8523	......	.8009	.7914	.0095	.7368	1B	.755	.778	.8028	.8151	.0123	.8750
		2A	.0019	.8731	.8592	.8523	.8069	.7946	.0063	.7368	2B	.755	.778	.8028	.8110	.0082	.8750
		3A	.0000	.8750	.8611	......	.8028	.7981	.0047	.7387	3B	.7550	.7681	.8028	.8089	.0061	.8750
⅞-12	N	2A	.0017	.8733	.8619	......	.8192	.8137	.0055	.7711	2B	.785	.803	.8209	.8281	.0072	.8750
		3A	.0000	.8750	.8636	......	.8209	.8168	.0041	.7728	3B	.7850	.7952	.8209	.8263	.0054	.8750
⅞-14	UNF	1A	.0016	.8734	.8579	......	.8270	.8189	.0081	.7858	1B	.798	.814	.8286	.8392	.0106	.8750
		2A	.0016	.8734	.8631	......	.8270	.8216	.0054	.7858	2B	.798	.814	.8286	.8356	.0070	.8750
		3A	.0000	.8750	.8647	......	.8286	.8245	.0041	.7874	3B	.7980	.8068	.8286	.8339	.0053	.8750
⅞ 16	UN	2A	.0015	.8735	.8641	......	.8329	.8280	.0049	.7968	2B	.807	.821	.8344	.8407	.0063	.8750
		3A	.0000	.8750	.8656	......	.8344	.8308	.0036	.7983	3B	.8070	.8158	.8344	.8391	.0047	.8750
⅞-20	UNEF	2A	.0013	.8737	.8656	......	.8412	.8368	.0044	.8124	2B	.821	.832	.8125	.8482	.0057	.8750
		3A	.0000	.8750	.8669	......	.8425	.8392	.0033	.8137	3B	.8210	.8287	.8125	.8468	.0043	.8750
15/16 12	UN	2A	.0017	.9358	.9244	......	.8817	.8760	.0057	.8336	2B	.847	.865	.8834	.8908	.0074	.9375
		3A	.0000	.9375	.9261	......	.8834	.8793	.0041	.8353	3B	.8470	.8575	.8834	.8889	.0055	.9375
15/16 16	UN	2A	.0015	.9360	.9266	......	.8954	.8904	.0050	.8593	2B	.870	.884	.8969	.9034	.0065	.9375
		3A	.0000	.9375	.9281	......	.8969	.8932	.0037	.8608	3B	.8700	.8783	.8969	.9018	.0049	.9375
15/16 20	UNEF	2A	.0014	.9361	.9280	......	.9036	.8991	.0045	.8748	2B	.883	.895	.9050	.9109	.0059	.9375
		3A	.0000	.9375	.9294	......	.9050	.9016	.0034	.8762	3B	.8830	.8912	.9050	.9094	.0044	.9375
1 8	UNC	1A	.0020	.9980	.9755	......	.9168	.9067	.0101	.8446	1B	.865	.890	.9188	.9320	.0132	1.0000
		2A	.0020	.9980	.9830	.9755	.9168	.9100	.0068	.8446	2B	.865	.890	.9188	.9276	.0088	1.0000
		3A	.0000	1.0000	.9850	......	.9188	.9137	.0051	.8466	3B	.8650	.8797	.9188	.9254	.0066	1.0000
1-12	UNF	1A	.0018	.9982	.9810	......	.9441	.9353	.0088	.8960	1B	.910	.928	.9459	.9573	.0114	1.0000
		2A	.0018	.9982	.9868	......	.9441	.9382	.0059	.8960	2B	.910	.928	.9459	.9535	.0076	1.0000
		3A	.0000	1.0000	.9886	......	.9459	.9415	.0044	.8978	3B	.9100	.9198	.9459	.9516	.0057	1.0000
1-16	UN	2A	.0015	.9985	.9891	......	.9579	.9529	.0050	.9218	2B	.932	.946	.9594	.9659	.0065	1.0000
		3A	.0000	1.0000	.9906	......	.9594	.9557	.0037	.9233	3B	.9320	.9408	.9594	.9643	.0049	1.0000
1-20	UNEF	2A	.0014	.9986	.9905	......	.9661	.9616	.0045	.9373	2B	.946	.957	.9675	.9734	.0059	1.0000
		3A	.0000	1.0000	.9919	......	.9675	.9641	.0034	.9387	3B	.9460	.9537	.9675	.9719	.0044	1.0000
1 1/16 12	UN	2A	.0017	1.0608	1.0494	......	1.0067	1.0010	.0057	.9586	2B	.972	.990	1.0084	1.0158	.0074	1.0625
		3A	.0000	1.0625	1.0511	......	1.0084	1.0042	.0042	.9603	3B	.9720	.9823	1.0084	1.0139	.0055	1.0625
1 1/16-16	UN	2A	.0015	1.0610	1.0516	......	1.0204	1.0154	.0050	.9843	2B	.995	1.009	1.0219	1.0284	.0065	1.0625
		3A	.0000	1.0625	1.0531	......	1.0219	1.0182	.0037	.9858	3B	.9950	1.0033	1.0219	1.0268	.0049	1.0625
1 1/16-18	NEF	2A	.0014	1.0611	1.0554	......	1.0250	1.0203	.0047	.9929	2B	1.002	1.015	1.0264	1.0326	.0062	1.0625
		3A	.0000	1.0625	1.0538	......	1.0264	1.0228	.0036	.9943	3B	1.0020	1.0105	1.0264	1.0310	.0046	1.0625
1⅛ 7	UNC	1A	.0022	1.1228	1.0982		1.0300	1.0191	.0109	.9475	1B	.970	.998	1.0322	1.0463	.0141	1.1250
		2A	.0022	1.1228	1.1064	1.0982	1.0300	1.0228	.0072	.9475	2B	.970	.998	1.0322	1.0416	.0094	1.1250
		3A	.0000	1.1250	1.1086		1.0322	1.0268	.0054	.9497	3B	.9700	.9875	1.0322	1.0393	.0071	1.1250
1⅛ 8	N	2A	.0021	1.1229	1.1079	1.1004	1.0417	1.0348	.0069	.9695	2B	.980	1.015	1.0438	1.0528	.0090	1.1250
		3A	.0000	1.1250	1.1100	......	1.0438	1.0386	.0052	.9716	3B	.9800	1.0047	1.0438	1.0505	.0067	1.1250
1⅛-12	UNF	1A	.0018	1.1232	1.1050	......	1.0691	1.0601	.0090	1.0210	1B	1.035	1.053	1.0709	1.0826	.0117	1.1250
		2A	.0018	1.1232	1.1118	......	1.0691	1.0631	.0060	1.0210	2B	1.035	1.053	1.0709	1.0787	.0078	1.1250
		3A	.0000	1.1250	1.1136	......	1.0709	1.0664	.0045	1.0228	3B	1.0350	1.0448	1.0709	1.0768	.0059	1.1250

See footnotes at end of table.

TABLE III.10.—*Standard series limits of size—Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	External [a]									Internal [a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter [d]	Class	Minor diameter limits [e]		Pitch diameter limits			Major diameter
				Max [b]	Min	Min [c]	Max [b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
1⅛-16	UN	2A	0.0015	1.1235	1.1141	......	1.0829	1.0779	0.0050	1.0468	2B	1.057	1.071	1.0844	1.0909	0.0065	1.1250
		3A	.0000	1.1250	1.1156	......	1.0844	1.0807	.0037	1.0483	3B	1.0570	1.0658	1.0844	1.0893	.0049	1.1250
1⅛-18	NEF	2A	.0014	1.1236	1.1149	......	1.0875	1.0828	.0047	1.0554	2B	1.065	1.078	1.0889	1.0951	.0062	1.1250
		3A	.0000	1.1250	1.1163	......	1.0889	1.0853	.0036	1.0568	3B	1.0650	1.0730	1.0889	1.0935	.0046	1.1250
1 3/16-12	UN	2A	.0017	1.1858	1.1744	......	1.1317	1.1259	.0058	1.0836	2B	1.097	1.115	1.1334	1.1409	.0075	1.1875
		3A	.0000	1.1875	1.1761	......	1.1334	1.1291	.0043	1.0853	3B	1.0970	1.1073	1.1334	1.1390	.0056	1.1875
1 3/16-16	UN	2A	.0015	1.1860	1.1766	......	1.1451	1.1403	.0051	1.1093	2B	1.120	1.134	1.1469	1.1535	.0066	1.1875
		3A	.0000	1.1875	1.1781	......	1.1469	1.1431	.0038	1.1108	3B	1.1200	1.1283	1.1469	1.1519	.0050	1.1875
1³⁄₁₆-18	NEF	2A	.0015	1.1860	1.1773	......	1.1499	1.1450	.0049	1.1178	2B	1.127	1.140	1.1514	1.1577	.0063	1.1875
		3A	.0000	1.1875	1.1788	......	1.1514	1.1478	.0036	1.1193	3B	1.1270	1.1355	1.1514	1.1561	.0047	1.1875
1¼-7	UNC	1A	.0022	1.2478	1.2232		1.1550	1.1439	.0111	1.0725	1B	1.095	1.123	1.1572	1.1716	.0144	1.2500
		2A	.0022	1.2478	1.2314	1.2232	1.1550	1.1476	.0074	1.0725	2B	1.095	1.123	1.1572	1.1668	.0096	1.2500
		3A	.0000	1.2500	1.2336		1.1572	1.1517	.0055	1.0747	3B	1.0950	1.1125	1.1572	1.1644	.0072	1.2500
1¼-8	N	2A	.0021	1.2479	1.2329	1.2254	1.1667	1.1597	.0070	1.0945	2B	1.115	1.140	1.1688	1.1780	.0092	1.2500
		3A	.0000	1.2500	1.2350	......	1.1688	1.1635	.0053	1.0966	3B	1.1150	1.1297	1.1688	1.1757	.0069	1.2500
1¼-12	UNF	1A	.0018	1.2482	1.2310	......	1.1941	1.1849	.0092	1.1460	1B	1.160	1.178	1.1959	1.2079	.0120	1.2500
		2A	.0018	1.2482	1.2368	......	1.1941	1.1879	.0062	1.1460	2B	1.160	1.178	1.1959	1.2039	.0080	1.2500
		3A	.0000	1.2500	1.2386	......	1.1959	1.1913	.0046	1.1478	3B	1.1600	1.1698	1.1959	1.2019	.0060	1.2500
1¼-16	UN	2A	.0015	1.2485	1.2391	......	1.2079	1.2028	.0051	1.1718	2B	1.182	1.196	1.2094	1.2160	.0066	1.2500
		3A	.0000	1.2500	1.2406	......	1.2094	1.2056	.0038	1.1733	3B	1.1820	1.1908	1.2094	1.2144	.0050	1.2500
1¼-18	NEF	2A	.0015	1.2485	1.2398	......	1.2124	1.2075	.0049	1.1803	2B	1.190	1.203	1.2139	1.2202	.0063	1.2500
		3A	.0000	1.2500	1.2413	......	1.2139	1.2103	.0036	1.1818	3B	1.1900	1.1980	1.2139	1.2186	.0047	1.2500
1 5/16-12	UN	2A	.0017	1.3108	1.2991	......	1.2567	1.2509	.0058	1.2086	2B	1.222	1.240	1.2584	1.2659	.0075	1.3125
		3A	.0000	1.3125	1.3011	......	1.2584	1.2541	.0043	1.2103	3B	1.2220	1.2323	1.2584	1.2640	.0056	1.3125
1 5/16-16	UN	2A	.0015	1.3110	1.3016	......	1.2704	1.2653	.0051	1.2343	2B	1.245	1.259	1.2719	1.2785	.0066	1.3125
		3A	.0000	1.3125	1.3031	......	1.2719	1.2681	.0038	1.2358	3B	1.2450	1.2533	1.2719	1.2769	.0050	1.3125
1 5/16-18	NEF	2A	.0015	1.3110	1.3023	......	1.2749	1.2700	.0049	1.2428	2B	1.252	1.265	1.2764	1.2827	.0063	1.3125
		3A	.0000	1.3125	1.3038	......	1.2764	1.2728	.0036	1.2443	3B	1.2520	1.2605	1.2764	1.2811	.0047	1.3125
1⅜-6	UNC	1A	.0024	1.3726	1.3453		1.2643	1.2523	.0120	1.1681	1B	1.195	1.225	1.2667	‡1.2822	‡.0155	1.3750
		2A	.0024	1.3726	1.3544	1.3453	1.2643	1.2563	.0080	1.1681	2B	1.195	1.225	1.2667	1.2771	.0104	1.3750
		3A	.0000	1.3750	1.3568		1.2667	1.2607	.0060	1.1705	3B	1.1950	1.2146	1.2667	1.2745	.0078	1.3750
1⅜-8	N	2A	.0022	1.3728	1.3578	1.3503	1.2916	1.2844	.0072	1.2194	2B	1.240	1.265	1.2938	1.3031	.0093	1.3750
		3A	.0000	1.3750	1.3600		1.2938	1.2884	.0054	1.2216	3B	1.2400	1.2547	1.2938	1.3008	.0070	1.3750
1⅜-12	UNF	1A	.0019	1.3731	1.3559	......	1.3190	1.3096	.0094	1.2709	1B	1.285	1.303	1.3209	1.3332	.0123	1.3750
		2A	.0019	1.3731	1.3617	......	1.3190	1.3127	.0063	1.2709	2B	1.285	1.303	1.3209	1.3291	.0082	1.3750
		3A	.0000	1.3750	1.3636	......	1.3209	1.3162	.0047	1.2728	3B	1.2850	1.2948	1.3209	1.3270	.0061	1.3750
1⅜-16	UN	2A	.0015	1.3735	1.3641	......	1.3329	1.3278	.0051	1.2968	2B	1.307	1.321	1.3344	1.3410	.0066	1.3750
		3A	.0000	1.3750	1.3656	......	1.3344	1.3306	.0038	1.2983	3B	1.3070	1.3158	1.3344	1.3394	.0050	1.3750
1⅜-18	NEF	2A	.0015	1.3735	1.3648	......	1.3374	1.3325	.0049	1.3053	2B	1.315	1.328	1.3389	1.3452	.0063	1.3750
		3A	.0000	1.3750	1.3663	......	1.3389	1.3353	.0036	1.3068	3B	1.3150	1.3230	1.3389	1.3436	.0047	1.3750
1 7/16-12	UN	2A	.0018	1.4357	1.4243	......	1.3816	1.3757	.0059	1.3335	2B	1.347	1.365	1.3834	1.3910	.0076	1.4375
		3A	.0000	1.4375	1.4261	......	1.3834	1.3790	.0044	1.3353	3B	1.3470	1.3573	1.3834	1.3891	.0057	1.4375
1 7/16-16	UN	2A	.0016	1.4359	1.4265	......	1.3953	1.3901	.0052	1.3592	2B	1.370	1.384	1.3969	1.4037	.0068	1.4375
		3A	.0000	1.4375	1.4281	......	1.3969	1.3930	.0039	1.3608	3B	1.3700	1.3783	1.3969	1.4020	.0051	1.4375
1⁷⁄₁₆-18	NEF	2A	.0015	1.4360	1.4273	......	1.3999	1.3949	.0050	1.3678	2B	1.377	1.390	1.4014	1.4079	.0065	1.4375
		3A	.0000	1.4375	1.4288	......	1.4014	1.3977	.0037	1.3693	3B	1.3770	1.3855	1.4014	1.4062	.0048	1.4375
1½-6	UNC	1A	.0024	1.4976	1.4703		1.3893	1.3772	.0121	1.2931	1B	1.320	1.350	1.3917	1.4075	.0158	1.5000
		2A	.0024	1.4976	1.4794	1.4703	1.3893	1.3812	.0081	1.2931	2B	1.320	1.350	1.3917	1.4022	.0105	1.5000
		3A	.0000	1.5000	1.4818		1.3917	1.3856	.0061	1.2955	3B	1.3200	1.3396	1.3917	1.3996	.0079	1.5000
1½-8	N	2A	.0022	1.4978	1.4828	1.4753	1.4166	1.4093	.0073	1.3444	2B	1.365	1.390	1.4188	1.4283	.0095	1.5000
		3A	.0000	1.5000	1.4850	......	1.4188	1.4133	.0055	1.3466	3B	1.3650	1.3797	1.4188	1.4259	.0071	1.5000
1½-12	UNF	1A	.0019	1.4981	1.4809	......	1.4440	1.4344	.0096	1.3959	1B	1.410	1.428	1.4459	1.4584	.0125	1.5000
		2A	.0019	1.4981	1.4867	......	1.4440	1.4376	.0064	1.3959	2B	1.410	1.428	1.4459	1.4542	.0083	1.5000
		3A	.0000	1.5000	1.4886	......	1.4459	1.4411	.0048	1.3978	3B	1.4100	1.4198	1.4459	1.4522	.0063	1.5000
1½-16	UN	2A	.0016	1.4984	1.4890	......	1.4578	1.4526	.0052	1.4217	2B	1.432	1.446	1.4594	1.4662	.0068	1.5000
		3A	.0000	1.5000	1.4906	......	1.4594	1.4555	.0039	1.4233	3B	1.4320	1.4408	1.4594	1.4645	.0051	1.5000
1½-18	NEF	2A	.0015	1.4985	1.4898	......	1.4624	1.4574	.0050	1.4303	2B	1.440	1.452	1.4639	1.4704	.0065	1.5000
		3A	.0000	1.5000	1.4913	......	1.4639	1.4602	.0037	1.4318	3B	1.4400	1.4480	1.4639	1.4687	.0048	1.5000
1⁹⁄₁₆-16	N	2A	.0016	1.5609	1.5515	......	1.5203	1.5151	.0052	1.4842	2B	1.495	1.509	1.5219	1.5287	.0068	1.5625
		3A	.0000	1.5625	1.5531	......	1.5219	1.5180	.0039	1.4858	3B	1.4950	1.5033	1.5219	1.5270	.0051	1.5625
1⁹⁄₁₆-18	NEF	2A	.0015	1.5610	1.5523	......	1.5249	1.5199	.0050	1.4928	2B	1.502	1.515	1.5264	1.5329	.0065	1.5625
		3A	.0000	1.5625	1.5538	......	1.5264	1.5227	.0037	1.4943	3B	1.5020	1.5105	1.5264	1.5312	.0048	1.5625
1⅝-8	N	2A	.0022	1.6228	1.6078	1.6003	1.5416	1.5342	.0074	1.4691	2B	1.490	1.515	1.5438	1.5535	.0097	1.6250
		3A	.0000	1.6250	1.6100	......	1.5438	1.5382	.0056	1.4716	3B	1.4900	1.5047	1.5438	1.5510	.0072	1.6250
1⅝-12	UN	2A	.0018	1.6232	1.6118	......	1.5691	1.5632	.0059	1.5210	2B	1.535	1.553	1.5709	1.5785	.0076	1.6250
		3A	.0000	1.6250	1.6136	......	1.5709	1.5665	.0044	1.5228	3B	1.5350	1.5448	1.5709	1.5766	.0057	1.6250
1⅝-16	UN	2A	.0016	1.6234	1.6140	......	1.5828	1.5776	.0052	1.5467	2B	1.557	1.571	1.5844	1.5912	.0068	1.6250
		3A	.0000	1.6250	1.6156	......	1.5844	1.5805	.0039	1.5483	3B	1.5570	1.5658	1.5844	1.5895	.0051	1.6250
1⅝-18	NEF	2A	.0015	1.6235	1.6148	......	1.5874	1.5824	.0050	1.5553	2B	1.565	1.578	1.5889	1.5954	.0065	1.6250
		3A	.0000	1.6250	1.6163	......	1.5889	1.5852	.0037	1.5568	3B	1.5650	1.5730	1.5889	1.5937	.0048	1.6250
1¹¹⁄₁₆-16	N	2A	.0016	1.6859	1.6765	......	1.6453	1.6400	.0053	1.6092	2B	1.620	1.634	1.6469	1.6538	.0069	1.6875
		3A	.0000	1.6875	1.6781	......	1.6469	1.6429	.0040	1.6108	3B	1.6200	1.6283	1.6469	1.6521	.0052	1.6875
1¹¹⁄₁₆-18	NEF	2A	.0015	1.6860	1.6773	......	1.6499	1.6448	.0051	1.6178	2B	1.627	1.640	1.6514	1.6580	.0066	1.6875
		3A	.0000	1.6875	1.6788	......	1.6514	1.6476	.0038	1.6193	3B	1.6270	1.6355	1.6514	1.6563	.0049	1.6875
1¾-5	UNC	1A	.0027	1.7473	1.7165		1.6174	1.6040	.0134	1.5019	1B	1.534	1.568	1.6201	1.6375	.0174	1.7500
		2A	.0027	1.7473	1.7268	1.7165	1.6174	1.6085	.0089	1.5019	2B	1.534	1.568	1.6201	1.6317	.0116	1.7500
		3A	.0000	1.7500	1.7295		1.6201	1.6134	.0067	1.5046	3B	1.5340	1.5575	1.6201	1.6288	.0087	1.7500
1¾-8	N	2A	.0023	1.7477	1.7327	1.7252	1.6665	1.6590	.0075	1.5943	2B	1.615	1.640	1.6688	1.6786	.0098	1.7500
		3A	.0000	1.7500	1.7350		1.6688	1.6632	.0056	1.5966	3B	1.6150	1.6297	1.6688	1.6762	.0074	1.7500
1¾-12	UN	2A	.0018	1.7482	1.7368	......	1.6941	1.6881	.0060	1.6460	2B	1.660	1.678	1.6959	1.7037	.0078	1.7500
		3A	.0000	1.7500	1.7386	......	1.6959	1.6914	.0045	1.6478	3B	1.6600	1.6698	1.6959	1.7017	.0058	1.7500

See footnotes at end of table.

TABLE III.10.—*Standard series limits of size—Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	External [a]									Internal [a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter [d]	Class	Minor diameter limits [e]		Pitch diameter limits			Major diameter
				Max [b]	Min	Min [c]	Max [b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
			in.	in.	in.	in.	in.	in.	in.	in.		in.	in.	in.	in.	in.	in.
1¾-16	UNEF	2A	0.0016	1.7484	1.7390		1.7078	1.7025	0.0053	1.6717	2B	1.682	1.696	1.7094	1.7163	0.0069	1.7500
		3A	.0000	1.7500	1.7406		1.7094	1.7054	.0040	1.6733	3B	1.6820	1.6908	1.7094	1.7146	.0052	1.7500
1¹³⁄₁₆-16	N	2A	.0016	1.8109	1.8015		1.7703	1.7650	.0053	1.7342	2B	1.745	1.759	1.7719	1.7788	.0069	1.8125
		3A	.0000	1.8125	1.8031		1.7719	1.7679	.0040	1.7358	3B	1.7450	1.7533	1.7719	1.7771	.0052	1.8125
1⅞-8	N	2A	.0023	1.8727	1.8577	1.8502	1.7915	1.7838	.0077	1.7193	2B	1.740	1.765	1.7938	1.8038	.0100	1.8750
		3A	.0000	1.8750	1.8600		1.7938	1.7881	.0057	1.7216	3B	1.7400	1.7547	1.7938	1.8013	.0075	1.8750
1⅞-12	UN	2A	.0018	1.8732	1.8618		1.8191	1.8131	.0060	1.7710	2B	1.785	1.803	1.8209	1.8287	.0078	1.8750
		3A	.0000	1.8750	1.8636		1.8209	1.8164	.0045	1.7728	3B	1.7850	1.7948	1.8209	1.8267	.0058	1.8750
1⅞-16	UN	2A	.0016	1.8734	1.8640		1.8328	1.8275	.0053	1.7967	2B	1.807	1.821	1.8344	1.8413	.0069	1.8750
		3A	.0000	1.8750	1.8656		1.8344	1.8304	.0040	1.7983	3B	1.8070	1.8158	1.8344	1.8396	.0052	1.8750
1¹⁵⁄₁₆-16	N	2A	.0016	1.9359	1.9265		1.8953	1.8899	.0054	1.8592	2B	1.870	1.884	1.8969	1.9039	.0070	1.9375
		3A	.0000	1.9375	1.9281		1.8969	1.8929	.0040	1.8608	3B	1.8700	1.8783	1.8969	1.9021	.0052	1.9375
2-4½	UNC	1A	.0029	1.9971	1.9641		1.8528	1.8385	.0143	1.7245	1B	1.759	1.795	1.8557	1.8743	.0186	2.0000
		2A	.0029	1.9971	1.9751	1.9641	1.8528	1.8433	.0095	1.7245	2B	1.759	1.795	1.8557	1.8681	.0124	2.0000
		3A	.0000	2.0000	1.9780		1.8557	1.8486	.0071	1.7274	3B	1.7590	1.7861	1.8557	1.8650	.0093	2.0000
2-8	N	2A	.0023	1.9977	1.9827	1.9752	1.9165	1.9087	.0078	1.8443	2B	1.865	1.890	1.9188	1.9289	.0101	2.0000
		3A	.0000	2.0000	1.9850		1.9188	1.9130	.0058	1.8466	3B	1.8650	1.8797	1.9188	1.9264	.0076	2.0000
2-12	UN	2A	.0018	1.9982	1.9868		1.9441	1.9380	.0061	1.8960	2B	1.910	1.928	1.9459	1.9538	.0079	2.0000
		3A	.0000	2.0000	1.9886		1.9459	1.9414	.0045	1.8978	3B	1.9100	1.9198	1.9459	1.9518	.0059	2.0000
2-16	UNEF	2A	.0016	1.9984	1.9890		1.9578	1.9524	.0054	1.9217	2B	1.932	1.946	1.9594	1.9664	.0070	2.0000
		3A	.0000	2.0000	1.9906		1.9594	1.9554	.0040	1.9233	3B	1.9320	1.9408	1.9594	1.9646	.0052	2.0000
2¹⁄₁₆-16	N	2A	.0016	2.0609	2.0515		2.0203	2.0149	.0054	1.9842	2B	1.995	2.009	2.0219	2.0289	.0070	2.0625
		3A	.0000	2.0625	2.0531		2.0219	2.0179	.0040	1.9858	3B	1.9950	2.0033	2.0219	2.0271	.0052	2.0625
2⅛-8	N	2A	.0024	2.1226	2.1076	2.1001	2.0414	2.0335	.0079	1.9692	2B	1.990	2.015	2.0438	2.0540	.0102	2.1250
		3A	.0000	2.1250	2.1100		2.0438	2.0379	.0059	1.9716	3B	1.9900	2.0047	2.0438	2.0515	.0077	2.1250
2⅛-12	UN	2A	.0018	2.1232	2.1118		2.0691	2.0630	.0061	2.0210	2B	2.035	2.053	2.0709	2.0788	.0079	2.1250
		3A	.0000	2.1250	2.1136		2.0709	2.0664	.0045	2.0228	3B	2.0350	2.0448	2.0709	2.0768	.0059	2.1250
2⅛-16	UN	2A	.0016	2.1234	2.1140		2.0828	2.0774	.0054	2.0467	2B	2.057	2.071	2.0844	2.0914	.0070	2.1250
		3A	.0000	2.1250	2.1156		2.0844	2.0803	.0041	2.0483	3B	2.0570	2.0658	2.0844	2.0896	.0052	2.1250
2³⁄₁₆-16	N	2A	.0016	2.1859	2.1765		2.1453	2.1399	.0054	2.1092	2B	2.120	2.134	2.1469	2.1539	.0070	2.1875
		3A	.0000	2.1875	2.1781		2.1469	2.1428	.0041	2.1108	3B	2.1200	2.1283	2.1469	2.1521	.0052	2.1875
2¼-4½	UNC	1A	.0029	2.2471	2.2141		2.1028	2.0882	.0146	1.9745	1B	2.009	2.045	2.1057	2.1247	.0190	2.2500
		2A	.0029	2.2471	2.2251	2.2141	2.1028	2.0931	.0097	1.9745	2B	2.009	2.045	2.1057	2.1183	.0126	2.2500
		3A	.0000	2.2500	2.2280		2.1057	2.0984	.0073	1.9774	3B	2.0090	2.0361	2.1057	2.1152	.0095	2.2500
2¼-8	N	2A	.0024	2.2476	2.2326	2.2251	2.1664	2.1584	.0080	2.0942	2B	2.115	2.140	2.1688	2.1792	.0104	2.2500
		3A	.0000	2.2500	2.2350		2.1688	2.1628	.0060	2.0966	3B	2.1150	2.1297	2.1688	2.1766	.0078	2.2500
2¼-12	UN	2A	.0018	2.2482	2.2368		2.1941	2.1880	.0061	2.1460	2B	2.160	2.178	2.1959	2.2038	.0079	2.2500
		3A	.0000	2.2500	2.2386		2.1959	2.1914	.0045	2.1478	3B	2.1600	2.1698	2.1959	2.2018	.0059	2.2500
2¼-16	UN	2A	.0016	2.2484	2.2390		2.2078	2.2024	.0054	2.1717	2B	2.182	2.196	2.2094	2.2164	.0070	2.2500
		3A	.0000	2.2500	2.2406		2.2094	2.2053	.0041	2.1733	3B	2.1820	2.1908	2.2094	2.2146	.0052	2.2500
2⁵⁄₁₆-16	N	2A	.0017	2.3108	2.3014		2.2702	2.2647	.0055	2.2341	2B	2.245	2.259	2.2719	2.2791	.0072	2.3125
		3A	.0000	2.3125	2.3031		2.2719	2.2678	.0041	2.2358	3B	2.2450	2.2533	2.2719	2.2773	.0054	2.3125
2⅜-12	UN	2A	.0019	2.3731	2.3617		2.3190	2.3128	.0062	2.2709	2B	2.285	2.303	2.3209	2.3290	.0081	2.3750
		3A	.0000	2.3750	2.3636		2.3209	2.3163	.0046	2.2728	3B	2.2850	2.2948	2.3209	2.3269	.0060	2.3750
2⅜-16	UN	2A	.0017	2.3733	2.3639		2.3327	2.3272	.0055	2.2966	2B	2.307	2.321	2.3344	2.3416	.0072	2.3750
		3A	.0000	2.3750	2.3656		2.3344	2.3303	.0041	2.2983	3B	2.3070	2.3158	2.3344	2.3398	.0054	2.3750
2⁷⁄₁₆-16	N	2A	.0017	2.4358	2.4264		2.3952	2.3897	.0055	2.3591	2B	2.370	2.384	2.3969	2.4041	.0072	2.4375
		3A	.0000	2.4375	2.4281		2.3969	2.3928	.0041	2.3608	3B	2.3700	2.3783	2.3969	2.4023	.0054	2.4375
2½-4	UNC	1A	.0031	2.4969	2.4612		2.3345	2.3190	.0155	2.1902	1B	2.229	2.267	2.3376	2.3578	.0202	2.5000
		2A	.0031	2.4969	2.4731	2.4612	2.3345	2.3241	.0104	2.1902	2B	2.229	2.267	2.3376	2.3511	.0135	2.5000
		3A	.0000	2.5000	2.4762		2.3376	2.3298	.0078	2.1933	3B	2.2290	2.2594	2.3376	2.3477	.0101	2.5000
2½-8	N	2A	.0024	2.4976	2.4826	2.4751	2.4164	2.4082	.0082	2.3442	2B	2.365	2.390	2.4188	2.4294	.0106	2.5000
		3A	.0000	2.5000	2.4850		2.4188	2.4127	.0061	2.3466	3B	2.3650	2.3797	2.4188	2.4268	.0080	2.5000
2½-12	UN	2A	.0019	2.4981	2.4867		2.4440	2.4378	.0062	2.3959	2B	2.410	2.428	2.4459	2.4540	.0081	2.5000
		3A	.0000	2.5000	2.4886		2.4459	2.4413	.0046	2.3978	3B	2.4100	2.4198	2.4459	2.4519	.0060	2.5000
2½-16	UN	2A	.0017	2.4983	2.4889		2.4577	2.4522	.0055	2.4216	2B	2.432	2.446	2.4594	2.4666	.0072	2.5000
		3A	.0000	2.5000	2.4906		2.4594	2.4553	.0041	2.4233	3B	2.4320	2.4408	2.4594	2.4648	.0054	2.5000
2⅝-12	UN	2A	.0019	2.6231	2.6117		2.5690	2.5628	.0062	2.5209	2B	2.535	2.553	2.5709	2.5790	.0081	2.6250
		3A	.0000	2.6250	2.6136		2.5709	2.5663	.0046	2.5228	3B	2.5350	2.5448	2.5709	2.5769	.0060	2.6250
2⅝-16	UN	2A	.0017	2.6233	2.6139		2.5827	2.5772	.0055	2.5466	2B	2.557	2.571	2.5844	2.5916	.0072	2.6250
		3A	.0000	2.6250	2.6156		2.5844	2.5803	.0041	2.5483	3B	2.5570	2.5658	2.5844	2.5898	.0054	2.6250
2¾-4	UNC	1A	.0032	2.7468	2.7111		2.5844	2.5686	.0158	2.4401	1B	2.479	2.517	2.5876	2.6082	.0206	2.7500
		2A	.0032	2.7468	2.7230	2.7111	2.5844	2.5739	.0105	2.4401	2B	2.479	2.517	2.5876	2.6013	.0137	2.7500
		3A	.0000	2.7500	2.7262		2.5876	2.5797	.0079	2.4433	3B	2.4790	2.5094	2.5876	2.5979	.0103	2.7500
2¾-8	N	2A	.0025	2.7475	2.7325	2.7250	2.6663	2.6580	.0083	2.5941	2B	2.615	2.640	2.6688	2.6796	.0108	2.7500
		3A	.0000	2.7500	2.7350		2.6688	2.6625	.0063	2.5966	3B	2.6150	2.6297	2.6688	2.6769	.0081	2.7500
2¾-12	UN	2A	.0019	2.7481	2.7367		2.6940	2.6878	.0062	2.6459	2B	2.660	2.678	2.6959	2.7040	.0081	2.7500
		3A	.0000	2.7500	2.7386		2.6959	2.6913	.0046	2.6478	3B	2.6600	2.6698	2.6959	2.7019	.0060	2.7500
2¾-16	UN	2A	.0017	2.7483	2.7389		2.7077	2.7022	.0055	2.6716	2B	2.682	2.696	2.7094	2.7166	.0072	2.7500
		3A	.0000	2.7500	2.7406		2.7094	2.7053	.0041	2.6733	3B	2.6820	2.6908	2.7094	2.7148	.0054	2.7500
2⅞-12	UN	2A	.0019	2.8731	2.8617		2.8190	2.8127	.0063	2.7709	2B	2.785	2.803	2.8209	2.8291	.0082	2.8750
		3A	.0000	2.8750	2.8636		2.8209	2.8162	.0047	2.7728	3B	2.7850	2.7948	2.8209	2.8271	.0062	2.8750
2⅞-16	UN	2A	.0017	2.8733	2.8639		2.8327	2.8271	.0056	2.7966	2B	2.807	2.821	2.8344	2.8417	.0073	2.8750
		3A	.0000	2.8750	2.8656		2.8344	2.8302	.0042	2.7983	3B	2.8070	2.8158	2.8344	2.8399	.0055	2.8750
3-4	UNC	1A	.0032	2.9968	2.9611		2.8344	2.8183	.0161	2.6901	1B	2.729	2.767	2.8376	2.8585	.0209	3.0000
		2A	.0032	2.9968	2.9730	2.9611	2.8344	2.8237	.0107	2.6901	2B	2.729	2.767	2.8376	2.8515	.0139	3.0000
		3A	.0000	3.0000	2.9762		2.8376	2.8296	.0080	2.6933	3B	2.7290	2.7594	2.8376	2.8480	.0104	3.0000
3-8	N	2A	.0026	2.9974	2.9824	2.9749	2.9162	2.9077	.0085	2.8440	2B	2.865	2.890	2.9188	2.9299	.0111	3.0000
		3A	.0000	3.0000	2.9850		2.9188	2.9124	.0064	2.8466	3B	2.8650	2.8797	2.9188	2.9271	.0083	3.0000
3-12	UN	2A	.0019	2.9981	2.9867		2.9440	2.9377	.0063	2.8959	2B	2.910	2.928	2.9459	2.9541	.0082	3.0000
		3A	.0000	3.0000	2.9886		2.9459	2.9412	.0047	2.8978	3B	2.9100	2.9198	2.9459	2.9521	.0062	3.0000
3-16	UN	2A	.0017	2.9983	2.9889		2.9577	2.9521	.0056	2.9216	2B	2.932	2.946	2.9594	2.9667	.0073	3.0000
		3A	.0000	3.0000	2.9906		2.9594	2.9552	.0042	2.9233	3B	2.9320	2.9408	2.9594	2.9649	.0055	3.0000

See footnotes at end of table.

TABLE III.10.—*Standard series limits of size—Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	External[a]									Internal[a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter[d]	Class	Minor diameter limits[e]		Pitch diameter limits			Major diameter
				Max[b]	Min	Min[c]	Max[b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
			in.	in.	in.	in.	in.	in.	in.	in.		in.	in.	in.	in.	in.	in.
3⅛-12	UN	2A	0.0019	3.1231	3.1117		3.0690	3.0627	0.0063	3.0209	2B	3.035	3.053	3.0709	3.0791	0.0082	3.1250
		3A	.0000	3.1250	3.1136		3.0709	3.0662	.0047	3.0228	3B	3.0350	3.0448	3.0709	3.0771	.0062	3.1250
3⅛-16	UN	2A	.0017	3.1233	3.1139		3.0827	3.0771	.0056	3.0466	2B	3.057	3.071	3.0844	3.0917	.0073	3.1250
		3A	.0000	3.1250	3.1156		3.0844	3.0802	.0042	3.0483	3B	3.0570	3.0658	3.0844	3.0899	.0055	3.1250
3¼-4	UNC	1A	.0033	3.2467	3.2110		3.0843	3.0680	.0163	2.9400	1B	2.979	3.017	3.0876	3.1088	.0212	3.2500
		2A	.0033	3.2467	3.2229	3.2110	3.0843	3.0734	.0109	2.9400	2B	2.979	3.017	3.0876	3.1017	.0141	3.2500
		3A	.0000	3.2500	3.2262		3.0876	3.0794	.0082	2.9433	3B	2.9790	3.0094	3.0876	3.0982	.0106	3.2500
3¼-8	N	2A	.0026	3.2474	3.2324	3.2249	3.1662	3.1575	.0087	3.0940	2B	3.115	3.140	3.1688	3.1801	.0113	3.2500
		3A	.0000	3.2500	3.2350		3.1688	3.1623	.0065	3.0966	3B	3.1150	3.1297	3.1688	3.1772	.0084	3.2500
3¼-12	UN	2A	.0019	3.2481	3.2367		3.1940	3.1877	.0063	3.1459	2B	3.160	3.178	3.1959	3.2041	.0082	3.2500
		3A	.0000	3.2500	3.2386		3.1959	3.1912	.0047	3.1478	3B	3.1600	3.1698	3.1959	3.2021	.0062	3.2500
3¼-16	UN	2A	.0017	3.2483	3.2389		3.2077	3.2021	.0056	3.1716	2B	3.182	3.196	3.2094	3.2167	.0073	3.2500
		3A	.0000	3.2500	3.2406		3.2094	3.2052	.0042	3.1733	3B	3.1820	3.1908	3.2094	3.2149	.0055	3.2500
3⅜-12	UN	2A	.0019	3.3731	3.3617		3.3190	3.3126	.0064	3.2709	2B	3.285	3.303	3.3209	3.3293	.0084	3.3750
		3A	.0000	3.3750	3.3636		3.3209	3.3161	.0048	3.2728	3B	3.2850	3.2948	3.3209	3.3272	.0063	3.3750
3⅜-16	UN	2A	.0017	3.3733	3.3639		3.3327	3.3269	.0058	3.2966	2B	3.307	3.321	3.3344	3.3419	.0075	3.3750
		3A	.0000	3.3750	3.3656		3.3344	3.3301	.0043	3.2983	3B	3.3070	3.3158	3.3344	3.3400	.0056	3.3750
3½-4	UNC	1A	.0033	3.4967	3.4610		3.3343	3.3177	.0166	3.1900	1B	3.229	3.267	3.3376	3.3591	.0215	3.5000
		2A	.0033	3.4967	3.4729	3.4610	3.3343	3.3233	.0110	3.1900	2B	3.229	3.267	3.3376	3.3519	.0143	3.5000
		3A	.0000	3.5000	3.4762		3.3376	3.3293	.0083	3.1933	3B	3.2290	3.2594	3.3376	3.3484	.0108	3.5000
3½-8	N	2A	.0026	3.4974	3.4824	3.4749	3.4162	3.4074	.0088	3.3440	2B	3.365	3.390	3.4188	3.4303	.0115	3.5000
		3A	.0000	3.5000	3.4850		3.4188	3.4122	.0066	3.3466	3B	3.3650	3.3797	3.4188	3.4274	.0086	3.5000
3½-12	UN	2A	.0019	3.4981	3.4867		3.4440	3.4376	.0064	3.3959	2B	3.410	3.428	3.4459	3.4543	.0084	3.5000
		3A	.0000	3.5000	3.4886		3.4459	3.4411	.0048	3.3978	3B	3.4100	3.4198	3.4459	3.4522	.0063	3.5000
3½-16	UN	2A	.0017	3.4983	3.4889		3.4577	3.4519	.0058	3.4216	2B	3.432	3.446	3.4594	3.4669	.0075	3.5000
		3A	.0000	3.5000	3.4906		3.4594	3.4551	.0043	3.4233	3B	3.4320	3.4408	3.4594	3.4650	.0056	3.5000
3⅝-12	UN	2A	.0019	3.6231	3.6117		3.5690	3.5626	.0064	3.5209	2B	3.535	3.553	3.5709	3.5793	.0084	3.6250
		3A	.0000	3.6250	3.6136		3.5709	3.5661	.0048	3.5228	3B	3.5350	3.5448	3.5709	3.5772	.0063	3.6250
3⅝-16	UN	2A	.0017	3.6233	3.6139		3.5827	3.5769	.0058	3.5466	2B	3.557	3.571	3.5844	3.5919	.0075	3.6250
		3A	.0000	3.6250	3.6156		3.5844	3.5801	.0043	3.5483	3B	3.5570	3.5658	3.5844	3.5900	.0056	3.6250
3¾-4	UNC	1A	.0034	3.7466	3.7109		3.5842	3.5674	.0168	3.4399	1B	3.479	3.517	3.5876	3.6094	.0218	3.7500
		2A	.0034	3.7466	3.7228	3.7109	3.5842	3.5730	.0112	3.4399	2B	3.479	3.517	3.5876	3.6021	.0145	3.7500
		3A	.0000	3.7500	3.7262		3.5876	3.5792	.0084	3.4433	3B	3.4790	3.5094	3.5876	3.5985	.0109	3.7500
3¾-8	N	2A	.0027	3.7473	3.7323	3.7248	3.6661	3.6571	.0090	3.5939	2B	3.615	3.640	3.6688	3.6805	.0117	3.7500
		3A	.0000	3.7500	3.7350		3.6688	3.6621	.0067	3.5966	3B	3.6150	3.6297	3.6688	3.6776	.0088	3.7500
3¾-12	UN	2A	.0019	3.7481	3.7367		3.6940	3.6876	.0064	3.6459	2B	3.660	3.678	3.6959	3.7043	.0084	3.7500
		3A	.0000	3.7500	3.7386		3.6959	3.6911	.0048	3.6478	3B	3.6600	3.6698	3.6959	3.7022	.0063	3.7500
3¾-16	UN	2A	.0017	3.7483	3.7389		3.7077	3.7019	.0058	3.6716	2B	3.682	3.696	3.7094	3.7169	.0075	3.7500
		3A	.0000	3.7500	3.7406		3.7094	3.7051	.0043	3.6733	3B	3.6820	3.6908	3.7094	3.7150	.0056	3.7500
3⅞-12	UN	2A	.0020	3.8730	3.8616		3.8189	3.8124	.0065	3.7708	2B	3.785	3.803	3.8209	3.8294	.0085	3.8750
		3A	.0000	3.8750	3.8636		3.8209	3.8160	.0049	3.7728	3B	3.7850	3.7948	3.8209	3.8273	.0064	3.8750
3⅞-16	UN	2A	.0018	3.8732	3.8638		3.8326	3.8267	.0059	3.7965	2B	3.807	3.821	3.8344	3.8420	.0076	3.8750
		3A	.0000	3.8750	3.8656		3.8344	3.8300	.0044	3.7983	3B	3.8070	3.8158	3.8344	3.8401	.0057	3.8750
4-4	UNC	1A	.0034	3.9966	3.9609		3.8342	3.8172	.0170	3.6899	1B	3.729	3.767	3.8376	3.8597	.0221	4.0000
		2A	.0034	3.9966	3.9728	3.9609	3.8342	3.8229	.0113	3.6899	2B	3.729	3.767	3.8376	3.8523	.0147	4.0000
		3A	.0000	4.0000	3.9762		3.8376	3.8291	.0085	3.6933	3B	3.7290	3.7594	3.8376	3.8487	.0111	4.0000
4-8	N	2A	.0027	3.9973	3.9823	3.9748	3.9161	3.9070	.0091	3.8439	2B	3.865	3.890	3.9188	3.9307	.0119	4.0000
		3A	.0000	4.0000	3.9850		3.9188	3.9120	.0068	3.8466	3B	3.8650	3.8797	3.9188	3.9277	.0089	4.0000
4-12	UN	2A	.0020	3.9980	3.9866		3.9439	3.9374	.0065	3.8958	2B	3.910	3.928	3.9459	3.9544	.0085	4.0000
		3A	.0000	4.0000	3.9886		3.9459	3.9410	.0049	3.8978	3B	3.9100	3.9198	3.9459	3.9523	.0064	4.0000
4-16	UN	2A	.0018	3.9982	3.9888		3.9576	3.9517	.0059	3.9215	2B	3.932	3.946	3.9594	3.9670	.0076	4.0000
		3A	.0000	4.0000	3.9906		3.9594	3.9550	.0044	3.9233	3B	3.9320	3.9408	3.9594	3.9651	.0057	4.0000
4¼-8	N	2A	.0028	4.2472	4.2322	4.2247	4.1660	4.1567	.0093	4.0938	2B	4.115	4.140	4.1688	4.1809	.0121	4.2500
		3A	.0000	4.2500	4.2350		4.1688	4.1618	.0070	4.0966	3B	4.1150	4.1297	4.1688	4.1778	.0090	4.2500
4¼-12	UN	2A	.0020	4.2480	4.2366		4.1939	4.1874	.0065	4.1458	2B	4.160	4.178	4.1959	4.2044	.0085	4.2500
		3A	.0000	4.2500	4.2386		4.1959	4.1910	.0049	4.1478	3B	4.1600	4.1698	4.1959	4.2023	.0064	4.2500
4¼-16	UN	2A	.0018	4.2482	4.2388		4.2076	4.2017	.0059	4.1715	2B	4.182	4.196	4.2094	4.2170	.0076	4.2500
		3A	.0000	4.2500	4.2406		4.2094	4.2050	.0044	4.1733	3B	4.1820	4.1908	4.2094	4.2151	.0057	4.2500
4½-8	N	2A	.0028	4.4972	4.4822	4.4747	4.4160	4.4066	.0094	4.3438	2B	4.365	4.390	4.4188	4.4310	.0122	4.5000
		3A	.0000	4.5000	4.4850		4.4188	4.4117	.0071	4.3466	3B	4.3650	4.3797	4.4188	4.4280	.0092	4.5000
4½-12	UN	2A	.0020	4.4980	4.4866		4.4439	4.4374	.0065	4.3958	2B	4.410	4.428	4.4459	4.4544	.0085	4.5000
		3A	.0000	4.5000	4.4886		4.4459	4.4410	.0049	4.3978	3B	4.4100	4.4198	4.4459	4.4523	.0064	4.5000
4½-16	UN	2A	.0018	4.4982	4.4888		4.4576	4.4517	.0059	4.4215	2B	4.432	4.446	4.4594	4.4670	.0076	4.5000
		3A	.0000	4.5000	4.4906		4.4594	4.4550	.0044	4.4233	3B	4.4320	4.4408	4.4594	4.4651	.0057	4.5000
4¾-8	N	2A	.0029	4.7471	4.7321	4.7246	4.6659	4.6564	.0095	4.5937	2B	4.615	4.640	4.6688	4.6812	.0124	4.7500
		3A	.0000	4.7500	4.7350		4.6688	4.6616	.0072	4.5966	3B	4.6150	4.6297	4.6688	4.6781	.0093	4.7500
4¾-12	UN	2A	.0020	4.7480	4.7366		4.6939	4.6872	.0067	4.6458	2B	4.660	4.678	4.6959	4.7046	.0087	4.7500
		3A	.0000	4.7500	4.7386		4.6959	4.6909	.0050	4.6478	3B	4.6600	4.6698	4.6959	4.7025	.0066	4.7500
4¾-16	UN	2A	.0018	4.7482	4.7388		4.7076	4.7015	.0061	4.6715	2B	4.682	4.696	4.7094	4.7173	.0079	4.7500
		3A	.0000	4.7500	4.7406		4.7094	4.7049	.0045	4.6733	3B	4.6820	4.6908	4.7094	4.7153	.0059	4.7500
5-8	N	2A	.0029	4.9971	4.9821	4.9746	4.9159	4.9062	.0097	4.8437	2B	4.865	4.890	4.9188	4.9314	.0126	5.0000
		3A	.0000	5.0000	4.9850		4.9188	4.9116	.0072	4.8466	3B	4.8650	4.8797	4.9188	4.9282	.0094	5.0000
5-12	UN	2A	.0020	4.9980	4.9866		4.9439	4.9372	.0067	4.8958	2B	4.910	4.928	4.9459	4.9546	.0087	5.0000
		3A	.0000	5.0000	4.9886		4.9459	4.9409	.0050	4.8978	3B	4.9100	4.9198	4.9459	4.9525	.0066	5.0000
5-16	UN	2A	.0018	4.9982	4.9888		4.9576	4.9515	.0061	4.9215	2B	4.932	4.946	4.9594	4.9673	.0079	5.0000
		3A	.0000	5.0000	4.9906		4.9594	4.9549	.0045	4.9233	3B	4.9320	4.9408	4.9594	4.9653	.0059	5.0000
5¼-8	N	2A	.0029	5.2471	5.2321	5.2246	5.1659	5.1561	.0098	5.0937	2B	5.115	5.140	5.1688	5.1815	.0127	5.2500
		3A	.0000	5.2500	5.2350		5.1688	5.1615	.0073	5.0966	3B	5.1150	5.1297	5.1688	5.1783	.0095	5.2500
5¼-12	UN	2A	.0020	5.2480	5.2366		5.1939	5.1872	.0067	5.1458	2B	5.160	5.178	5.1959	5.2046	.0087	5.2500
		3A	.0000	5.2500	5.2386		5.1959	5.1909	.0050	5.1478	3B	5.1600	5.1698	5.1959	5.2025	.0066	5.2500

See footnotes at end of table.

TABLE III.10.—*Standard series limits of size—Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	External [a]									Internal [a]						
		Class	Allowance	Major diameter limits			Pitch diameter limits			Minor diameter [d]	Class	Minor diameter limits [e]		Pitch diameter limits			Major diameter
				Max [b]	Min	Min [c]	Max [b]	Min	Tolerance			Min	Max	Min	Max	Tolerance	Min
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
5¼-16	**UN**	**2A**	0.0018	**5.2482**	**5.2383**	....	5.2076	**5.2015**	0.0061	5.1715	**2B**	5.182	5.196	5.2094	5.2173	0.0079	**5.2500**
		3A	.0000	**5.2500**	**5.2406**	....	5.2094	**5.2049**	.0045	5.1733	**3B**	5.1820	5.1968	5.2094	5.2153	.0059	**5.2500**
5½-8	N	2A	.0030	5.4970	5.4820	5.4745	5.4158	5.4059	.0099	5.3436	2B	5.365	5.390	5.4188	5.4317	.0129	5.5000
		3A	.0000	5.5000	5.4850	....	5.4188	5.4114	.0074	5.3466	3B	5.3650	5.3797	5.4188	5.4285	.0097	5.5000
5½-12	**UN**	**2A**	.0020	**5.4980**	**5.4866**	....	**5.4439**	**5.4372**	.0067	**5.3958**	**2B**	**5.410**	5.428	5.4439	**5.4546**	.0087	**5.5000**
		3A	.0000	**5.5000**	**5.4886**	....	**5.4459**	**5.4409**	.0050	**5.3978**	**3B**	**5.4100**	**5.4198**	5.4459	**5.4525**	.0066	**5.5000**
5½-16	**UN**	**2A**	.0018	**5.4982**	**5.4888**	....	**5.4576**	**5.4515**	.0061	**5.4215**	**2B**	**5.432**	5.446	5.4594	**5.4673**	.0079	**5.5000**
		3A	.0000	**5.5000**	**5.4906**	....	**5.4594**	**5.4549**	.0045	**5.4233**	**3B**	**5.4320**	5.4408	5.4594	**5.4653**	.0059	**5.5000**
5¾-8	N	2A	.0030	5.7470	5.7320	5.7245	5.6658	5.6558	.0100	5.5936	2B	5.615	5.640	5.6688	5.6818	.0130	5.7500
		3A	.0000	5.7500	5.7350	....	5.6688	5.6613	.0075	5.5966	3B	5.6150	5.6297	5.6688	5.6786	.0098	5.7500
5¾-12	**UN**	**2A**	.0021	**5.7479**	**5.7365**	....	**5.6938**	**5.6869**	.0069	**5.6457**	**2B**	**5.660**	5.678	5.6959	**5.7049**	.0090	**5.7500**
		3A	.0000	**5.7500**	**5.7386**	....	**5.6959**	**5.6907**	.0052	**5.6478**	**3B**	**5.6600**	5.6698	5.6959	**5.7026**	.0067	**5.7500**
5¾-16	**UN**	**2A**	.0019	**5.7481**	**5.7387**	....	**5.7075**	**5.7013**	.0062	**5.6714**	**2B**	**5.682**	5.696	5.7094	**5.7175**	.0081	**5.7500**
		3A	.0000	**5.7500**	**5.7406**	....	**5.7094**	**5.7047**	.0047	**5.6733**	**3B**	**5.6820**	5.6908	5.7094	**5.7155**	.0061	**5.7500**
6-8	N	2A	.0030	5.9970	5.9820	5.9745	5.9158	5.9056	.0102	5.8436	2B	5.865	5.890	5.9188	5.9320	.0132	6.0000
		3A	.0000	6.0000	5.9850	....	5.9188	5.9112	.0076	5.8466	3B	5.8650	5.8797	5.9188	5.9287	.0099	6.0000
6-12	**UN**	**2A**	.0021	**5.9979**	**5.9865**	....	**5.9438**	**5.9369**	.0069	**5.8957**	**2B**	**5.910**	**5.928**	**5.9459**	**5.9549**	.0090	**6.0000**
		3A	.0000	**6.0000**	**5.9886**	....	**5.9459**	**5.9407**	.0052	**5.8978**	**3B**	**5.9100**	**5.9198**	**5.9459**	**5.9526**	.0067	**6.0000**
6-16	**UN**	**2A**	.0019	**5.9981**	**5.9887**	....	**5.9575**	**5.9513**	.0062	**5.9214**	**2B**	**5.932**	**5.946**	**5.9594**	**5.9675**	.0081	**6.0000**
		3A	.0000	**6.0000**	**5.9906**	....	**5.9594**	**5.9517**	.0047	**5.9233**	**3B**	**5.9320**	**5.9408**	**5.9594**	**5.9655**	.0061	**6.0000**

[a] Regarding combinations of thread classes, see par. 1, p. 18.

[b] For class 2A threads having an additive finish the maximum is increased to the basic size, the value being the same as for class 3A shown in this column, see par. 2, and 4, p. 23.

[c] For unfinished hot-rolled material.

[d] See figs. III.1, III.3, and III.4, pp. 11, 24, and 25

[e] Revised minor diameter limits of classes 1B and 2B are in process of ratification as Unified Standard.

TABLE III.11.—*Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified and American screw threads*

Designation		External					Internal				
Size		Threads per inch	Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle		Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle	
1		2	3	4	5	6		7	8	9	10	
No.	*in.*			*in.*	*in*	*deg*	*min*		*in.*	*in.*	*deg*	*min*
0	0.060	80	NF 2A	0.00090	0.00052	3	18	NF 2B	0.00115	0.00066	4	13
			NF 3A	.00065	.00038	2	23	NF 3B	.00085	.00049	3	7
1	.073	64	NC-2A	.00100	.00058	2	56	NC 2B	.00130	.00075	3	48
			NC-3A	.00075	.00043	2	12	NC 3B	.00095	.00055	2	47
1	.073	72	NF-2A	.00095	.00055	3	8	NF-2B	.00125	.00072	4	7
			NF 3A	.00070	.00040	2	19	NF 3B	.00095	.00055	3	8
2	.086	56	NC-2A	.00105	.00061	2	42	NC 2B	.00140	.00081	3	35
			NC 3A	.00080	.00046	2	3	NC 3B	.00105	.00061	2	42
2	.086	64	NF 2A	.00100	.00058	2	56	NF 2B	.00135	.00078	3	57
			NF-3A	.00075	.00043	2	12	NF 3B	.00100	.00058	2	56
3	.099	48	NC-2A	.00115	.00066	2	32	NC 2B	.00150	.00087	3	18
			NC 3A	.00085	.00049	1	52	NC 3B	.00110	.00064	2	25
3	.099	56	NF 2A	.00110	.00064	2	49	NF 2B	.00140	.00081	3	35
			NF 3A	.00080	.00046	2	3	NF 3B	.00105	.00061	2	42
4	.112	40	NC-2A	.00125	.00072	2	17	NC 2B	.00165	.00095	3	1
			NC 3A	.00095	.00055	1	44	NC 3B	.00120	.00069	2	12
4	.112	48	NF 2A	.00120	.00069	2	38	NF 2B	.00155	.00089	3	24
			NF 3A	.00090	.00052	1	59	NF 3B	.00115	.00066	2	32
5	.125	40	NC 2A	.00130	.00075	2	23	NC 2B	.00165	.00095	3	1
			NC-3A	.00095	.00055	1	44	NC 3B	.00125	.00072	2	17
5	.125	44	NF 2A	.00125	.00072	2	31	NF 2B	.00160	.00092	3	13
			NF 3A	.00095	.00055	1	55	NF 3B	.00120	.00069	2	25
6	.138	32	NC-2A	.00140	.00081	2	3	NC 2B	.00185	.00107	2	43
			NC-3A	.00106	.00061	1	32	NC 3B	.00135	.00078	1	59

TABLE III.11.—*Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified and American screw threads*—Continued

Designation			External					Internal				
Size		Threads per inch	Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle		Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle	
1		2	3	4	5	6		7	8	9	10	
No.	*in.*			*in.*	*in.*	*deg*	*min*		*in.*	*in.*	*deg*	*min*
6	0.138	40	NF-2A	0.00130	0.00075	2	23	NF 2B	0.00170	0.00098	3	7
			NF 3A	.00100	.00058	1	50	NF 3B	.00125	.00072	2	17
8	.164	32	NC 2A	.00145	.00084	2	8	NC 2B	.00190	.00110	2	47
			NC 3A	.00110	.00064	1	37	NC 3B	.00140	.00081	2	3
8	.164	36	NF-2A	.00140	.00081	2	19	NF 2B	.00180	.00104	2	58
			NF-3A	.00105	.00061	1	44	NF 3B	.00135	.00078	2	14
10	.190	24	NC-2A	.00165	.00095	1	49	NC 2B	.00215	.00124	2	22
			NC-3A	.00125	.00072	1	22	NC 3B	.00160	.00092	1	46
10	.190	32	NF-2A	.00150	.00087	2	12	NF 2B	.00195	.00113	2	52
			NF 3A	.00115	.00066	1	41	NF-3B	.00145	.00084	2	8
12	.216	24	NC-2A	.00170	.00098	1	52	NC 2B	.00220	.00127	2	25
			NC 3A	.00130	.00075	1	26	NC 3B	.00165	.00095	1	49
12	.216	28	NF 2A	.00160	.00092	2	3	NF-2B	.00210	.00121	2	42
			NF 3A	.00120	.00069	1	32	NF 3B	.00155	.00089	1	59
12	.216	32	NEF 2A	.00155	.00089	2	16	NEF 2B	.00205	.00118	3	0
			NEF-3A	.00120	.00069	1	46	NEF 3B	.00155	.00089	2	16
	¼	20	UNC-1A	.00280	.00162	2	34	UNC 1B	.00365	.00211	3	21
			UNC 2A	.00185	.00107	1	42	UNC 2B	.00240	.00139	2	12
			UNC 3A	.00140	.00081	1	17	UNC 3B	.00180	.00104	1	39
	¼	28	UNF 1A	.00250	.00144	3	12	UNF 1B	.00325	.00188	4	10
			UNF-2A	.00165	.00095	2	7	UNF 2B	.00215	.00124	2	45
			UNF-3A	.00125	.00072	1	36	UNF-3B	.00160	.00092	2	3
	¼	32	NEF-2A	.00160	.00092	2	21	NEF 2B	.00210	.00121	3	5
			NEF 3A	.00120	.00069	1	46	NEF 3B	.00155	.00089	2	16
	5/16	18	UNC 1A	.00305	.00176	2	31	UNC-1B	.00395	.00228	3	15
			UNC-2A	.00200	.00115	1	39	UNC 2B	.00265	.00153	2	11
			UNC-3A	.00150	.00087	1	14	UNC 3B	.00195	.00113	1	37
	5/16	24	UNF 1A	.00275	.00159	3	1	UNF 1B	.00355	.00205	3	54
			UNF 2A	.00185	.00107	2	2	UNF 2B	.00240	.00139	2	33
			UNF 3A	.00135	.00078	1	29	UNF 3B	.00180	.00104	1	59
	5/16	32	NEF 2A	.00160	.00092	2	21	NEF 2B	.00210	.00121	3	5
			NEF 3A	.00120	.00069	1	46	NEF 3B	.00155	.00089	2	16
	⅜	16	UNC-1A	.00325	.00188	2	23	UNC 1B	.00425	.00245	3	7
			UNC 2A	.00220	.00127	1	37	UNC 2B	.00285	.00165	2	5
			UNC-3A	.00165	.00095	1	13	UNC-3B	.00215	.00124	1	35
	⅜	24	UNF 1A	.00285	.00165	3	8	UNF 1B	.00370	.00214	4	4
			UNF 2A	.00190	.00110	2	5	UNF 2B	.00245	.00141	2	42
			UNF 3A	.00145	.00084	1	36	UNF 3B	.00185	.00107	2	2
	⅜	32	NEF 2A	.00170	.00098	2	30	NEF 2B	.00220	.00127	3	13
			NEF 3A	.00125	.00072	1	50	NEF 3B	.00165	.00095	2	25
	7/16	14	UNC-1A	.00355	.00205	2	17	UNC 1B	.00460	.00266	2	57
			UNC 2A	.00235	.00136	1	30	UNC 2B	.00305	.00176	1	57
			UNC 3A	.00175	.00101	1	7	UNC 3B	.00230	.00133	1	29
	7/16	20	UNF 1A	.00310	.00179	2	50	UNF 1B	.00405	.00234	3	42
			UNF 2A	.00210	.00121	1	55	UNF 2B	.00270	.00156	2	28
			UNF 3A	.00155	.00089	1	25	UNF 3B	.00205	.00118	1	53
	7/16	28	UNEF 2A	.00180	.00104	2	19	UNEF 2B	.00230	.00133	2	57
			UNEF 3A	.00135	.00078	1	44	UNEF 3B	.00175	.00101	2	15
	½	12	N 2A	.00270	.00156	1	29	N 2B	.00350	.00202	1	55
			N 3A	.00200	.00115	1	6	N 3B	.00260	.00150	1	26
	½	13	UNC 1A	.00370	.00214	2	12	UNC 1B	.00485	.00280	2	53
			UNC 2A	.00250	.00144	1	29	UNC 2B	.00325	.00188	1	56
			UNC 3A	.00185	.00107	1	6	UNC 3B	.00240	.00139	1	26
	½	20	UNF 1A	.00320	.00185	2	56	UNF 1B	.00420	.00242	3	51
			UNF 2A	.00215	.00124	1	58	UNF 2B	.00280	.00162	2	34
			UNF-3A	.00160	.00092	1	28	UNF 3B	.00210	.00121	1	55
	½	28	UNEF 2A	.00185	.00107	2	22	UNEF 2B	.00240	.00139	3	5
			UNEF 3A	.00140	.00081	1	48	UNEF 3B	.00180	.00104	2	19
	9/16	12	UNC-1A	.00390	.00225	2	9	UNC 1B	.00510	.00294	2	48
			UNC 2A	.00260	.00150	1	26	UNC 2B	.00340	.00196	1	52
			UNC-3A	.00195	.00113	1	4	UNC 3B	.00255	.00147	1	24
	9/16	18	UNF 1A	.00340	.00196	2	48	UNF 1B	.00445	.00257	3	40
			UNF 2A	.00225	.00130	1	51	UNF 2B	.00295	.00170	2	26
			UNF 3A	.00170	.00098	1	24	UNF 3B	.00220	.00127	1	49
	9/16	24	NEF 2A	.00195	.00113	2	9	NEF 2B	.00255	.00147	2	48
			NEF 3A	.00145	.00084	1	36	NEF 3B	.00190	.00110	2	5
	⅝	11	UNC 1A	.00415	.00240	2	5	UNC 1B	.00535	.00309	2	42
			UNC 2A	.00275	.00159	1	23	UNC 2B	.00360	.00208	1	49
			UNC 3A	.00205	.00118	1	2	UNC 3B	.00270	.00156	1	22
	⅝	12	N 2A	.00270	.00156	1	29	N 2B	.00355	.00205	1	57
			N 3A	.00205	.00118	1	8	N 3B	.00265	.00153	1	27
	⅝	18	UNF 1A	.00350	.00202	2	53	UNF 1B	.00455	.00263	3	45
			UNF 2A	.00235	.00136	1	56	UNF 2B	.00300	.00173	2	28
			UNF 3A	.00175	.00101	1	27	UNF 3B	.00225	.00130	1	51
	⅝	24	NEF 2A	.00200	.00115	2	12	NEF 2B	.00260	.00150	2	51
			NEF 3A	.00150	.00087	1	30	NEF 3B	.00195	.00113	2	9
	11/16	12	N 2A	.00270	.00156	1	29	N 2B	.00355	.00205	1	57
			N 3A	.00205	.00118	1	8	N 3B	.00265	.00153	1	27
	11/16	24	NEF 2A	.00200	.00115	2	12	NEF 2B	.00260	.00150	2	51
			NEF 3A	.00150	.00087	1	30	NEF 3B	.00195	.00113	2	9

TABLE III.11.—*Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified and American screw threads*—Continued

Designation		External					Internal				
Size	Threads per inch	Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle		Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
No. *in.*			*in.*	*in.*	*deg*	*min*		*in.*	*in.*	*deg*	*min*
¾	10	UNC-1A	0.00440	0.00254	2	1	UNC-1B	0.00575	0.00332	2	38
		UNC-2A	.00295	.00170	1	21	UNC-2B	.00385	.00222	1	46
		UNC-3A	.00220	.00127	1	0	UNC-3B	.00285	.00165	1	18
¾	12	N-2A	.00275	.00159	1	31	N-2B	.00360	.00208	1	59
		N-3A	.00205	.00118	1	8	N-3B	.00270	.00156	1	29
¾	16	UNF-1A	.00375	.00217	2	45	UNF-1B	.00490	.00283	3	35
		UNF-2A	.00250	.00144	1	50	UNF-2B	.00325	.00188	2	23
		UNF-3A	.00190	.00110	1	24	UNF-3B	.00245	.00141	1	48
¾	20	UNEF-2A	.00220	.00127	2	1	UNEF-2B	.00285	.00165	2	37
		UNEF-3A	.00165	.00095	1	31	UNEF-3B	.00215	.00124	1	58
¹³⁄₁₆	12	N-2A	.00275	.00159	1	31	N-2B	.00360	.00208	1	59
		N-3A	.00205	.00118	1	8	N-3B	.00270	.00156	1	29
¹³⁄₁₆	16	UN-2A	.00245	.00141	1	48	UN-2B	.00315	.00182	2	19
		UN-3A	.00180	.00104	1	19	UN-3B	.00235	.00136	1	43
¹³⁄₁₆	20	UNEF-2A	.00220	.00127	2	1	UNEF-2B	.00285	.00165	2	37
		UNEF-3A	.00165	.00095	1	31	UNEF-3B	.00215	.00124	1	58
⅞	9	UNC-1A	.00475	.00274	1	58	UNC-1B	.00615	.00355	2	32
		UNC-2A	.00315	.00182	1	18	UNC-2B	.00410	.00237	1	41
		UNC-3A	.00235	.00136	0	58	UNC-3B	.00305	.00176	1	15
⅞	12	N-2A	.00275	.00159	1	31	N-2B	.00360	.00208	1	59
		N-3A	.00205	.00118	1	8	N-3B	.00270	.00156	1	29
⅞	14	UNF-1A	.00405	.00234	2	36	UNF-1B	.00530	.00306	3	24
		UNF-2A	.00270	.00156	1	44	UNF-2B	.00350	.00202	2	15
		UNF-3A	.00205	.00118	1	19	UNF-3B	.00265	.00153	1	42
⅞	16	UN-2A	.00245	.00141	1	48	UN-2B	.00315	.00182	2	19
		UN-3A	.00180	.00104	1	19	UN-3B	.00235	.00136	1	43
⅞	20	UNEF-2A	.00220	.00127	2	1	UNEF-2B	.00285	.00165	2	37
		UNEF-3A	.00165	.00095	1	31	UNEF-3B	.00215	.00124	1	58
¹⁵⁄₁₆	12	UN-2A	.00285	.00165	1	34	UN-2B	.00370	.00214	2	2
		UN-3A	.00205	.00118	1	8	UN-3B	.00275	.00159	1	31
¹⁵⁄₁₆	16	UN-2A	.00250	.00144	1	50	UN-2B	.00325	.00188	2	23
		UN-3A	.00185	.00107	1	21	UN-3B	.00245	.00141	1	48
¹⁵⁄₁₆	20	UNEF-2A	.00225	.00130	2	4	UNEF-2B	.00295	.00170	2	42
		UNEF-3A	.00170	.00098	1	33	UNEF-3B	.00220	.00127	2	1
1	8	UNC-1A	.00505	.00292	1	51	UNC-1B	.00660	.00381	2	25
		UNC-2A	.00340	.00196	1	15	UNC-2B	.00440	.00254	1	37
		UNC-3A	.00255	.00147	0	56	UNC-3B	.00330	.00191	1	13
1	12	UNF-1A	.00440	.00254	2	25	UNF-1B	.00570	.00329	3	8
		UNF-2A	.00295	.00170	1	37	UNF-2B	.00380	.00219	2	5
		UNF-3A	.00220	.00127	1	13	UNF-3B	.00285	.00165	1	34
1	16	UN-2A	.00250	.00144	1	50	UN-2B	.00325	.00188	2	23
		UN-3A	.00185	.00107	1	21	UN-3B	.00245	.00141	1	48
1	20	UNEF-2A	.00225	.00130	2	4	UNEF-2B	.00295	.00170	2	42
		UNEF-3A	.00170	.00098	1	33	UNEF-3B	.00220	.00127	2	1
1¹⁄₁₆	12	UN-2A	.00285	.00165	1	34	UN-2B	.00370	.00214	2	2
		UN-3A	.00210	.00121	1	9	UN-3B	.00275	.00159	1	31
1¹⁄₁₆	16	UN-2A	.00250	.00144	1	50	UN-2B	.00325	.00188	2	23
		UN-3A	.00185	.00107	1	21	UN-3B	.00245	.00141	1	48
1¹⁄₁₆	18	NEF-2A	.00235	.00136	1	56	NEF-2B	.00310	.00179	2	33
		NEF-3A	.00180	.00104	1	29	NEF-3B	.00230	.00133	1	54
1⅛	7	UNC-1A	.00545	.00315	1	45	UNC-1B	.00705	.00407	2	16
		UNC-2A	.00360	.00208	1	9	UNC-2B	.00470	.00271	1	36
		UNC-3A	.00270	.00156	0	52	UNC-3B	.00355	.00205	1	8
1⅛	8	N-2A	.00345	.00199	1	16	N-2B	.00450	.00260	1	39
		N-3A	.00260	.00150	0	57	N-3B	.00335	.00193	1	14
1⅛	12	UNF-1A	.00450	.00260	2	28	UNF-1B	.00585	.00338	3	13
		UNF-2A	.00300	.00173	1	39	UNF-2B	.00390	.00225	2	9
		UNF-3A	.00225	.00130	1	14	UNF-3B	.00295	.00170	1	37
1⅛	16	UN-2A	.00250	.00144	1	50	UN-2B	.00325	.00188	2	23
		UN-3A	.00185	.00107	1	21	UN-3B	.00245	.00141	1	48
1⅛	18	NEF-2A	.00235	.00136	1	56	NEF-2B	.00310	.00179	2	33
		NEF-3A	.00180	.00104	1	29	NEF-3B	.00230	.00133	1	54
1³⁄₁₆	12	UN-2A	.00290	.00167	1	36	UN-2B	.00375	.00217	2	4
		UN-3A	.00215	.00124	1	11	UN-3B	.00280	.00162	1	32
1³⁄₁₆	16	UN-2A	.00255	.00147	1	52	UN-2B	.00330	.00191	2	27
		UN-3A	.00190	.00110	1	24	UN-3B	.00250	.00144	1	50
1³⁄₁₆	18	NEF-2A	.00245	.00141	2	1	NEF-2B	.00315	.00182	2	36
		NEF-3A	.00180	.00104	1	20	NEF-3B	.00235	.00136	1	56
1¼	7	UNC-1A	.00555	.00320	1	47	UNC-1B	.00720	.00416	2	19
		UNC-2A	.00370	.00214	1	11	UNC-2B	.00480	.00277	1	32
		UNC-3A	.00275	.00159	0	53	UNC-3B	.00360	.00208	1	9
1¼	8	N-2A	.00350	.00202	1	17	N-2B	.00460	.00266	1	41
		N-3A	.00265	.00153	0	58	N-3B	.00345	.00199	1	16
1¼	12	UNF-1A	.00460	.00266	2	32	UNF-1B	.00600	.00346	3	18
		UNF-2A	.00310	.00179	1	42	UNF-2B	.00400	.00231	2	12
		UNF-3A	.00230	.00133	1	16	UNF-3B	.00300	.00173	1	39

Table III.11.—*Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified and American screw threads*—Continued

Designation		External					Internal				
Size	Threads per inch	Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle		Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
No. in.			*in.*	*in.*	*deg*	*min*		*in.*	*in.*	*deg*	*min*
1¼	16	UN-2A	0.00255	0.00147	1	52	UN-2B	0.00330	0.00191	2	25
		UN-3A	.00190	.00110	1	24	UN-3B	.00250	.00144	1	50
1¼	18	NEF-2A	.00245	.00141	2	1	NEF-2B	.00315	.00182	2	36
		NEF-3A	.00180	.00104	1	29	NEF-3B	.00235	.00136	1	56
1 5/16	12	UN-2A	.00290	.00167	1	36	UN-2B	.00375	.00217	2	4
		UN-3A	.00215	.00124	1	11	UN-3B	.00280	.00162	1	32
1 5/16	16	UN-2A	.00255	.00147	1	52	UN-2B	.00330	.00191	2	25
		UN-3A	.00190	.00110	1	24	UN-3B	.00250	.00144	1	50
1 5/16	18	NEF-2A	.00245	.00141	2	1	NEF-2B	.00315	.00182	2	36
		NEF-3A	.00180	.00104	1	29	NEF-3B	.00235	.00136	1	56
1⅜	6	UNC-1A	.00600	.00346	1	39	UNC-1B	.00780	.00450	2	9
		UNC-2A	.00400	.00231	1	6	UNC-2B	.00520	.00300	1	26
		UNC-3A	.00300	.00173	0	50	UNC-3B	.00390	.00225	1	4
1⅜	8	N-2A	.00360	.00208	1	19	N-2B	.00465	.00268	1	42
		N-3A	.00270	.00156	0	59	N-3B	.00350	.00202	1	17
1⅜	12	UNF-1A	.00470	.00271	2	35	UNF-1B	.00615	.00355	3	23
		UNF-2A	.00315	.00182	1	44	UNF-2B	.00410	.00237	2	15
		UNF-3A	.00235	.00136	1	18	UNF-3B	.00305	.00176	1	41
1⅜	16	UN-2A	.00255	.00147	1	52	UN-2B	.00330	.00191	2	25
		UN-3A	.00190	.00110	1	24	UN-3B	.00250	.00144	1	50
1⅜	18	NEF-2A	.00245	.00141	2	1	NEF-2B	.00315	.00182	2	36
		NEF-3A	.00180	.00104	1	29	NEF-3B	.00235	.00136	1	56
1 7/16	12	UN-2A	.00295	.00170	1	37	UN-2B	.00380	.00219	2	5
		UN-3A	.00220	.00127	1	13	UN-3B	.00285	.00165	1	34
1 7/16	16	UN-2A	.00260	.00150	1	54	UN-2B	.00340	.00196	2	39
		UN-3A	.00195	.00113	1	26	UN-3B	.00255	.00147	1	52
1 7/16	18	NEF-2A	.00250	.00144	2	4	NEF-2B	.00325	.00188	2	41
		NEF-3A	.00185	.00107	1	32	NEF-3B	.00240	.00139	1	59
1½	6	UNC-1A	.00605	.00349	1	40	UNC-1B	.00790	.00456	2	10
		UNC-2A	.00405	.00234	1	7	UNC-2B	.00525	.00303	1	27
		UNC-3A	.00305	.00176	0	50	UNC-3B	.00395	.00228	1	5
1½	8	N-2A	.00365	.00211	1	20	N-2B	.00475	.00274	1	44
		N-3A	.00275	.00159	1	0	N-3B	.00355	.00205	1	18
1½	12	UNF-1A	.00480	.00277	2	38	UNF-1B	.00625	.00361	3	26
		UNF-2A	.00320	.00185	1	46	UNF-2B	.00415	.00240	2	17
		UNF-3A	.00240	.00139	1	19	UNF-3B	.00315	.00182	1	44
1½	16	UN-2A	.00260	.00150	1	54	UN-2B	.00340	.00196	2	30
		UN-3A	.00195	.00113	1	26	UN-3B	.00255	.00147	1	52
1½	18	NEF-2A	.00250	.00144	2	4	NEF-2B	.00325	.00188	2	41
		NEF-3A	.00185	.00107	1	32	NEF-3B	.00240	.00139	1	59
1 9/16	16	N-2A	.00260	.00150	1	54	N-2B	.00340	.00196	2	30
		N-3A	.00195	.00113	1	26	N-3B	.00255	.00147	1	52
1 9/16	18	NEF-2A	.00250	.00144	2	4	NEF-2B	.00325	.00188	2	41
		NEF-3A	.00185	.00107	1	32	NEF-3B	.00240	.00139	1	59
1⅝	8	N-2A	.00370	.00214	1	21	N-2B	.00485	.00280	1	47
		N-3A	.00280	.00162	1	2	N-3B	.00360	.00208	1	19
1⅝	12	UN-2A	.00295	.00170	1	37	UN-2B	.00380	.00219	2	5
		UN-3A	.00220	.00127	1	13	UN-3B	.00285	.00165	1	34
1⅝	16	UN-2A	.00260	.00150	1	54	UN-2B	.00340	.00196	2	30
		UN-3A	.00195	.00113	1	26	UN-3B	.00255	.00147	1	52
1⅝	18	NEF-2A	.00250	.00144	2	4	NEF-2B	.00325	.00188	2	41
		NEF-3A	.00185	.00107	1	32	NEF-3B	.00240	.00139	1	59
1 11/16	16	N-2A	.00265	.00153	1	57	N-2B	.00345	.00199	2	32
		N-3A	.00200	.00115	1	28	N-3B	.00260	.00150	1	54
1 11/16	18	NEF-2A	.00255	.00147	2	6	NEF-2B	.00330	.00191	2	43
		NEF-3A	.00190	.00110	1	34	NEF-3B	.00245	.00141	2	1
1¾	5	UNC-1A	.00670	.00387	1	32	UNC-1B	.00870	.00502	2	0
		UNC-2A	.00445	.00257	1	1	UNC-2B	.00580	.00335	1	20
		UNC-3A	.00335	.00193	0	46	UNC-3B	.00435	.00251	1	0
1¾	8	N-2A	.00375	.00217	1	22	N-2B	.00490	.00283	1	48
		N-3A	.00280	.00162	1	2	N-3B	.00370	.00214	1	21
1¾	12	UN-2A	.00300	.00173	1	39	UN-2B	.00390	.00225	2	9
		UN-3A	.00225	.00130	1	14	UN-3B	.00290	.00167	1	36
1¾	16	UNEF-2A	.00265	.00153	1	57	UNEF-2B	.00345	.00199	2	32
		UNEF-3A	.00200	.00115	1	28	UNEF-3B	.00260	.00150	1	54
1 13/16	16	N-2A	.00265	.00153	1	57	N-2B	.00345	.00199	2	32
		N-3A	.00200	.00115	1	28	N-3B	.00260	.00150	1	54
1⅞	8	N-2A	.00385	.00222	1	25	N-2B	.00500	.00289	1	50
		N-3A	.00285	.00165	1	3	N-3B	.00375	.00217	1	22
1⅞	12	UN-2A	.00300	.00173	1	39	UN-2B	.00390	.00225	2	9
		UN-3A	.00225	.00130	1	14	UN-3B	.00290	.00167	1	36
1⅞	16	UN-2A	.00265	.00153	1	57	UN-2B	.00345	.00199	2	32
		UN-3A	.00200	.00115	1	28	UN-3B	.00260	.00150	1	54
1 15/16	16	N-2A	.00270	.00156	1	59	N-2B	.00350	.00202	2	34
		N-3A	.00200	.00115	1	28	N-3B	.00260	.00150	1	54

TABLE III.11.—*Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified and American screw threads*—Continued

Designation		External					Internal				
Size	Threads per inch	Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle		Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
No. in.			*in.*	*in.*	*deg*	*min*		*in.*	*in.*	*deg*	*min*
2	4½	UNC-1A	0.00715	0.00413	1	28	UNC-1B	0.00930	0.00537	1	55
		UNC-2A	.00475	.00274	0	59	UNC-2B	.00620	.00358	1	17
		UNC-3A	.00355	.00205	0	44	UNC-3B	.00465	.00268	0	58
2	8	N-2A	.00390	.00225	1	26	N-2B	.00505	.00292	1	51
		N-3A	.00290	.00167	1	4	N-3B	.00380	.00219	1	24
2	12	UN-2A	.00305	.00176	1	41	UN-2B	.00395	.00228	2	10
		UN-3A	.00225	.00130	1	14	UN-3B	.00295	.00170	1	37
2	16	UNEF-2A	.00270	.00156	1	59	UNEF-2B	.00350	.00202	2	34
		UNEF-3A	.00200	.00115	1	28	UNEF-3B	.00260	.00150	1	54
2¹⁄₁₆	16	N-2A	.00270	.00156	1	59	N-2B	.00350	.00202	2	34
		N-3A	.00200	.00115	1	28	N-3B	.00260	.00150	1	54
2⅛	8	N-2A	.00395	.00228	1	27	N-2B	.00510	.00294	1	52
		N-3A	.00295	.00170	1	5	N-3B	.00385	.00222	1	25
2⅛	12	UN-2A	.00305	.00176	1	41	UN-2B	.00395	.00228	2	10
		UN-3A	.00225	.00130	1	14	UN-3B	.00295	.00170	1	37
2⅛	16	UN-2A	.00270	.00156	1	59	UN-2B	.00350	.00202	2	34
		UN-3A	.00200	.00115	1	28	UN-3B	.00260	.00150	1	54
2³⁄₁₆	16	N-2A	.00270	.00156	1	59	N-2B	.00350	.00202	2	34
		N-3A	.00200	.00115	1	28	N-3B	.00260	.00150	1	54
2¼	4½	UNC-1A	.00730	.00421	1	30	UNC-1B	.00950	.00548	1	58
		UNC-2A	.00485	.00280	1	0	UNC-2B	.00630	.00364	1	18
		UNC-3A	.00365	.00211	0	45	UNC-3B	.00475	.00274	0	59
2¼	8	N-2A	.00400	.00231	1	28	N-2B	.00520	.00300	1	54
		N-3A	.00300	.00173	1	6	N-3B	.00390	.00225	1	26
2¼	12	UN-2A	.00305	.00176	1	41	UN-2B	.00395	.00228	2	10
		UN-3A	.00225	.00130	1	14	UN-3B	.00295	.00170	1	37
2¼	16	UN-2A	.00270	.00156	1	59	UN-2B	.00350	.00202	2	34
		UN-3A	.00200	.00115	1	28	UN-3B	.00260	.00150	1	54
2⁵⁄₁₆	16	N-2A	.00275	.00159	2	1	N-2B	.00360	.00208	2	38
		N-3A	.00205	.00118	1	30	N-3B	.00270	.00156	1	59
2⅜	12	UN-2A	.00310	.00179	1	42	UN-2B	.00405	.00234	2	14
		UN-3A	.00230	.00133	1	16	UN-3B	.00300	.00173	1	39
2⅜	16	UN-2A	.00275	.00159	2	1	UN-2B	.00360	.00208	2	38
		UN-3A	.00205	.00118	1	30	UN-3B	.00270	.00158	1	59
2⁷⁄₁₆	16	N-2A	.00275	.00159	2	1	N-2B	.00360	.00208	2	38
		N-3A	.00205	.00118	1	30	N-3B	.00270	.00156	1	59
2½	4	UNC-1A	.00775	.00447	1	25	UNC-1B	.01010	.00583	1	51
		UNC-2A	.00520	.00300	0	57	UNC-2B	.00675	.00390	1	14
		UNC-3A	.00390	.00225	0	43	UNC-3B	.00505	.00292	0	56
2½	8	N-2A	.00410	.00237	1	30	N-2B	.00530	.00306	1	57
		N-3A	.00305	.00176	1	7	N-3B	.00400	.00231	1	28
2½	12	UN-2A	.00310	.00179	1	42	UN-2B	.00405	.00234	2	14
		UN-3A	.00230	.00133	1	16	UN-3B	.00300	.00173	1	39
2½	16	UN-2A	.00275	.00159	2	1	UN-2B	.00360	.00208	2	38
		UN-3A	.00205	.00118	1	30	UN-3B	.00270	.00156	1	59
2⅝	12	UN-2A	.00310	.00179	1	42	UN-2B	.00405	.00234	2	14
		UN-3A	.00230	.00133	1	16	UN-3B	.00300	.00173	1	39
2⅝	16	UN-2A	.00275	.00159	2	1	UN-2B	.00360	.00208	2	38
		UN-3A	.00205	.00118	1	30	UN-3B	.00270	.00156	1	59
2¾	4	UNC-1A	.00790	.00456	1	27	UNC-1B	.01030	.00595	1	53
		UNC-2A	.00525	.00303	0	58	UNC-2B	.00685	.00395	1	15
		UNC-3A	.00395	.00228	0	43	UNC-3B	.00515	.00297	0	57
2¾	8	N-2A	.00415	.00240	1	31	N-2B	.00540	.00312	1	59
		N-3A	.00310	.00179	1	8	N-3B	.00405	.00234	1	29
2¾	12	UN-2A	.00310	.00179	1	42	UN-2B	.00405	.00234	2	14
		UN-3A	.00230	.00133	1	16	UN-3B	.00300	.00173	1	39
2¾	16	UN-2A	.00275	.00159	2	1	UN-2B	.00360	.00208	2	38
		UN-3A	.00205	.00118	1	30	UN-3B	.00270	.00156	1	59
2⅞	12	UN-2A	.00315	.00182	1	44	UN-2B	.00410	.00237	2	15
		UN-3A	.00235	.00136	1	18	UN-3B	.00310	.00179	1	42
2⅞	16	UN-2A	.00280	.00162	2	3	UN-2B	.00365	.00211	2	40
		UN-3A	.00210	.00121	1	32	UN-3B	.00275	.00159	2	1
3	4	UNC-1A	.00805	.00465	1	29	UNC-1B	.01045	.00603	1	55
		UNC-2A	.00535	.00309	0	59	UNC-2B	.00695	.00401	1	16
		UNC-3A	.00400	.00231	0	44	UNC-3B	.00520	.00300	0	57
3	8	N-2A	.00425	.00245	1	33	N-2B	.00555	.00320	2	2
		N-3A	.00320	.00185	1	10	N-3B	.00415	.00240	1	31
3	12	UN-2A	.00315	.00182	1	44	UN-2B	.00410	.00237	2	15
		UN-3A	.00235	.00136	1	18	UN-3B	.00310	.00179	1	42
3	16	UN-2A	.00280	.00162	2	3	UN-2B	.00365	.00211	2	40
		UN-3A	.00210	.00121	1	32	UN-3B	.00275	.00159	2	1
3⅛	12	UN-2A	.00315	.00182	1	44	UN-2B	.00410	.00237	2	15
		UN-3A	.00235	.00136	1	18	UN-3B	.00310	.00179	1	42

Table III.11.—*Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified and American screw threads*—Continued

Designation		External					Internal				
Size	Threads per inch	Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle		Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
No. in.			*in.*	*in.*	*deg*	*min*		*in.*	*in.*	*deg*	*min*
3⅛	16	UN-2A	0.00280	0.00162	2	3	UN-2B	0.00365	0.00211	2	40
		UN-3A	.00210	.00121	1	32	UN-3B	.00275	.00159	2	1
3¼	4	UNC-1A	.00815	.00471	1	30	UNC-1B	.01060	.00612	1	57
		UNC-2A	.00545	.00315	1	0	UNC-2B	.00705	.00407	1	18
		UNC-3A	.00410	.00237	0	45	UNC-3B	.00530	.00306	0	58
3¼	8	N-2A	.00435	.00251	1	36	N-2B	.00565	.00326	2	4
		N-3A	.00325	.00188	1	11	N-3B	.00420	.00242	1	32
3¼	12	UN-2A	.00315	.00182	1	44	UN-2B	.00410	.00237	2	15
		UN-3A	.00235	.00136	1	18	UN-3B	.00310	.00179	1	42
3¼	16	UN-2A	.00280	.00162	2	3	UN-2B	.00365	.00211	2	40
		UN-3A	.00210	.00121	1	32	UN-3B	.00275	.00159	2	1
3⅜	12	UN-2A	.00320	.00185	1	46	UN-2B	.00420	.00242	2	19
		UN-3A	.00240	.00139	1	19	UN-3B	.00315	.00182	1	44
3⅜	16	UN-2A	.00290	.00167	2	8	UN-2B	.00375	.00217	2	45
		UN-3A	.00215	.00124	1	35	UN-3B	.00280	.00162	2	3
3½	4	UNC-1A	.00830	.00479	1	31	UNC-1B	.01075	.00621	1	58
		UNC-2A	.00550	.00318	1	0	UNC-2B	.00715	.00413	1	19
		UNC-3A	.00415	.00240	0	46	UNC-3B	.00540	.00312	0	59
3½	8	N-2A	.00440	.00254	1	37	N-2B	.00575	.00332	2	6
		N-3A	.00330	.00191	1	13	N-3B	.00430	.00248	1	35
3½	12	UN-2A	.00320	.00185	1	46	UN-2B	.00420	.00242	2	19
		UN-3A	.00240	.00139	1	19	UN-3B	.00315	.00182	1	44
3½	16	UN-2A	.00290	.00167	2	8	UN-2B	.00375	.00217	2	45
		UN-3A	.00215	.00124	1	35	UN-3B	.00280	.00162	2	3
3⅝	12	UN-2A	.00320	.00185	1	46	UN-2B	.00420	.00242	2	19
		UN-3A	.00240	.00139	1	19	UN-3B	.00315	.00182	1	44
3⅝	16	UN-2A	.00290	.00167	2	8	UN-2B	.00375	.00217	2	45
		UN-3A	.00215	.00124	1	35	UN-3B	.00280	.00162	2	3
3¾	4	UNC-1A	.00840	.00485	1	32	UNC-1B	.01090	.00629	2	0
		UNC-2A	.00560	.00323	1	2	UNC-2B	.00725	.00419	1	20
		UNC-3A	.00420	.00242	0	46	UNC-3B	.00545	.00315	1	0
3¾	8	N-2A	.00450	.00260	1	39	N-2B	.00585	.00338	2	9
		N-3A	.00335	.00193	1	14	N-3B	.00440	.00254	1	37
3¾	12	UN-2A	.00320	.00185	1	46	UN-2B	.00420	.00242	2	19
		UN-3A	.00240	.00139	1	19	UN-3B	.00315	.00182	1	44
3¾	16	UN-2A	.00290	.00167	2	8	UN-2B	.00375	.00217	2	45
		UN-3A	.00215	.00124	1	35	UN-3B	.00280	.00162	2	3
3⅞	12	UN-2A	.00325	.00188	1	47	UN-2B	.00425	.00245	2	20
		UN-3A	.00245	.00141	1	21	UN-3B	.00320	.00185	1	46
3⅞	16	UN-2A	.00295	.00170	2	10	UN-2B	.00380	.00219	2	47
		UN-3A	.00220	.00127	1	37	UN-3B	.00285	.00165	2	5
4	4	UNC-1A	.00850	.00491	1	33	UNC-1B	.01105	.00638	2	2
		UNC-2A	.00565	.00326	1	2	UNC-2B	.00735	.00424	1	21
		UNC-3A	.00425	.00245	0	47	UNC-3B	.00555	.00320	1	1
4	8	N-2A	.00455	.00263	1	40	N-2B	.00595	.00344	2	11
		N-3A	.00340	.00196	1	15	N-3B	.00445	.00257	1	38
4	12	UN-2A	.00325	.00188	1	47	UN-2B	.00425	.00245	2	20
		UN-3A	.00245	.00141	1	21	UN-3B	.00320	.00185	1	46
4	16	UN-2A	.00295	.00170	2	10	UN-2B	.00380	.00219	2	47
		UN-3A	.00220	.00127	1	37	UN-3B	.00285	.00165	2	5
4¼	8	N-2A	.00465	.00268	1	42	N-2B	.00605	.00349	2	13
		N-3A	.00350	.00202	1	17	N-3B	.00450	.00260	1	39
4¼	12	UN-2A	.00325	.00188	1	47	UN-2B	.00425	.00245	2	20
		UN-3A	.00245	.00141	1	21	UN-3B	.00320	.00185	1	46
4¼	16	UN-2A	.00295	.00170	2	10	UN-2B	.00380	.00219	2	47
		UN-3A	.00220	.00127	1	37	UN-3B	.00285	.00165	2	5
4½	8	N-2A	.00470	.00271	1	43	N-2B	.00610	.00352	2	14
		N-3A	.00355	.00205	1	18	N-3B	.00460	.00266	1	41
4½	12	UN-2A	.00325	.00188	1	47	UN-2B	.00425	.00245	2	20
		UN-3A	.00245	.00141	1	21	UN-3B	.00320	.00185	1	46
4½	16	UN-2A	.00295	.00170	2	10	UN-2B	.00380	.00219	2	47
		UN-3A	.00220	.00127	1	27	UN-3B	.00285	.00165	2	5
4¾	8	N-2A	.00475	.00274	1	44	N-2B	.00620	.00358	2	16
		N-3A	.00360	.00208	1	19	N-3B	.00465	.00268	1	42
4¾	12	UN-2A	.00335	.00193	1	51	UN-2B	.00435	.00251	2	23
		UN-3A	.00250	.00144	1	22	UN-3B	.00330	.00191	1	49
4¾	16	UN-2A	.00305	.00176	2	14	UN-2B	.00395	.00228	2	54
		UN-3A	.00225	.00130	1	39	UN-3B	.00295	.00170	2	10
5	8	N-2A	.00485	.00280	1	47	N-2B	.00630	.00364	2	19
		N-3A	.00360	.00208	1	19	N-3B	.00470	.00271	1	43
5	12	UN-2A	.00335	.00193	1	51	UN-2B	.00435	.00251	2	23
		UN-3A	.00250	.00144	1	22	UN-3B	.00330	.00191	1	49
5	16	UN-2A	.00305	.00176	2	14	UN-2B	.00395	.00228	2	54
		UN-3A	.00225	.00130	1	39	UN-3B	.00295	.00170	2	10
5¼	8	N-2A	.00490	.00283	1	48	N-2B	.00635	.00367	2	20
		N-3A	.00365	.00211	1	20	N-3B	.00475	.00274	1	44

TABLE III.11.—*Deviations in lead and half-angle equivalent to one-half of pitch diameter tolerances, Unified and American screw threads*—Continued

Designation		External					Internal				
Size	Threads per inch	Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle		Thread symbol	Half of pitch diameter tolerance	Equiv. deviation in lead	Equiv. deviation in half-angle	
1	2	3	4	5	6		7	8	9	10	
No. *in.*			*in.*	*in.*	*deg*	*min*		*in.*	*in.*	*deg*	*min*
5¼	12	UN-2A	0.00335	0.00193	1	51	UN-2B	0.00435	0.00251	2	23
		UN-3A	.00250	.00144	1	22	UN-3B	.00330	.00191	1	49
5¼	16	UN-2A	.00305	.00176	2	14	UN-2B	.00395	.00228	2	54
		UN-3A	.00225	.00130	1	39	UN-3B	.00295	.00170	2	10
5½	8	N-2A	.00495	.00286	1	49	N-2B	.00645	.00372	2	22
		N-3A	.00370	.00214	1	21	N-3B	.00485	.00280	1	47
5½	12	UN-2A	.00335	.00193	1	51	UN-2B	.00435	.00251	2	23
		UN-3A	.00250	.00144	1	22	UN-3B	.00330	.00191	1	49
5½	16	UN-2A	.00305	.00176	2	14	UN-2B	.00395	.00228	2	54
		UN-3A	.00225	.00130	1	39	UN-3B	.00295	.00170	2	10
5¾	8	N-2A	.00500	.00289	1	50	N-2B	.00650	.00375	2	23
		N-3A	.00375	.00217	1	22	N-3B	.00490	.00283	1	48
5¾	12	UN-2A	.00345	.00199	1	54	UN-2B	.00450	.00260	2	28
		UN-3A	.00260	.00150	1	26	UN-3B	.00335	.00193	1	51
5¾	16	UN-2A	.00310	.00179	2	16	UN-2B	.00405	.00234	2	58
		UN-3A	.00235	.00136	1	43	UN-3B	.00305	.00176	2	14
6	8	N-2A	.00510	.00294	1	52	N-2B	.00660	.00381	2	25
		N-3A	.00380	.00219	1	24	N-3B	.00495	.00286	1	49
6	12	UN-2A	.00345	.00199	1	54	UN-2B	.00450	.00260	2	28
		UN-3A	.00260	.00150	1	26	UN-3B	.00335	.00193	1	51
6	16	UN-2A	.00310	.00179	2	16	UN-2B	.00405	.00234	2	58
		UN-3A	.00236	.00136	1	43	UN-3B	.00305	.00176	2	14

7. LIMITS OF SIZE OF GAGES

The limits of size of plain and thread gages applicable to the standard series of Unified and American screw threads are presented in table III.12. In this table *X* tolerances are applied to thread gages and *Z* tolerances to plain gages.

The limits of size of *W* truncated thread setting plug gages, and of both *W* and *X* basic-crest thread setting plug gages, are presented in table III.13 or as indicated in the footnotes to table III.13. These limits are developed in accordance with the requirements for gages and gaging stated in section VI, p. 107.

TABLE III.12.—*Gages for standard thread series, Unified and American screw threads*

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			X thread gages					Z plain gages for major diameter			X thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Un-finished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tolerance gage	Minus tolerance gage								Minus tolerance gage	Plus tolerance gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
0-80	NF	2A	0.0514	0.0460	0.0406	0.0496	0.0469	0.0595	0.0563	....	0.0600	0.0519	0.0596	0.0542	0.9542	0.0465	0.0514	2B	NF	0-80
			.0512	.0457	.0498	.0494	.0472	.0594	.0564	....	.0603	.0521	.0593	.0540	.0544	.0466	.0513			
		3A	.0519	.0465	0506	.0506	.0479	.0600	.0568	....	.5600	.0519	.0590	.0536	.0536	.0465	.0514	3B		
			.0517	.0462	.0508	.0504	.0482	.0599	.0569	....	.0603	.0521	.0587	.0531	.0538	.0406	.0513			
1-64	NC	2A	.0623	.0555	.0603	.0603	.0569	.0724	.0686	....	.0730	.0629	.0723	.0655	.0655	.0561	.0623	2B	NC	1-64
			.0621	.0551	.0605	.0601	.0573	.0723	.0687	....	.0734	.0631	.0719	.0653	.0657	.0562	.0622			
		3A	.0629	.0561	.0614	.0614	.0580	.0730	.0692	....	.0730	.0629	.0716	.0648	.0648	.0561	.0623	3B		
			.0627	.0557	.0616	.0612	.0584	.0729	.0693	....	.0734	.0631	.0712	.0646	.0650	.0562	.0622			
1-72	NF	2A	.0634	.0574	.0615	.0615	.0585	.0724	.0689	....	.0730	.0640	.0725	.0665	.0665	.0580	.0635	2B	NF	1-72
			.0632	.0571	.0617	.0613	.0588	.0723	.0690	....	.0733	.0642	.0722	.0663	.0667	.0581	.0634			
		3A	.0640	.0580	.0626	.0626	.0596	.0730	.0695	....	.0730	.0640	.0719	.0659	.0659	.0580	.0635	3B		
			.0638	.0577	.0628	.0624	.0599	.0729	.0696	....	.0733	.0642	.0716	.0657	.0661	.0581	.0634			
2-56	NC	2A	.0738	.0661	.0717	.0717	.0678	.0854	.0813	....	.0860	.0744	.0849	.0772	.0772	.0667	.0737	2B	NC	2-56
			.0736	.0657	.0719	.0715	.0682	.0853	.0814	....	.0864	.0746	.0845	.0770	.0774	.0668	.0736			
		3A	.0744	.0667	.0728	.0728	.0689	.0860	.0819	....	.0860	.0744	.0842	.0765	.0765	.0667	.0737	3B		
			.0742	.0663	.0730	.0726	.0693	.0859	.0820	....	.0864	.0746	.0838	.0763	.0767	.0668	.0736			
2-64	NF	2A	.0753	.0685	.0733	.0733	.0699	.0854	.0816	....	.0860	.0759	.0854	.0786	.0786	.0691	.0753	2B	NF	2-64
			.0751	.0681	.0735	.0731	.0703	.0853	.0817	....	.0864	.0761	.0850	.0784	.0788	.0692	.0752			
		3A	.0759	.0691	.0744	.0744	.0710	.0860	.0822	....	.0860	.0759	.0847	.0779	.0779	.0691	.0753	3B		
			.0757	.0687	.0746	.0742	.0714	.0859	.0823	....	.0864	.0761	.0843	.0777	.0781	.0692	.0752			
3-48	NC	2A	.0848	.0758	.0825	.0825	.0780	.0983	.0938	....	.0990	.0855	.0975	.0885	.0885	.0764	.0845	2B	NC	3-48
			.0846	.0754	.0827	.0823	.0784	.0982	.0939	....	.0994	.0857	.0971	.0883	.0887	.0765	.0844			
		3A	.0855	.0765	.0838	.0838	.0793	.0990	.0945	....	.0990	.0855	.0967	.0877	.0877	.0764	.0845	3B		
			.0853	.0761	.0840	.0836	.0797	.0989	.0946	....	.0994	.0857	.0963	.0875	.0879	.0765	.9844			
3-56	NF	2A	.0867	.0790	.0845	.0845	.0806	.0983	.0942	....	.0990	.0874	.0979	.0902	.0902	.0797	.0865	2B	NF	3-56
			.0865	.0786	.0847	.0843	.0810	.0982	.0943	....	.0994	.0876	.0975	.0900	.0904	.0798	.0864			
		3A	.0874	.0797	.0858	.0858	.0819	.0990	.0949	....	.0990	.0874	.0972	.0895	.0895	.0797	.0865	3B		
			.0872	.0793	.0860	.0856	.0823	.0989	.0950	....	.0994	.0876	.0968	.0893	.0897	.0798	.0864			
4-40	NC	2A	.0950	.0842	.0925	.0925	.0871	.1112	.1061	....	.1120	.0958	.1099	.0991	.0991	.0849	.0939	2B	NC	4-40
			.0948	.0838	.0927	.0923	.0875	.1111	.1062	....	.1124	.0960	.1095	.0989	.0993	.0850	.0938			
		3A	.0958	.0850	.0939	.0939	.0885	[illegible]	.1069	....	.1120	.0958	.1090	.0982	.0982	.0849	.0939	3B		
			.0956	.0846	.0941	.0937	.0889	.1119	.1070	....	.1124	.0960	.1086	.0980	.0984	.0850	.0938			
4-48	NF	2A	.0978	.0888	.0954	.0954	.0909	.1113	.1068	....	.1120	.0985	.1106	.1016	.1016	.0894	.0968	2B	NF	4-48
			.0976	.0884	.0956	.0952	.0913	.1112	.1069	....	.1124	.0987	.1102	.1014	.1018	.0895	.0967			
		3A	.0985	.0895	.0967	.0967	.0922	.1120	.1075	....	.1120	.0985	.1098	.1008	.1008	.0894	.0968	3B		
			.0983	.0891	.0969	.0965	.0926	.1119	.1076	....	.1124	.0987	.1094	.1006	.1010	.0895	.0967			
5-40	NC	2A	.1080	.0972	.1054	.1054	.1000	.1242	.1191	....	.1250	.1088	.1229	.1121	.1121	.0979	.1062	2B	NC	5-40
			.1078	.0968	.1056	.1052	.1004	.1241	.1192	....	.1254	.1090	.1225	.1119	.1123	.0980	.1061			
		3A	.1088	.0980	.1069	.1069	.1015	.1250	.1199	....	.1250	.1088	.1221	.1113	.1113	.0979	.1062	3B		
			.1086	.0976	.1071	.1067	.1019	.1249	.1200	....	.1254	.1090	.1217	.1111	.1115	.0980	.1061			
5-44	NF	2A	.1095	.0997	.1070	.1070	.1021	.1243	.1195	....	.1250	.1102	.1232	.1134	.1134	.1004	.1079	2B	NF	5-44
			.1093	.0993	.1072	.1068	.1025	.1242	.1196	....	.1254	.1104	.1228	.1132	.1136	.1005	.1078			
		3A	.1102	.1004	.1083	.1083	.1034	.1250	.1202	....	.1250	.1102	.1224	.1126	.1126	.1004	.1079	3B		
			.1100	.1000	.1085	.1081	.1038	.1249	.1203	....	.1254	.1104	.1220	.1124	.1128	.1005	.1078			

TABLE III.12.—*Gages for standard thread series, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			X thread gages					Z plain gages for major diameter			X thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
					Pitch diameter									Pitch diameter						
			Pitch diameter	Minor diameter	Plus tolerance gage	Minus tolerance gage	Minor diameter		Semi-finished	Un-finished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Minus tolerance gage	Plus tolerance gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
6-32	NC	2A	0.1169	0.1034	0.1141	0.1141	0.1073	0.1372	0.1312	....	0.1380	0.1177	0.1349	0.1214	0.1214	0.1040	0.1140	2B	NC	6-32
			.1166	.1029	.1144	.1138	.1078	.1371	.1313	....	.1385	.1180	.1344	.1211	.1217	.1041	.1139			
		3A	.1177	.1042	.1156	.1156	.1088	.1380	.1320	....	.1380	.1177	.1339	.1204	.1204	.1040	.1140	3B		
			.1174	.1037	.1159	.1153	.1093	.1379	.1321	....	.1385	.1180	.1334	.1201	.1207	.1041	.1139			
6-40	NF	2A	.1210	.1102	.1184	.1184	.1130	.1372	.1321	....	.1380	.1218	.1360	.1252	.1252	.1110	.1190	2B	NF	6-40
			.1208	.1098	.1186	.1182	.1134	.1371	.1322	....	.1384	.1220	.1356	.1250	.1254	.1111	.1189			
		3A	.1218	.1110	.1198	.1198	.1144	.1380	.1329	....	.1380	.1218	.1351	.1243	.1243	.1110	.1186	3B		
			.1216	.1106	.1200	.1196	.1148	.1379	.1330	....	.1384	.1220	.1347	.1241	.1245	.1111	.1185			
8-32	NC	2A	.1428	.1293	.1399	.1399	.1331	.1631	.1571	....	.1640	.1437	.1610	.1475	.1475	.1300	.1390	2B	NC	8-32
			.1425	.1288	.1402	.1396	.1336	.1630	.1572	....	.1645	.1440	.1605	.1472	.1478	.1301	.1389			
		3A	.1437	.1302	.1415	.1415	.1347	.1640	.1580	....	.1640	.1437	.1600	.1465	.1465	.1300	.1389	3B		
			.1434	.1297	.1418	.1412	.1352	.1639	.1581	....	.1645	.1440	.1595	.1462	.1468	.1301	.1388			
8-36	NF	2A	.1452	.1332	.1424	.1424	.1364	.1632	.1577	....	.1640	.1460	.1616	.1496	.1496	.1340	.1420	2B	NF	8-36
			.1450	.1328	.1426	.1422	.1368	.1631	.1578	....	.1644	.1462	.1612	.1494	.1498	.1341	.1419			
		3A	.1460	.1340	.1439	.1439	.1379	.1640	.1585	....	.1640	.1460	.1607	.1487	.1487	.1340	.1416	3B		
			.1458	.1336	.1441	.1437	.1383	.1639	.1586	....	.1644	.1462	.1603	.1485	.1489	.1341	.1415			
10-24	NC	2A	.1619	.1439	.1586	.1586	.1496	.1890	.1818	....	.1900	.1629	.1852	.1672	.1672	.1450	.1560	2B	NC	10-24
			.1616	.1434	.1589	.1583	.1501	.1889	.1819	....	.1905	.1632	.1847	.1669	.1675	.1451	.1559			
		3A	.1629	.1449	.1604	.1604	.1514	.1900	.1828	....	.1900	.1629	.1841	.1661	.1661	.1450	.1555	3B		
			.1626	.1444	.1607	.1601	.1519	.1899	.1829	....	.1905	.1632	.1836	.1658	.1664	.1451	.1554			
10-32	NF	2A	.1688	.1553	.1658	.1658	.1590	.1891	.1831	....	.1900	.1697	.1871	.1736	.1736	.1560	.1640	2B	NF	10-32
			.1685	.1548	.1661	.1655	.1595	.1890	.1832	....	.1905	.1700	.1866	.1733	.1739	.1561	.1639			
		3A	.1697	.1562	.1674	.1674	.1606	.1900	.1840	....	.1900	.1697	.1861	.1726	.1726	.1560	.1641	3B		
			.1694	.1557	.1677	.1671	.1611	.1899	.1841	....	.1905	.1700	.1856	.1723	.1729	.1561	.1640			
12-24	NC	2A	.1879	.1699	.1845	.1845	.1755	.2150	.2078	....	.2160	.1889	.2113	.1933	.1933	.1710	.1810	2B	NC	12-24
			.1876	.1694	.1848	.1842	.1760	.2149	.2079	....	.2165	.1892	.2108	.1930	.1936	.1711	.1809			
		3A	.1889	.1709	.1863	.1863	.1773	.2160	.2088	....	.2160	.1889	.2102	.1922	.1922	.1710	.1807	3B		
			.1886	.1704	.1866	.1860	.1778	.2159	.2089	....	.2165	.1892	.2097	.1919	.1925	.1711	.1806			
12-28	NF	2A	.1918	.1763	.1886	.1886	.1809	.2150	.2085	....	.2160	.1928	.2125	.1970	.1970	.1770	.1860	2B	NF	12-28
			.1915	.1758	.1889	.1883	.1814	.2149	.2086	....	.2165	.1931	.2120	.1967	.1973	.1771	.1859			
		3A	.1928	.1773	.1904	.1904	.1827	.2160	.2095	....	.2160	.1928	.2114	.1959	.1959	.1770	.1857	3B		
			.1925	.1768	.1907	.1901	.1832	.2159	.2096	....	.2165	.1931	.2109	.1956	.1962	.1771	.1856			
12-32	NEF	2A	.1948	.1813	.1917	.1917	.1849	.2151	.2091	....	.2160	.1957	.2133	.1998	.1998	.1820	.1900	2B	NEF	12-32
			.1945	.1808	.1920	.1914	.1854	.2150	.2092	....	.2165	.1960	.2128	.1995	.2001	.1821	.1899			
		3A	.1957	.1822	.1933	.1933	.1865	.2160	.2100	....	.2160	.1957	.2123	.1988	.1988	.1820	.1895	3B		
			.1954	.1817	.1936	.1930	.1870	.2159	.2101	....	.2165	.1960	.2118	.1985	.1991	.1821	.1894			
¼-20	UNC	1A	.2164	.1948	.2108	.2108	.2000	.2489	.2367	....	.2500	.2175	.2465	.2248	.2248	.1960	.2070	1B	UNC	¼-20
			.2161	.1943	.2111	.2105	.2005	.2488	.2368	....	.2505	.2178	.2460	.2245	.2251	.1961	.2069			
		2A	.2164	.1948	.2127	.2127	.2019	.2489	.2408	0.2367	.2500	.2175	.2440	.2223	.2223	.1960	.2070	2B		
			.2161	.1943	.2130	.2124	.2024	.2488	.2409	.2368	.2505	.2178	.2435	.2220	.2226	.1961	.2069			
		3A	.2175	.1959	.2147	.2147	.2039	.2500	.2419	....	.2500	.2175	.2428	.2211	.2211	.1960	.2067	3B		
			.2172	.1954	.2150	.2144	.2044	.2499	.2420	....	.2505	.2178	.2423	.2208	.2214	.1961	.2066			

¼-28	UNF	1A	.2258	.2103	.2208	.2208	.2131	.2490	.2392	....	.2500	.2268	.2488	.2333	.2333	.2110	.2200	1B	UNF	¼-28
			.2253	.2098	.2211	.2205	.2136	.2489	.2393	....	.2505	.2271	.2483	.2330	.2336	.2111	.2199			
		2A	.2258	.2103	.2225	.2225	.2148	.2490	.2425	....	.2500	.2268	.2466	.2311	.2311	.2110	.2200	2B		
			.2253	.2098	.2228	.2222	.2153	.2489	.2426	....	.2505	.2271	.2461	.2308	.2314	.2111	.2199			
		3A	.2268	.2113	.2243	.2243	.2166	.2500	.2435	....	.2500	.2268	.2455	.2300	.2300	.2110	.2190	3B		
			.2265	.2108	.2246	.2240	.2171	.2499	.2436	....	.2505	.2271	.2450	.2297	.2303	.2111	.2189			
¼-32	NEF	2A	.2287	.2152	.2255	.2255	.2187	.2490	.2430	....	.2500	.2297	.2474	.2339	.2339	.2160	.2240	2B	NEF	¼-32
			.2284	.2147	.2258	.2252	.2192	.2489	.2431	....	.2505	.2300	.2469	.2336	.2342	.2161	.2239			
		3A	.2297	.2162	.2273	.2273	.2205	.2500	.2440	....	.2500	.2297	.2463	.2328	.2324	.2160	.2229	3B		
			.2294	.2157	.2276	.2270	.2210	.2499	.2441	....	.2505	.2300	.2458	.2325	.2331	.2161	.2228			
5/16-18	UNC	1A	.2752	.2511	.2691	.2691	.2571	.3113	.2982	....	.3125	.2764	.3084	.2843	.2843	.2520	.2650	1B	UNC	5/16-18
			.2749	.2506	.2694	.2688	.2576	.3112	.2983	....	.3130	.2767	.3079	.2840	.2846	.2521	.2649			
		2A	.2752	.2511	.2712	.2712	.2592	.3113	.3026	.2982	.3125	.2764	.3058	.2817	.2817	.2520	.2650	2B		
			.2749	.2506	.2715	.2709	.2597	.3112	.3027	.2983	.3130	.2767	.3053	.2814	.2820	.2521	.2649			
		3A	.2764	.2523	.2734	.2734	.2614	.3125	.3038	....	.3125	.2764	.3044	.2803	.2803	.2520	.2630	3B		
			.2761	.2518	.2737	.2731	.2619	.3124	.3039	....	.3130	.2767	.3039	.2800	.2806	.2521	.2629			
5/16-24	UNF	1A	.2843	.2663	.2788	.2788	.2698	.3114	.3006	....	.3125	.2854	.3105	.2925	.2925	.2670	.2770	1B	UNF	5/16-24
			.2840	.2658	.2791	.2785	.2703	.3113	.3007	....	.3130	.2857	.3100	.2922	.2928	.2671	.2769			
		2A	.2843	.2663	.2806	.2806	.2718	.3114	.3042	....	.3125	.2854	.3082	.2902	.2902	.2670	.2770	2B		
			.2840	.2658	.2809	.2803	.2723	.3113	.3043	....	.3130	.2857	.3077	.2899	.2905	.2671	.2769			
		3A	.2854	.2674	.2827	.2827	.2737	.3125	.3053	....	.3125	.2854	.3070	.2890	.2890	.2670	.2754	3B		
			.2851	.2669	.2830	.2824	.2742	.3124	.3054	....	.3130	.2857	.3065	.2887	.2893	.2671	.2753			
5/16-32	NEF	2A	.2912	.2777	.2880	.2880	.2812	.3115	.3055	....	.3125	.2922	.3099	.2964	.2964	.2790	.2860	2B	NEF	5/16-32
			.2909	.2772	.2883	.2877	.2817	.3114	.3056	....	.3130	.2925	.3094	.2961	.2967	.2791	.2859			
		3A	.2922	.2787	.2898	.2898	.2830	.3125	.3065	....	.3125	.2922	.3088	.2953	.2953	.2790	.2847	3B		
			.2919	.2782	.2901	.2895	.2835	.3124	.3066	....	.3130	.2925	.3083	.2950	.2956	.2791	.2846			
⅜-16	UNC	1A	.3331	.3060	.3266	.3266	.3131	.3737	.3595	....	.3750	.3344	.3700	.3429	.3429	.3070	.3210	1B	UNC	⅜-16
			.3328	.3054	.3269	.3263	.3137	.3736	.3596	....	.3756	.3347	.3694	.3426	.3432	.3071	.3209			
		2A	.3331	.3060	.3287	.3287	.3152	.3737	.3643	.3595	.3750	.3344	.3672	.3401	.3401	.3070	.3210	2B		
			.3328	.3054	.3290	.3284	.3158	.3736	.3644	.3596	.3756	.3347	.3666	.3398	.3404	.3071	.3209			
		3A	.3344	.3073	.3311	.3311	.3176	.3750	.3656	....	.3750	.3344	.3658	.3387	.3387	.3070	.3182	3B		
			.3341	.3067	.3314	.3308	.3182	.3749	.3657	....	.3756	.3347	.3652	.3384	.3390	.3071	.3181			
⅜-24	UNF	1A	.3468	.3288	.3411	.3411	.3321	.3739	.3631	....	.3750	.3479	.3733	.3553	.3553	.3300	.3400	1B	UNF	⅜-24
			.3465	.3283	.3414	.3408	.3326	.3738	.3632	....	.3755	.3482	.3728	.3550	.3556	.3301	.3399			
		2A	.3468	.3288	.3430	.3430	.3340	.3739	.3667	....	.3750	.3479	.3708	.3528	.3528	.3300	.3400	2B		
			.3465	.3283	.3433	.3427	.3345	.3738	.3668	....	.3755	.3482	.3703	.3525	.3531	.3301	.3399			
		3A	.3479	.3299	.3450	.3450	.3360	.3750	.3678	....	.3750	.3479	.3696	.3516	.3516	.3300	.3372	3B		
			.3476	.3294	.3453	.3447	.3365	.3749	.3679	....	.3755	.3482	.3691	.3513	.3519	.3301	.3371			
⅜-32	NEF	2A	.3537	.3402	.3503	.3503	.3435	.3740	.3680	....	.3750	.3547	.3726	.3591	.3591	.3410	.3490	2B	NEF	⅜-32
			.3534	.3397	.3506	.3500	.3440	.3739	.3681	....	.3755	.3550	.3721	.3588	.3594	.3411	.3489			
		3A	.3547	.3412	.3522	.3522	.3454	.3750	.3690	....	.3750	.3547	.3715	.3580	.3580	.3410	.3469	3B		
			.3544	.3407	.3525	.3519	.3459	.3749	.3691	....	.3755	.3550	.3710	.3577	.3583	.3411	.3468			
7/16-14	UNC	1A	.3897	.3588	.3826	.3826	.3671	.4361	.4206	....	.4375	.3911	.4312	.4003	.4003	.3600	.3760	1B	UNC	7/16-14
			.3894	.3582	.3829	.3823	.3677	.4360	.4207	....	.4381	.3914	.4306	.4000	.4006	.3601	.3759			
		2A	.3897	.3588	.3850	.3850	.3695	.4361	.4258	.4206	.4375	.3911	.4281	.3972	.3972	.3600	.3760	2B		
			.3894	.3582	.3853	.3847	.3701	.4360	.4259	.4207	.4381	.3914	.4275	.3969	.3975	.3601	.3759			
		3A	.3911	.3602	.3876	.3876	.3721	.4375	.4272	....	.4375	.3911	.4266	.3957	.3957	.3600	.3717	3B		
			.3908	.3596	.3879	.3873	.3727	.4374	.4273	....	.4381	.3914	.4260	.3954	.3960	.3601	.3716			
7/16-20	UNF	1A	.4037	.3821	.3975	.3975	.3867	.4362	.4240	....	.4375	.4050	.4348	.4131	.4131	.3830	.3950	1B	UNF	7/16-20
			.4034	.3816	.3978	.3972	.3872	.4361	.4241	....	.4380	.4053	.4343	.4128	.4134	.3831	.3949			
		2A	.4037	.3821	.3995	.3995	.3887	.4362	.4281	....	.4375	.4050	.4321	.4104	.4104	.3830	.3950	2B		
			.4034	.3816	.3998	.3992	.3892	.4361	.4282	....	.4380	.4053	.4316	.4101	.4107	.3831	.3949			
		3A	.4050	.3834	.4019	.4019	.3911	.4375	.4294	....	.4375	.4050	.4308	.4091	.4091	.3830	.3916	3B		
			.4047	.3829	.4022	.4016	.3916	.4374	.4295	....	.4380	.4053	.4303	.4088	.4094	.3831	.3915			
7/16-28	UNEF	2A	.4132	.3977	.4096	.4096	.4019	.4364	.4299	....	.4375	.4143	.4344	.4189	.4189	.3990	.4070	2B	UNEF	7/16-28
			.4129	.3972	.4099	.4093	.4024	.4363	.4300	....	.4380	.4146	.4339	.4186	.4192	.3991	.4069			
		3A	.4143	.3988	.4116	.4116	.4039	.4375	.4310	....	.4375	.4143	.4333	.4178	.4178	.3990	.4051	3B		
			.4140	.3983	.4119	.4113	.4044	.4374	.4311	....	.4380	.4146	.4328	.4175	.4181	.3991	.4050			
½-12	N	2A	.4443	.4082	.4389	.4389	.4209	.4984	.4870	.4812	.5000	.4459	.4890	.4529	.4529	.4100	.4280	2B	N	½-12
			.4440	.4076	.4392	.4386	.4215	.4983	.4871	.4813	.5006	.4462	.4884	.4526	.4532	.4101	.4279			
		3A	.4479	.4098	.4419	.4419	.4239	.5000	.4886	....	.5000	.4459	.4872	.4511	.4511	.4100	.4223	3B		
			.4476	.4092	.4422	.4416	.4245	.4999	.4887	....	.5006	.4462	.4866	.4508	.4514	.4101	.4222			
½-13	UNC	1A	.4485	.4152	.4411	.4411	.4245	.4985	.4822	....	.5000	.4500	.4930	.4597	.4597	.4170	.4340	1B	UNC	½-13
			.4482	.4146	.4414	.4408	.4251	.4984	.4823	....	.5006	.4503	.4924	.4594	.4600	.4171	.4339			
		2A	.4485	.4152	.4435	.4435	.4269	.4985	.4876	.4822	.5000	.4500	.4898	.4565	.4565	.4170	.4340	2B		
			.4482	.4146	.4438	.4432	.4275	.4984	.4877	.4823	.5006	.4503	.4892	.4562	.4568	.4171	.4339			
		3A	.4500	.4167	.4463	.4463	.4297	.5000	.4891	....	.5000	.4500	.4881	.4548	.4548	.4170	.4284	3B		
			.4497	.4161	.4466	.4460	.4303	.4999	.4892	....	.5006	.4503	.4875	.4515	.4551	.4171	.4283			

TABLE III.12.—*Gages for standard thread series, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			X thread gages					Z plain gages for major diameter			X thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tolerance gage	Minus tolerance gage								Minus tolerance gage	Plus tolerance gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
½-20	UNF	1A	0.4662	0.4446	0.4598	0.4598	0.4490	0.4987	0.4905		0.5000	0.4675	0.4976	0.4759	0.4759	0.4460	0.4570	1B	UNF	½-20
			.4659	.4441	.4601	.4595	.4495	.4986	.4906		.5005	.4678	.4971	.4756	.4762	.4461	.4569			
		2A	.4662	.4446	.4619	.4619	.4511	.4987	.4906		.5000	.4675	.4948	.4731	.4731	.4460	.4570	2B		
			.4659	.4441	.4622	.4616	.4516	.4986	.4907		.5005	.4678	.4943	.4728	.4734	.4461	.4569			
		3A	.4675	.4459	.4643	.4643	.4535	.5000	.4919		.5000	.4675	.4934	.4717	.4717	.4460	.4537	3B		
			.4672	.4454	.4646	.4640	.4540	.4999	.4920		.5005	.4678	.4929	.4714	.4720	.4461	.4536			
½-28	UNEF	2A	.4757	.4602	.4720	.4720	.4643	.4989	.4924		.5000	.4768	.4971	.4816	.4816	.4610	.4700	2B	UNEF	½-28
			.4754	.4597	.4723	.4717	.4648	.4988	.4925		.5005	.4771	.4966	.4813	.4819	.4611	.4699			
		3A	.4768	.4613	.4740	.4740	.4663	.5000	.4935		.5000	.4768	.4959	.4804	.4804	.4610	.4676	3B		
			.4765	.4608	.4743	.4737	.4668	.4999	.4936		.5005	.4771	.4954	.4801	.4807	.4611	.4675			
9/16-12	UNC	1A	.5068	.4707	.4990	.4990	.4810	.5609	.5437		.5625	.5084	.5547	.5186	.5186	.4720	.4900	1B	UNC	9/16-12
			.5065	.4701	.4993	.4987	.4816	.5608	.5438		.5631	.5087	.5541	.5183	.5189	.4721	.4899			
		2A	.5068	.4707	.5016	.5016	.4836	.5609	.5495	0.5437	.5625	.5084	.5513	.5152	.5152	.4720	.4900	2B		
			.5065	.4701	.5019	.5013	.4842	.5608	.5496	.5438	.5631	.5087	.5507	.5149	.5155	.4721	.4899			
		3A	.5084	.4723	.5045	.5045	.4865	.5625	.5511		.5625	.5084	.5496	.5135	.5135	.4720	.4843	3B		
			.5081	.4717	.5048	.5042	.4871	.5624	.5512		.5631	.5087	.5490	.5132	.5138	.4721	.4842			
9/16-18	UNF	1A	.5250	.5009	.5182	.5182	.5062	.5611	.5480		.5625	.5264	.5594	.5353	.5353	.5020	.5150	1B	UNF	9/16-18
			.5247	.5004	.5185	.5179	.5067	.5610	.5481		.5630	.5267	.5589	.5350	.5356	.5021	.5149			
		2A	.5250	.5009	.5205	.5205	.5085	.5611	.5524		.5625	.5264	.5564	.5323	.5322	.5020	.5150	2B		
			.5247	.5004	.5208	.5202	.5090	.5610	.5525		.5630	.5267	.5559	.5320	.5326	.5021	.5149			
		3A	.5264	.5023	.5230	.5230	.5110	.5625	.5538		.5625	.5264	.5549	.5308	.5308	.5020	.5106	3B		
			.5261	.5018	.5233	.5227	.5115	.5624	.5539		.5630	.5267	.5544	.5305	.5311	.5021	.5105			
9/16-24	NEF	2A	.5342	.5162	.5303	.5303	.5213	.5613	.5541		.5625	.5354	.5585	.5405	.5405	.5170	.5270	2B	NEF	9/16-24
			.5339	.5157	.5306	.5300	.5218	.5612	.5542		.5630	.5357	.5580	.5402	.5408	.5171	.5269			
		3A	.5354	.5174	.5325	.5325	.5235	.5625	.5553		.5625	.5354	.5572	.5392	.5392	.5170	.5244	3B		
			.5351	.5169	.5328	.5322	.5240	.5624	.5554		.5630	.5357	.5567	.5389	.5395	.5171	.5243			
5/8-11	UNC	1A	.5644	.5250	.5561	.5561	.5364	.6234	.6052		.6250	.5660	.6161	.5767	.5767	.5270	.5460	1B	UNC	5/8-11
			.5641	.5244	.5564	.5558	.5370	.6233	.6053		.6256	.5663	.6155	.5764	.5770	.5271	.5459			
		2A	.5644	.5250	.5589	.5589	.5392	.6234	.6113	.6052	.6250	.5660	.6126	.5732	.5732	.5270	.5460	2B		
			.5641	.5244	.5592	.5586	.5398	.6233	.6114	.6053	.6256	.5663	.6120	.5729	.5735	.5271	.5459			
		3A	.5660	.5266	.5619	.5619	.5422	.6250	.6129		.6250	.5660	.6108	.5714	.5714	.5270	.5391	3B		
			.5657	.5260	.5622	.5616	.5428	.6249	.6130		.6256	.5663	.6102	.5711	.5717	.5271	.5390			
5/8-12	N	2A	.5693	.5332	.5639	.5639	.5459	.6234	.6120		.6250	.5709	.6141	.5780	.5780	.5350	.5530	2B	N	5/8-12
			.5690	.5326	.5642	.5636	.5465	.6233	.6121		.6256	.5712	.6135	.5777	.5783	.5351	.5529			
		3A	.5709	.5348	.5668	.5668	.5488	.6250	.6136		.6250	.5709	.6122	.5762	.5762	.5350	.5463	3B		
			.5706	.5342	.5671	.5665	.5494	.6249	.6137		.6256	.5712	.6117	.5759	.5765	.5351	.5462			
5/8-18	UNF	1A	.5875	.5634	.5805	.5805	.5685	.6236	.6105		.6250	.5889	.6221	.5980	.5980	.5650	.5780	1B	UNF	5/8-18
			.5872	.5629	.5808	.5802	.5690	.6235	.6106		.6255	.5892	.6216	.5977	.5983	.5651	.5779			
		2A	.5875	.5634	.5828	.5828	.5708	.6236	.6149		.6250	.5889	.6190	.5949	.5949	.5650	.5780	2B		
			.5872	.5629	.5831	.5825	.5713	.6235	.6150		.6255	.5892	.6185	.5946	.5952	.5651	.5779			
		3A	.5889	.5648	.5854	.5854	.5734	.6250	.6163		.6250	.5889	.6175	.5934	.5934	.5650	.5730	3B		
			.5886	.5643	.5857	.5851	.5739	.6249	.6164		.6255	.5892	.6170	.5931	.5937	.5651	.5729			
5/8-24	NEF	2A	.5967	.5787	.5927	.5927	.5837	.6238	.6166		.6250	.5979	.6211	.6031	.6031	.5800	.5900	2B	NEF	5/8-24
			.5964	.5782	.5930	.5924	.5842	.6237	.6167		.6255	.5982	.6206	.6028	.6034	.5801	.5899			
		3A	.5979	.5799	.5949	.5949	.5859	.6250	.6178		.6250	.5979	.6198	.6018	.6018	.5800	.5869	3B		
			.5976	.5794	.5952	.5946	.5864	.6249	.6179		.6255	.5982	.6193	.6015	.6021	.5801	.5868			

11/16-12	N	2A	.6318 .6315	.5957 .5951	.6264 .6267	.6264 .6261	.6084 .6090	.6859 .6858	.6745 .6746		.6875 .6881	.6334 .6337	.6766 .6760	.6405 .6402	.6405 .6408	.5970 .5971	.6150 .6149	2B	N	11/16-12
		3A	.6334 .6331	.5973 .5967	.6293 .6296	.6293 .6290	.6113 .6119	.6875 .6874	.6761 .6762		.6875 .6881	.6334 .6337	.6748 .6742	.6387 .6384	.6387 .6390	.5970 .5971	.6085 .6084	3B		
11/16-24	NEF	2A	.6592 .6589	.6412 .6407	.6552 .6555	.6552 .6549	.6462 .6467	.6863 .6862	.6791 .6792		.6875 .6880	.6604 .6607	.6836 .6831	.6656 .6653	.6656 .6659	.6420 .6421	.6520 .6519	2B	NEF	11/16-24
		3A	.6604 .6601	.6424 .6419	.6574 .6577	.6574 .6571	.6484 .6489	.6875 .6874	.6803 .6804		.6875 .6880	.6604 .6607	.6823 .6818	.6643 .6640	.6643 .6646	.6420 .6421	.6494 .6493	3B		
3/4-10	UNC	1A	.6832 .6829	.6399 .6393	.6744 .6747	.6744 .6741	.6528 .6534	.7482 .7481	.7288 .7289		.7500 .7506	.6850 .6853	.7398 .7392	.6965 .6962	.6965 .6968	.6420 .6421	.6630 .6629	1B	UNC	3/4-10
		2A	.6832 .6829	.6399 .6393	.6773 .6776	.6773 .6770	.6557 .6563	.7482 .7481	.7353 .7354	.7288 .7289	.7500 .7506	.6850 .6853	.7360 .7354	.6927 .6924	.6927 .6930	.6420 .6421	.6630 .6629	2B		
		3A	.6850 .6847	.6417 .6411	.6806 .6809	.6806 .6803	.6590 .6596	.7500 .7499	.7371 .7372		.7500 .7506	.6850 .6853	.7340 .7334	.6907 .6904	.6907 .6910	.6420 .6421	.6545 .6544	3B		
3/4-12	N	2A	.6942 .6939	.6581 .6575	.6887 .6890	.6887 .6884	.6707 .6713	.7483 .7482	.7369 .7370		.7500 .7506	.6959 .6962	.7392 .7386	.7031 .7028	.7031 .7034	.6600 .6601	.6780 .6779	2B	N	3/4-12
		3A	.6959 .6956	.6598 .6592	.6918 .6921	.6918 .6915	.6738 .6744	.7500 .7499	.7386 .7387		.7500 .7506	.6959 .6962	.7374 .7368	.7013 .7010	.7013 .7016	.6600 .6601	.6707 .6706	3B		
3/4-16	UNF	1A	.7079 .7076	.6808 .6802	.7004 .7007	.7004 .7001	.6869 .6875	.7485 .7484	.7343 .7344		.7500 .7506	.7094 .7097	.7463 .7457	.7192 .7189	.7192 .7195	.6820 .6821	.6960 .6959	1B	UNF	3/4-16
		2A	.7079 .7076	.6808 .6802	.7029 .7032	.7029 .7026	.6894 .6900	.7485 .7484	.7391 .7392		.7500 .7506	.7094 .7097	.7430 .7424	.7159 .7156	.7159 .7162	.6820 .6821	.6960 .6959	2B		
		3A	.7094 .7091	.6823 .6817	.7056 .7059	.7056 .7053	.6921 .6927	.7500 .7499	.7406 .7407		.7500 .7506	.7094 .7097	.7414 .7408	.7143 .7140	.7143 .7146	.6820 .6821	.6908 .6907	3B		
3/4-20	UNEF	2A	.7162 .7159	.6946 .6941	.7118 .7121	.7118 .7115	.7010 .7015	.7487 .7486	.7406 .7407		.7500 .7505	.7175 .7178	.7449 .7444	.7232 .7229	.7232 .7235	.6960 .6961	.7070 .7069	2B	UNEF	3/4-20
		3A	.7175 .7172	.6959 .6954	.7142 .7145	.7142 .7139	.7034 .7039	.7500 .7499	.7419 .7420		.7500 .7505	.7175 .7178	.7435 .7430	.7218 .7215	.7218 .7221	.6960 .6961	.7037 .7036	3B		
13/16-12	UN	2A	.7567 .7564	.7206 .7200	.7512 .7515	.7512 .7509	.7332 .7338	.8108 .8107	.7994 .7995		.8125 .8131	.7584 .7587	.8017 .8011	.7656 .7653	.7656 .7659	.7220 .7221	.7400 .7399	2B	UN	13/16-12
		3A	.7584 .7581	.7223 .7217	.7543 .7546	.7543 .7540	.7363 .7369	.8125 .8124	.8011 .8012		.8125 .8131	.7584 .7587	.7999 .7993	.7638 .7635	.7638 .7641	.7220 .7221	.7329 .7328	3B		
13/16-16	UN	2A	.7704 .7701	.7433 .7427	.7655 .7658	.7655 .7652	.7520 .7526	.8110 .8109	.8016 .8017		.8125 .8131	.7719 .7722	.8053 .8047	.7782 .7779	.7782 .7785	.7450 .7451	.7590 .7589	2B	UN	13/16-16
		3A	.7719 .7716	.7448 .7442	.7683 .7686	.7683 .7680	.7548 .7554	.8125 .8124	.8031 .8032		.8125 .8131	.7719 .7722	.8037 .8031	.7766 .7763	.7766 .7769	.7450 .7451	.7533 .7532	3B		
13/16-20	UNEF	2A	.7787 .7784	.7571 .7566	.7743 .7746	.7743 .7740	.7635 .7640	.8112 .8111	.8031 .8032		.8125 .8130	.7800 .7803	.8074 .8069	.7857 .7854	.7857 .7860	.7580 .7581	.7700 .7699	2B	UNEF	13/16-20
		3A	.7800 .7797	.7584 .7579	.7767 .7770	.7767 .7764	.7659 .7664	.8125 .8124	.8044 .8045		.8125 .8130	.7800 .7803	.8060 .8055	.7843 .7840	.7843 .7846	.7580 .7581	.7662 .7661	3B		
7/8-9	UNC	1A	.8009 .8006	.7528 .7521	.7914 .7917	.7914 .7911	.7673 .7680	.87310 .87298	.85230 .85242		.8750 .8757	.8028 .8031	.8632 .8625	.8151 .8148	.8151 .8154	.75500 .75512	.77800 .77788	1B	UNC	7/8-9
		2A	.8009 .8006	.7528 .7521	.7946 .7949	.7946 .7943	.7705 .7712	.87310 .87298	.85920 .85932	.85230 .85242	.8750 .8757	.8028 .8031	.8591 .8584	.8110 .8107	.8110 .8113	.75500 .75512	.77800 .77788	2B		
		3A	.8028 .8025	.7547 .7540	.7981 .7984	.7981 .7978	.7740 .7747	.87500 .87488	.86110 .86122		.8750 .8757	.8028 .8031	.8570 .8563	.8089 .8086	.8089 .8092	.75500 .75512	.76810 .76798	3B		
7/8-12	N	2A	.8192 .8189	.7831 .7825	.8137 .8140	.8137 .8134	.7957 .7963	.87330 .87318	.86190 .86202		.8750 .8756	.8209 .8212	.8642 .8636	.8281 .8278	.8281 .8284	.78500 .78512	.80300 .80288	2B	N	7/8-12
		3A	.8209 .8206	.7848 .7842	.8168 .8171	.8168 .8165	.7988 .7994	.87500 .87488	.86360 .86372		.8750 .8756	.8209 .8212	.8624 .8618	.8263 .8260	.8263 .8266	.78500 .78512	.79520 .79508	3B		
7/8-14	UNF	1A	.8270 .8267	.7961 .7955	.8189 .8192	.8189 .8186	.8034 .8040	.87340 .87328	.85790 .85802		.8750 .8756	.8286 .8289	.8701 .8695	.8392 .8389	.8392 .8395	.79800 .79812	.81400 .81388	1B	UNF	7/8-14
		2A	.8270 .8267	.7961 .7955	.8216 .8219	.8216 .8213	.8061 .8067	.87340 .87328	.86310 .86322		.8750 .8756	.8286 .8289	.8665 .8659	.8356 .8353	.8356 .8359	.79800 .79812	.81400 .81388	2B		
		3A	.8286 .8283	.7977 .7971	.8245 .8248	.8245 .8242	.8090 .8096	.87500 .87488	.86470 .86482		.8750 .8756	.8286 .8289	.8648 .8642	.8339 .8336	.8339 .8342	.79800 .79812	.80680 .80668	3B		
7/8-16	UN	2A	.8329 .8326	.8058 .8052	.8280 .8283	.8280 .8277	.8145 .8151	.87350 .87338	.86410 .86422		.8750 .8756	.8344 .8347	.8678 .8672	.8407 .8404	.8407 .8410	.80700 .80712	.82100 .82088	2B	UN	7/8-16
		3A	.8344 .8341	.8073 .8067	.8308 .8311	.8308 .8305	.8173 .8179	.87500 .87488	.86560 .86572		.8750 .8756	.8344 .8347	.8662 .8656	.8391 .8388	.8391 .8394	.80700 .80712	.81580 .81568	3B		
7/8-20	UNEF	2A	.8412 .8409	.8196 .8191	.8368 .8371	.8368 .8365	.8260 .8265	.87370 .87358	.86560 .86572		.8750 .8755	.8425 .8428	.8699 .8694	.8482 .8479	.8482 .8485	.82100 .82112	.83200 .83188	2B	UNEF	7/8-20
		3A	.8425 .8422	.8209 .8204	.8392 .8395	.8392 .8389	.8284 .8289	.87500 .87488	.86690 .86702		.8750 .8755	.8425 .8428	.8685 .8680	.8468 .8465	.8468 .8471	.82100 .82112	.82870 .82858	3B		

TABLE III.12.—*Gages for standard thread series, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			X thread gages					Z plain gages for major diameter			X thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semifinished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tolerance gage	Minus tolerance gage								Minus tolerance gage	Plus tolerance gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
15/16-12	UN	2A	0.8817	0.8456	0.8760	0.8760	0.8580	0.93580	0.92440	....	0.9375	0.8834	0.9269	0.8908	0.8908	0.84700	0.86500	2B	UN	15/16-12
			.8814	.8450	.8763	.8757	.8586	.93568	.92452	....	.9381	.8837	.9263	.8905	.8911	.84712	.86488			
		3A	.8834	.8473	.8793	.8796	.8613	.93750	.92610	....	.9375	.8834	.9250	.8889	.8889	.84700	.85750	3B		
			.8831	.8467	.8796	.8790	.8619	.93738	.92622	....	.9381	.8837	.9244	.8886	.8892	.84712	.85738			
15/16-16	UN	2A	.8954	.8683	.8904	.8904	.8769	.93600	.92660	....	.9375	.8969	.9305	.9034	.9034	.87000	.88400	2B	UN	15/16-16
			.8951	.8677	.8907	.8901	.8775	.93588	.92672	....	.9381	.8972	.9299	.9031	.9037	.87012	.88388			
		3A	.8969	.8698	.8932	.8932	.8797	.93750	.92810	....	.9375	.8969	.9289	.9018	.9018	.87000	.87830	3B		
			.8966	.8692	.8935	.8929	.8803	.93738	.92822	....	.9381	.8972	.9283	.9015	.9021	.87012	.87818			
15/16-20	UNEF	2A	.9036	.8820	.8991	.8991	.8883	.93610	.92800	....	.9375	.9050	.9326	.9109	.9109	.88300	.89500	2B	UNEF	15/16-20
			.9033	.8815	.8994	.8988	.8888	.93598	.92812	....	.9380	.9053	.9321	.9106	.9112	.88312	.89488			
		3A	.9050	.8834	.9016	.9016	.8908	.93750	.92940	....	.9375	.9050	.9311	.9094	.9094	.88300	.89120	3B		
			.9047	.8829	.9019	.9013	.8913	.93738	.92952	....	.9380	.9053	.9306	.9091	.9097	.88312	.89108			
1-8	UNC	1A	.9168	.8627	.9067	.9067	.8796	.99800	.97550	....	1.0000	.9188	.9861	.9320	.9320	.86500	.89000	1B	UNC	1-8
			.9164	.8620	.9071	.9063	.8803	.99788	.97562	....	1.0007	.9192	.9854	.9316	.9324	.86512	.88988			
		2A	.9168	.8627	.9100	.9100	.8829	.99800	.98300	0.97550	1.0000	.9188	.9817	.9276	.9276	.85500	.89000	2B		
			.9164	.8620	.9104	.9096	.8836	.99788	.98312	.97562	1.0007	.9192	.9810	.9272	.9280	.86512	.88988			
		3A	.9188	.8647	.9137	.9137	.8866	1.00000	.98500	....	1.0000	.9188	.9795	.9254	.9254	.86500	.87970	3B		
			.9184	.8640	.9141	.9133	.8873	.99989	.98512	....	1.0007	.9192	.9788	.9250	.9258	.86512	.87958			
1-12	UNF	1A	.9441	.9080	.9353	.9353	.9173	.99820	.98100	....	1.0000	.9459	.9934	.9573	.9573	.91000	.92800	1B	UNF	1-12
			.9438	.9074	.9356	.9350	.9179	.99808	.98112	....	1.0006	.9462	.9928	.9570	.9576	.91012	.92788			
		2A	.9441	.9080	.9382	.9382	.9202	.99820	.98680	....	1.0000	.9459	.9896	.9535	.9535	.91000	.92800	2B		
			.9438	.9074	.9385	.9379	.9208	.99808	.98692	....	1.0006	.9462	.9890	.9532	.9538	.91012	.92788			
		3A	.9459	.9098	.9415	.9415	.9235	1.00000	.98860	....	1.0000	.9459	.9877	.9516	.9516	.91000	.91980	3B		
			.9456	.9092	.9418	.9412	.9241	.99988	.98872	....	1.0006	.9462	.9871	.9513	.9519	.91012	.91968			
1-16	UN	2A	.9579	.9308	.9529	.9529	.9394	.99850	.98910	....	1.0000	.9594	.9930	.9659	.9659	.93200	.94600	2B	UN	1-16
			.9576	.9302	.9532	.9526	.9400	.99838	.98922	....	1.0006	.9597	.9924	.9656	.9662	.93212	.94588			
		3A	.9594	.9323	.9557	.9557	.9422	1.00000	.99060	....	1.0000	.9594	.9914	.9643	.9643	.93200	.94080	3B		
			.9591	.9317	.9560	.9554	.9428	.99988	.99072	....	1.0006	.9597	.9908	.9640	.9646	.93212	.94068			
1-20	UNEF	2A	.9661	.9444	.9616	.9616	.9508	.99860	.99050	....	1.0000	.9675	.9951	.9734	.9734	.94600	.95700	2B	UNEF	1-20
			.9658	.9439	.9619	.9613	.9513	.99848	.99062	....	1.0005	.9678	.9946	.9731	.9737	.94612	.95688			
		3A	.9675	.9459	.9641	.9641	.9533	1.00000	.99190	....	1.0000	.9675	.9936	.9719	.9719	.94600	.95370	3B		
			.9672	.9454	.9644	.9638	.9538	.99988	.99202	....	1.0005	.9678	.9931	.9716	.9722	.94612	.95358			
1 1/16-12	UN	2A	1.0067	.9706	1.0010	1.0010	.9830	1.06080	1.04940	....	1.0625	1.0084	1.0519	1.0158	1.0158	.97200	.99000	2B	UN	1 1/16-12
			1.0064	.9700	1.0013	1.0007	.9836	1.06068	1.04952	....	1.0631	1.0087	1.0513	1.0155	1.0161	.97212	.98988			
		3A	1.0084	.9723	1.0042	1.0042	.9862	1.06250	1.05110	....	1.0625	1.0084	1.0500	1.0139	1.0139	.97200	.98230	3B		
			1.0081	.9717	1.0045	1.0039	.9868	1.06238	1.05122	....	1.0631	1.0087	1.0494	1.0136	1.0142	.97212	.98218			
1 1/16-16	UN	2A	1.0204	.9933	1.0154	1.0154	1.0019	1.06100	1.05160	....	1.0625	1.0219	1.0555	1.0284	1.0284	.99500	1.00900	2B	UN	1 1/16-16
			1.0201	.9927	1.0157	1.0151	1.0025	1.06088	1.05172	....	1.0631	1.0222	1.0549	1.0281	1.0287	.99512	1.00888			
		3A	1.0219	.9948	1.0182	1.0182	1.0047	1.06250	1.05310	....	1.0625	1.0219	1.0539	1.0268	1.0268	.99500	1.00330	3B		
			1.0216	.9942	1.0185	1.0179	1.0053	1.06238	1.05322	....	1.0631	1.0222	1.0533	1.0265	1.0271	.99512	1.00318			
1 1/16-18	NEF	2A	1.0250	1.0003	1.0203	1.0203	1.0083	1.06110	1.05240	....	1.0625	1.0264	1.0567	1.0326	1.0326	1.00200	1.01500	2B	NEF	1 1/16-18
			1.0247	1.0004	1.0206	1.0200	1.0088	1.06098	1.05252	....	1.0630	1.0267	1.0562	1.0323	1.0329	1.00212	1.01488			
		3A	1.0264	1.0023	1.0228	1.0228	1.0108	1.06250	1.05380	....	1.0625	1.0264	1.0551	1.0310	1.0310	1.00200	1.01050	3B		
			1.0261	1.0018	1.0231	1.0225	1.0113	1.06238	1.05392	....	1.0630	1.0267	1.0546	1.0307	1.0313	1.00212	1.01038			

1⅛-7	UNC	1A	1.0300	.9681	1.0191	1.0191	.9882	1.12280	1.09820	....	1.1250	1.0322	1.1082	1.0463	1.0463	.97000	.99800	1B	UNC	1⅛-7
			1.0296	.9674	1.0195	1.0187	.9889	1.12268	1.09832	....	1.1257	1.0326	1.1075	1.0459	1.0467	.97012	.99788			
		2A	1.0300	.9681	1.0228	1.0228	.9919	1.12280	1.10640	1.09820	1.1250	1.0322	1.1035	1.0416	1.0416	.97000	.99800	2B		
			1.0296	.9674	1.0232	1.0224	.9926	1.12268	1.10652	1.09832	1.1257	1.0326	1.1028	1.0412	1.0420	.97012	.99788			
		3A	1.0322	.9703	1.0268	1.0268	.9959	1.12500	1.10860	....	1.1250	1.0322	1.1012	1.0393	1.0393	.97000	.98750	3B		
			1.0318	.9696	1.0272	1.0264	.9966	1.12488	1.10872	....	1.1257	1.0326	1.1005	1.0389	1.0397	.97012	.98738			
1⅛-8	N	2A	1.0417	.9876	1.0348	1.0348	1.0077	1.12290	1.10790	1.10040	1.1250	1.0438	1.1069	1.0528	1.0528	.99000	1.01500	2B	N	1⅛-8
			1.0413	.9869	1.0352	1.0344	1.0084	1.12278	1.10802	1.10052	1.1257	1.0442	1.1062	1.0524	1.0532	.99012	1.01488			
		3A	1.0438	.9897	1.0386	1.0386	1.0115	1.12500	1.11000	....	1.1250	1.0438	1.1046	1.0505	1.0505	.99000	1.00470	3B		
			1.0434	.9890	1.0390	1.0382	1.0122	1.12488	1.11012	....	1.1257	1.0442	1.1039	1.0501	1.0509	.99012	1.00458			
1⅛-12	UNF	1A	1.0691	1.0330	1.0601	1.0601	1.0421	1.12320	1.10600	....	1.1250	1.0709	1.1187	1.0826	1.0826	1.03500	1.05300	1B	UNF	1⅛-12
			1.0688	1.0324	1.0604	1.0598	1.0427	1.12308	1.10612	....	1.1256	1.0712	1.1181	1.0823	1.0829	1.03512	1.05288			
		2A	1.0691	1.0330	1.0631	1.0631	1.0451	1.12320	1.11180	....	1.1250	1.0709	1.1148	1.0787	1.0787	1.03500	1.05300	2B		
			1.0688	1.0324	1.0634	1.0628	1.0457	1.12308	1.11192	....	1.1256	1.0712	1.1142	1.0784	1.0790	1.03512	1.05288			
		3A	1.0709	1.0348	1.0664	1.0664	1.0484	1.12500	1.11360	....	1.1250	1.0709	1.1129	1.0768	1.0768	1.03500	1.04480	3B		
			1.0706	1.0342	1.0667	1.0661	1.0490	1.12488	1.11372	....	1.1256	1.0712	1.1123	1.0765	1.0771	1.03512	1.04468			
1⅛-16	UN	2A	1.0829	1.0558	1.0779	1.0779	1.0644	1.12350	1.11410	....	1.1250	1.0844	1.1180	1.0909	1.0909	1.05700	1.07100	2B	UN	1⅛-16
			1.0826	1.0552	1.0782	1.0776	1.0650	1.12338	1.11422	....	1.1256	1.0847	1.1174	1.0906	1.0912	1.05712	1.07088			
		3A	1.0844	1.0573	1.0807	1.0807	1.0672	1.12500	1.11560	....	1.1250	1.0844	1.1164	1.0893	1.0893	1.05700	1.06580	3B		
			1.0841	1.0567	1.0810	1.0804	1.0678	1.12488	1.11572	....	1.1256	1.0847	1.1158	1.0890	1.0896	1.05712	1.06568			
1⅛-18	NEF	2A	1.0875	1.0634	1.0828	1.0828	1.0708	1.12360	1.11490	....	1.1250	1.0889	1.1192	1.0951	1.0951	1.06500	1.07800	2B	NEF	1⅛-18
			1.0872	1.0629	1.0831	1.0825	1.0713	1.12348	1.11502	....	1.1255	1.0892	1.1187	1.0948	1.0954	1.06512	1.07788			
		3A	1.0889	1.0648	1.0853	1.0853	1.0733	1.12500	1.11630	....	1.1250	1.0889	1.1176	1.0935	1.0935	1.06500	1.07300	3B		
			1.0886	1.0643	1.0856	1.0850	1.0738	1.12488	1.11642	....	1.1255	1.0892	1.1171	1.0932	1.0938	1.06512	1.07288			
1$^{3}/_{16}$-12	UN	2A	1.1317	1.0956	1.1259	1.1259	1.1079	1.18580	1.17440	....	1.1875	1.1334	1.1770	1.1409	1.1409	1.09700	1.11500	2B	UN	1$^{3}/_{16}$-12
			1.1314	1.0950	1.1262	1.1256	1.1085	1.18568	1.17452	....	1.1881	1.1337	1.1764	1.1406	1.1412	1.09712	1.11488			
		3A	1.1334	1.0973	1.1291	1.1291	1.1111	1.18750	1.17610	....	1.1875	1.1334	1.1751	1.1390	1.1390	1.09700	1.10730	3B		
			1.1331	1.0967	1.1294	1.1288	1.1117	1.18738	1.17622	....	1.1881	1.1337	1.1745	1.1387	1.1393	1.09712	1.10718			
1$^{3}/_{16}$-16	UN	2A	1.1454	1.1183	1.1403	1.1403	1.1268	1.18600	1.17660	....	1.1875	1.1469	1.1806	1.1535	1.1535	1.12000	1.13400	2B	UN	1$^{3}/_{16}$-16
			1.1451	1.1177	1.1406	1.1400	1.1274	1.18588	1.17672	....	1.1881	1.1472	1.1800	1.1532	1.1538	1.12012	1.13388			
		3A	1.1469	1.1198	1.1431	1.1431	1.1296	1.18750	1.17810	....	1.1875	1.1469	1.1790	1.1519	1.1519	1.12000	1.12830	3B		
			1.1466	1.1192	1.1434	1.1428	1.1302	1.18738	1.17822	....	1.1881	1.1472	1.1784	1.1516	1.1522	1.12012	1.12818			
1$^{3}/_{16}$-18	NEF	2A	1.1499	1.1258	1.1450	1.1450	1.1330	1.18600	1.17730	....	1.1875	1.1514	1.1818	1.1577	1.1577	1.12700	1.14000	2B	NEF	1$^{3}/_{16}$-18
			1.1496	1.1253	1.1453	1.1447	1.1335	1.18588	1.17742	....	1.1880	1.1517	1.1813	1.1574	1.1580	1.12712	1.13988			
		3A	1.1514	1.1273	1.1478	1.1478	1.1358	1.18750	1.17880	....	1.1875	1.1514	1.1802	1.1561	1.1561	1.12700	1.13550	3B		
			1.1511	1.1268	1.1481	1.1475	1.1363	1.18738	1.17892	....	1.1880	1.1517	1.1797	1.1558	1.1564	1.12712	1.13538			
1¼-7	UNC	1A	1.1550	1.0931	1.1439	1.1439	1.1130	1.24780	1.22320	....	1.2500	1.1572	1.2335	1.1716	1.1716	1.09500	1.12300	1B	UNC	1¼-7
			1.1546	1.0924	1.1443	1.1435	1.1137	1.24768	1.22332	....	1.2507	1.1576	1.2328	1.1712	1.1720	1.09512	1.12288			
		2A	1.1550	1.0931	1.1476	1.1476	1.1167	1.24780	1.23140	1.22320	1.2500	1.1572	1.2287	1.1668	1.1668	1.09500	1.12300	2B		
			1.1546	1.0924	1.1480	1.1472	1.1174	1.24768	1.23152	1.22332	1.2507	1.1576	1.2280	1.1664	1.1672	1.09512	1.12288			
		3A	1.1572	1.0953	1.1517	1.1517	1.1208	1.25000	1.23360	....	1.2500	1.1572	1.2263	1.1644	1.1644	1.09500	1.11250	3B		
			1.1568	1.0946	1.1521	1.1513	1.1215	1.24988	1.23372	....	1.2507	1.1576	1.2256	1.1640	1.1648	1.09512	1.11238			
1¼-8	N	2A	1.1667	1.1126	1.1597	1.1597	1.1326	1.24790	1.23290	1.22540	1.2500	1.1688	1.2321	1.1780	1.1780	1.11500	1.14000	2B	N	1¼-8
			1.1663	1.1119	1.1601	1.1593	1.1333	1.24778	1.23302	1.22552	1.2507	1.1692	1.2314	1.1776	1.1784	1.11512	1.13988			
		3A	1.1688	1.1147	1.1635	1.1635	1.1364	1.25000	1.23500	....	1.2500	1.1688	1.2298	1.1757	1.1757	1.11500	1.12970	3B		
			1.1684	1.1140	1.1639	1.1631	1.1371	1.24988	1.23512	....	1.2507	1.1692	1.2291	1.1753	1.1761	1.11512	1.12958			
1¼-12	UNF	1A	1.1941	1.1580	1.1849	1.1849	1.1669	1.24820	1.23100	....	1.2500	1.1959	1.2440	1.2079	1.2079	1.16000	1.17500	1B	UNF	1¼-12
			1.1938	1.1574	1.1852	1.1846	1.1675	1.24808	1.23112	....	1.2506	1.1962	1.2434	1.2076	1.2082	1.16012	1.17488			
		2A	1.1941	1.1580	1.1879	1.1879	1.1699	1.24820	1.23680	....	1.2500	1.1959	1.2400	1.2039	1.2039	1.16000	1.17500	2B		
			1.1938	1.1574	1.1882	1.1876	1.1705	1.24808	1.23692	....	1.2506	1.1962	1.2394	1.2036	1.2042	1.16012	1.17488			
		3A	1.1959	1.1598	1.1913	1.1913	1.1733	1.25000	1.23860	....	1.2500	1.1959	1.2380	1.2019	1.2019	1.16000	1.16980	3B		
			1.1956	1.1592	1.1916	1.1910	1.1739	1.24988	1.23872	....	1.2506	1.1962	1.2374	1.2016	1.2022	1.16012	1.16968			
1¼-16	UN	2A	1.2079	1.1808	1.2028	1.2028	1.1893	1.24850	1.23910	....	1.2500	1.2094	1.2431	1.2160	1.2160	1.18200	1.19600	2B	UN	1¼-16
			1.2076	1.1802	1.2031	1.2025	1.1899	1.24838	1.23922	....	1.2506	1.2097	1.2425	1.2157	1.2163	1.18212	1.19588			
		3A	1.2094	1.1823	1.2056	1.2056	1.1921	1.25000	1.24060	....	1.2500	1.2094	1.2415	1.2144	1.2144	1.18200	1.19080	3B		
			1.2091	1.1817	1.2059	1.2053	1.1927	1.24988	1.24072	....	1.2506	1.2097	1.2409	1.2141	1.2147	1.18212	1.19068			
1¼-18	NEF	2A	1.2124	1.1883	1.2075	1.2075	1.1955	1.24850	1.23980	....	1.2500	1.2139	1.2443	1.2202	1.2202	1.19000	1.20300	2B	NEF	1¼-18
			1.2121	1.1878	1.2078	1.2072	1.1960	1.24838	1.23992	....	1.2505	1.2142	1.2438	1.2199	1.2205	1.19012	1.20288			
		3A	1.2139	1.1898	1.2103	1.2103	1.1983	1.25000	1.24130	....	1.2500	1.2139	1.2427	1.2186	1.2186	1.19000	1.19800	3B		
			1.2136	1.1893	1.2106	1.2100	1.1988	1.24988	1.24142	....	1.2505	1.2142	1.2422	1.2183	1.2189	1.19012	1.19788			
1$^{5}/_{16}$-12	UN	2A	1.2567	1.2206	1.2509	1.2509	1.2329	1.31080	1.29940	....	1.3125	1.2584	1.3020	1.2659	1.2659	1.22200	1.24000	2B	UN	1$^{5}/_{16}$-12
			1.2564	1.2200	1.2512	1.2506	1.2335	1.31068	1.29952	....	1.3131	1.2587	1.3014	1.2656	1.2662	1.22212	1.23988			
		3A	1.2584	1.2223	1.2541	1.2541	1.2361	1.31250	1.30110	....	1.3125	1.2584	1.3001	1.2640	1.2640	1.22200	1.23230	3B		
			1.2581	1.2217	1.2544	1.2538	1.2367	1.31238	1.30122	....	1.3131	1.2587	1.2995	1.2637	1.2643	1.22212	1.23218			

TABLE III.12.—*Gages for standard thread series, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			X thread gages					Z plain gages for major diameter			X thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Un-finished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tolerance gage	Minus tolerance gage								Minus tolerance gage	Plus tolerance gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1 5/16-16	UN	2A	*in.* 1.2704 1.2701	*in.* 1.2433 1.2427	*in.* 1.2653 1.2656	*in.* 1.2653 1.2650	*in.* 1.2518 1.2524	*in.* 1.31100 1.31088	*in.* 1.30160 1.30172	*in.*	*in.* 1.3125 1.3131	*in.* 1.2719 1.2722	*in.* 1.3056 1.3050	*in.* 1.2785 1.2782	*in.* 1.2785 1.2788	*in.* 1.24500 1.24512	*in.* 1.25900 1.25888	2B	UN	1 5/16-16
		3A	1.2719 1.2716	1.2448 1.2442	1.2681 1.2684	1.2681 1.2678	1.2546 1.2542	1.31250 1.31238	1.30310 1.30322	....	1.3125 1.3131	1.2719 1.2722	1.3040 1.3034	1.2769 1.2766	1.2769 1.2772	1.24500 1.24512	1.25330 1.25318	3B		
1 5/16-18	NEF	2A	1.2749 1.2746	1.2508 1.2503	1.2700 1.2703	1.2700 1.2697	1.2580 1.2585	1.31100 1.31088	1.30230 1.30242	....	1.3125 1.3130	1.2764 1.2767	1.3068 1.3063	1.2827 1.2824	1.2827 1.2830	1.25200 1.25212	1.26500 1.26488	2B	NEF	1 5/16-18
		3A	1.2764 1.2761	1.2523 1.2518	1.2728 1.2731	1.2728 1.2725	1.2608 1.2613	1.31250 1.31238	1.30380 1.30392	....	1.3125 1.3130	1.2764 1.2767	1.3052 1.3047	1.2811 1.2808	1.2811 1.2814	1.25200 1.25212	1.26050 1.26038	3B		
1 3/8-6	UNC	1A	1.2643 1.2639	1.1921 1.1913	1.2523 1.2527	1.2523 1.2519	1.2162 1.2170	1.37260 1.37248	1.34530 1.34542	....	1.3750 1.3758	1.2667 1.2671	1.3544 1.3536	1.2822 1.2818	1.2822 1.2826	1.19500 1.19512	1.22500 1.22488	1B	UNC	1 3/8-6
		2A	1.2643 1.2639	1.1921 1.1913	1.2563 1.2567	1.2563 1.2559	1.2202 1.2210	1.37260 1.37248	1.35440 1.35452	1.34530 1.34542	1.3750 1.3758	1.2667 1.2671	1.3493 1.3485	1.2771 1.2767	1.2771 1.2775	1.19500 1.19512	1.22500 1.22488	2B		
		3A	1.2667 1.2663	1.1945 1.1937	1.2607 1.2611	1.2607 1.2603	1.2246 1.2254	1.37500 1.37488	1.35680 1.35692	....	1.3750 1.3758	1.2667 1.2671	1.3467 1.3459	1.2745 1.2741	1.2745 1.2749	1.19500 1.19512	1.21460 1.21448	3B		
1 3/8-8	N	2A	1.2916 1.2912	1.2375 1.2368	1.2844 1.2848	1.2844 1.2840	1.2573 1.2580	1.37280 1.37268	1.35780 1.35792	1.35030 1.35042	1.3750 1.3757	1.2938 1.2942	1.3572 1.3565	1.3031 1.3027	1.3031 1.3035	1.24000 1.24012	1.26500 1.26488	2B	N	1 3/8-8
		3A	1.2938 1.2934	1.2397 1.2390	1.2884 1.2888	1.2884 1.2880	1.2613 1.2620	1.37500 1.37488	1.36000 1.36012	....	1.3750 1.3757	1.2938 1.2942	1.3549 1.3542	1.3008 1.3004	1.3008 1.3012	1.24000 1.24012	1.25470 1.25458	3B		
1 3/8-12	UNF	1A	1.3190 1.3187	1.2829 1.2823	1.3096 1.3099	1.3096 1.3093	1.2915 1.2922	1.37310 1.37298	1.35590 1.35602	....	1.3750 1.3756	1.3209 1.3212	1.3693 1.3687	1.3332 1.3329	1.3332 1.3335	1.28500 1.28512	1.30300 1.30288	1B	UNF	1 3/8-12
		2A	1.3190 1.3187	1.2829 1.2823	1.3127 1.3130	1.3127 1.3124	1.2947 1.2953	1.37310 1.37298	1.36170 1.36182	....	1.3750 1.3756	1.3209 1.3212	1.3652 1.3646	1.3291 1.3288	1.3291 1.3294	1.28500 1.28512	1.30300 1.30288	2B		
		3A	1.3209 1.3206	1.2848 1.2842	1.3162 1.3165	1.3162 1.3159	1.2982 1.2988	1.37500 1.37488	1.36360 1.36372	....	1.3750 1.3756	1.3209 1.3212	1.3631 1.3625	1.3270 1.3267	1.3270 1.3273	1.28500 1.28512	1.29480 1.29468	3B		
1 3/8-16	UN	2A	1.3329 1.3326	1.3058 1.3052	1.3278 1.3281	1.3278 1.3275	1.3143 1.3149	1.37350 1.37338	1.36410 1.36422	....	1.3750 1.3756	1.3344 1.3347	1.3681 1.3675	1.3410 1.3407	1.3410 1.3413	1.30700 1.30712	1.32100 1.32088	2B	UN	1 3/8-16
		3A	1.3344 1.3341	1.3073 1.3067	1.3306 1.3309	1.3306 1.3303	1.3171 1.3177	1.37500 1.37488	1.36560 1.36572	....	1.3750 1.3756	1.3344 1.3347	1.3665 1.3659	1.3394 1.3391	1.3394 1.3397	1.30700 1.30712	1.31580 1.31568	3B		
1 3/8-18	NEF	2A	1.3374 1.3371	1.3133 1.3128	1.3325 1.3328	1.3325 1.3322	1.3205 1.3210	1.37350 1.37338	1.36480 1.36492	....	1.3750 1.3755	1.3389 1.3392	1.3693 1.3688	1.3452 1.3449	1.3452 1.3455	1.31500 1.31512	1.32800 1.32788	2B	NEF	1 3/8-18
		3A	1.3389 1.3386	1.3148 1.3143	1.3353 1.3356	1.3353 1.3350	1.3233 1.3238	1.37500 1.37488	1.36630 1.36642	....	1.3750 1.3755	1.3389 1.3392	1.3677 1.3672	1.3436 1.3433	1.3436 1.3439	1.31500 1.31512	1.32300 1.32288	3B		
1 7/16-12	UN	2A	1.3816 1.3813	1.3455 1.3449	1.3757 1.3760	1.3757 1.3754	1.3577 1.3583	1.43570 1.43558	1.42430 1.42442	....	1.4375 1.4381	1.3834 1.3837	1.4271 1.4265	1.3910 1.3907	1.3910 1.3913	1.34700 1.34712	1.36000 1.35988	2B	UN	1 7/16-12
		3A	1.3834 1.3831	1.3473 1.3467	1.3790 1.3793	1.3790 1.3787	1.3610 1.3616	1.43750 1.43738	1.42610 1.42622	....	1.4375 1.4381	1.3834 1.3837	1.4252 1.4246	1.3891 1.3888	1.3891 1.3894	1.34700 1.34712	1.35730 1.35718	3B		

1 7/16-16	UN	2A	1.3953 1.3950	1.3682 1.3676	1.3901 1.3904	1.2901 1.3898	1.3766 1.3772	1.43590 1.43578	1.42650 1.42662	....	1.4375 1.4331	1.3969 1.3972	1.4308 1.4302	1.4037 1.4034	1.4037 1.4040	1.37000 1.37012	1.38400 1.38388	2B	UN	1 7/16-16
		3A	1.3969 1.3966	1.3698 1.3692	1.3930 1.3933	1.3930 1.3927	1.3795 1.3801	1.43750 1.43738	1.42810 1.42822	....	1.4375 1.4381	1.3969 1.3972	1.4291 1.4285	1.4020 1.4017	1.4020 1.4023	1.37000 1.37012	1.37830 1.37818	3B		
1 7/16-18	NEF	2A	1.3999 1.3996	1.3758 1.3753	1.3949 1.3952	1.3949 1.3946	1.3829 1.3834	1.43600 1.43588	1.42730 1.42742	....	1.4375 1.4380	1.4014 1.4017	1.4320 1.4315	1.4079 1.4076	1.4079 1.4082	1.37700 1.37712	1.39000 1.38988	2B	NEF	1 7/16-18
		3A	1.4014 1.4011	1.3773 1.3768	1.3977 1.3980	1.3977 1.3974	1.3857 1.3862	1.43750 1.43738	1.42880 1.42892	....	1.4375 1.4380	1.4014 1.4017	1.4303 1.4298	1.4062 1.4059	1.4062 1.4065	1.37700 1.37712	1.38550 1.38538	3B		
1 1/2-6	UNC	1A	1.3893 1.3889	1.3171 1.3163	1.3772 1.3776	1.3772 1.3768	1.3411 1.3419	1.49760 1.49748	1.47030 1.47042	....	1.5000 1.5008	1.3917 1.3921	1.4797 1.4789	1.4075 1.4071	1.4075 1.4079	1.32000 1.32012	1.35000 1.34988	1B	UNC	1 1/2-6
		2A	1.3893 1.3889	1.3171 1.3163	1.3812 1.3816	1.3812 1.3808	1.3451 1.3459	1.49760 1.49748	1.47940 1.47952	1.47030 1.47042	1.5000 1.5008	1.3917 1.3921	1.4744 1.4736	1.4022 1.4018	1.4022 1.4026	1.32000 1.32012	1.35000 1.34988	2B		
		3A	1.3917 1.3913	1.3195 1.3187	1.3856 1.3860	1.3856 1.3852	1.3495 1.3503	1.50000 1.49988	1.48180 1.48192	....	1.5000 1.5008	1.3917 1.3921	1.4718 1.4710	1.3996 1.3992	1.3996 1.4000	1.32000 1.32012	1.33960 1.33948	3B		
1 1/2-8	N	2A	1.4166 1.4162	1.3625 1.3618	1.4093 1.4097	1.4093 1.4089	1.3822 1.3829	1.49780 1.49768	1.48280 1.48292	1.47530 1.47542	1.5000 1.5007	1.4188 1.4192	1.4824 1.4817	1.4283 1.4279	1.4283 1.4287	1.36500 1.36512	1.39000 1.38988	2B	N	1 1/2-8
		3A	1.4188 1.4184	1.3647 1.3640	1.4133 1.4137	1.4133 1.4129	1.3862 1.3869	1.50000 1.49988	1.48500 1.48512	....	1.5000 1.5007	1.4188 1.4192	1.4800 1.4793	1.4259 1.4255	1.4259 1.4263	1.36500 1.36512	1.37970 1.37958	3B		
1 1/2-12	UNF	1A	1.4440 1.4437	1.4079 1.4073	1.4344 1.4347	1.4344 1.4341	1.4164 1.4170	1.49810 1.49798	1.48090 1.48102	....	1.5000 1.5006	1.4459 1.4462	1.4945 1.4939	1.4584 1.4581	1.4584 1.4587	1.41000 1.41012	1.42800 1.42788	1B	UNF	1 1/2-12
		2A	1.4440 1.4437	1.4079 1.4073	1.4376 1.4379	1.4376 1.4373	1.4196 1.4202	1.49810 1.49798	1.48570 1.48582	....	1.5000 1.5006	1.4459 1.4462	1.4903 1.4897	1.4542 1.4539	1.4542 1.4545	1.41000 1.41012	1.42800 1.42788	2B		
		3A	1.4459 1.4456	1.4098 1.4092	1.4411 1.4414	1.4411 1.4408	1.4231 1.4237	1.50000 1.49988	1.48860 1.48872	....	1.5000 1.5006	1.4459 1.4462	1.4883 1.4877	1.4522 1.4519	1.4522 1.4525	1.41000 1.41012	1.41980 1.41968	3B		
1 1/2-16	UN	2A	1.4578 1.4575	1.4307 1.4301	1.4526 1.4529	1.4526 1.4523	1.4391 1.4397	1.49840 1.49828	1.48900 1.48912	....	1.5000 1.5006	1.4594 1.4597	1.4933 1.4927	1.4662 1.4659	1.4662 1.4665	1.43200 1.43212	1.44600 1.44588	2B	UN	1 1/2-16
		3A	1.4594 1.4591	1.4323 1.4317	1.4555 1.4558	1.4555 1.4552	1.4420 1.4426	1.50000 1.49988	1.49060 1.49072	....	1.5000 1.5006	1.4594 1.4597	1.4916 1.4910	1.4645 1.4642	1.4645 1.4648	1.43200 1.43212	1.44080 1.44068	3B		
1 1/2-18	NEF	2A	1.4624 1.4621	1.4583 1.4578	1.4574 1.4577	1.4574 1.4571	1.4454 1.4459	1.49850 1.49838	1.48980 1.48992	....	1.5000 1.5005	1.4639 1.4642	1.4945 1.4940	1.4704 1.4701	1.4704 1.4707	1.44[illegible] 1.44[illegible]	1.45200 1.45188	2B	NEF	1 1/2-18
		3A	1.4639 1.4636	1.4398 1.4393	1.4602 1.4605	1.4602 1.4599	1.4482 1.4487	1.50000 1.49988	1.49130 1.49142	....	1.5000 1.5005	1.4639 1.4642	1.4928 1.4923	1.4687 1.4684	1.4687 1.4690	1.44[illegible] 1.44012	1.44800 1.44788	3B		
1 9/16-16	N	2A	1.5203 1.5199	1.4932 1.4926	1.5151 1.5155	1.5151 1.5147	1.5016 1.5022	1.56090 1.56074	1.55150 1.55166	....	1.5625 1.5631	1.5219 1.5223	1.5558 1.5552	1.5287 1.5283	1.5287 1.5291	1.49500 1.49516	1.50900 1.50884	2B	N	1 9/16-16
		3A	1.5219 1.5215	1.4948 1.4942	1.5180 1.5184	1.5180 1.5176	1.5045 1.5051	1.56250 1.56234	1.55310 1.55326	....	1.5625 1.5631	1.5219 1.5223	1.5541 1.5535	1.5270 1.5266	1.5270 1.5274	1.49500 1.49516	1.50330 1.50314	3B		
1 9/16-18	NEF	2A	1.5249 1.5245	1.5008 1.5003	1.5199 1.5203	1.5199 1.5195	1.5079 1.5084	1.56100 1.56084	1.55230 1.55246	....	1.5625 1.5630	1.5264 1.5268	1.5570 1.5565	1.5329 1.5325	1.5329 1.5333	1.50200 1.50216	1.51500 1.51484	2B	NEF	1 9/16-18
		3A	1.5264 1.5260	1.5023 1.5018	1.5227 1.5231	1.5227 1.5223	1.5107 1.5112	1.56250 1.56234	1.55380 1.55396	....	1.5625 1.5630	1.5264 1.5268	1.5553 1.5548	1.5312 1.5308	1.5312 1.5316	1.50200 1.50216	1.51050 1.51034	3B		
1 5/8-8	N	2A	1.5416 1.5411	1.4873 1.4868	1.5342 1.5347	1.5342 1.5337	1.5071 1.5078	1.62280 1.62264	1.60780 1.60796	1.60030 1.60046	1.6250 1.6257	1.5438 1.5443	1.6076 1.6069	1.5535 1.5530	1.5535 1.5540	1.49000 1.49016	1.51500 1.51484	2B	N	1 5/8-8
		3A	1.5438 1.5433	1.4897 1.4890	1.5382 1.5387	1.5382 1.5377	1.5111 1.5118	1.62500 1.62484	1.61000 1.61016	....	1.6250 1.6257	1.5438 1.5443	1.6051 1.6044	1.5510 1.5505	1.5510 1.5515	1.49000 1.49016	1.50470 1.50454	3B		
1 5/8-12	UN	2A	1.5691 1.5687	1.5330 1.5324	1.5632 1.5636	1.5632 1.5628	1.5452 1.5458	1.62320 1.62304	1.61180 1.61196	....	1.6250 1.6256	1.5709 1.5713	1.6146 1.6140	1.5785 1.5781	1.5785 1.5789	1.53500 1.53516	1.55300 1.55284	2B	UN	1 5/8-12
		3A	1.5709 1.5705	1.5348 1.5342	1.5665 1.5669	1.5665 1.5661	1.5485 1.5491	1.62500 1.62484	1.61360 1.61376	....	1.6250 1.6256	1.5709 1.5713	1.6127 1.6121	1.5766 1.5762	1.5766 1.5770	1.53500 1.53516	1.54480 1.54464	3B		
1 5/8-16	UN	2A	1.5828 1.5824	1.5557 1.5551	1.5776 1.5780	1.5776 1.5772	1.5641 1.5647	1.62340 1.62324	1.61400 1.61416	....	1.6250 1.6256	1.5844 1.5848	1.6183 1.6177	1.5912 1.5908	1.5912 1.5916	1.55700 1.55716	1.57100 1.57084	2B	UN	1 5/8-16
		3A	1.5844 1.5840	1.5573 1.5567	1.5805 1.5809	1.5805 1.5801	1.5670 1.5676	1.62500 1.62484	1.61560 1.61576	....	1.6250 1.6256	1.5844 1.5848	1.6166 1.6160	1.5895 1.5891	1.5895 1.5899	1.55700 1.55716	1.56580 1.56564	3B		
1 5/8-18	NEF	2A	1.5874 1.5870	1.5633 1.5628	1.5824 1.5828	1.5824 1.5820	1.5704 1.5709	1.62350 1.62334	1.61480 1.61496	....	1.6250 1.6255	1.5889 1.5893	1.6195 1.6190	1.5954 1.5950	1.5954 1.5958	1.56500 1.56516	1.57800 1.57784	2B	NEF	1 5/8-18
		3A	1.5889 1.5885	1.5648 1.5643	1.5852 1.5856	1.5852 1.5848	1.5732 1.5737	1.62500 1.62484	1.61630 1.61646	....	1.6250 1.6255	1.5889 1.5893	1.6178 1.6173	1.5937 1.5933	1.5937 1.5941	1.56500 1.56516	1.57300 1.57284	3B		

TABLE III.12.—*Gages for standard thread series, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads: X thread gages: Go: Pitch diameter	Gages for external threads: X thread gages: Go: Minor diameter	Gages for external threads: X thread gages: Not go: Pitch diameter: Plus tolerance gage	Gages for external threads: X thread gages: Not go: Pitch diameter: Minus tolerance gage	Gages for external threads: X thread gages: Not go: Minor diameter	Gages for external threads: Z plain gages for major diameter: Go	Gages for external threads: Z plain gages for major diameter: Not go: Semi-finished	Gages for external threads: Z plain gages for major diameter: Not go: Un-finished hot-rolled material	Gages for internal threads: X thread gages: Go: Major diameter	Gages for internal threads: X thread gages: Go: Pitch diameter	Gages for internal threads: X thread gages: Not go: Major diameter	Gages for internal threads: X thread gages: Not go: Pitch diameter: Minus tolerance gage	Gages for internal threads: X thread gages: Not go: Pitch diameter: Plus tolerance gage	Gages for internal threads: Z plain gages for minor diameter: Go	Gages for internal threads: Z plain gages for minor diameter: Not go	Class	Series designation	Nominal size and threads per inch
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
1$^{11}/_{16}$-16	N	2A	1.6453 1.6449	1.6182 1.6176	1.6400 1.6404	1.6400 1.6396	1.6265 1.6271	1.68590 1.68574	1.67650 1.67666	....	1.6875 1.6881	1.6469 1.6473	1.6809 1.6803	1.6538 1.6534	1.6538 1.6542	1.62000 1.62016	1.63400 1.63384	2B	N	1$^{11}/_{16}$-16
		3A	1.6469 1.6465	1.6198 1.6192	1.6429 1.6433	1.6429 1.6425	1.6294 1.6300	1.68750 1.68734	1.67810 1.67826	....	1.6875 1.6881	1.6469 1.6473	1.6792 1.6786	1.6521 1.6517	1.6521 1.6525	1.62000 1.62016	1.62830 1.62814	3B		
1$^{11}/_{16}$-18	NEF	2A	1.6499 1.6495	1.6258 1.6253	1.6448 1.6452	1.6448 1.6444	1.6328 1.6333	1.68600 1.68584	1.67730 1.67746	....	1.6875 1.6880	1.6514 1.6518	1.6821 1.6816	1.6580 1.6576	1.6580 1.6584	1.62700 1.62716	1.64000 1.63984	2B	NEF	1$^{11}/_{16}$-18
		3A	1.6514 1.6510	1.6273 1.6268	1.6476 1.6480	1.6476 1.6472	1.6356 1.6361	1.68750 1.68734	1.67880 1.67896	....	1.6875 1.6880	1.6514 1.6518	1.6804 1.6799	1.6563 1.6559	1.6563 1.6567	1.62700 1.62716	1.63550 1.63534	3B		
1$^{3}/_{4}$-5	UNC	1A	1.6174 1.6169	1.5308 1.5300	1.6040 1.6045	1.6040 1.6035	1.5607 1.5615	1.74730 1.74714	1.71650 1.71666	....	1.7500 1.7508	1.6201 1.6206	1.7241 1.7233	1.6375 1.6370	1.6375 1.6380	1.53400 1.53416	1.56800 1.56784	1B	UNC	1$^{3}/_{4}$-5
		2A	1.6174 1.6169	1.5308 1.5300	1.6085 1.6090	1.6085 1.6080	1.5652 1.5660	1.74730 1.74714	1.72680 1.72696	1.71650 1.71666	1.7500 1.7508	1.6201 1.6206	1.7183 1.7175	1.6317 1.6312	1.6317 1.6322	1.53400 1.53416	1.56800 1.56784	2B		
		3A	1.6201 1.6196	1.5335 1.5327	1.6134 1.6139	1.6134 1.6129	1.5701 1.5709	1.75000 1.74984	1.72950 1.72966	....	1.7500 1.7508	1.6201 1.6206	1.7154 1.7146	1.6288 1.6283	1.6288 1.6293	1.53400 1.53416	1.55750 1.55734	3B		
1$^{3}/_{4}$-8	N	2A	1.6665 1.6660	1.6124 1.6117	1.6580 1.6585	1.6580 1.6575	1.6319 1.6326	1.74770 1.74754	1.73270 1.73286	1.72520 1.72536	1.7500 1.7507	1.6688 1.6693	1.7327 1.7320	1.6786 1.6781	1.6786 1.6791	1.61500 1.61516	1.64000 1.63984	2B	N	1$^{3}/_{4}$-8
		3A	1.6688 1.6683	1.6147 1.6140	1.6632 1.6637	1.6632 1.6627	1.6361 1.6368	1.75000 1.74984	1.73500 1.73516	....	1.7500 1.7507	1.6688 1.6693	1.7303 1.7296	1.6762 1.6757	1.6762 1.6767	1.61500 1.61516	1.62970 1.62954	3B		
1$^{3}/_{4}$-12	UN	2A	1.6941 1.6937	1.6580 1.6574	1.6882 1.6886	1.6882 1.6878	1.6701 1.6707	1.74820 1.74804	1.73680 1.73696	....	1.7500 1.7506	1.6959 1.6963	1.7398 1.7392	1.7037 1.7033	1.7037 1.7041	1.66000 1.66016	1.67500 1.67484	2B	UN	1$^{3}/_{4}$-12
		3A	1.6959 1.6955	1.6598 1.6592	1.6914 1.6918	1.6914 1.6910	1.6734 1.6740	1.75000 1.74984	1.73860 1.73876	....	1.7500 1.7506	1.6959 1.6963	1.7378 1.7372	1.7017 1.7013	1.7017 1.7021	1.66000 1.66016	1.66980 1.66964	3B		
1$^{3}/_{4}$-16	UNEF	2A	1.7078 1.7074	1.6807 1.6801	1.7025 1.7029	1.7025 1.7021	1.6890 1.6896	1.74840 1.74824	1.73900 1.73916	....	1.7500 1.7506	1.7094 1.7098	1.7434 1.7428	1.7163 1.7159	1.7163 1.7167	1.68200 1.68216	1.69600 1.69584	2B	UNEF	1$^{3}/_{4}$-16
		3A	1.7094 1.7090	1.6823 1.6817	1.7054 1.7058	1.7054 1.7050	1.6919 1.6925	1.75000 1.74984	1.74060 1.74076	....	1.7500 1.7506	1.7094 1.7098	1.7417 1.7411	1.7146 1.7142	1.7146 1.7150	1.68200 1.68216	1.69080 1.69064	3B		
1$^{13}/_{16}$-16	N	2A	1.7703 1.7699	1.7432 1.7426	1.7650 1.7654	1.7650 1.7646	1.7515 1.7521	1.81090 1.81074	1.80150 1.80166	....	1.8125 1.8131	1.7719 1.7723	1.8059 1.8053	1.7788 1.7784	1.7788 1.7792	1.74500 1.74516	1.75900 1.75884	2B	N	1$^{13}/_{16}$-16
		3A	1.7719 1.7715	1.7448 1.7442	1.7679 1.7683	1.7679 1.7675	1.7544 1.7550	1.81250 1.81234	1.80310 1.80326	....	1.8125 1.8131	1.7719 1.7723	1.8042 1.8036	1.7771 1.7767	1.7771 1.7775	1.74500 1.74516	1.75330 1.75314	3B		
1$^{7}/_{8}$-8	N	2A	1.7915 1.7910	1.7374 1.7367	1.7838 1.7843	1.7838 1.7833	1.7567 1.7574	1.87270 1.87254	1.85770 1.85786	1.85020 1.85036	1.8750 1.8757	1.7938 1.7943	1.8579 1.8572	1.8038 1.8033	1.8038 1.8043	1.74000 1.74016	1.76500 1.76484	2B	N	1$^{7}/_{8}$-8
		3A	1.7938 1.7933	1.7397 1.7390	1.7881 1.7886	1.7881 1.7876	1.7610 1.7617	1.87500 1.87484	1.86000 1.86016	....	1.8750 1.8757	1.7938 1.7943	1.8554 1.8547	1.8013 1.8008	1.8013 1.8018	1.74000 1.74016	1.75470 1.75454	3B		
1$^{7}/_{8}$-12	UN	2A	1.8191 1.8187	1.7830 1.7824	1.8131 1.8135	1.8131 1.8127	1.7951 1.7957	1.87320 1.87304	1.86180 1.86196	....	1.8750 1.8756	1.8209 1.8213	1.8648 1.8642	1.8287 1.8283	1.8287 1.8291	1.78500 1.78516	1.80300 1.80284	2B	UN	1$^{7}/_{8}$-12
		3A	1.8209 1.8205	1.7848 1.7842	1.8164 1.8168	1.8164 1.8160	1.7984 1.7990	1.87500 1.87484	1.86360 1.86376	....	1.8750 1.8756	1.8209 1.8213	1.8628 1.8622	1.8267 1.8263	1.8267 1.8271	1.78500 1.78516	1.79480 1.79464	3B		
1$^{7}/_{8}$-16	UN	2A	1.8328 1.8324	1.8057 1.8051	1.8275 1.8279	1.8275 1.8271	1.8140 1.8146	1.87340 1.87324	1.86400 1.86416	....	1.8750 1.8756	1.8344 1.8348	1.8684 1.8678	1.8413 1.8409	1.8413 1.8417	1.80700 1.80716	1.82100 1.82084	2B	UN	1$^{7}/_{8}$-16
		3A	1.8344 1.8340	1.8073 1.8067	1.8304 1.8308	1.8304 1.8300	1.8169 1.8175	1.87500 1.87484	1.86560 1.86576	....	1.8750 1.8756	1.8344 1.8348	1.8667 1.8661	1.8396 1.8392	1.8396 1.8400	1.80700 1.80716	1.81580 1.81564	3B		

1 15/16-16	N	2A	1.8953	1.8882	1.8899	1.8899	1.8764	1.93590	1.92650	....	1.9375	1.8969	1.9310	1.9039	1.9039	1.87000	1.88400	2B	N	1 15/16-16
			1.8949	1.8876	1.8903	1.8895	1.8770	1.93574	1.92666	....	1.9381	1.8973	1.9304	1.9035	1.9043	1.87016	1.88384			
		3A	1.8969	1.8898	1.8929	1.8929	1.8794	1.93750	1.92810	....	1.9375	1.8969	1.9292	1.9021	1.9021	1.87000	1.87830	3B		
			1.8965	1.8892	1.8933	1.8925	1.8800	1.93734	1.92826	....	1.9381	1.8973	1.9286	1.9017	1.9025	1.87016	1.87814			
2-4 1/2	UNC	1A	1.8528	1.7596	1.8385	1.8385	1.7904	1.99710	1.96410	....	2.0000	1.8557	1.9705	1.8743	1.8743	1.75900	1.79500	1B	UNC	2-4 1/2
			1.8523	1.7588	1.8390	1.8380	1.7912	1.99694	1.96426	....	2.0008	1.8562	1.9697	1.8738	1.8748	1.75916	1.79484			
		2A	1.8528	1.7566	1.8433	1.8433	1.7952	1.99710	1.97510	1.9641	2.0000	1.8557	1.9643	1.8681	1.8681	1.75900	1.79500	2B		
			1.8523	1.7558	1.8438	1.8428	1.7960	1.99694	1.97526	1.96426	2.0008	1.8562	1.9635	1.8676	1.8686	1.75916	1.79484			
		3A	1.8557	1.7595	1.8486	1.8486	1.8005	2.00000	1.97800	....	2.0000	1.8557	1.9612	1.8650	1.8650	1.75900	1.78610	3B		
			1.8552	1.7587	1.8491	1.8481	1.8013	1.99984	1.97816	....	2.0008	1.8562	1.9604	1.8645	1.8655	1.75916	1.78594			
2-8	N	2A	1.9165	1.8624	1.9087	1.9087	1.8816	1.99770	1.98270	1.97520	2.0000	1.9188	1.9830	1.9289	1.9289	1.86500	1.89000	2B	N	2-8
			1.9160	1.8617	1.9092	1.9082	1.8823	1.99754	1.98286	1.97536	2.0007	1.9193	1.9823	1.9284	1.9294	1.86516	1.88984			
		3A	1.9188	1.8647	1.9130	1.9130	1.8859	2.00000	1.98500	....	2.0000	1.9188	1.9805	1.9264	1.9264	1.86500	1.87970	3B		
			1.9183	1.8640	1.9135	1.9125	1.8866	1.99984	1.98516	....	2.0007	1.9193	1.9798	1.9259	1.9269	1.86516	1.87954			
2-12	UN	2A	1.9441	1.9080	1.9380	1.9380	1.9200	1.99820	1.98580	....	2.0000	1.9459	1.9899	1.9538	1.9538	1.91000	1.92800	2B	UN	2-12
			1.9437	1.9074	1.9384	1.9376	1.9206	1.99804	1.98596	....	2.0006	1.9463	1.9893	1.9534	1.9542	1.91016	1.92784			
		3A	1.9459	1.9098	1.9411	1.9411	1.9234	2.00000	1.98860	....	2.0000	1.9459	1.9879	1.9518	1.9518	1.91000	1.91980	3B		
			1.9455	1.9092	1.9415	1.9407	1.9240	1.99984	1.98876	....	2.0006	1.9463	1.9873	1.9514	1.9522	1.91016	1.91964			
2-16	UNEF	2A	1.9578	1.9307	1.9524	1.9524	1.9389	1.99840	1.98900	....	2.0000	1.9594	1.9935	1.9664	1.9664	1.93200	1.94600	2B	UNEF	2-16
			1.9574	1.9301	1.9528	1.9520	1.9395	1.99824	1.98916	....	2.0006	1.9598	1.9929	1.9660	1.9668	1.93216	1.94584			
		3A	1.9594	1.9323	1.9554	1.9554	1.9419	2.00000	1.99060	....	2.0000	1.9594	1.9917	1.9646	1.9646	1.93200	1.94080	3B		
			1.9590	1.9317	1.9558	1.9550	1.9425	1.99984	1.99076	....	2.0006	1.9598	1.9911	1.9642	1.9650	1.93216	1.94064			
2 1/16-16	N	2A	2.0203	1.9932	2.0149	2.0149	2.0014	2.06090	2.05150	....	2.0625	2.0219	2.0560	2.0289	2.0289	1.99500	2.00900	2B	N	2 1/16-16
			2.0199	1.9926	2.0153	2.0145	2.0020	2.06074	2.05166	....	2.0631	2.0223	2.0554	2.0285	2.0293	1.99516	2.00884			
		3A	2.0219	1.9948	2.0179	2.0179	2.0044	2.06250	2.05310	....	2.0625	2.0219	2.0542	2.0271	2.0271	1.99500	2.00330	3B		
			2.0215	1.9942	2.0183	2.0175	2.0050	2.06234	2.05326	....	2.0631	2.0223	2.0536	2.0267	2.0275	1.99516	2.00314			
2 1/8-8	N	2A	2.0414	1.9873	2.0335	2.0335	2.0064	2.12260	2.10760	2.10010	2.1250	2.0438	2.1081	2.0540	2.0540	1.99000	2.01500	2B	N	2 1/8-8
			2.0409	1.9866	2.0340	2.0330	2.0071	2.12244	2.10776	2.10026	2.1257	2.0443	2.1074	2.0535	2.0545	1.99016	2.01484			
		3A	2.0438	1.9897	2.0379	2.0379	2.0108	2.12500	2.11000	....	2.1250	2.0438	2.1056	2.0517	2.0515	1.99000	2.00470	3B		
			2.0433	1.9890	2.0384	2.0374	2.0115	2.12484	2.11016	....	2.1257	2.0443	2.1049	2.0510	2.0520	1.99016	2.00454			
2 1/8-12	UN	2A	2.0691	2.0330	2.0630	2.0630	2.0450	2.12320	2.11180	....	2.1250	2.0709	2.1149	2.0788	2.0788	2.03500	2.05300	2B	UN	2 1/8-12
			2.0687	2.0324	2.0634	2.0626	2.0456	2.12304	2.11196	....	2.1256	2.0713	2.1143	2.0784	2.0792	2.03516	2.05284			
		3A	2.0709	2.0348	2.0664	2.0664	2.0484	2.12500	2.11360	....	2.1250	2.0709	2.1129	2.0768	2.0768	2.03500	2.04480	3B		
			2.0705	2.0342	2.0668	2.0660	2.0490	2.12484	2.11376	....	2.1256	2.0713	2.1123	2.0764	2.0772	2.03516	2.04464			
2 1/8-16	UN	2A	2.0828	2.0557	2.0774	2.0774	2.0639	2.12340	2.11400	....	2.1250	2.0844	2.1185	2.0914	2.0914	2.05700	2.07100	2B	UN	2 1/8-16
			2.0824	2.0551	2.0778	2.0770	2.0645	2.12324	2.11416	....	2.1256	2.0848	2.1179	2.0910	2.0918	2.05716	2.07084			
		3A	2.0844	2.0573	2.0803	2.0803	2.0669	2.12500	2.11560	....	2.1250	2.0844	2.1167	2.0896	2.0896	2.05700	2.06580	3B		
			2.0840	2.0567	2.0807	2.0799	2.0675	2.12484	2.11576	....	2.1256	2.0848	2.1161	2.0892	2.0900	2.05716	2.06564			
2 3/16-16	N	2A	2.1453	2.1182	2.1399	2.1399	2.1264	2.18590	2.17650	....	2.1875	2.1469	2.1810	2.1539	2.1539	2.12000	2.13400	B	N	2 3/16-16
			2.1449	2.1176	2.1403	2.1395	2.1270	2.18574	2.17666	....	2.1881	2.1473	2.1804	2.1535	2.1543	2.12016	2.13384			
		3A	2.1469	2.1198	2.1428	2.1428	2.1294	2.18750	2.17810	....	2.1875	2.1469	2.1792	2.1521	2.1521	2.12000	2.12830	3B		
			2.1465	2.1192	2.1432	2.1424	2.1300	2.18734	2.17826	....	2.1881	2.1473	2.1786	2.1517	2.1525	2.12016	2.12814			
2 1/4-4 1/2	UNC	1A	2.1028	2.0096	2.0882	2.0882	2.0401	2.24710	2.21410	....	2.2500	2.1057	2.2209	2.1247	2.1247	2.00600	2.04500	1B	UNC	2 1/4-4 1/2
			2.1023	2.0088	2.0887	2.0877	2.0409	2.24694	2.21426	....	2.2508	2.1062	2.2201	2.1242	2.1252	2.00616	2.04484			
		2A	2.1028	2.0066	2.0931	2.0931	2.0450	2.24710	2.22510	2.21410	2.2500	2.1057	2.2145	2.1183	2.1183	2.00600	2.04500	2B		
			2.1023	2.0058	2.0936	2.0926	2.0458	2.24694	2.22526	2.21426	2.2508	2.1062	2.2137	2.1178	2.1188	2.00616	2.04484			
		3A	2.1057	2.0095	2.0984	2.0984	2.0503	2.25000	2.22800	....	2.2500	2.1057	2.2114	2.1152	2.1152	2.00600	2.03610	3B		
			2.1052	2.0087	2.0989	2.0979	2.0511	2.24984	2.22816	....	2.2508	2.1062	2.2106	2.1147	2.1157	2.00616	2.03594			
2 1/4-8	N	2A	2.1664	2.1123	2.1584	2.1584	2.1313	2.24760	2.23260	2.22510	2.2500	2.1688	2.2333	2.1792	2.1792	2.11500	2.14000	2B	N	2 1/4-8
			2.1659	2.1116	2.1589	2.1579	2.1320	2.24744	2.23276	2.22526	2.2507	2.1693	2.2326	2.1787	2.1797	2.11516	2.13984			
		3A	2.1688	2.1147	2.1628	2.1628	2.1357	2.25000	2.23500	....	2.2500	2.1688	2.2307	2.1766	2.1766	2.11500	2.12970	3B		
			2.1683	2.1140	2.1633	2.1623	2.1364	2.24984	2.23516	....	2.2507	2.1693	2.2300	2.1761	2.1771	2.11516	2.12954			
2 1/4-12	UN	2A	2.1941	2.1580	2.1880	2.1880	2.1700	2.24820	2.23680	....	2.2500	2.1959	2.2399	2.2038	2.2038	2.16000	2.17800	2B	UN	2 1/4-12
			2.1937	2.1574	2.1884	2.1876	2.1706	2.24804	2.23696	....	2.2506	2.1963	2.2393	2.2034	2.2042	2.16016	2.17784			
		3A	2.1959	2.1598	2.1914	2.1914	2.1734	2.25000	2.23860	....	2.2500	2.1959	2.2379	2.2018	2.2018	2.16000	2.16980	3B		
			2.1955	2.1592	2.1918	2.1910	2.1740	2.24984	2.23876	....	2.2506	2.1963	2.2373	2.2014	2.2022	2.16016	2.16964			
2 1/4-16	UN	2A	2.2078	2.1807	2.2024	2.2024	2.1889	2.24840	2.23900	....	2.2500	2.2094	2.2435	2.2164	2.2164	2.18200	2.19600	2B	UN	2 1/4-16
			2.2074	2.1801	2.2028	2.2020	2.1895	2.24824	2.23916	....	2.2506	2.2098	2.2429	2.2160	2.2168	2.18216	2.19584			
		3A	2.2094	2.1823	2.2053	2.2053	2.1919	2.25000	2.24060	....	2.2500	2.2094	2.2417	2.2146	2.2146	2.18200	2.19080	3B		
			2.2090	2.1817	2.2057	2.2049	2.1925	2.24984	2.24076	....	2.2506	2.2098	2.2411	2.2142	2.2150	2.18216	2.19064			
2 5/16-16	N	2A	2.2702	2.2431	2.2647	2.2647	2.2512	2.31080	2.30140	....	2.3125	2.2719	2.3062	2.2791	2.2791	2.24500	2.25900	2B	N	2 5/16-16
			2.2698	2.2425	2.2651	2.2643	2.2518	2.31064	2.30156	....	2.3131	2.2723	2.3056	2.2787	2.2795	2.24516	2.25884			
		3A	2.2719	2.2448	2.2678	2.2678	2.2543	2.31250	2.30310	....	2.3125	2.2719	2.3044	2.2773	2.2773	2.24500	2.25330	3B		
			2.2715	2.2442	2.2682	2.2674	2.2549	2.31234	2.30326	....	2.3131	2.2723	2.3038	2.2769	2.2777	2.24516	2.25314			

TABLE III.12.—*Gages for standard thread series, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			X thread gages					Z plain gages for major diameter			X thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tolerance gage	Minus tolerance gage								Minus tolerance gage	Plus tolerance gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
2⅜-12	UN	2A	2.3190	2.2829	2.3128	2.3128	2.2948	2.37310	2.36170	....	2.3750	2.3209	2.3651	2.3290	2.3290	2.28500	2.30300	2B	UN	2⅜-12
			2.3186	2.2823	2.3132	2.3124	2.2954	2.37294	2.36186	....	2.3756	2.3213	2.3645	2.3286	2.3294	2.28516	2.30284			
		3A	2.3209	2.2848	2.3163	2.3163	2.2983	2.37500	2.36360	....	2.3750	2.3209	2.3630	2.3269	2.3269	2.28500	29480	3B		
			2.3205	2.2842	2.3167	2.3159	2.2989	2.37484	2.36376	....	2.3756	2.3213	2.3624	2.3265	2.3273	2.28516	2.29464			
2⅜-16	UN	2A	2.3327	2.3056	2.3272	2.3272	2.3137	2.37330	2.36390	....	2.3750	2.3344	2.3687	2.3416	2.3416	2.30700	2.32100	2B	UN	2⅜-16
			2.3323	2.3050	2.3276	2.3268	2.3143	2.37214	2.36406	....	2.3756	2.3348	2.3681	2.3412	2.3420	2.30716	2.32084			
		3A	2.3344	2.3073	2.3303	2.3303	2.3168	2.37500	2.36560	....	2.3750	2.3344	2.3669	2.3398	2.3398	2.30700	2.31580	3B		
			2.3340	2.3067	2.3307	2.3299	2.3174	2.37484	2.36576	....	2.3756	2.3348	2.3663	2.3394	2.3402	2.30716	2.31564			
2⁷⁄₁₆-16	N	2A	2.3952	2.3681	2.3897	2.3897	2.3762	2.43580	2.42640	....	2.4375	2.3969	2.4312	2.4041	2.4041	2.37000	2.38400	2B	N	2⁷⁄₁₆-16
			2.3948	2.3675	2.3901	2.3893	2.3768	2.43564	2.42656	....	2.4381	2.3973	2.4306	2.4037	2.4045	2.37016	2.38384			
		3A	2.3969	2.3698	2.3928	2.3928	2.3793	2.43750	2.42810	....	2.4375	2.3969	2.4294	2.4023	2.4023	2.37000	2.37830	3B		
			2.3965	2.3692	2.3932	2.3924	2.3799	2.43734	2.42826	....	2.4381	2.3973	2.4288	2.4019	2.4027	2.37016	2.37814			
2½-4	UNC	1A	2.3345	2.2263	2.3190	2.3190	2.2649	2.49690	2.46120	....	2.5000	2.3376	2.4661	2.3578	2.3578	2.22900	2.26700	1B	UNC	2½-4
			2.3340	2.2254	2.3195	2.3185	2.2658	2.49674	2.46136	....	2.5009	2.3381	2.4652	2.3573	2.3583	2.22916	2.26684			
		2A	2.3345	2.2263	2.3241	2.3241	2.2710	2.49690	2.47310	2.46120	2.5000	2.3376	2.4594	2.3511	2.3511	2.22900	2.26700	2B		
			2.3340	2.2254	2.3246	2.3236	2.2719	2.49674	2.47326	2.46136	2.5009	2.3381	2.4585	2.3506	2.3516	2.22916	2.26684			
		3A	2.3376	2.2294	2.3298	2.3298	2.2757	2.50000	2.47620	....	2.5000	2.3376	2.4560	2.3477	2.3477	2.22900	2.25940	3B		
			2.3371	2.2285	2.3303	2.3293	2.2766	2.49984	2.47636	....	2.5009	2.3381	2.4551	2.3472	2.3482	2.22916	2.25924			
2½-8	N	2A	2.4164	2.3623	2.4082	2.4082	2.3811	2.49760	2.48260	2.47510	2.5000	2.4188	2.4835	2.4294	2.4294	2.36500	2.39000	2B	N	2½-8
			2.4159	2.3616	2.4087	2.4077	2.3818	2.49744	2.48276	2.47526	2.5007	2.4193	2.4828	2.4289	2.4299	2.36516	2.38984			
		3A	2.4188	2.3647	2.4127	2.4127	2.3856	2.50000	2.48500	....	2.5000	2.4188	2.4819	2.4268	2.4268	2.36500	2.37970	3B		
			2.4183	2.3640	2.4132	2.4122	2.3863	2.49984	2.48516	....	2.5007	2.4193	2.4812	2.4263	2.4273	2.36516	2.37954			
2½-12	UN	2A	2.4440	2.4079	2.4378	2.4378	2.4198	2.49810	2.48670	....	2.5000	2.4459	2.4901	2.4540	2.4540	2.41000	2.42800	2B	UN	2½-12
			2.4436	2.4073	2.4382	2.4374	2.4204	2.49794	2.48686	....	2.5006	2.4463	2.4895	2.4536	2.4544	2.41016	2.42784			
		3A	2.4459	2.4098	2.4413	2.4413	2.4233	2.50000	2.48860	....	2.5000	2.4459	2.4880	2.4519	2.4519	2.41000	2.41980	3B		
			2.4455	2.4092	2.4417	2.4409	2.4239	2.49984	2.48876	....	2.5006	2.4463	2.4874	2.4515	2.4523	2.41016	2.41964			
2½-16	UN	2A	2.4577	2.4306	2.4522	2.4522	2.4387	2.49830	2.48890	....	2.5000	2.4594	2.4937	2.4666	2.4666	2.43200	2.44600	2B	UN	2½-16
			2.4573	2.4300	2.4526	2.4518	2.4393	2.49814	2.48906	....	2.5006	2.4598	2.4931	2.4662	2.4670	2.43216	2.44584			
		3A	2.4594	2.4323	2.4553	2.4553	2.4418	2.50000	2.49060	....	2.5000	2.4594	2.4919	2.4648	2.4648	2.43200	2.44080	3B		
			2.4590	2.4317	2.4557	2.4549	2.4424	2.49984	2.49076	....	2.5006	2.4598	2.4913	2.4644	2.4652	2.43216	2.44064			
2⅝-12	UN	2A	2.5690	2.5329	2.5628	2.5628	2.5448	2.6231	2.6117	....	2.6250	2.5709	2.6151	2.5790	2.5790	2.5350	2.5530	2B	UN	2⅝-12
			2.5686	2.5323	2.5632	2.5624	2.5454	2.6229	2.6119	....	2.6256	2.5713	2.6145	2.5786	2.5794	2.5352	2.5528			
		3A	2.5709	2.5348	2.5663	2.5663	2.5483	2.6250	2.6136	....	2.6250	2.5709	2.6130	2.5769	2.5769	2.5350	2.5448	3B		
			2.5705	2.5342	2.5667	2.5659	2.5489	2.6248	2.6138	....	2.6256	2.5713	2.6124	2.5765	2.5773	2.5352	2.5446			
2⅝-16	UN	2A	2.5827	2.5556	2.5772	2.5772	2.5637	2.6233	2.6139	....	2.6250	2.5844	2.6187	2.5916	2.5916	2.5570	2.5710	2B	UN	2⅝-16
			2.5823	2.5550	2.5776	2.5768	2.5643	2.6231	2.6141	....	2.6256	2.5848	2.6181	2.5912	2.5920	2.5572	2.5708			
		3A	2.5844	2.5573	2.5803	2.5803	2.5668	2.6250	2.6156	....	2.6250	2.5844	2.6169	2.5898	2.5898	2.5570	2.5658	3B		
			2.5840	2.5567	2.5807	2.5799	2.5674	2.6248	2.6158	....	2.6256	2.5848	2.6163	2.5894	2.5902	2.5572	2.5656			
2¾-4	UNC	1A	2.5844	2.4762	2.5686	2.5686	2.5145	2.7468	2.7111	....	2.7500	2.5876	2.7165	2.6082	2.6082	2.4790	2.5170	1B	UNC	2¾-4
			2.5839	2.4753	2.5691	2.5681	2.5154	2.7466	2.7113	....	2.7509	2.5881	2.7156	2.6077	2.6087	2.4792	2.5168			
		2A	2.5844	2.4762	2.5739	2.5739	2.5198	2.7468	2.7230	2.7111	2.7500	2.5876	2.7096	2.6013	2.6013	2.4790	2.5170	2B		
			2.5839	2.4753	2.5744	2.5734	2.5207	2.7466	2.7232	2.7113	2.7509	2.5881	2.7087	2.6008	2.6018	2.4792	2.5168			
		3A	2.5876	2.4794	2.5797	2.5797	2.5256	2.7500	2.7262	....	2.7500	2.5876	2.7062	2.5979	2.5979	2.4790	2.5094	3B		
			2.5871	2.4785	2.5802	2.5792	2.5265	2.7498	2.7264	....	2.7509	2.5881	2.7053	2.5974	2.5984	2.4792	2.5092			

2¾-8	N	2A	2.6663	2.6122	2.6580	2.6580	2.6309	2.7475	2.7325	2.7250	2.7500	2.6688	2.7337	2.6796	2.6796	2.6150	2.6400	2B	N	2¾-8
			2.6658	2.6115	2.6585	2.6575	2.6316	2.7473	2.7327	2.7252	2.7507	2.6693	2.7330	2.6791	2.6801	2.6152	2.6393			
		3A	2.6688	2.6147	‡2.6625	‡2.6625	2.6355	2.7500	2.7350	...	2.7500	2.6688	2.7310	2.6769	2.6769	2.6150	2.6297	3B		
			2.6683	2.6140	‡2.6630	‡2.6620	2.6362	2.7498	2.7352	...	2.7507	2.6693	2.7303	2.6764	2.6774	2.6152	2.6295			
2¾-12	UN	2A	2.6940	2.6579	2.6878	2.6878	2.6698	2.7481	2.7367	...	2.7500	2.6959	2.7401	2.7040	2.7040	2.6600	2.6780	2B	UN	2¾-12
			2.6936	2.6573	2.6882	2.6874	2.6704	2.7479	2.7369	...	2.7506	2.6963	2.7395	2.7036	2.7044	2.6602	2.6778			
		3A	2.6959	2.6598	2.6913	2.6913	2.6733	2.7500	2.7386	...	2.7500	2.6959	2.7380	2.7019	2.7019	2.6600	2.6698	3B		
			2.6955	2.6592	2.6917	2.6909	2.6739	2.7498	2.7388	...	2.7506	2.6963	2.7374	2.7015	2.7023	2.6602	2.6696			
2¾-16	UN	2A	2.7077	2.6806	2.7022	2.7022	2.6887	2.7483	2.7389	...	2.7500	2.7094	2.7437	2.7166	2.7166	2.6820	2.6960	2B	UN	2¾-16
			2.7073	2.6800	2.7026	2.7018	2.6893	2.7481	2.7391	...	2.7506	2.7098	2.7431	2.7162	2.7170	2.6822	2.6958			
		3A	2.7094	2.6823	2.7053	2.7053	2.6918	2.7500	2.7406	...	2.7500	2.7094	2.7419	2.7148	2.7148	2.6820	2.6908	3B		
			2.7090	2.6817	2.7057	2.7049	2.6924	2.7498	2.7408	...	2.7506	2.7098	2.7413	2.7144	2.7152	2.6822	2.6906			
2⅞-12	UN	2A	2.8190	2.7829	2.8127	2.8127	2.7947	2.8731	2.8617	...	2.8750	2.8209	2.8652	2.8291	2.8291	2.7850	2.8030	2B	UN	2⅞-12
			2.8186	2.7823	2.8131	2.8123	2.7953	2.8729	2.8619	...	2.8756	2.8213	2.8646	2.8287	2.8295	2.7852	2.8028			
		3A	2.8209	2.7848	2.8162	2.8162	2.7982	2.8750	2.8636	...	2.8750	2.8209	2.8632	2.8271	2.8271	2.7850	2.7948	3B		
			2.8205	2.7842	2.8166	2.8158	2.7988	2.8748	2.8638	...	2.8756	2.8213	2.8626	2.8267	2.8275	2.7852	2.7946			
2⅞-16	UN	2A	2.8327	2.8056	2.8271	2.8271	2.8136	2.8733	2.8639	...	2.8750	2.8344	2.8688	2.8417	2.8417	2.8070	2.8210	2B	UN	2⅞-16
			2.8323	2.8050	2.8275	2.8267	2.8142	2.8731	2.8641	...	2.8756	2.8348	2.8682	2.8413	2.8421	2.8072	2.8208			
		3A	2.8344	2.8073	2.8302	2.8302	2.8167	2.8750	2.8656	...	2.8750	2.8344	2.8670	2.8399	2.8399	2.8070	2.8158	3B		
			2.8340	2.8067	2.8306	2.8298	2.8173	2.8748	2.8658	...	2.8756	2.8348	2.8664	2.8395	2.8403	2.8072	2.8156			
3-4	UNC	1A	2.8344	2.7262	2.8183	2.8183	2.7642	2.9968	2.9611	...	3.0000	2.8376	2.9668	2.8585	2.8585	2.7290	2.7670	1B	UNC	3-4
			2.8339	2.7253	2.8188	2.8178	2.7651	2.9966	2.9613	...	3.0009	2.8381	2.9659	2.8580	2.8590	2.7292	2.7668			
		2A	2.8344	2.7262	2.8237	2.8237	2.7696	2.9968	2.9730	2.9611	3.0000	2.8376	2.9598	2.8515	2.8515	2.7290	2.7670	2B		
			2.8339	2.7253	2.8242	2.8232	2.7705	2.9966	2.9732	2.9613	3.0009	2.8381	2.9589	2.8510	2.8520	2.7292	2.7668			
		3A	2.8376	2.7294	2.8296	2.8296	2.7755	3.0000	2.9762	...	3.0000	2.8376	2.9563	2.8480	2.8480	2.7290	2.7594	3B		
			2.8371	2.7285	2.8301	2.8291	2.7764	2.9998	2.9764	...	3.0009	2.8381	2.9554	2.8475	2.8485	2.7292	2.7592			
3-8	N	2A	2.9162	2.8621	2.9077	2.9077	2.8806	2.9974	2.9824	2.9749	3.0000	2.9188	2.9840	2.9299	2.9299	2.8650	2.8900	2B	N	3-8
			2.9157	2.8614	2.9082	2.9072	2.8813	2.9972	2.9826	2.9751	3.0007	2.9193	2.9833	2.9294	2.9304	2.8652	2.8898			
		3A	2.9188	2.8647	2.9124	2.9124	2.8853	3.0000	2.9850	...	3.0000	2.9188	2.9812	2.9271	2.9271	2.8650	2.8797	3B		
			2.9183	2.8640	2.9129	2.9119	2.8860	2.9998	2.9852	...	3.0007	2.9193	2.9805	2.9266	2.9276	2.8652	2.8795			
3-12	UN	2A	2.9440	2.9079	2.9377	2.9377	2.9197	2.9981	2.9867	...	3.0000	2.9459	2.9902	2.9541	2.9541	2.9100	2.9280	2B	UN	3-12
			2.9436	2.9073	2.9381	2.9373	2.9203	2.9979	2.9869	...	3.0006	2.9463	2.9896	2.9537	2.9545	2.9102	2.9278			
		3A	2.9459	2.9098	2.9412	2.9412	2.9232	3.0000	2.9886	...	3.0000	2.9459	2.9882	2.9521	2.9521	2.9100	2.9198	3B		
			2.9455	2.9092	2.9416	2.9408	2.9238	2.9998	2.9888	...	3.0006	2.9463	2.9876	2.9517	2.9525	2.9102	2.9196			
3-16	UN	2A	2.9577	2.9306	2.9521	2.9521	2.9386	2.9983	2.9889	...	3.0000	2.9594	2.9938	2.9667	2.9667	2.9320	2.9460	2B	UN	3-16
			2.9573	2.9300	2.9525	2.9517	2.9392	2.9981	2.9891	...	3.0006	2.9598	2.9932	2.9663	2.9671	2.9322	2.9458			
		3A	2.9594	2.9323	2.9552	2.9552	2.9417	3.0000	2.9906	...	3.0000	2.9594	2.9920	2.9649	2.9649	2.9320	2.9408	3B		
			2.9590	2.9317	2.9556	2.9548	2.9423	2.9998	2.9908	...	3.0006	2.9598	2.9914	2.9645	2.9653	2.9322	2.9406			
3⅛-12	UN	2A	3.0690	3.0329	3.0627	3.0627	3.0447	3.1231	3.1117	...	3.1250	3.0709	3.1152	3.0791	3.0791	3.0350	3.0530	2B	UN	3⅛-12
			3.0686	3.0323	3.0631	3.0623	3.0453	3.1229	3.1119	...	3.1256	3.0713	3.1146	3.0787	3.0795	3.0352	3.0528			
		3A	3.0709	3.0348	3.0662	3.0662	3.0482	3.1250	3.1136	...	3.1250	3.0709	3.1132	3.0771	3.0771	3.0350	3.0448	3B		
			3.0705	3.0342	3.0666	3.0658	3.0488	3.1248	3.1138	...	3.1256	3.0713	3.1126	3.0767	3.0775	3.0352	3.0446			
3⅛-16	UN	2A	3.0827	3.0556	3.0771	3.0771	3.0636	3.1233	3.1139	...	3.1250	3.0844	3.1188	3.0917	3.0917	3.0570	3.0710	2B	UN	3⅛-16
			3.0823	3.0550	3.0775	3.0767	3.0642	3.1231	3.1141	...	3.1256	3.0848	3.1182	3.0913	3.0921	3.0572	3.0708			
		3A	3.0844	3.0573	3.0802	3.0802	3.0667	3.1250	3.1156	...	3.1250	3.0844	3.1170	3.0899	3.0899	3.0570	3.0658	3B		
			3.0840	3.0567	3.0806	3.0798	3.0673	3.1248	3.1158	...	3.1256	3.0848	3.1164	3.0895	3.0903	3.0572	3.0656			
3¼-4	UNC	1A	3.0843	2.9761	3.0680	3.0680	3.0139	3.2467	3.2110	...	3.2500	3.0876	3.2171	3.1088	3.1088	2.9790	3.0170	1B	UNC	3¼-4
			3.0838	2.9752	3.0685	3.0675	3.0148	3.2465	3.2112	...	3.2509	3.0881	3.2162	3.1083	3.1093	2.9792	3.0168			
		2A	3.0843	2.9761	3.0734	3.0734	3.0193	3.2467	3.2229	3.2110	3.2500	3.0876	3.2100	3.1017	3.1017	2.9790	3.0170	2B		
			3.0838	2.9752	3.0739	3.0729	3.0202	3.2465	3.2231	3.2112	3.2509	3.0881	3.2091	3.1012	3.1022	2.9792	3.0168			
		3A	3.0876	2.9794	3.0794	3.0794	3.0253	3.2500	3.2262	...	3.2500	3.0876	3.2065	3.0982	3.0982	2.9790	3.0094	3B		
			3.0871	2.9785	3.0799	3.0789	3.0262	3.2498	3.2264	...	3.2509	3.0881	3.2056	3.0977	3.0987	2.9792	3.0092			
3¼-8	N	2A	3.1662	3.1121	3.1577	3.1577	3.1306	3.2474	3.2324	3.2249	3.2500	3.1688	3.2342	3.1801	3.1801	3.1150	3.1400	2B	N	3¼-8
			3.1657	3.1114	3.1582	3.1572	3.1311	3.2472	3.2326	3.2251	3.2507	3.1693	3.2335	3.1796	3.1806	3.1152	3.1398			
		3A	3.1688	3.1147	3.1623	3.1623	3.1352	3.2500	3.2350	...	3.2500	3.1688	3.2313	3.1772	3.1772	3.1150	3.1297	3B		
			3.1683	3.1140	3.1628	3.1618	3.1359	3.2498	3.2352	...	3.2507	3.1693	3.2306	3.1767	3.1777	3.1152	3.1295			
3¼-12	UN	2A	3.1940	3.1579	3.1877	3.1877	3.1697	3.2481	3.2367	...	3.2500	3.1959	3.2402	3.2041	3.2041	3.1600	3.1780	2B	UN	3¼-12
			3.1936	3.1573	3.1881	3.1873	3.1703	3.2479	3.2369	...	3.2506	3.1963	3.2396	3.2037	3.2045	3.1602	3.1778			
		3A	3.1959	3.1598	3.1912	3.1912	3.1732	3.2500	3.2386	...	3.2500	3.1959	3.2382	3.2021	3.2021	3.1600	3.1698	3B		
			3.1955	3.1592	3.1916	3.1908	3.1738	3.2498	3.2388	...	3.2506	3.1963	3.2376	3.2017	3.2025	3.1602	3.1696			
3¼-16	UN	2A	3.2077	3.1806	3.2021	3.2021	3.1886	3.2483	3.2389	...	3.2500	3.2094	3.2438	3.2167	3.2167	3.1820	3.1960	2B	UN	3¼-16
			3.2073	3.1800	3.2025	3.2017	3.1892	3.2481	3.2391	...	3.2506	3.2098	3.2432	3.2163	3.2171	3.1822	3.1958			
		3A	3.2094	3.1823	3.2052	3.2052	3.1917	3.2500	3.2406	...	3.2500	3.2094	3.2420	3.2149	3.2149	3.1820	3.1908	3B		
			3.2090	3.1817	3.2056	3.2048	3.1923	3.2498	3.2408	...	3.2506	3.2098	3.2414	3.2145	3.2153	3.1822	3.1906			

TABLE III.12.—*Gages for standard thread series, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			X thread gages					Z plain gages for major diameter			X thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tolerance gage	Minus tolerance gage								Minus tolerance gage	Plus tolerance gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
3⅜-12	UN	2A	3.3190	3.2829	3.3126	3.3126	3.2946	3.3731	3.3617	....	3.3750	3.3209	3.3654	3.3293	3.3293	3.2850	3.3030	2B	UN	3⅜-12
			3.3186	3.2823	3.3130	3.3122	3.2952	3.3729	3.3619	....	3.3756	3.3213	3.3648	3.3289	3.3297	3.2852	3.3028			
		3A	3.3209	3.2848	3.3161	3.3161	3.2981	3.3750	3.3636	....	3.3750	3.3209	3.3633	3.3272	3.3272	3.2850	3.2948	3B		
			3.3205	3.2842	3.3165	3.3157	3.2987	3.3748	3.3638	....	3.3756	3.3213	3.3627	3.3268	3.3276	3.2852	3.2946			
3⅜-16	UN	2A	3.3327	3.3056	3.3269	3.3269	3.3134	3.3733	3.3639	....	3.3750	3.3344	3.3690	3.3419	3.3419	3.3070	3.3210	2B	UN	3⅜-16
			3.3323	3.3050	3.3273	3.3265	3.3140	3.3731	3.3641	....	3.3756	3.3348	3.3684	3.3415	3.3423	3.3072	3.3208			
		3A	3.3344	3.3073	3.3301	3.3301	3.3166	3.3750	3.3656	....	3.3750	3.3344	3.3671	3.3400	3.3400	3.3070	3.3158	3B		
			3.3340	3.3067	3.3305	3.3297	3.3172	3.3748	3.3658	....	3.3756	3.3348	3.3665	3.3396	3.3404	3.3072	3.3156			
3½-4	UNC	1A	3.3343	3.2261	3.3177	3.3177	3.2636	3.4967	3.4710	....	3.5000	3.3376	3.4674	3.3591	3.3591	3.2290	3.2670	1B	UNC	3½-4
			3.3338	3.2252	3.3182	3.3172	3.2645	3.4965	3.4712	....	3.5009	3.3381	3.4665	3.3586	3.3596	3.2292	3.2668			
		2A	3.3343	3.2261	3.3233	3.3233	3.2692	3.4967	3.4729	3.4610	3.5000	3.3376	3.4602	3.3519	3.3519	3.2290	3.2670	2B		
			3.3338	3.2252	3.3238	3.3228	3.2701	3.4965	3.4731	3.4612	3.5009	3.3381	3.4593	3.3514	3.3524	3.2292	3.2668			
		3A	3.3376	3.2294	3.3293	3.3293	3.2752	3.5000	3.4762	....	3.5000	3.3376	3.4567	3.3484	3.3484	3.2290	3.2594	3B		
			3.3371	3.2285	3.3298	3.3288	3.2761	3.4998	3.4764	....	3.5009	3.3381	3.4558	3.3479	3.3489	3.2292	3.2592			
3½-8	N	2A	3.4162	3.3621	3.4074	3.4074	3.3803	3.4974	3.4824	3.4749	3.5000	3.4188	3.4844	3.4303	3.4303	3.3650	3.3900	2B	N	3½-8
			3.4157	3.3614	3.4079	3.4069	3.3810	3.4972	3.4826	3.4751	3.5007	3.4193	3.4837	3.4298	3.4308	3.3652	3.3898			
		3A	3.4188	3.3647	3.4122	3.4122	3.3851	3.5000	3.4850	....	3.5000	3.4188	3.4815	3.4274	3.4274	3.3650	3.3797	3B		
			3.4183	3.3640	3.4127	3.4117	3.3858	3.4998	3.4852	....	3.5007	3.4193	3.4808	3.4269	3.4279	3.3652	3.3795			
3½-12	UN	2A	3.4440	3.4079	3.4376	3.4376	3.4196	3.4981	3.4867	....	3.5000	3.4459	3.4904	3.4543	3.4543	3.4100	3.4280	2B	UN	3½-12
			3.4436	3.4073	3.4380	3.4372	3.4202	3.4979	3.4869	....	3.5006	3.4463	3.4898	3.4539	3.4547	3.4102	3.4278			
		3A	3.4459	3.4098	3.4411	3.4411	3.4231	3.5000	3.4886	....	3.5000	3.4459	3.4883	3.4522	3.4522	3.4100	3.4198	3B		
			3.4455	3.4092	3.4415	3.4407	3.4237	3.4998	3.4888	....	3.5006	3.4463	3.4877	3.4518	3.4526	3.4102	3.4196			
3½-16	UN	2A	3.4577	3.4306	3.4519	3.4519	3.4384	3.4983	3.4889	....	3.5000	3.4594	3.4940	3.4669	3.4669	3.4320	3.4460	2B	UN	3½-16
			3.4573	3.4300	3.4523	3.4515	3.4390	3.4981	3.4891	....	3.5006	3.4598	3.4934	3.4665	3.4673	3.4322	3.4458			
		3A	3.4594	3.4323	3.4551	3.4551	3.4416	3.5000	3.4906	....	3.5000	3.4594	3.4921	3.4650	3.4650	3.4320	3.4408	3B		
			3.4590	3.4317	3.4555	3.4547	3.4422	3.4998	3.4908	....	3.5006	3.4598	3.4915	3.4646	3.4654	3.4322	3.4406			
3⅝-12	UN	2A	3.5690	3.5329	3.5626	3.5626	3.5446	3.6231	3.6117	....	3.6250	3.5709	3.6154	3.5793	3.5793	3.5350	3.5530	2B	UN	3⅝-12
			3.5686	3.5323	3.5630	3.5622	3.5452	3.6229	3.6119	....	3.6256	3.5713	3.6148	3.5789	3.5797	3.5352	3.5528			
		3A	3.5709	3.5348	3.5661	3.5661	3.5481	3.6250	3.6136	....	3.6250	3.5709	3.6133	3.5772	3.5772	3.5350	3.5448	3B		
			3.5705	3.5342	3.5665	3.5657	3.5487	3.6248	3.6138	....	3.6256	3.5713	3.6127	3.5768	3.5776	3.5352	3.5446			
3⅝-16	UN	2A	3.5827	3.5556	3.5769	3.5769	3.5634	3.6233	3.6139	....	3.6250	3.5844	3.6190	3.5919	3.5919	3.5570	3.5710	2B	UN	3⅝-16
			3.5823	3.5550	3.5773	3.5765	3.5640	3.6231	3.6141	....	3.6256	3.5848	3.6184	3.5915	3.5923	3.5572	3.5708			
		3A	3.5844	3.5573	3.5801	3.5801	3.5666	3.6250	3.6156	....	3.6250	3.5844	3.6171	3.5900	3.5900	3.5570	3.5658	3B		
			3.5840	3.5567	3.5805	3.5797	3.5672	3.6248	3.6158	....	3.6256	3.5848	3.6165	3.5896	3.5904	3.5572	3.5656			
3¾-4	UNC	1A	3.5842	3.4760	3.5674	3.5674	3.5133	3.7466	3.7209	....	3.7500	3.5876	3.7177	3.6094	3.6094	3.4790	3.5170	1B	UNC	3¾-4
			3.5837	3.4751	3.5679	3.5669	3.5142	3.7464	3.7211	....	3.7509	3.5881	3.7168	3.6089	3.6099	3.4792	3.5168			
		2A	3.5842	3.4760	3.5730	3.5730	3.5189	3.7466	3.7228	3.7109	3.7500	3.5876	3.7104	3.6021	3.6021	3.4790	3.5170	2B		
			3.5837	3.4751	3.5735	3.5725	3.5198	3.7464	3.7230	3.7111	3.7509	3.5881	3.7095	3.6016	3.6026	3.4792	3.5168			
		3A	3.5876	3.4794	3.5792	3.5792	[illegible]	3.7500	3.7262	....	3.7500	3.5876	3.7068	3.5985	3.5985	3.4790	3.5094	3B		
			3.5871	3.4785	3.5797	3.5787	3.5260	3.7498	3.7264	....	3.7509	3.5881	3.7059	3.5980	3.5990	3.4792	3.5092			
3¾-8	N	2A	3.6661	3.6120	3.6571	3.6571	3.6200	3.7473	3.7323	3.7218	3.7500	3.6688	3.7346	3.6805	3.6805	3.6150	3.6400	2B	N	3¾-8
			3.6656	3.6113	3.6576	3.6566	3.6207	3.7471	3.7325	3.7220	3.7507	3.6693	3.7339	3.6800	3.6810	3.6152	3.6398			
		3A	3.6688	3.6147	3.6621	3.6621	3.6250	3.7500	3.7350	....	3.7500	3.6688	3.7317	3.6776	3.6776	3.6150	3.6297	3B		
			3.6683	3.6140	3.6626	3.6616	3.6257	3.7498	3.7352	....	3.7507	3.6693	3.7310	3.6771	3.6781	3.6152	3.6295			

3¾-12	UN	2A	3.6940	3.6570	3.6876	3.6876	3.6696	3.7481	3.7367	....	3.7500	3.6959	3.7404	3.7043	3.7043	3.6600	3.6780	2B	UN	3¾-12
			3.6936	3.6573	3.6880	3.6872	3.6702	3.7479	3.7369	....	3.7506	3.6963	3.7398	3.7039	3.7047	3.6602	3.6778			
		3A	3.6959	3.6598	3.6911	3.6911	3.6731	3.7500	3.7386	....	3.7500	3.6959	3.7383	3.7022	3.7022	3.6600	3.6698	3B		
			3.6955	3.6592	3.6915	3.6907	3.6737	3.7498	3.7388	....	3.7506	3.6963	3.7377	3.7018	3.7026	3.6602	3.6696			
3¾-16	UN	2A	3.7077	3.6806	3.7019	3.7019	3.6884	3.7483	3.7389	....	3.7500	3.7094	3.7440	3.7169	3.7169	3.6820	3.6960	2B	UN	3¾-16
			3.7073	3.6800	3.7023	3.7015	3.6890	3.7481	3.7391	....	3.7506	3.7098	3.7434	3.7165	3.7173	3.6822	3.6958			
		3A	3.7094	3.6823	3.7051	3.7051	3.6916	3.7500	3.7406	....	3.7500	3.7094	3.7421	3.7150	3.7150	3.6820	3.6908	3B		
			3.7090	3.6817	3.7055	3.7047	3.6922	3.7498	3.7408	....	3.7506	3.7098	3.7415	3.7146	3.7154	3.6822	3.6906			
3⅞-12	UN	2A	3.8189	3.7828	3.8124	3.8124	3.7944	3.8730	3.8616	....	3.8750	3.8209	3.8655	3.8294	3.8294	3.7850	3.8030	2B	UN	3⅞-12
			3.8185	3.7822	3.8128	3.8120	3.7950	3.8728	3.8618	....	3.8756	3.8213	3.8649	3.8290	3.8298	3.7852	3.8028			
		3A	3.8209	3.7848	3.8160	3.8160	3.7980	3.8750	3.8636	....	3.8750	3.8209	2.8634	3.8273	3.8273	2.7850	3.7948	3B		
			3.8205	3.7842	3.8164	3.8156	3.7986	3.8748	3.8638	....	3.8756	3.8213	3.8628	3.8269	3.8277	3.7852	3.7946			
3⅞-16	UN	2A	3.8326	3.8055	3.8267	3.8267	3.8132	3.8732	3.8638	....	3.8750	3.8344	3.8691	3.8420	3.8420	3.8070	3.8210	2B	UN	3⅞-16
			3.8322	3.8049	3.8271	3.8263	3.8138	3.8730	3.8640	....	3.8756	3.8348	3.8685	3.8416	3.8424	3.8072	3.8208			
		3A	3.8344	3.8073	3.8300	3.8300	3.8165	3.8750	3.8656	....	3.8750	3.8344	3.8672	3.8401	3.8401	3.8070	3.8158	3B		
			3.8340	3.8067	3.8304	3.8296	3.8171	3.8748	3.8658	....	3.8756	3.8348	3.8666	3.8397	3.8405	3.8072	3.8156			
4-4	UNC	1A	3.8342	3.7260	3.8172	3.8172	3.7631	3.9966	3.9609	....	4.0000	3.8376	3.9680	3.8597	3.8597	3.7290	3.7670	1B	UNC	4-4
			3.8337	3.7251	3.8177	3.8167	3.7640	3.9964	3.9611	....	4.0009	3.8381	3.9671	3.8592	3.8602	3.7292	3.7668			
		2A	3.8342	3.7260	3.8229	3.8229	3.7688	3.9966	3.9728	3.9609	4.0000	3.8376	3.9606	3.8523	3.8523	3.7290	3.7670	2B		
			3.8337	3.7251	3.8234	3.8224	3.7697	3.9964	3.9730	3.9611	4.0009	3.8381	3.9597	3.8518	3.8528	3.7292	3.7668			
		3A	3.8376	3.7294	3.8291	3.8291	3.7750	4.0000	3.9762	....	4.0000	3.8376	3.9570	3.8487	3.8487	3.7290	3.7594	3B		
			3.8371	3.7285	3.8296	3.8286	3.7759	3.9998	3.9764	....	4.0009	3.8381	3.9561	3.8482	3.8492	3.7292	3.7592			
4-8	N	2A	3.9161	3.8620	3.9070	3.9070	3.8799	3.9973	3.9823	3.9748	4.0000	3.9188	3.9848	3.9307	3.9307	3.8650	3.8900	2B	N	4-8
			3.9156	3.8613	3.9075	3.9065	3.8806	3.9971	3.9825	3.9750	4.0007	3.9193	3.9841	3.9302	3.9312	3.8652	3.8898			
		3A	3.9188	3.8647	3.9120	3.9120	3.8849	4.0000	3.9850	....	4.0000	3.9188	3.9818	3.9277	3.9277	3.8650	3.8797	3B		
			3.9183	3.8640	3.9125	3.9115	3.8856	3.9998	3.9852	....	4.0007	3.9193	3.9811	3.9272	3.9282	3.8652	3.8795			
4-12	UN	2A	3.9439	3.9078	3.9374	3.9374	3.9194	3.9980	3.9866	....	4.0000	3.9459	3.9905	3.9544	3.9544	3.9100	3.9280	2B	UN	4-12
			3.9435	3.9072	3.9378	3.9370	3.9200	3.9978	3.9868	....	4.0006	3.9463	3.9899	3.9540	3.9548	3.9102	3.9278			
		3A	3.9459	3.9098	3.9410	3.9410	3.9230	4.0000	3.9886	....	4.0000	3.9459	3.9884	3.9523	3.9523	3.9100	3.9198	3B		
			3.9455	3.9092	3.9414	3.9406	3.9236	3.9998	3.9888	....	4.0006	3.9463	3.9878	3.9519	3.9527	3.9102	3.9196			
4-16	UN	2A	3.9576	3.9305	3.9517	3.9517	3.9382	3.9982	3.9888	....	4.0000	3.9594	3.9941	3.9670	3.9670	3.9320	3.9460	2B	UN	4-16
			3.9572	3.9299	3.9521	3.9513	3.9388	3.9980	3.9890	....	4.0006	3.9598	3.9935	3.9666	3.9674	3.9322	3.9458			
		3A	3.9594	3.9323	3.9550	3.9550	3.9415	4.0000	3.9906	....	4.0000	3.9594	3.9922	3.9651	3.9651	3.9320	3.9408	3B		
			3.9590	3.9317	3.9554	3.9546	3.9421	3.9998	3.9908	....	4.0006	3.9598	3.9916	3.9647	3.9655	3.9322	3.9406			
4¼-8	N	2A	4.1660	4.1119	4.1567	4.1567	4.1296	4.2472	4.2322	4.2247	4.2500	4.1688	4.2350	4.1809	4.1809	4.1150	4.1400	2B	N	4¼-8
			4.1654	4.1108	4.1573	4.1561	4.1307	4.2470	4.2324	4.2249	4.2511	4.1694	4.2339	4.1803	4.1815	4.1152	4.1398			
		3A	4.1688	4.1147	4.1618	4.1618	4.1347	4.2500	4.2350	....	4.2500	4.1688	4.2319	4.1778	4.1778	4.1150	4.1297	3B		
			4.1682	4.1136	4.1624	4.1612	4.1358	4.2498	4.2352	....	4.2511	4.1694	4.2308	4.1772	4.1784	4.1152	4.1295			
4¼-12	UN	2A	4.1939	4.1578	4.1874	4.1874	4.1694	4.2480	4.2366	....	4.2500	4.1959	4.2405	4.2044	4.2044	4.1600	4.1780	2B	UN	4¼-12
			4.1933	4.1569	4.1880	4.1868	4.1703	4.2478	4.2368	....	4.2509	4.1965	4.2396	4.2038	4.2050	4.1602	4.1778			
		3A	4.1959	4.1598	4.1910	4.1910	4.1730	4.2500	4.2386	....	4.2500	4.1959	4.2384	4.2023	4.2023	4.1600	4.1698	3B		
			4.1953	4.1589	4.1916	4.1904	4.1739	4.2498	4.2388	....	4.2509	4.1965	4.2375	4.2017	4.2029	4.1602	4.1696			
4¼-16	UN	2A	4.2076	4.1805	4.2017	4.2017	4.1882	4.2482	4.2388	....	4.2500	4.2094	4.2441	4.2170	4.2170	4.1820	4.1960	B	UN	4¼-16
			4.2070	4.1796	4.2023	4.2011	4.1891	4.2480	4.2390	....	4.2509	4.2100	4.2432	4.2164	4.2176	4.1822	4.1958			
		3A	4.2094	4.1823	4.2050	4.2050	4.1915	4.2500	4.2406	....	4.2500	4.2094	4.2422	4.2151	4.2151	4.1820	4.1908	3B		
			4.2088	4.1814	4.2056	4.2044	4.1924	4.2498	4.2408	....	4.2509	4.2100	4.2413	4.2145	4.2157	4.1822	4.1906			
4½-8	N	2A	4.4160	4.3619	4.4066	4.4066	4.3795	4.4972	4.4822	4.4747	4.5000	4.4188	4.4851	4.4310	4.4310	4.3650	4.3900	2B	N	4½-8
			4.4154	4.3608	4.4072	4.4060	4.3806	4.4970	4.4824	4.4749	4.5011	4.4194	4.4840	4.4304	4.4316	4.3652	4.3898			
		3A	4.4188	4.3647	4.4117	4.4117	4.3846	4.5000	4.4850	....	4.5000	4.4188	4.4821	4.4280	4.4280	4.3650	4.3797	3B		
			4.4182	4.3636	4.4123	4.4111	4.3857	4.4998	4.4852	....	4.5011	4.4194	4.4810	4.4274	4.4286	4.3652	4.2795			
4½-12	UN	2A	4.4439	4.4078	4.4374	4.4374	4.4194	4.4980	4.4866	....	4.5000	4.4459	4.4905	4.4544	4.4544	4.4100	4.4280	2B	UN	4½-12
			4.4433	4.4069	4.4380	4.4368	4.4203	4.4978	4.4868	....	4.5009	4.4465	4.4896	4.4538	4.4550	4.4102	4.4278			
		3A	4.4459	4.4098	4.4410	4.4410	4.4230	4.5000	4.4886	....	4.5000	4.4459	4.4884	4.4523	4.4523	4.4100	4.4198	3B		
			4.4453	4.4089	4.4416	4.4404	4.4239	4.4998	4.4888	....	4.5009	4.4465	4.4875	4.4527	4.4529	4.4102	4.4196			
4½-16	UN	2A	4.4576	4.4305	4.4517	4.4517	4.4382	4.4982	4.4888	....	4.5000	4.4594	4.4941	4.4670	4.4670	4.4320	4.4460	2B	UN	4½-16
			4.4570	4.4296	4.4523	4.4511	4.4391	4.4980	4.4890	....	4.5009	4.4600	4.4932	4.4664	4.4676	4.4322	4.4458			
		3A	4.4594	4.4323	4.4550	4.4550	4.4415	4.5000	4.4906	....	4.5000	4.4594	4.4922	4.4651	4.4651	4.4320	4.4408	3B		
			4.4588	4.4314	4.4556	4.4544	4.4124	4.4998	4.4908	....	4.5009	4.4600	4.4913	4.4645	4.4657	4.4322	4.4406			
4¾-8	N	2A	4.6659	4.6118	4.6564	4.6564	4.6293	4.74710	4.73210	4.72460	4.7500	4.6688	4.7353	4.6812	4.6812	4.61500	4.64000	2B	N	4¾-8
			4.6653	4.6107	4.6570	4.6558	4.6304	4.74685	4.73235	4.72485	4.7511	4.6694	4.7342	4.6806	4.6818	4.61525	4.63975			
		3A	4.6688	4.6147	4.6616	4.6616	4.6345	4.75000	4.73500	....	4.7500	4.6688	4.7322	4.6781	4.6781	4.61500	4.62970	3B		
			4.6682	4.6136	4.6622	4.6610	4.6356	4.74975	4.73525	....	4.7511	4.6694	4.7311	4.6775	4.6787	4.61525	4.62945			

TABLE III.12.—*Gages for standard thread series, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			X thread gages					Z plain gages for major diameter			X thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter: Plus tolerance gage	Pitch diameter: Minus tolerance gage	Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter: Minus tolerance gage	Pitch diameter: Plus tolerance gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
4¾-12	UN	2A	4.6939	4.6578	4.6872	4.6872	4.6692	4.74800	4.73660	....	4.7500	4.6959	4.7407	4.7046	4.7046	4.66400	4.67800	2B	UN	4¾-12
			4.6933	4.6569	4.6878	4.6866	4.6701	4.74775	4.73685	....	4.7509	4.6965	4.7398	4.7040	4.7052	4.66025	4.67775			
		3A	4.6959	4.6598	4.6909	4.6909	4.6729	4.75000	4.73860	....	4.7500	4.6959	4.7386	4.7025	4.7025	4.66000	4.66980	3B		
			4.6953	4.6589	4.6915	4.6903	4.6738	4.74975	4.73885	....	4.7509	4.6965	4.7377	4.7019	4.7031	4.66025	4.66955			
4¾-16	UN	2A	4.7076	4.6805	4.7015	4.7015	4.6880	4.74820	4.73880	....	4.7500	4.7094	4.7444	4.7173	4.7173	4.68200	4.69600	2B	UN	4¾-16
			4.7070	4.6796	4.7021	4.7009	4.6889	4.74795	4.73905	....	4.7509	4.7100	4.7435	4.7167	4.7179	4.68225	4.69575			
		3A	4.7094	4.6823	4.7049	4.7049	4.6914	4.75000	4.74060	....	4.7500	4.7094	4.7424	4.7153	4.7153	4.68200	4.69080	3B		
			4.7088	4.6814	4.7055	4.7043	4.692	4.74975	4.74085	....	4.7509	4.7100	4.7415	4.7147	4.7159	4.68225	4.69055			
5-8	N	2A	4.9159	4.8618	4.9062	4.9062	4.8711	4.99710	4.98210	4.97460	5.0000	4.9188	4.9855	4.9314	4.9314	4.86500	4.89000	2B	N	5-8
			4.9153	4.8607	4.9068	4.9056	4.880	4.99685	4.98235	4.97485	5.0011	4.9194	4.9844	4.9308	4.9320	4.86525	4.88975			
		3A	4.9188	4.8647	4.9116	4.9116	4.8845	5.00000	4.98500	....	5.0000	4.9188	4.9823	4.9282	4.9282	4.86500	4.87970	3B		
			4.9182	4.8636	4.9122	4.9110	4.8856	4.99975	4.98525	....	5.0011	4.9194	4.9812	4.9276	4.9288	4.86525	4.87945			
5-12	UN	2A	4.9439	4.9078	4.9372	4.9372	4.9192	4.99800	4.98660	....	5.0000	4.9459	4.9907	4.9546	4.9546	4.91000	4.92800	2B	UN	5-12
			4.9433	4.9069	4.9378	4.9366	4.9201	4.99775	4.98685	....	5.0009	4.9465	4.9898	4.9540	4.9552	4.91025	4.92775			
		3A	4.9459	4.9098	4.9409	4.9409	4.9229	5.00000	4.98860	....	5.0000	4.9459	4.9886	4.9525	4.9525	4.91000	4.91980	3B		
			4.9453	4.9089	4.9415	4.9403	4.9238	4.99975	4.98885	....	5.0009	4.9465	4.9877	4.9519	4.9531	4.91025	4.91955			
5-16	UN	2A	4.9576	4.9305	4.9515	4.9515	4.9380	4.99820	4.98880	....	5.0000	4.9594	4.9944	4.9673	4.9673	4.93200	4.94600	2B	UN	5-16
			4.9570	4.9296	4.9521	4.9509	4.9389	4.99795	4.98905	....	5.0009	4.9600	4.9935	4.9667	4.9679	4.93225	4.94575			
		3A	4.9594	4.9323	4.9549	4.9549	4.9414	5.00000	4.99060	....	5.0000	4.9594	4.9924	4.9653	4.9653	4.93200	4.94080	3B		
			4.9588	4.9314	4.9555	4.9543	4.9423	4.99975	4.99085	....	5.0009	4.9600	4.9915	4.9647	4.9659	4.93225	4.94055			
5¼-8	N	2A	5.1659	5.1118	5.1561	5.1561	5.1290	5.24710	5.23210	5.22460	5.2500	5.1688	5.2356	5.1815	5.1815	5.11500	5.14000	2B	N	5¼-8
			5.1653	5.1107	5.1567	5.1555	5.1301	5.24685	5.23235	5.22485	5.2511	5.1694	5.2345	5.1809	5.1821	5.11525	5.13975			
		3A	5.1688	5.1147	5.1615	5.1615	5.1344	5.25000	5.23500	....	5.2500	5.1688	5.2324	5.1783	5.1783	5.11500	5.12970	3B		
			5.1682	5.1136	5.1621	5.1609	5.1355	5.24975	5.23525	....	5.2511	5.1694	5.2313	5.1777	5.1789	5.11525	5.12945			
5¼-12	UN	2A	5.1939	5.1578	5.1872	5.1872	5.1692	5.24800	5.23660	....	5.2500	5.1959	5.2407	5.2046	5.2046	5.16000	5.17800	2B	UN	5¼-12
			5.1933	5.1569	5.1878	5.1866	5.1701	5.24775	5.23685	....	5.2509	5.1965	5.2398	5.2040	5.2052	5.16025	5.17775			
		3A	5.1959	5.1598	5.1909	5.1909	5.1729	5.25000	5.23860	....	5.2500	5.1959	5.2386	5.2025	5.2025	5.16000	5.16980	3B		
			5.1953	5.1589	5.1915	5.1903	5.1738	5.24975	5.23885	....	5.2509	5.1965	5.2377	5.2019	5.2031	5.16025	5.16955			
5¼-16	UN	2A	5.2076	5.1805	5.2015	5.2015	5.1880	5.24820	5.23880	....	5.2500	5.2094	5.2444	5.2173	5.2173	5.18200	5.19600	2B	UN	5¼-16
			5.2070	5.1796	5.2021	5.2009	5.1889	5.24795	5.23905	....	5.2509	5.2100	5.2435	5.2167	5.2179	5.18225	5.19575			
		3A	5.2094	5.1823	5.2049	5.2049	5.1914	5.25000	5.24060	....	5.2500	5.2094	5.2424	5.2153	5.2153	5.18200	5.19080	3B		
			5.2088	5.1814	5.2055	5.2043	5.1923	5.24975	5.24085	....	5.2509	5.2100	5.2415	5.2147	5.2159	5.18225	5.19055			
5½-8	N	2A	5.4158	5.3617	5.4059	5.4059	5.3788	5.49700	5.48200	5.47450	5.5000	5.4188	5.4858	5.4317	5.4317	5.36500	5.39000	2B	N	5½-8
			5.4152	5.3606	5.4065	5.4053	5.3799	5.49675	5.48225	5.47475	5.5011	5.4194	5.4847	5.4311	5.4323	5.36525	5.38975			
		3A	5.4188	5.3647	5.4114	5.4114	5.3843	5.50000	5.48500	....	5.5000	5.4188	5.4826	5.4285	5.4285	5.36500	5.37970	3B		
			5.4182	5.3636	5.4120	5.4108	5.3854	5.49975	5.48525	....	5.5011	5.4194	5.4815	5.4279	5.4291	5.36525	5.37945			
5½-12	UN	2A	5.4439	5.4078	5.4372	5.4372	5.4192	5.49800	5.48660	....	5.5000	5.4459	5.4907	5.4546	5.4546	5.41000	5.42800	2B	UN	5½-12
			5.4433	5.4069	5.4378	5.4366	5.4201	5.49775	5.48685	....	5.5009	5.4465	5.4898	5.4540	5.4552	5.41025	5.42775			
		3A	5.4459	5.4098	5.4409	5.4409	5.4229	5.50000	5.48860	....	5.5000	5.4459	5.4886	5.4525	5.4525	5.41000	5.41980	3B		
			5.4453	5.4089	5.4415	5.4403	5.4238	5.49975	5.48885	....	5.5009	5.4465	5.4877	5.4519	5.4531	5.41025	5.41955			

5½-16	UN	2A	5.4576	5.4305	5.4515	5.4515	5.4380	5.49820	5.48880	....	5.5000	5.4594	5.4944	5.4673	5.4673	5.43200	5.44600	2B	UN	5½-16
			5.4570	5.4296	5.4521	5.4509	5.4389	5.49795	5.48905	....	5.5009	5.4600	5.4935	5.4667	5.4679	5.43225	5.44575			
		3A	5.4594	5.4323	5.4549	5.4549	5.4414	5.50000	5.49060	....	5.5000	5.4594	5.4924	5.4653	5.4653	5.43200	5.44080	3B		
			5.4588	5.4314	5.4555	5.4543	5.4423	5.49975	5.49085	....	5.5009	5.4600	5.4915	5.4647	5.4659	5.43225	5.44055			
5¾-8	N	2A	5.6658	5.6117	5.6558	5.6558	5.6287	5.74700	5.73200	5.72450	5.7500	5.6688	5.7359	5.6818	5.6818	5.61500	5.64000	2B	N	5¾-8
			5.6652	5.6106	5.6564	5.6552	5.6298	5.74675	5.73225	5.72475	5.7511	5.6694	5.7348	5.6812	5.6824	5.61525	5.63975			
		3A	5.6688	5.6147	5.6613	5.6613	5.6342	5.75000	5.73500	....	5.7500	5.6688	5.7327	5.6786	5.6786	5.61500	5.62970	3B		
			5.6682	5.6136	5.6619	5.6607	5.6353	5.74975	5.73525	....	5.7511	5.6694	5.7316	5.6780	5.6702	5.61525	5.62945			
5¾-12	UN	2A	5.6938	5.6577	5.6869	5.6869	5.6689	5.74790	5.73650	....	5.7500	5.6959	5.7410	5.7049	5.7049	5.66000	5.67800	2B	UN	5¾-12
			5.6932	5.6568	5.6875	5.6863	5.6698	5.74765	5.73675	....	5.7509	5.6965	5.7401	5.7043	5.7055	5.66025	5.67775			
		3A	5.6959	5.6598	5.6907	5.6907	5.6727	5.75000	5.73860	....	5.7500	5.6959	5.7387	5.7026	5.7026	5.66000	5.66980	3B		
			5.6953	5.6589	5.6913	5.6901	5.6736	5.74975	5.73885	....	5.7509	5.6965	5.7378	5.7020	5.7032	5.66025	5.66955			
5¾-16	UN	2A	5.7075	5.6804	5.7013	5.7013	5.6878	5.74810	5.73870	....	5.7500	5.7094	5.7446	5.7175	5.7175	5.68200	5.69600	2B	UN	5¾-16
			5.7069	5.6795	5.7019	5.7007	5.6887	5.74785	5.73895	....	5.7509	5.7100	5.7437	5.7169	5.7181	5.68225	5.69575			
		3A	5.7094	5.6823	5.7047	5.7047	5.6912	5.75000	5.74060	....	5.7500	5.7094	5.7426	5.7155	5.7155	5.68200	5.69080	3B		
			5.7088	5.6814	5.7053	5.7041	5.6921	5.74975	5.74085	....	5.7509	5.7100	5.7417	5.7149	5.7161	5.68225	5.69055			
6-8	N	2A	5.9158	5.8617	5.9056	5.9056	5.8785	5.99700	5.98200	5.97450	6.0000	5.9188	5.9861	5.9320	5.9320	5.86500	5.89000	2B	N	6-8
			5.9152	5.8606	5.9062	5.9050	5.8796	5.99675	5.98225	5.97475	6.0011	5.9194	5.9850	5.9314	5.9326	5.86525	5.88975			
		3A	5.9188	5.8647	5.9112	5.9112	5.8841	6.00000	5.98500	....	6.0000	5.9188	5.9828	5.9287	5.9287	5.86500	5.87970	3B		
			5.9182	5.8636	5.9118	5.9106	5.8852	5.99975	5.98525	....	6.0011	5.9194	5.9817	5.9281	5.9293	5.86525	5.87945			
6-12	UN	2A	5.9438	5.9077	5.9369	5.9369	5.9189	5.99790	5.98650	....	6.0000	5.9459	5.9910	5.9549	5.9549	5.91000	5.92800	2B	UN	6-12
			5.9432	5.9068	5.9375	5.9363	5.9198	5.99765	5.98675	....	6.0009	5.9465	5.9901	5.9543	5.9555	5.91025	5.92775			
		3A	5.9459	5.9098	5.9407	5.9407	5.9227	6.00000	5.98860	....	6.0000	5.9459	5.9887	5.9526	5.9526	5.91000	5.91980	3B		
			5.9453	5.9089	5.9413	5.9401	5.9236	5.99975	5.98885	....	6.0009	5.9465	5.9878	5.9520	5.9532	5.91025	5.91955			
6-16	UN	2A	5.9575	5.9304	5.9513	5.9513	5.9375	5.99810	5.98870	....	6.0000	5.9594	5.9946	5.9675	5.9675	5.93200	5.94600	2B	UN	6-16
			5.9569	5.9295	5.9519	5.9507	5.9387	5.99785	5.98895	....	6.0009	5.9600	5.9937	5.9669	5.9681	5.93225	5.94575			
		3A	5.9594	5.9323	5.9547	5.9547	5.9412	6.00000	5.99060	....	6.0000	5.9594	5.9926	5.9655	5.9655	5.93200	5.94080	3B		
			5.9588	5.9314	5.9553	5.9541	5.9421	5.99975	5.99085	....	6.0009	5.9600	5.9917	5.9649	5.9661	5.93225	5.94055			

TABLE III.13.—*Setting plug gages, Unified and American screw threads*

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs			
			Plug for "Go"			Plug for "Not go"				Major diameter			
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]		Not go [1]	
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W tolerance	X tolerance	W tolerance	X tolerance
1	2	3	4	5	6	7	8	9	10	11A	11B	12A	12B
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
0-80	NF	2A	0.0561	0.0595	0.0514	0.0550	0.0584	0.0496	0.0496	0.0595	0.0595	0.0584	0.0584
			.0558	.0598	.0513	.0547	.0587	.0497	.0495	.0598	.0598	.0587	.0587
		3A	.0566	.0600	.0519	.0560	.0594	.0506	.0506	.0600	.0600	.0594	.0594
			.0563	.0603	.0518	.0557	.0597	.0507	.0505	.0603	.0603	.0597	.0597
1-64	NC	2A	.0684	.0724	.0623	.0671	.0717	.0603	.0603	.0724	.0724	.0717	.0717
			.0681	.0727	.0622	.0668	.0720	.0604	.0602	.0727	.0728	.0720	.0721
		3A	.0690	.0730	.0629	.0682	.0728	.0614	.0614	.0730	.0730	.0728	.0728
			.0687	.0733	.0628	.0679	.0731	.0615	.0613	.0733	.0734	.0731	.0732
1-72	NF	2A	.0687	.0724	.0634	.0675	.0715	.0615	.0615	.0724	.0724	.0715	.0715
			.0684	.0727	.0633	.0672	.0718	.0616	.0614	.0727	.0727	.0718	.0718
		3A	.0693	.0730	.0640	.0686	.0726	.0626	.0626	.0730	.0730	.0726	.0726
			.0690	.0733	.0639	.0683	.0729	.0627	.0625	.0733	.0733	.0729	.0729
2-56	NC	2A	.0810	.0854	.0738	.0794	.0850	.0717	.0717	.0854	.0854	.0850	.0850
			.0807	.0857	.0737	.0791	.0853	.0718	.0716	.0857	.0858	.0853	.0854
		3A	.0816	.0860	.0744	.0805	.0860	.0728	.0728	.0860	.0860	.0860	.0860
			.0813	.0863	.0743	.0802	.0863	.0729	.0727	.0863	.0864	.0863	.0864
2-64	NF	2A	.0814	.0854	.0753	.0801	.0847	.0733	.0733	.0854	.0854	.0847	.0847
			.0811	.0857	.0752	.0798	.0850	.0734	.0732	.0857	.0858	.0850	.0851
		3A	.0820	.0860	.0759	.0812	.0858	.0744	.0744	.0860	.0860	.0858	.0858
			.0817	.0863	.0758	.0809	.0861	.0745	.0743	.0863	.0864	.0861	.0862
3-48	NC	2A	.0934	.0983	.0848	.0915	.0981	.0825	.0825	.0983	.0983	.0981	.0981
			.0931	.0986	.0847	.0912	.0984	.0826	.0824	.0986	.0987	.0984	.0985
		3A	.0941	.0990	.0855	.0928	.0990	.0838	.0838	.0990	.0990	.0990	.0990
			.0938	.0993	.0854	.0925	.0993	.0839	.0837	.0993	.0994	.0993	.0994
3-56	NF	2A	.0939	.0983	.0867	.0922	.0978	.0845	.0845	.0983	.0983	.0978	.0978
			.0936	.0986	.0866	.0919	.0981	.0846	.0844	.0986	.0987	.0981	.0982
		3A	.0946	.0990	.0874	.0935	.0990	.0858	.0858	.0990	.0990	.0990	.0990
			.0943	.0993	.0873	.0932	.0993	.0859	.0857	.0993	.0994	.0993	.0994
4-40	NC	2A	.1056	.1112	.0950	.1033	.1112	.0925	.0925	.1112	.1112	.1112	.1112
			.1053	.1115	.0949	.1030	.1115	.0926	.0924	.1115	.1116	.1115	.1116
		3A	.1064	.1120	.0958	.1047	.1120	.0939	.0939	.1120	.1120	.1120	.1120
			.1061	.1123	.0957	.1044	.1123	.0940	.0938	.1123	.1124	.1123	.1124
4-48	NF	2A	.1064	.1113	.0978	.1044	.1110	.0954	.0954	.1113	.1113	.1110	.1110
			.1061	.1116	.0977	.1041	.1113	.0955	.0953	.1116	.1117	.1113	.1114
		3A	.1071	.1120	.0985	.1057	.1120	.0967	.0967	.1120	.1120	.1120	.1120
			.1068	.1123	.0984	.1054	.1123	.0968	.0966	.1123	.1124	.1123	.1124
5-40	NC	2A	.1186	.1242	.1080	.1162	.1242	.1054	.1054	.1242	.1242	.1242	.1242
			.1183	.1245	.1079	.1159	.1245	.1055	.1053	.1245	.1246	.1245	.1246
		3A	.1194	.1250	.1088	.1177	.1250	.1069	.1069	.1250	.1250	.1250	.1250
			.1191	.1253	.1087	.1174	.1253	.1070	.1068	.1253	.1254	.1253	.1254
5-44	NF	2A	.1191	.1243	.1095	.1168	.1240	.1070	.1070	.1243	.1243	.1240	.1240
			.1188	.1246	.1094	.1165	.1243	.1071	.1069	.1246	.1247	.1243	.1244
		3A	.1198	.1250	.1102	.1181	.1250	.1083	.1083	.1250	.1250	.1250	.1250
			.1195	.1253	.1101	.1178	.1253	.1084	.1082	.1253	.1254	.1253	.1254
6-32	NC	2A	.1307	.1372	.1169	.1276	.1372	.1141	.1141	.1372	.1372	.1372	.1372
			.1304	.1375	.1168	.1273	.1375	.1142	.1140	.1375	.1377	.1375	.1377
		3A	.1315	.1380	.1177	.1291	.1380	.1156	.1156	.1380	.1380	.1380	.1380
			.1312	.1383	.1176	.1288	.1383	.1157	.1155	.1383	.1385	.1383	.1385
6-40	NF	2A	.1316	.1372	.1210	.1292	.1372	.1184	.1184	.1372	.1372	.1372	.1372
			.1313	.1375	.1209	.1289	.1375	.1185	.1183	.1375	.1376	.1375	.1376
		3A	.1324	.1380	.1218	.1306	.1380	.1198	.1198	.1380	.1380	.1380	.1380
			.1321	.1383	.1217	.1303	.1383	.1199	.1197	.1383	.1384	.1383	.1384
8-32	NC	2A	.1566	.1631	.1428	.1534	.1631	.1399	.1399	.1631	.1631	.1631	.1631
			.1563	.1634	.1427	.1531	.1634	.1400	.1398	.1634	.1636	.1634	.1636
		3A	.1575	.1640	.1437	.1550	.1640	.1415	.1415	.1640	.1640	.1640	.1640
			.1572	.1643	.1436	.1547	.1643	.1416	.1414	.1643	.1645	.1643	.1645
8-36	NF	2A	.1572	.1632	.1452	.1544	.1632	.1424	.1424	.1632	.1632	.1632	.1632
			.1569	.1635	.1451	.1541	.1635	.1425	.1423	.1635	.1636	.1635	.1636
		3A	.1580	.1640	.1460	.1559	.1640	.1439	.1439	.1640	.1640	.1640	.1640
			.1577	.1643	.1459	.1556	.1643	.1440	.1438	.1643	.1644	.1643	.1644
10-24	NC	2A	.1811	.1890	.1619	.1766	.1890	.1586	.1586	.1890	.1890	.1890	.1890
			.1806	.1895	.1618	.1761	.1895	.1587	.1585	.1895	.1895	.1895	.1895
		3A	.1821	.1900	.1629	.1784	.1900	.1604	.1604	.1900	.1900	.1900	.1900
			.1816	.1905	.1628	.1779	.1905	.1605	.1603	.1905	.1905	.1905	.1905
10-32	NF	2A	.1826	.1891	.1688	.1793	.1891	.1658	.1658	.1891	.1891	.1891	.1891
			.1823	.1894	.1687	.1790	.1894	.1659	.1657	.1894	.1896	.1894	.1896
		3A	.1835	.1900	.1697	.1809	.1900	.1674	.1674	.1900	.1900	.1900	.1900
			.1832	.1903	.1696	.1806	.1903	.1675	.1673	.1903	.1905	.1903	.1905

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs			
			Plug for "Go"			Plug for "Not go"				Major diameter			
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]		Not go [2]	
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W tolerance	X tolerance	W tolerance	X tolerance
1	2	3	4	5	6	7	8	9	10	11A	11B	12A	12B
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
12-24	NC	2A	0.2071	0.2150	0.1879	0.2025	0.2150	0.1845	0.1845	0.2150	0.2150	0.2150	0.2150
			.2066	.2155	.1878	.2020	.2155	.1846	.1844	.2155	.2155	.2155	.2155
		3A	.2081	.2160	.1889	.2043	.2160	.1863	.1863	.2160	.2160	.2160	.2160
			.2076	.2165	.1888	.2038	.2165	.1864	.1862	.2165	.2165	.2165	.2165
12-28	NF	2A	.2079	.2150	.1918	.2041	.2150	.1886	.1886	.2150	.2150	.2150	.2150
			.2074	.2155	.1917	.2036	.2155	.1887	.1885	.2155	.2155	.2155	.2155
		3A	.2089	.2160	.1928	.2059	.2160	.1904	.1904	.2160	.2160	.2160	.2160
			.2084	.2165	.1927	.2054	.2165	.1905	.1903	.2165	.2165	.2165	.2165
12-32	NEF	2A	.2086	.2151	.1948	.2052	.2151	.1917	.1917	.2151	.2151	.2151	.2151
			.2083	.2154	.1947	.2049	.2154	.1918	.1916	.2154	.2156	.2154	.2156
		3A	.2096	.2160	.1957	.2068	.2160	.1933	.1933	.2160	.2160	.2160	.2160
			.2092	.2163	.1956	.2065	.2163	.1934	.1932	.2163	.2165	.2163	.2165
¼-20	UNC	1A	.2399	.2489	.2164	.2324	.2483	.2108	.2108	.2489	.2489	.2483	.2483
			.2394	.2494	.2163	.2319	.2488	.2109	.2107	.2494	.2494	.2488	.2488
		2A	.2399	.2489	.2164	.2344	.2489	.2127	.2127	.2489	.2489	.2489	.2489
			.2394	.2494	.2163	.2339	.2494	.2128	.2126	.2494	.2494	.2494	.2494
		3A	.2410	.2500	.2175	.2364	.2500	.2147	.2147	.2500	.2500	.2500	.2500
			.2405	.2505	.2174	.2359	.2505	.2148	.2146	.2505	.2505	.2505	.2505
¼-28	UNF	1A	.2419	.2490	.2258	.2363	.2476	.2208	.2208	.2490	.2490	.2476	.2476
			.2414	.2495	.2257	.2358	.2481	.2209	.2207	.2495	.2495	.2481	.2481
		2A	.2419	.2490	.2258	.2380	.2490	.2225	.2225	.2490	.2490	.2490	.2490
			.2414	.2495	.2257	.2375	.2495	.2226	.2224	.2495	.2495	.2495	.2495
		3A	.2429	.2500	.2268	.2398	.2500	.2243	.2243	.2500	.2500	.2500	.2500
			.2424	.2505	.2267	.2393	.2505	.2244	.2242	.2505	.2505	.2505	.2505
¼-32	NEF	2A	.2425	.2490	.2287	.2390	.2489	.2255	.2255	.2490	.2490	.2489	.2489
			.2422	.2493	.2286	.2387	.2492	.2256	.2254	.2493	.2495	.2492	.2494
		3A	.2435	.2500	.2297	.2408	.2500	.2273	.2273	.2500	.2500	.2500	.2500
			.2432	.2503	.2296	.2405	.2503	.2274	.2272	.2503	.2505	.2503	.2505
5/16-18	UNC	1A	.3016	.3113	.2752	.2932	.3108	.2691	.2691	.3113	.3113	.3108	.3108
			.3011	.3118	.2751	.2927	.3113	.2692	.2690	.3118	.3113	.3113	.3113
		2A	.3016	.3113	.2752	.2953	.3113	.2712	.2712	.3113	.3113	.3113	.3113
			.3011	.3118	.2751	.2948	.3118	.2713	.2711	.3118	.3118	.3118	.3118
		3A	.3028	.3125	.2764	.2975	.3125	.2734	.2734	.3125	.3125	.3125	.3125
			.3023	.3130	.2763	.2970	.3130	.2735	.2733	.3130	.3130	.3130	.3130
5/16-24	UNF	1A	.3035	.3114	.2843	.2968	.3100	.2788	.2788	.3114	.3114	.3100	.3100
			.3030	.3119	.2842	.2963	.3155	.2789	.2787	.3119	.3119	.3105	.3105
		2A	.3035	.3114	.2843	.2986	.3114	.2806	.2806	.3114	.3114	.3114	.3114
			.3030	.3119	.2842	.2981	.3119	.2807	.2805	.3119	.3119	.3119	.3119
		3A	.3046	.3125	.2854	.3007	.3125	.2827	.2827	.3125	.3125	.3125	.3125
			.3041	.3130	.2853	.3002	.3130	.2828	.2826	.3130	.3130	.3130	.3130
5/16-32	NEF	2A	.3050	.3115	.2912	.3015	.3114	.2880	.2880	.3115	.3115	.3114	.3114
			.3047	.3118	.2911	.3012	.3117	.2881	.2879	.3118	.3120	.3117	.3119
		3A	.3060	.3125	.2922	.3033	.3125	.2898	.2898	.3125	.3125	.3125	.3125
			.3057	.3128	.2921	.3030	.3128	.2899	.2897	.3128	.3130	.3128	.3130
⅜-16	UNC	1A	.3632	.3737	.3331	.3537	.3735	.3266	.3266	.3737	.3737	.3735	.3735
			.3626	.3743	.3330	.3531	.3741	.3267	.3265	.3743	.3743	.3741	.3741
		2A	.3632	.3737	.3331	.3558	.3737	.3287	.3287	.3737	.3737	.3737	.3737
			.3626	.3743	.3330	.3552	.3743	.3288	.3286	.3743	.3743	.3743	.3743
		3A	.3645	.3750	.3344	.3582	.3750	.3311	.3311	.3750	.3750	.3750	.3750
			.3639	.3756	.3343	.3576	.3756	.3312	.3310	.3756	.3756	.3756	.3756
⅜-24	UNF	1A	.3660	.3739	.3468	.3591	.3724	.3411	.3411	.3739	.3739	.3724	.3724
			.3655	.3744	.3467	.3586	.3729	.3412	.3410	.3744	.3744	.3729	.3729
		2A	.3660	.3739	.3468	.3610	.3739	.3430	.3430	.3739	.3739	.3739	.3739
			.3655	.3744	.3467	.3605	.3744	.3431	.3429	.3744	.3744	.3744	.3744
		3A	.3671	.3750	.3479	.3630	.3750	.3450	.3450	.3750	.3750	.3750	.3750
			.3666	.3755	.3478	.3625	.3755	.3451	.3449	.3755	.3755	.3755	.3755
⅜-32	NEF	2A	.3675	.3740	.3537	.3638	.3737	.3503	.3503	.3740	.3740	.3737	.3737
			.3672	.3743	.3536	.3635	.3740	.3504	.3502	.3743	.3745	.3740	.3742
		3A	.3685	.3750	.3547	.3657	.3750	.3522	.3522	.3750	.3750	.3750	.3750
			.3682	.3753	.3546	.3654	.3753	.3523	.3521	.3753	.3755	.3753	.3755
										W and X tolerances		W and X tolerances	
7/16-14	UNC	1A	.4246	.4361	.38970	.4135	.4361	.38260	.38260	0.4361		0.4361	
			.4240	.4367	.38955	.4129	.4367	.38275	.38245	.4367		.4367	
		2A	.4246	.4361	.38970	.4159	.4361	.38500	.38500	.4361		.4361	
			.4240	.4367	.38955	.4153	.4367	.38515	.38485	.4367		.4367	
		3A	.4260	.4375	.39110	.4185	.4375	.38760	.38760	.4375		.4375	
			.4254	.4381	.39095	.4179	.4381	.38775	.38745	.4381		.4381	
7/16-20	UNF	1A	.4272	.4362	.4037	.4192	.4350	.3975	.3975	.4362		.4350	
			.4267	.4367	.4036	.4187	.4355	.3976	.3974	.4367		.4355	
		2A	.4272	.4362	.4037	.4212	.4362	.3995	.3995	.4362		.4362	
			.4267	.4367	.4036	.4207	.4367	.3996	.3994	.4367		.4367	
		3A	.4285	.4375	.4050	.4236	.4375	.4019	.4019	.4375		.4375	
			.4280	.4380	.4049	.4221	.4380	.4020	.4018	.4380		.4380	

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
7/16-28	UNEF	2A	0.4293	0.4364	0.4132	0.4251	0.4364	0.4096	0.4096	0.4364	0.4364
			.4288	.4369	.4131	.4246	.4369	.4097	.4095	.4369	.4369
		3A	.4304	.4375	.4143	.4271	.4375	.4116	.4116	.4375	.4375
			.4299	.4380	.4142	.4266	.4380	.4117	.4115	.4380	.4380
1/2-12	N	2A	.4855	.4984	.44430	.4750	.4984	.43890	.43890	.4984	.4984
			.4849	.4990	.44415	.4744	.4990	.43905	.43875	.4990	.4990
		3A	.4871	.5000	.44590	.4780	.5000	.44190	.44190	.5000	.5000
			.4865	.5006	.44575	.4774	.5006	.44205	.44175	.5006	.5006
1/2-13	UNC	1A	.4863	.4985	.44850	.4744	.4985	.44110	.44110	.4985	.4985
			.4857	.4991	.44835	.4738	.4991	.44125	.44095	.4991	.4991
		2A	.4863	.4985	.44850	.4768	.4985	.44350	.44350	.4985	.4985
			.4857	.4991	.44835	.4762	.4991	.44365	.44335	.4991	.4991
		3A	.4878	.5000	.45000	.4796	.5000	.44630	.44630	.5000	.5000
			.4872	.5006	.44985	.4790	.5006	.44645	.44615	.5006	.5006
1/2-20	UNF	1A	.4897	.4987	.4662	.4814	.4973	.4598	.4598	.4987	.4973
			.4892	.4992	.4661	.4809	.4978	.4599	.4597	.4992	.4978
		2A	.4897	.4987	.4662	.4836	.4987	.4619	.4619	.4987	.4987
			.4892	.4992	.4661	.4831	.4992	.4620	.4618	.4992	.4992
		3A	.4910	.5000	.4675	.4860	.5000	.4643	.4643	.5000	.5000
			.4905	.5005	.4674	.4855	.5005	.4644	.4642	.5005	.5005
1/2-28	UNEF	2A	.4918	.4989	.4757	.4875	.4988	.4720	.4720	.4989	.4988
			.4913	.4994	.4756	.4870	.4993	.4721	.4719	.4994	.4993
		3A	.4929	.5000	.4768	.4895	.5000	.4740	.4740	.5000	.5000
			.4924	.5005	.4767	.4890	.5005	.4741	.4739	.5005	.5005
9/16-12	UNC	1A	.5480	.5609	.5068	.5351	.5609	.4990	.4990	.5609	.5609
			.5474	.5615	.5066	.5345	.5615	.4992	.4988	.5615	.5615
		2A	.5480	.5609	.5068	.5377	.5609	.5016	.5016	.5609	.5609
			.5474	.5615	.5066	.5371	.5615	.5018	.5014	.5615	.5615
		3A	.5496	.5625	.5084	.5406	.5625	.5045	.5045	.5625	.5625
			.5490	.5631	.5082	.5400	.5631	.5047	.5043	.5631	.5631
9/16-18	UNF	1A	.5514	.5611	.52500	.5423	.5599	.51820	.51820	.5611	.5599
			.5509	.5616	.52485	.5418	.5604	.51835	.51805	.5616	.5604
		2A	.5514	.5611	.52500	.5446	.5611	.52050	.52050	.5611	.5611
			.5509	.5616	.52485	.5441	.5616	.52065	.52035	.5616	.5616
		3A	.5528	.5625	.52640	.5471	.5625	.52300	.52300	.5625	.5625
			.5523	.5630	.52625	.5466	.5630	.52315	.52285	.5630	.5630
9/16-24	NEF	2A	.5534	.5613	.53420	.5483	.5613	.53030	.53030	.5613	.5613
			.5529	.5618	.53405	.5478	.5618	.53045	.53015	.5618	.5618
		3A	.5546	.5625	.53540	.5505	.5625	.53250	.53250	.5625	.5625
			.5541	.5630	.53525	.5500	.5630	.53265	.53235	.5630	.5630
5/8-11	UNC	1A	.6097	.6234	.5644	.5955	.6234	.5561	.5561	.6234	.6234
			.6091	.6240	.5642	.5949	.6240	.5563	.5559	.6240	.6240
		2A	.6097	.6234	.5644	.5983	.6234	.5589	.5589	.6234	.6234
			.6091	.6240	.5642	.5977	.6240	.5591	.5587	.6240	.6240
		3A	.6113	.6250	.5660	.6013	.6250	.5619	.5619	.6250	.6250
			.6107	.6256	.5658	.6007	.6256	.5621	.5617	.6256	.6256
5/8-12	N	2A	.6105	.6234	.5693	.6000	.6234	.5639	.5639	.6234	.6234
			.6099	.6240	.5691	.5994	.6240	.5641	.5637	.6240	.6240
		3A	.6121	.6250	.5709	.6029	.6250	.5668	.5668	.6250	.6250
			.6115	.6256	.5707	.6023	.6256	.5670	.5666	.6256	.6256
5/8-18	UNF	1A	.6139	.6236	.58750	.6046	.6222	.58050	.58050	.6236	.6222
			.6134	.6241	.58735	.6041	.6227	.58065	.58035	.6241	.6227
		2A	.6139	.6236	.58750	.6069	.6236	.58280	.58280	.6236	.6236
			.6134	.6241	.58735	.6064	.6241	.58295	.58265	.6241	.6241
		3A	.6153	.6250	.58890	.6095	.6250	.58540	.58540	.6250	.6250
			.6148	.6255	.58875	.6090	.6255	.58555	.58525	.6255	.6255
5/8-24	NEF	2A	.6159	.6238	.59670	.6107	.6238	.59270	.59270	.6238	.6238
			.6154	.6243	.59655	.6102	.6243	.59285	.59255	.6243	.6243
		3A	.6171	.6250	.59790	.6129	.6250	.59490	.59490	.6250	.6250
			.6166	.6255	.59775	.6124	.6255	.59505	.59475	.6255	.6255
11/16-12	N	2A	.6730	.6859	.6318	.6625	.6859	.6264	.6264	.6859	.6859
			.6724	.6865	.6316	.6619	.6865	.6266	.6262	.6865	.6865
		3A	.6746	.6875	.6334	.6654	.6875	.6293	.6293	.6875	.6875
			.6740	.6881	.6332	.6648	.6881	.6295	.6291	.6881	.6881
11/16-24	NEF	2A	.6784	.6863	.65920	.6732	.6863	.65520	.65520	.6863	.6863
			.6779	.6868	.65905	.6727	.6868	.65535	.65505	.6868	.6868
		3A	.6796	.6875	.66040	.6754	.6875	.65740	.65740	.6875	.6875
			.6791	.6880	.66025	.6749	.6880	.65755	.65725	.6880	.6880

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in*	*in.*	*in.*
¾-10	UNC	1A	0.7336	0.7482	0.6832	0.7177	0.7482	0.6744	0.6744	0.7482	0.7482
			.7330	.7488	.6830	.7171	.7488	.6746	.6742	.7488	.7488
		2A	.7336	.7482	.6832	.7206	.7482	.6773	.6773	.7482	.7482
			.7330	.7488	.6830	.7200	.7488	.6775	.6771	.7488	.7488
		3A	.7354	.7500	.6850	.7239	.7500	.6806	.6806	.7500	.7500
			.7348	.7506	.6848	.7233	.7506	.6808	.6804	.7506	.7506
¾-12	N	2A	.7354	.7483	.6942	.7248	.7483	.6887	.6887	.7483	.7483
			.7348	.7489	.6940	.7242	.7489	.6889	.6885	.7489	.7489
		3A	.7371	.7500	.6959	.7279	.7500	.6918	.6918	.7500	.7500
			.7365	.7506	.6957	.7273	.7506	.6920	.6916	.7506	.7506
¾-16	UNF	1A	.7380	.7485	.7079	.7275	.7473	.7004	.7004	.7485	.7473
			.7374	.7491	.7077	.7269	.7479	.7006	.7002	.7491	.7479
		2A	.7380	.7485	.7079	.7300	.7485	.7029	.7029	.7485	.7485
			.7374	.7491	.7077	.7294	.7491	.7031	.7027	.7491	.7491
		3A	.7395	.7500	.7094	.7327	.7500	.7056	.7056	.7500	.7500
			.7389	.7506	.7092	.7321	.7506	.7058	.7054	.7506	.7506
¾-20	UNEF	2A	.7397	.7487	.71620	.7334	.7487	.71180	.71180	.7487	.7487
			.7392	.7492	.71605	.7329	.7492	.71195	.71165	.7492	.7492
		3A	.7410	.7500	.71750	.7358	.7500	.71420	.71420	.7500	.7500
			.7405	.7505	.71735	.7353	.7505	.71435	.71405	.7505	.7505
¹³⁄₁₆-12	N	2A	.7979	.8108	.7567	.7873	.8108	.7512	.7512	.8108	.8108
			.7973	.8114	.7565	.7867	.8114	.7514	.7510	.8114	.8114
		3A	.7996	.8125	.7584	.7904	.8125	.7543	.7543	.8125	.8125
			.7990	.8131	.7582	.7898	.8131	.7545	.7541	.8131	.8131
¹³⁄₁₆-16	UN	2A	.8005	.8110	.7704	.7926	.8110	.7655	.7655	.8110	.8110
			.7999	.8116	.7702	.7920	.8116	.7657	.7653	.8116	.8116
		3A	.8020	.8125	.7719	.7954	.8125	.7683	.7683	.8125	.8125
			.8014	.8131	.7717	.7948	.8131	.7685	.7681	.8131	.8131
¹³⁄₁₆-20	UNEF	2A	.8022	.8112	.77870	.7960	.8112	.77430	.77430	.8112	.8112
			.8017	.8117	.77855	.7955	.8117	.77445	.77415	.8117	.8117
		3A	.8035	.8125	.78000	.7984	.8125	.77670	.77670	.8125	.8125
			.8030	.8130	.77985	.7979	.8130	.77685	.77655	.8130	.8130
⅞-9	UNC	1A	.8573	.8731	.8009	.8395	.8731	.7914	.7914	.8731	.8731
			.8566	.8738	.8007	.8388	.8738	.7916	.7912	.8738	.8738
		2A	.8573	.8731	.8009	.8427	.8731	.7946	.7946	.8731	.8731
			.8566	.8738	.8007	.8420	.8738	.7948	.7944	.8738	.8738
		3A	.8592	.8750	.8028	.8462	.8750	.7981	.7981	.8750	.8750
			.8585	.8757	.8026	.8455	.8757	.7983	.7979	.8757	.8757
⅞-12	N	2A	.8604	.8733	.8192	.8498	.8733	.8137	.8137	.8733	.8733
			.8598	.8739	.8190	.8492	.8739	.8139	.8135	.8739	.8739
		3A	.8621	.8750	.8209	.8529	.8750	.8168	.8168	.8750	.8750
			.8615	.8756	.8207	.8523	.8756	.8170	.8166	.8756	.8756
⅞-14	UNF	1A	.8619	.8734	.8270	.8198	.8725	.8189	.8189	.8734	.8725
			.8613	.8740	.8268	.8192	.8731	.8191	.8187	.8740	.8731
		2A	.8619	.8734	.8270	.8525	.8734	.8216	.8216	.8734	.8734
			.8613	.8740	.8268	.8519	.8740	.8218	.8214	.8740	.8740
		3A	.8635	.8750	.8286	.8551	.8750	.8245	.8245	.8750	.8750
			.8629	.8756	.8284	.8545	.8756	.8247	.8243	.8756	.8756
⅞-16	UN	2A	.8630	.8735	.8329	.8551	.8735	.8280	.8280	.8735	.8735
			.8624	.8741	.8327	.8545	.8741	.8282	.8278	.8741	.8741
		3A	.8645	.8750	.8344	.8579	.8750	.8308	.8308	.8750	.8750
			.8639	.8756	.8342	.8573	.8756	.8310	.8306	.8756	.8756
⅞-20	UNEF	2A	.8647	.8737	.84120	.8584	.8737	.83680	.83680	.8737	.8737
			.8642	.8742	.84105	.8579	.8742	.83695	.83665	.8742	.8742
		3A	.8660	.8750	.84250	.8608	.8750	.83920	.83920	.8750	.8750
			.8655	.8755	.84235	.8603	.8755	.83935	.83905	.8755	.8755
¹⁵⁄₁₆-12	UN	2A	.9229	.9358	.8817	.9121	.9358	.8760	.8760	.9358	.9358
			.9223	.9364	.8815	.9115	.9364	.8762	.8758	.9364	.9364
		3A	.9246	.9375	.8834	.9154	.9375	.8793	.8793	.9375	.9375
			.9240	.9381	.8832	.9148	.9381	.8795	.8791	.9381	.9381
¹⁵⁄₁₆-16	UN	2A	.9255	.9360	.8954	.9175	.9360	.8904	.8904	.9360	.9360
			.9249	.9366	.8952	.9169	.9366	.8906	.8902	.9366	.9366
		3A	.9270	.9375	.8969	.9203	.9375	.8932	.8932	.9375	.9375
			.9264	.9381	.8967	.9197	.9381	.8934	.8930	.9381	.9381
¹⁵⁄₁₆-20	UNEF	2A	.9271	.9361	.90330	.9208	.9361	.89910	.89910	.9361	.9361
			.9266	.9366	.90315	.9203	.9366	.89925	.89895	.9366	.9366
		3A	.9285	.9375	.90500	.9232	.9375	.90160	.90160	.9375	.9375
			.9280	.9380	.90485	.9227	.9380	.90175	.90145	.9380	.9380

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
1-8	UNC	1A	0.9809	0.9989	0.9168	0.9608	0.9980	0.9067	0.9067	0.9980	0.9980
			.9802	.9987	.9166	.9601	.9987	.9069	.9065	.9987	.9987
		2A	.9809	.9989	.9168	.9641	.9980	.9100	.9100	.9980	.9980
			.9802	.9987	.9166	.9631	.9987	.9102	.9098	.9987	.9987
		3A	.9829	1.0000	.9188	.9678	1.0000	.9137	.9137	1.0000	1.0000
			.9822	1.0007	.9186	.9671	1.0007	.9139	.9135	1.0007	1.0007
1-12	UNF	1A	.9853	.9982	.9441	.9714	.9978	.9353	.9353	.9982	.9978
			.9847	.9988	.9439	.9708	.9984	.9355	.9351	.9988	.9984
		2A	.9853	.9982	.9441	.9743	.9982	.9382	.9382	.9982	.9982
			.9847	.9988	.9439	.9737	.9988	.9384	.9380	.9988	.9988
		3A	.9871	1.0000	.9459	.9776	1.0000	.9415	.9415	1.0000	1.0000
			.9865	1.0006	.9457	.9770	1.0006	.9417	.9413	1.0006	1.0006
1-16	UN	2A	.9880	.9985	.9579	.9800	.9985	.9529	.9529	.9985	.9985
			.9874	.9991	.9577	.9794	.9991	.9531	.9527	.9991	.9991
		3A	.9895	1.0000	.9594	.9828	1.0000	.9557	.9557	1.0000	1.0000
			.9889	1.0006	.9592	.9822	1.0006	.9559	.9555	1.0006	1.0006
1-20	UNEF	2A	.9896	.9986	.96610	.9832	.9986	.96160	.96160	.9986	.9986
			.9891	.9991	.96595	.9827	.9991	.96175	.96145	.9991	.9991
		3A	.9910	1.0000	.96750	.9858	1.0000	.96410	.96410	1.0000	1.0000
			.9905	1.0005	.96735	.9853	1.0005	.96425	.96395	1.0005	1.0005
1 1/16-12	UN	2A	1.0479	1.0608	1.0067	1.0371	1.0608	1.0010	1.0010	1.0608	1.0608
			1.0473	1.0614	1.0065	1.0365	1.0614	1.0012	1.0008	1.0614	1.0614
		3A	1.0496	1.0625	1.0084	1.0403	1.0625	1.0042	1.0042	1.0625	1.0625
			1.0490	1.0631	1.0082	1.0397	1.0631	1.0044	1.0040	1.0631	1.0631
1 1/16-16	UN	2A	1.0505	1.0610	1.0204	1.0425	1.0610	1.0154	1.0154	1.0610	1.0610
			1.0499	1.0616	1.0202	1.0419	1.0616	1.0156	1.0152	1.0616	1.0616
		3A	1.0520	1.0625	1.0219	1.0453	1.0625	1.0182	1.0182	1.0625	1.0625
			1.0514	1.0631	1.0217	1.0447	1.0631	1.0184	1.0180	1.0631	1.0631
1 1/16-18	NEF	2A	1.0514	1.0611	1.02500	1.0444	1.0611	1.02030	1.02030	1.0611	1.0611
			1.0509	1.0616	1.02485	1.0439	1.0616	1.02045	1.02015	1.0616	1.0616
		3A	1.0528	1.0625	1.02640	1.0469	1.0625	1.02280	1.02280	1.0625	1.0625
			1.0523	1.0630	1.02625	1.0464	1.0630	1.02295	1.02265	1.0630	1.0630
1 1/8-7	UNC	1A	1.1040	1.1228	1.0300	1.0810	1.1228	1.0191	1.0191	1.1228	1.1228
			1.1033	1.1235	1.0298	1.0803	1.1235	1.0193	1.0189	1.1235	1.1235
		2A	1.1040	1.1228	1.0300	1.0847	1.1228	1.0228	1.0228	1.1228	1.1228
			1.1033	1.1235	1.0298	1.0840	1.1235	1.0230	1.0226	1.1235	1.1235
		3A	1.1062	1.1250	1.0322	1.0887	1.1250	1.0268	1.0268	1.1250	1.1250
			1.1055	1.1257	1.0320	1.0880	1.1257	1.0270	1.0266	1.1257	1.1257
1 1/8-8	N	2A	1.1058	1.1229	1.0417	1.0889	1.1229	1.0348	1.0348	1.1229	1.1229
			1.1051	1.1236	1.0415	1.0882	1.1236	1.0350	1.0346	1.1236	1.1236
		3A	1.1079	1.1250	1.0438	1.0927	1.1250	1.0386	1.0386	1.1250	1.1250
			1.1072	1.1257	1.0436	1.0920	1.1257	1.0388	1.0384	1.1257	1.1257
1 1/8-12	UNF	1A	1.1103	1.1232	1.0691	1.0962	1.1226	1.0601	1.0601	1.1232	1.1226
			1.1097	1.1238	1.0689	1.0956	1.1232	1.0603	1.0599	1.1238	1.1232
		2A	1.1103	1.1232	1.0691	1.0992	1.1232	1.0631	1.0631	1.1232	1.1232
			1.1097	1.1238	1.0689	1.0986	1.1238	1.0633	1.0629	1.1238	1.1238
		3A	1.1121	1.1250	1.0709	1.1025	1.1250	1.0664	1.0664	1.1250	1.1250
			1.1115	1.1256	1.0707	1.1019	1.1256	1.0666	1.0662	1.1256	1.1256
1 1/8-16	UN	2A	1.1130	1.1235	1.0829	1.1050	1.1235	1.0779	1.0779	1.1235	1.1235
			1.1124	1.1241	1.0827	1.1044	1.1241	1.0781	1.0777	1.1241	1.1241
		3A	1.1145	1.1250	1.0844	1.1078	1.1250	1.0807	1.0807	1.1250	1.1250
			1.1139	1.1256	1.0842	1.1072	1.1256	1.0809	1.0805	1.1256	1.1256
1 1/8-18	NEF	2A	1.1139	1.1236	1.08750	1.1069	1.1236	1.08280	1.08280	1.1236	1.1236
			1.1134	1.1241	1.08735	1.1064	1.1241	1.08295	1.08265	1.1241	1.1241
		3A	1.1153	1.1250	1.08890	1.1094	1.1250	1.08530	1.08530	1.1250	1.1250
			1.1148	1.1255	1.08875	1.1089	1.1255	1.08545	1.08515	1.1255	1.1255
1 3/16-12	UN	2A	1.1729	1.1858	1.1317	1.1620	1.1858	1.1259	1.1259	1.1858	1.1858
			1.1723	1.1864	1.1315	1.1614	1.1864	1.1261	1.1257	1.1864	1.1864
		3A	1.1746	1.1875	1.1334	1.1652	1.1875	1.1291	1.1291	1.1875	1.1875
			1.1740	1.1881	1.1332	1.1646	1.1881	1.1293	1.1289	1.1881	1.1881
1 3/16-16	UN	2A	1.1755	1.1860	1.1454	1.1674	1.1860	1.1403	1.1403	1.1860	1.1860
			1.1749	1.1866	1.1452	1.1668	1.1866	1.1405	1.1401	1.1866	1.1866
		3A	1.1770	1.1875	1.1469	1.1702	1.1875	1.1431	1.1431	1.1875	1.1875
			1.1764	1.1881	1.1467	1.1696	1.1881	1.1433	1.1429	1.1881	1.1881
1 3/16-18	NEF	2A	1.1758	1.1860	1.14990	1.1691	1.1860	1.14500	1.14500	1.1860	1.1860
			1.1753	1.1865	1.14975	1.1686	1.1865	1.14515	1.14485	1.1865	1.1865
		3A	1.1778	1.1875	1.15140	1.1719	1.1875	1.14780	1.14780	1.1875	1.1875
			1.1773	1.1880	1.15125	1.1714	1.1880	1.14795	1.14765	1.1880	1.1880

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go[1]	Not go[1]
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in*	*in.*	*in.*	*in.*	*in.*	*in*	*in.*	*in.*
1¼-7	UNC	1A	1.2200	1.2478	1.1550	1.2058	1.2478	1.1439	1.1439	1.2478	1.2478
			1.2283	1.2485	1.1548	1.2051	1.2485	1.1441	1.1437	1.2485	1.2485
		2A	1.2290	1.2478	1.1550	1.2095	1.2478	1.1476	1.1476	1.2478	1.2478
			1.2283	1.2485	1.1548	1.2088	1.2485	1.1478	1.1474	1.2485	1.2485
		3A	1.2312	1.2500	1.1572	1.2136	1.2500	1.1517	1.1517	1.2500	1.2500
			1.2305	1.2507	1.1570	1.2129	1.2507	1.1519	1.1515	1.2507	1.2507
1¼-8	N	2A	1.2308	1.2479	1.1667	1.2138	1.2479	1.1597	1.1597	1.2479	1.2479
			1.2301	1.2486	1.1665	1.2131	1.2486	1.1599	1.1595	1.2486	1.2486
		3A	1.2329	1.2500	1.1688	1.2176	1.2500	1.1635	1.1635	1.2500	1.2500
			1.2322	1.2507	1.1686	1.2169	1.2507	1.1637	1.1633	1.2507	1.2507
1¼-12	UNF	1A	1.2353	1.2482	1.1941	1.2210	1.2474	1.1849	1.1849	1.2482	1.2474
			1.2347	1.2488	1.1939	1.2204	1.2480	1.1851	1.1847	1.2488	1.2480
		2A	1.2353	1.2482	1.1941	1.2240	1.2482	1.1879	1.1879	1.2482	1.2482
			1.2347	1.2488	1.1939	1.2234	1.2488	1.1881	1.1877	1.2488	1.2488
		3A	1.2371	1.2500	1.1959	1.2274	1.2500	1.1913	1.1913	1.2500	1.2500
			1.2365	1.2506	1.1957	1.2268	1.2506	1.1915	1.1911	1.2506	1.2506
1¼-16	UN	2A	1.2380	1.2485	1.2079	1.2299	1.2485	1.2028	1.2028	1.2485	1.2485
			1.2374	1.2491	1.2077	1.2293	1.2491	1.2030	1.2026	1.2491	1.2491
		3A	1.2395	1.2500	1.2094	1.2327	1.2500	1.2056	1.2056	1.2500	1.2500
			1.2389	1.2506	1.2092	1.2321	1.2506	1.2058	1.2054	1.2506	1.2506
1¼-18	NEF	2A	1.2388	1.2485	1.21240	1.2316	1.2485	1.20750	1.20750	1.2485	1.2485
			1.2383	1.2490	1.21225	1.2311	1.2490	1.20765	1.20735	1.2490	1.2490
		3A	1.2403	1.2500	1.21390	1.2344	1.2500	1.21030	1.21030	1.2500	1.2500
			1.2398	1.2505	1.21375	1.2339	1.2505	1.21045	1.21015	1.2505	1.2505
1⁵⁄₁₆-12	UN	2A	1.2979	1.3108	1.2567	1.2870	1.3108	1.2509	1.2509	1.3108	1.3108
			1.2973	1.3114	1.2565	1.2864	1.3114	1.2511	1.2507	1.3114	1.3114
		3A	1.2996	1.3125	1.2584	1.2902	1.3125	1.2541	1.2541	1.3125	1.3125
			1.2990	1.3131	1.2582	1.2896	1.3131	1.2543	1.2539	1.3131	1.3131
1⁵⁄₁₆-16	UN	2A	1.3005	1.3110	1.2704	1.2924	1.3110	1.2653	1.2653	1.3110	1.3110
			1.2999	1.3116	1.2702	1.2918	1.3116	1.2655	1.2651	1.3116	1.3116
		3A	1.3020	1.3125	1.2719	1.2952	1.3125	1.2681	1.2681	1.3125	1.3125
			1.3014	1.3131	1.2717	1.2946	1.3131	1.2683	1.2679	1.3131	1.3131
1⁵⁄₁₆-18	NEF	2A	1.3013	1.3110	1.27490	1.2941	1.3110	1.27000	1.27000	1.3110	1.3110
			1.3008	1.3115	1.27475	1.2936	1.3115	1.27015	1.26985	1.3115	1.3115
		3A	1.3028	1.3125	1.27640	1.2969	1.3125	1.27280	1.27280	1.3125	1.3125
			1.3023	1.3130	1.27625	1.2964	1.3130	1.27295	1.27265	1.3130	1.3130
1⅜-6	UNC	1A	1.3516	1.3726	1.2643	1.3245	1.3726	‡1.2522	‡1.2522	1.3726	1.3726
			1.3508	1.3734	1.2641	1.3237	1.3734	‡1.2524	‡1.2520	1.3734	1.3734
		2A	1.3516	1.3726	1.2643	1.3285	1.3726	1.2563	1.2563	1.3726	1.3726
			1.3508	1.3734	1.2641	1.3277	1.3734	1.2565	1.2561	1.3734	1.3734
		3A	1.3540	1.3750	1.2667	1.3329	1.3750	1.2607	1.2607	1.3750	1.3750
			1.3532	1.3758	1.2665	1.3321	1.3758	1.2609	1.2605	1.3758	1.3758
1⅜-8	N	2A	1.3557	1.3728	1.2916	1.3385	1.3728	1.2844	1.2844	1.3728	1.3728
			1.3550	1.3735	1.2914	1.3378	1.3735	1.2846	1.2842	1.3735	1.3735
		3A	1.3579	1.3750	1.2938	1.3425	1.3750	1.2884	1.2884	1.3750	1.3750
			1.3572	1.3757	1.2936	1.3418	1.3757	1.2886	1.2882	1.3757	1.3757
1⅜-12	UNF	1A	1.3602	1.3731	1.3190	1.3457	1.3721	1.3096	1.3096	1.3731	1.3721
			1.3596	1.3737	1.3188	1.3451	1.3727	1.3098	1.3094	1.3737	1.3727
		2A	1.3602	1.3731	1.3190	1.3488	1.3731	1.3127	1.3127	1.3731	1.3731
			1.3596	1.3737	1.3188	1.3482	1.3737	1.3129	1.3125	1.3737	1.3737
		3A	1.3621	1.3750	1.3209	1.3523	1.3750	1.3162	1.3162	1.3750	1.3750
			1.3615	1.3756	1.3207	1.3517	1.3756	1.3164	1.3160	1.3756	1.3756
1⅜-16	UN	2A	1.3630	1.3735	1.3329	1.3549	1.3735	1.3278	1.3278	1.3735	1.3735
			1.3624	1.3741	1.3327	1.3543	1.3741	1.3280	1.3276	1.3741	1.3741
		3A	1.3645	1.3750	1.3344	1.3577	1.3750	1.3306	1.3306	1.3750	1.3750
			1.3639	1.3756	1.3342	1.3571	1.3756	1.3308	1.3304	1.3756	1.3756
1⅜-18	NEF	2A	1.3638	1.3735	1.33740	1.3566	1.3735	1.33250	1.33250	1.3735	1.3735
			1.3633	1.3740	1.33725	1.3561	1.3740	1.33265	1.33235	1.3740	1.3740
		3A	1.3653	1.3750	1.33890	1.3594	1.3750	1.33530	1.33530	1.3750	1.3750
			1.3648	1.3755	1.33875	1.3589	1.3755	1.33545	1.33515	1.3755	1.3755
1⁷⁄₁₆-12	UN	2A	1.4228	1.4357	1.3816	1.4118	1.4357	1.3757	1.3757	1.4357	1.4357
			1.4222	1.4363	1.3814	1.4112	1.4363	1.3759	1.3755	1.4363	1.4363
		3A	1.4246	1.4375	1.3834	1.4151	1.4375	1.3790	1.3790	1.4375	1.4375
			1.4240	1.4381	1.3832	1.4145	1.4381	1.3792	1.3788	1.4381	1.4381
1⁷⁄₁₆-16	UN	2A	1.4254	1.4359	1.3953	1.4172	1.4359	1.3901	1.3901	1.4359	1.4359
			1.4248	1.4365	1.3951	1.4166	1.4365	1.3903	1.3899	1.4365	1.4365
		3A	1.4270	1.4375	1.3969	1.4201	1.4375	1.3930	1.3930	1.4375	1.4375
			1.4264	1.4381	1.3967	1.4195	1.4381	1.3932	1.3928	1.4381	1.4381

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go[1]	Not go[2]
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in*	*in.*	*in.*	*in.*	*in.*	*in.*
1 7/16-18	NEF	2A	1.4263	1.4360	1.39990	1.4190	1.4360	1.39490	1.39490	1.4360	1.4360
			1.4258	1.4365	1.39975	1.4185	1.4365	1.39505	1.39475	1.4365	1.4365
		3A	1.4278	1.4375	1.40140	1.4218	1.4375	1.39770	1.39770	1.4375	1.4375
			1.4273	1.4380	1.40125	1.4213	1.4380	1.39785	1.39755	1.4380	1.4380
1 1/2-6	UNC	1A	1.4766	1.4976	1.3893	1.4494	1.4976	1.3772	1.3772	1.4976	1.4976
			1.4758	1.4984	1.3891	1.4486	1.4984	1.3774	1.3770	1.4984	1.4984
		2A	1.4766	1.4976	1.3893	1.4534	1.4976	1.3812	1.3812	1.4976	1.4976
			1.4758	1.4984	1.3891	1.4526	1.4984	1.3814	1.3810	1.4984	1.4984
		3A	1.4790	1.5000	1.3917	1.4578	1.5000	1.3856	1.3856	1.5000	1.5000
			1.4782	1.5008	1.3915	1.4570	1.5008	1.3858	1.3854	1.5008	1.5008
1 1/2-8	N	2A	1.4807	1.4978	1.4166	1.4634	1.4978	1.4093	1.4093	1.4978	1.4978
			1.4800	1.4985	1.4164	1.4627	1.4985	1.4095	1.4091	1.4985	1.4985
		3A	1.4829	1.5000	1.4188	1.4674	1.5000	1.4133	1.4133	1.5000	1.5000
			1.4822	1.5007	1.4186	1.4667	1.5007	1.4135	1.4131	1.5007	1.5007
1 1/2-12	UNF	1A	1.4852	1.4981	1.4440	1.4705	1.4969	1.4344	1.4344	1.4981	1.4969
			1.4846	1.4987	1.4438	1.4699	1.4975	1.4346	1.4342	1.4987	1.4975
		2A	1.4852	1.4981	1.4440	1.4737	1.4981	1.4376	1.4376	1.4981	1.4981
			1.4846	1.4987	1.4438	1.4731	1.4987	1.4378	1.4374	1.4987	1.4987
		3A	1.4871	1.5000	1.4459	1.4772	1.5000	1.4411	1.4411	1.5000	1.5000
			1.4865	1.5006	1.4457	1.4766	1.5006	1.4413	1.4409	1.5006	1.5006
1 1/2-16	UN	2A	1.4879	1.4984	1.4578	1.4797	1.4984	1.4526	1.4526	1.4984	1.4984
			1.4873	1.4990	1.4576	1.4791	1.4990	1.4528	1.4524	1.4990	1.4990
		3A	1.4895	1.5000	1.4594	1.4826	1.5000	1.4555	1.4555	1.5000	1.5000
			1.4889	1.5006	1.4592	1.4820	1.5006	1.4557	1.4553	1.5006	1.5006
1 1/2-18	NEF	2A	1.4888	1.4985	1.46240	1.4815	1.4985	1.45740	1.45740	1.4985	1.4985
			1.4883	1.4990	1.46225	1.4810	1.4990	1.45755	1.45725	1.4990	1.4990
		3A	1.4903	1.5000	1.46390	1.4843	1.5000	1.46020	1.46020	1.5000	1.5000
			1.4898	1.5005	1.46375	1.4838	1.5005	1.46035	1.46005	1.5005	1.5005
1 9/16-16	N	2A	1.5504	1.5609	1.52030	1.5422	1.5609	1.51510	1.51510	1.5609	1.5609
			1.5498	1.5615	1.52005	1.5416	1.5615	1.51535	1.51485	1.5615	1.5615
		3A	1.5520	1.5625	1.52190	1.5451	1.5625	1.51800	1.51800	1.5625	1.5625
			1.5514	1.5631	1.52165	1.5445	1.5631	1.51825	1.51775	1.5631	1.5631
1 9/16-18	NEF	2A	1.5513	1.5610	1.5249	1.5440	1.5610	1.5199	1.5199	1.5610	1.5610
			1.5508	1.5615	1.5247	1.5435	1.5615	1.5201	1.5197	1.5615	1.5615
		3A	1.5528	1.5625	1.5264	1.5468	1.5625	1.5227	1.5227	1.5625	1.5625
			1.5523	1.5630	1.5262	1.5463	1.5630	1.5229	1.5225	1.5630	1.5630
1 5/8-8	N	2A	1.6057	1.6228	1.54160	1.5883	1.6228	1.53420	1.53420	1.6228	1.6228
			1.6050	1.6235	1.54135	1.5876	1.6235	1.53445	1.53395	1.6235	1.6235
		3A	1.6079	1.6250	1.54380	1.5923	1.6250	1.53820	1.53820	1.6250	1.6250
			1.6072	1.6257	1.54355	1.5916	1.6257	1.53845	1.53795	1.6257	1.6257
1 5/8-12	UN	2A	1.6103	1.6232	1.56910	1.5993	1.6232	1.56320	1.56320	1.6232	1.6232
			1.6097	1.6238	1.56885	1.5987	1.6238	1.56345	1.56295	1.6238	1.6238
		3A	1.6121	1.6250	1.57090	1.6026	1.6250	1.56650	1.56650	1.6250	1.6250
			1.6115	1.6256	1.57065	1.6020	1.6256	1.56675	1.56625	1.6256	1.6256
1 5/8-16	UN	2A	1.6129	1.6234	1.58280	1.6047	1.6234	1.57760	1.57760	1.6234	1.6234
			1.6123	1.6240	1.58255	1.6041	1.6240	1.57785	1.57735	1.6240	1.6240
		3A	1.6145	1.6250	1.58440	1.6076	1.6250	1.58050	1.58050	1.6250	1.6250
			1.6139	1.6256	1.58415	1.6070	1.6256	1.58075	1.58025	1.6256	1.6256
1 5/8-18	NEF	2A	1.6138	1.6235	1.5874	1.6065	1.6235	1.5824	1.5824	1.6235	1.6235
			1.6133	1.6240	1.5872	1.6060	1.6240	1.5826	1.5822	1.6240	1.6240
		3A	1.6153	1.6250	1.5889	1.6093	1.6250	1.5852	1.5852	1.6250	1.6250
			1.6148	1.6255	1.5887	1.6088	1.6255	1.5854	1.5850	1.6255	1.6255
1 11/16-16	N	2A	1.6754	1.6859	1.64530	1.6671	1.6859	1.64000	1.64000	1.6859	1.6859
			1.6748	1.6865	1.64505	1.6665	1.6865	1.64025	1.63975	1.6865	1.6865
		3A	1.6770	1.6875	1.64690	1.6700	1.6875	1.64290	1.64290	1.6875	1.6875
			1.6764	1.6881	1.64665	1.6694	1.6881	1.64315	1.64265	1.6881	1.6881
1 11/16-18	NEF	2A	1.6763	1.6860	1.6499	1.6689	1.6860	1.6448	1.6448	1.6860	1.6860
			1.6758	1.6865	1.6497	1.6684	1.6865	1.6450	1.6446	1.6865	1.6865
		3A	1.6778	1.6875	1.6514	1.6717	1.6875	1.6476	1.6476	1.6875	1.6875
			1.6773	1.6880	1.6512	1.6712	1.6880	1.6478	1.6474	1.6880	1.6880
1 3/4-5	UNC	1A	1.7234	1.7473	1.61740	1.6906	1.7473	1.60400	1.60400	1.7473	1.7473
			1.7226	1.7481	1.61715	1.6898	1.7481	1.60425	1.60375	1.7481	1.7481
		2A	1.7234	1.7473	1.61740	1.6951	1.7473	1.60850	1.60850	1.7473	1.7473
			1.7226	1.7481	1.61715	1.6943	1.7481	1.60875	1.60825	1.7481	1.7481
		3A	1.7261	1.7500	1.62010	1.7000	1.7500	1.61340	1.61340	1.7500	1.7500
			1.7253	1.7508	1.61985	1.6992	1.7508	1.61365	1.61315	1.7508	1.7508

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
1¾-8	N	2A	1.7306	1.7477	1.66650	1.7131	1.7477	1.65900	1.65900	1.7477	1.7477
			1.7299	1.7484	1.66625	1.7124	1.7484	1.65925	1.65875	1.7484	1.7484
		3A	1.7329	1.7500	1.66880	1.7173	1.7500	1.66320	1.66320	1.7500	1.7500
			1.7322	1.7507	1.66855	1.7166	1.7597	1.66345	1.66295	1.7507	1.7507
1¾-12	UN	2A	1.7353	1.7482	1.69410	1.7242	1.7482	1.68810	1.68810	1.7482	1.7482
			1.7347	1.7488	1.69385	1.7236	1.7488	1.68835	1.68785	1.7488	1.7488
		3A	1.7371	1.7500	1.69590	1.7275	1.7500	1.69140	1.69140	1.7500	1.7500
			1.7365	1.7506	1.69565	1.7269	1.7506	1.69165	1.69115	1.7506	1.7506
1¾-16	UNEF	2A	1.7379	1.7484	1.70780	1.7296	1.7484	1.70250	1.70250	1.7484	1.7484
			1.7373	1.7490	1.70755	1.7290	1.7490	1.70275	1.70225	1.7490	1.7490
		3A	1.7395	1.7500	1.70940	1.7325	1.7500	1.70540	1.70540	1.7500	1.7500
			1.7389	1.7506	1.70915	1.7319	1.7506	1.70565	1.70515	1.7506	1.7506
1^{13}⁄$_{16}$-16	N	2A	1.8004	1.8109	1.77030	1.7921	1.8109	1.76500	1.76500	1.8109	1.8109
			1.7998	1.8115	1.77005	1.7915	1.8115	1.76525	1.76475	1.8115	1.8115
		3A	1.8020	1.8125	1.77190	1.7950	1.8125	1.76790	1.76790	1.8125	1.8125
			1.8014	1.8131	1.77165	1.7944	1.8131	1.76815	1.76765	1.8131	1.8131
1⅞-8	N	2A	1.8556	1.8727	1.79150	1.8379	1.8727	1.78380	1.78380	1.8727	1.8727
			1.8549	1.8734	1.79125	1.8372	1.8734	1.78405	1.78355	1.8734	1.8734
		3A	1.8579	1.8750	1.79380	1.8422	1.8750	1.78810	1.78810	1.8750	1.8750
			1.8572	1.8757	1.79355	1.8415	1.8757	1.78835	1.78785	1.8757	1.8757
1⅞-12	UN	2A	1.8603	1.8732	1.81910	1.8492	1.8732	1.81310	1.81310	1.8732	1.8732
			1.8597	1.8738	1.81885	1.8486	1.8738	1.81335	1.81285	1.8738	1.8738
		3A	1.8621	1.8750	1.82090	1.8525	1.8750	1.81640	1.81640	1.8750	1.8750
			1.8615	1.8756	1.82065	1.8519	1.8756	1.81665	1.81615	1.8756	1.8756
1⅞-16	UN	2A	1.8629	1.8734	1.83280	1.8546	1.8734	1.82750	1.82750	1.8734	1.8734
			1.8623	1.8740	1.83255	1.8540	1.8740	1.82775	1.82725	1.8740	1.8740
		3A	1.8645	1.8750	1.83440	1.8575	1.8750	1.83040	1.83040	1.8750	1.8750
			1.8639	1.8756	1.83415	1.8569	1.8756	1.83065	1.83015	1.8756	1.8756
1^{15}⁄$_{16}$-16	N	2A	1.9254	1.9359	1.89530	1.9170	1.9359	1.88990	1.88990	1.9359	1.9359
			1.9248	1.9365	1.89505	1.9164	1.9365	1.89015	1.88965	1.9365	1.9365
		3A	1.9270	1.9375	1.89690	1.9200	1.9375	1.89290	1.89290	1.9375	1.9375
			1.9264	1.9381	1.89665	1.9194	1.9381	1.89315	1.89265	1.9381	1.9381
2-4½	UNC	1A	1.9713	1.9971	1.85280	1.9347	1.9971	1.83850	1.83850	1.9971	1.9971
			1.9705	1.9979	1.85255	1.9339	1.9979	1.83875	1.83825	1.9979	1.9979
		2A	1.9713	1.9971	1.85280	1.9395	1.9971	1.84330	1.84330	1.9971	1.9971
			1.9705	1.9979	1.85255	1.9387	1.9979	1.84355	1.84305	1.9979	1.9979
		3A	1.9742	2.0000	1.85570	1.9448	2.0000	1.84860	1.84860	2.0000	2.0000
			1.0734	2.0008	1.85545	1.9440	2.0008	1.84885	1.84835	2.0008	2.0008
2-8	N	2A	1.9806	1.9977	1.91650	1.9628	1.9977	1.90870	1.90870	1.9977	1.9977
			1.9799	1.9984	1.91625	1.9621	1.9984	1.90895	1.90845	1.9984	1.9984
		3A	1.9829	2.0000	1.91880	1.9671	2.0000	1.91300	1.91300	2.0000	2.0000
			1.9822	2.0007	1.91855	1.9664	2.0007	1.91325	1.91275	2.0007	2.0007
2-12	UN	2A	1.9853	1.9982	1.94410	1.9741	1.9982	1.93800	1.93800	1.9982	1.9982
			1.9847	1.9988	1.94385	1.9735	1.9988	1.93825	1.93775	1.9988	1.9988
		3A	1.9871	2.0000	1.94590	1.9775	2.0000	1.94140	1.94140	2.0000	2.0000
			1.9865	2.0006	1.94565	1.9769	2.0006	1.94165	1.94115	2.0006	2.0006
2-16	UNEF	2A	1.9879	1.9984	1.95780	1.9795	1.9984	1.95240	1.95240	1.9984	1.9984
			1.9873	1.9990	1.95755	1.9789	1.9990	1.95265	1.95215	1.9990	1.9990
		3A	1.9895	2.0000	1.95940	1.9825	2.0000	1.95540	1.95540	2.0000	2.0000
			1.9889	2.0006	1.95915	1.9819	2.0006	1.95565	1.95515	2.0006	2.0006
2^{1}⁄$_{16}$-16	N	2A	2.0504	2.0609	2.02030	2.0120	2.0609	2.01490	2.01490	2.0609	2.0609
			2.0498	2.0615	2.02005	2.0114	2.0615	2.01515	2.01465	2.0615	2.0615
		3A	2.0520	2.0625	2.02190	2.0150	2.0625	2.01790	2.01790	2.0625	2.0625
			2.0514	2.0631	2.02165	2.0144	2.0631	2.01815	2.01765	2.0631	2.0631
2⅛-8	N	2A	2.1055	2.1226	2.04140	2.0876	2.1226	2.03350	2.03350	2.1226	2.1226
			2.1048	2.1233	2.04115	2.0869	2.1233	2.03375	2.03325	2.1233	2.1233
		3A	2.1079	2.1250	2.04380	2.0920	2.1250	2.03790	2.03790	2.1250	2.1250
			2.1072	2.1257	2.04355	2.0913	2.1257	2.03815	2.03765	2.1257	2.1257
2⅛-12	UN	2A	2.1103	2.1232	2.06910	2.0991	2.1232	2.06300	2.06300	2.1232	2.1232
			2.1097	2.1238	2.06885	2.0985	2.1238	2.06325	2.06275	2.1238	2.1238
		3A	2.1121	2.1250	2.07090	2.1025	2.1250	2.06640	2.06640	2.1250	2.1250
			2.1115	2.1256	2.07065	2.1019	2.1256	2.06665	2.06615	2.1256	2.1256
2⅛-16	UN	2A	2.1129	2.1234	2.08280	2.1045	2.1234	2.07740	2.07740	2.1234	2.1234
			2.1123	2.1240	2.08255	2.1039	2.1240	2.07765	2.07715	2.1240	2.1240
		3A	2.1145	2.1250	2.08440	2.1075	2.1250	2.08030	2.08030	2.1250	2.1250
			2.1139	2.1256	2.08415	2.1069	2.1256	2.08055	2.08005	2.1256	2.1256
2^{3}⁄$_{16}$-16	N	2A	2.1754	2.1859	2.14530	2.1670	2.1859	2.13990	2.13990	2.1859	2.1859
			2.1748	2.1865	2.14505	2.1664	2.1865	2.14015	2.13965	2.1865	2.1865
		3A	2.1770	2.1875	2.14690	2.1700	2.1875	2.14280	2.14280	2.1875	2.1875
			2.1764	2.1881	2.14665	2.1694	2.1881	2.14305	2.14255	2.1881	2.1881

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go ¹	Not go ²
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
2¼-4½	UNC	1A	2.2213	2.2471	2.10280	2.1844	2.2471	2.08820	2.08820	2.2471	2.2471
			2.2205	2.2479	2.10255	2.1836	2.2479	2.08845	2.08795	2.2479	2.2479
		2A	2.2213	2.2471	2.10280	2.1893	2.2471	2.09310	2.09310	2.2471	2.2471
			2.2205	2.2479	2.10255	2.1885	2.2479	2.09335	2.09285	2.2479	2.2479
		3A	2.2242	2.2500	2.10570	2.1946	2.2500	2.09840	2.09840	2.2500	2.2500
			2.2234	2.2508	2.10545	2.1938	2.2508	2.09865	2.09815	2.2508	2.2508
2¼-8	N	2A	2.2305	2.2476	2.16640	2.2125	2.2476	2.15840	2.15840	2.2476	2.2476
			2.2298	2.2483	2.16615	2.2118	2.2483	2.15865	2.15815	2.2483	2.2483
		3A	2.2329	2.2500	2.16880	2.2169	2.2500	2.16280	2.16280	2.2500	2.2500
			2.2322	2.2507	2.16855	2.2162	2.2507	2.16305	2.16255	2.2507	2.2507
2¼-12	UN	2A	2.2353	2.2482	2.19410	2.2241	2.2482	2.18800	2.18800	2.2482	2.2482
			2.2347	2.2488	2.19385	2.2235	2.2488	2.18825	2.18775	2.2488	2.2488
		3A	2.2371	2.2500	2.19590	2.2275	2.2500	2.19140	2.19140	2.2500	2.2500
			2.2365	2.2506	2.19565	2.2269	2.2506	2.19165	2.19115	2.2506	2.2506
2¼-16	UN	2A	2.2379	2.2484	2.20780	2.2295	2.2484	2.20240	2.20240	2.2484	2.2484
			2.2373	2.2490	2.20755	2.2289	2.2490	2.20265	2.20215	2.2490	2.2490
		3A	2.2395	2.2500	2.20940	2.2325	2.2500	2.20530	2.20530	2.2500	2.2500
			2.2389	2.2506	2.20915	2.2319	2.2506	2.20555	2.20505	2.2506	2.2506
2⁵⁄₁₆-16	N	2A	2.3003	2.3108	2.27020	2.2918	2.3108	2.26470	2.26470	2.3108	2.3108
			2.2997	2.3114	2.26995	2.2912	2.3114	2.26495	2.26445	2.3114	2.3114
		3A	2.3020	2.3125	2.27190	2.2949	2.3125	2.26780	2.26780	2.3125	2.3125
			2.3014	2.3131	2.27165	2.2943	2.3131	2.26805	2.26755	2.3131	2.3131
2⅜-12	UN	2A	2.3602	2.3731	2.31900	2.3489	2.3731	2.31280	2.31280	2.3731	2.3731
			2.3596	2.3737	2.31875	2.3483	2.2737	2.31305	2.31255	2.3737	2.3737
		3A	2.3621	2.3750	2.32090	2.3524	2.3750	2.31630	2.31630	2.3750	2.3750
			2.3615	2.3756	2.32065	2.3518	2.3756	2.31655	2.31605	2.3756	2.3756
2⅜-16	UN	2A	2.3628	2.3733	2.33270	2.3543	2.3733	2.32720	2.32720	2.3733	2.3733
			2.3622	2.3739	2.33245	2.3537	2.3739	2.32745	2.32695	2.3739	2.3739
		3A	2.3645	2.3750	2.33440	2.3574	2.3750	2.33030	2.33030	2.3750	2.3750
			2.3639	2.3756	2.33415	2.3568	2.3756	2.33055	2.33005	2.3756	2.3756
2⁷⁄₁₆-16	N	2A	2.4253	2.4358	2.39520	2.4168	2.4358	2.38970	2.38970	2.4358	2.4358
			2.4247	2.4364	2.39495	2.4162	2.4364	2.38995	2.38945	2.4364	2.4364
		3A	2.4270	2.4375	2.39690	2.4199	2.4375	2.39280	2.39280	2.4375	2.4375
			2.4264	2.4381	2.39665	2.4193	2.4381	2.39305	2.39255	2.4381	2.4381
2½-4	UNC	1A	2.4688	2.4969	2.33450	2.4272	2.4969	2.31900	2.31900	2.4969	2.4969
			2.4679	2.4978	2.33425	2.4263	2.4978	2.31925	2.31875	2.4978	2.4978
		2A	2.4688	2.4969	2.33450	2.4324	2.4969	2.32410	2.32410	2.4969	2.4969
			2.4679	2.4978	2.33425	2.4315	2.4978	2.32435	2.32385	2.4978	2.4978
		3A	2.4719	2.5000	2.33760	2.4380	2.5000	2.32980	2.32980	2.5000	2.5000
			2.4710	2.5009	2.33735	2.4371	2.5009	2.33005	2.32955	2.5009	2.5009
2½-8	N	2A	2.4805	2.4976	2.41640	2.4623	2.4976	2.40820	2.40820	2.4976	2.4976
			2.4798	2.4983	2.41615	2.4616	2.4983	2.40845	2.40795	2.4983	2.4983
		3A	2.4829	2.5000	2.41880	2.4668	2.5000	2.41270	2.41270	2.5000	2.5000
			2.4822	2.5007	2.41855	2.4661	2.5007	2.41295	2.41245	2.5007	2.5007
2½-12	UN	2A	2.4852	2.4981	2.44400	2.4739	2.4981	2.43780	2.43780	2.4981	2.4981
			2.4846	2.4987	2.44375	2.4733	2.4987	2.43805	2.43755	2.4987	2.4987
		3A	2.4871	2.5000	2.44590	2.4774	2.5000	2.44130	2.44130	2.5000	2.5000
			2.4865	2.5006	2.44565	2.4768	2.5006	2.44155	2.44105	2.5006	2.5006
2½-16	UN	2A	2.4878	2.4983	2.45770	2.4793	2.4983	2.45220	2.45220	2.4983	2.4983
			2.4872	2.4989	2.45745	2.4787	2.4989	2.45245	2.45195	2.4989	2.4989
		3A	2.4895	2.5000	2.45940	2.4824	2.5000	2.45530	2.45530	2.5000	2.5000
			2.4889	2.5006	2.45915	2.4818	2.5006	2.45555	2.45505	2.5006	2.5006
2⅝-12	UN	2A	2.6102	2.6231	2.56900	2.5989	2.6231	2.56280	2.56280	2.6231	2.6231
			2.6096	2.6237	2.56875	2.5983	2.6237	2.56305	2.56255	2.6237	2.6237
		3A	2.6121	2.6250	2.57090	2.6024	2.6250	2.56630	2.56630	2.6250	2.6250
			2.6115	2.6256	2.57065	2.6018	2.6250	2.56655	2.56605	2.6256	2.6256
2⅝-16	UN	2A	2.6128	2.6233	2.58270	2.6043	2.6233	2.57720	2.57720	2.6233	2.6233
			2.6122	2.6239	2.58245	2.6037	2.6239	2.57745	2.57695	2.6239	2.6239
		3A	2.6145	2.6250	2.58440	2.6074	2.6250	2.58030	2.58030	2.6250	2.6250
			2.6139	2.6256	2.58415	2.6068	2.6256	2.58055	2.58005	2.6256	2.6256
2¾-4	UNC	1A	2.7187	2.7468	2.58440	2.6768	2.7468	2.56360	2.56360	2.7468	2.7468
			2.7178	2.7477	2.58415	2.6759	2.7477	2.56385	2.56335	2.7477	2.7477
		2A	2.7187	2.7468	2.58440	2.6822	2.7468	2.57390	2.57390	2.7468	2.7468
			2.7178	2.7477	2.58415	2.6813	2.7477	2.57415	2.57365	2.7477	2.7477
		3A	2.7219	2.7500	2.58760	2.6880	2.7500	2.57970	2.57970	2.7500	2.7500
			2.7210	2.7509	2.58735	2.6871	2.7509	2.57995	2.57945	2.7509	2.7509

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go ¹	Not go ¹
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
2¾-8	N	2A	2.7304	2.7475	2.66630	2.7121	2.7475	2.65800	2.65800	2.7475	2.7475
			2.7297	2.7482	2.66605	2.7114	2.7482	2.65825	2.65775	2.7482	2.7482
		3A	2.7329	2.7500	2.66880	2.7167	2.7500	2.66260	2.66260	2.7500	2.7500
			2.7322	2.7507	2.66855	2.7160	2.7507	2.66285	2.66235	2.7507	2.7507
2¾-12	UN	2A	2.7352	2.7481	2.69400	2.7239	2.7481	2.68780	2.68780	2.7481	2.7481
			2.7346	2.4787	2.69375	2.7233	2.7487	2.68805	2.68755	2.7487	2.7487
		3A	2.7371	2.7500	2.69590	2.7274	2.7500	2.69130	2.69130	2.7500	2.7500
			2.7365	2.7506	2.69565	2.7268	2.7506	2.69155	2.69105	2.7506	2.7506
2¾-16	UN	2A	2.7378	2.7483	2.70770	2.7293	2.7483	2.70220	2.70220	2.7483	2.7483
			2.7372	2.7489	2.70745	2.7287	2.7489	2.70245	2.70195	2.7489	2.7489
		3A	2.7395	2.7500	2.70940	2.7324	2.7500	2.70530	2.70530	2.7500	2.7500
			2.7389	2.7506	2.70915	2.7318	2.7506	2.70555	2.70505	2.7506	2.7506
2⅞-12	UN	2A	2.8602	2.8731	2.81900	2.8488	2.8731	2.81270	2.81270	2.8731	2.8731
			2.8596	2.8737	2.81875	2.8482	2.8737	2.81295	2.81245	2.8737	2.8737
		3A	2.8621	2.8750	2.82090	2.8523	2.8750	2.81620	2.81620	2.8750	2.8750
			2.8615	2.8750	2.82065	2.8517	2.8756	2.81645	2.81595	2.8756	2.8756
2⅞-16	UN	2A	2.8628	2.8733	2.83270	2.8542	2.8733	2.82710	2.82710	2.8733	2.8733
			2.8622	2.8739	2.83245	2.8536	2.8739	2.82735	2.82685	2.8739	2.8739
		3A	2.8645	2.8750	2.83440	2.8573	2.8750	2.83020	2.83020	2.8750	2.8750
			2.8639	2.8756	2.83415	2.8567	2.8756	2.83045	2.82995	2.8756	2.8756
3-4	UNC	1A	2.9687	2.9968	2.83440	2.9266	2.9968	2.81830	2.81830	2.9968	2.9968
			2.9678	2.9977	2.83415	2.9257	2.9977	2.81855	2.81805	2.9977	2.9977
		2A	2.9687	2.9968	2.83440	2.9320	2.9968	2.82370	2.82370	2.9968	2.9968
			2.9678	2.9977	2.83415	2.9311	2.9977	2.82395	2.82345	2.9977	2.9977
		3A	2.9719	3.0000	2.83760	2.9378	3.0000	2.82960	2.82960	3.0000	3.0000
			2.9710	3.0009	2.83735	2.9369	3.0009	2.82985	2.82935	3.0009	3.0009
3-8	N	2A	2.9803	2.9974	2.91620	2.9618	2.9974	2.90770	2.90770	2.9974	2.9974
			2.9796	2.9981	2.91595	2.9611	2.9981	2.90795	2.90745	2.9981	2.9981
		3A	2.9829	3.0000	2.91880	2.9665	3.0000	2.91240	2.91240	3.0000	3.0000
			2.9822	3.0007	2.91855	2.9658	3.0007	2.91265	2.91215	3.0007	3.0007
3-12	UN	2A	2.9852	2.9981	2.94400	2.9738	2.9981	2.93770	2.93770	2.9981	2,9981
			2.9846	2.9987	2.94375	2.9732	2.9987	2.93795	2.93745	2.9987	2.9987
		3A	2.9871	3.0000	2.94590	2.9773	3.0000	2.94120	2.94120	3.0000	3.0000
			2.9865	3.0006	2.94565	2.9767	3.0006	2.94145	2.94095	3.0006	3.0006
3-16	UN	2A	2.9878	2.9983	2.95770	2.9792	2.9983	2.95210	2.95210	2.9983	2.9983
			2.9872	2.9989	2.95745	2.9786	2.9989	2.95235	2.95185	2.9989	2.9989
		3A	2.9895	3.0000	2.95940	2.9823	3.0000	2.95520	2.95520	3.0000	3.0000
			2.9889	3.0006	2.95915	2.9817	3.0006	2.95545	2.95495	3.0006	3.0006
3⅛-12	UN	2A	3.1102	3.1231	3.06900	3.0988	3.1231	3.06270	3.06270	3.1231	3.1231
			3.1096	3.1237	3.06875	3.0982	3.1237	3.06295	3.06245	3.1237	3.1237
		3A	3.1121	3.1250	3.07090	3.1023	3.1250	3.06620	3.06620	3.1250	3.1250
			3.1115	3.1256	3.07065	3.1017	3.1256	3.06645	3.06595	3.1256	3.1256
3⅛-16	UN	2A	3.1128	3.1233	3.08270	3.1042	3.1233	3.07710	3.07710	3.1233	3.1233
			3.1122	3.1239	3.08245	3.1036	3.1239	3.07735	3.07685	3.1239	3.1239
		3A	3.1145	3.1250	3.08440	3.1073	3.1250	3.08020	3.08020	3.1250	3.1250
			3.1139	3.1256	3.08415	3.1067	3.1256	3.08045	3.07995	3.1256	3.1256
3¼-4	UNC	1A	3.2186	3.2467	3.08430	3.1762	3.2467	3.06800	3.06800	3.2467	3.2467
			3.2177	3.2476	3.08405	3.1753	3.2476	3.06825	3.06775	3.2476	3.2476
		2A	3.2186	3.2467	3.08430	3.1816	3.2467	3.07340	3.07340	3.2467	3.2467
			3.2177	3.2476	3.08405	3.1807	3.2476	3.07365	3.07315	3.2476	3.2476
		3A	3.2219	3.2500	3.08760	3.1876	3.2500	3.07940	3.07940	3.2500	3.2500
			3.2210	3.2509	3.08735	3.1867	3.2509	3.07965	3.07915	3.2509	3.2509
3¼-8	N	2A	3.2303	3.2474	3.16620	3.2116	3.2474	3.15750	3.15750	3.2474	3.2474
			3.2296	3.2481	3.16595	3.2109	3.2481	3.15775	3.15725	3.2481	3.2481
		3A	3.2329	3.2500	3.16880	3.2164	3.2500	3.16230	3.16230	3.2500	3.2500
			3.2322	3.2507	3.16855	3.2157	3.2507	3.16255	3.16205	3.2507	3.2507
3¼-12	UN	2A	3.2352	3.2481	3.19400	3.2238	3.2481	3.18770	3.18770	3.2481	3.2481
			3.2346	3.2487	3.19375	3.2232	3.2487	3.18795	3.18745	3.2487	3.2487
		3A	3.2371	3.2500	3.19590	3.2273	3.2500	3.19120	3.19120	3.2500	3.2500
			3.2365	3.2506	3.19565	3.2267	3.2506	3.19145	3.19095	3.2506	3.2506
3¼-16	UN	2A	3.2378	3.2483	3.20770	3.2292	3.2483	3.20210	3.20210	3.2483	3.2483
			3.2372	3.2489	3.20745	3.2286	3.2489	3.20235	3.20185	3.2489	3.2489
		3A	3.2395	3.2500	3.20940	3.2323	3.2500	3.20520	3.20520	3.2500	3.2500
			3.2389	3.2506	3.20915	3.2317	3.2506	3.20545	3.20495	3.2506	3.2506
3⅜-12	UN	2A	3.3602	3.3731	3.31900	3.3487	3.3731	3.31270	3.31270	3.3731	3.3731
			3.3596	3.3737	3.31875	3.3481	3.3737	3.31295	3.31245	3.3737	3.3737
		3A	3.3621	3.3750	3.32090	3.3522	3.3750	3.31620	3.31620	3.3750	3.3750
			3.3615	3.3756	3.32065	3.3516	3.3756	3.31645	3.31595	3.3756	3.3756

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go[1]	Not go[2]
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
3⅜-16	UN	2A	3.3628	3.3733	3.33270	3.3540	3.3733	3.32690	3.32690	3.3733	3.3733
			3.3622	3.3739	3.33245	3.3534	3.3739	3.32715	3.32665	3.3739	3.3739
		3A	3.3645	3.3750	3.33440	3.3572	3.3750	3.33010	3.33010	3.3750	3.3750
			3.3639	3.3756	3.33415	3.3566	3.3756	3.33035	3.32985	3.3756	3.3756
3½-4	UNC	1A	3.4686	3.4967	3.33430	3.4260	3.4967	3.31770	3.31770	3.4967	3.4967
			3.4677	3.4976	3.33405	3.4251	3.4976	3.31795	3.31745	3.4976	3.4976
		2A	3.4686	3.4967	3.33430	3.4316	3.4967	3.32330	3.32330	3.4967	3.4967
			3.4677	3.4976	3.33405	3.4307	3.4976	3.32355	3.32305	3.4976	3.4976
		3A	3.4719	3.5000	3.33760	3.4376	3.5000	3.32930	3.32930	3.5000	3.5000
			3.4710	3.5009	3.33735	3.4367	3.5009	3.32955	3.32905	3.5009	3.5009
3½-8	N	2A	3.4803	3.4974	3.41620	3.4615	3.4974	3.40740	3.40740	3.4974	3.4974
			3.4796	3.4981	3.41595	3.4608	3.4981	3.40765	3.40715	3.4981	3.4981
		3A	3.4829	3.5000	3.41880	3.4663	3.5000	3.41220	3.41220	3.5000	3.5000
			3.4822	3.5007	3.41855	3.4656	3.5007	3.41245	3.41195	3.5007	3.5007
3½-12	UN	2A	3.4852	3.4981	3.44400	3.4737	3.4981	3.43760	3.43760	3.4981	3.4981
			3.4846	3.4987	3.44375	3.4731	3.4987	3.43785	3.43735	3.4987	3.4987
		3A	3.4871	3.5000	3.44590	3.4772	3.5000	3.44110	3.44110	3.5000	3.5000
			3.4865	3.5006	3.44565	3.4766	3.5006	3.44135	3.44085	3.5006	3.5006
3½-16	UN	2A	3.4878	3.4983	3.45770	3.4790	3.4983	3.45190	3.45190	3.4983	3.4983
			3.4872	3.4989	3.45745	3.4784	3.4989	3.45215	3.45165	3.4989	3.4989
		3A	3.4895	3.5000	3.45940	3.4822	3.5000	3.45510	3.45510	3.5000	3.5000
			3.4889	3.5006	3.45915	3.4816	3.5006	3.45535	3.45485	3.5006	3.5006
3⅝-12	UN	2A	3.6102	3.6231	3.56900	3.5987	3.6231	3.56260	3.56260	3.6231	3.6231
			3.6096	3.6237	3.56875	3.5981	3.6237	3.56285	3.56235	3.6237	3.6237
		3A	3.6121	3.6250	3.57090	3.6022	3.6250	3.56610	3.56610	3.6250	3.6250
			3.6115	3.6256	3.57065	3.6016	3.6256	3.56635	3.56585	3.6256	3.6256
3⅝-16	UN	2A	3.6128	3.6233	3.58270	3.6040	3.6233	3.57690	3.57690	3.6233	3.6233
			3.6122	3.6239	3.58245	3.6034	3.6239	3.57715	3.57665	3.6239	3.6239
		3A	3.6145	3.6250	3.58440	3.6072	3.6250	3.58010	3.58010	3.6250	3.6250
			3.6139	3.6256	3.58415	3.6066	3.6256	3.58035	3.57985	3.6256	3.6256
3¾-4	UNC	1A	3.7185	3.7466	3.58420	3.6756	3.7466	3.56740	3.56740	3.7466	3.7466
			3.7176	3.7475	3.58395	3.6747	3.7475	3.56765	3.56715	3.7475	3.7475
		2A	3.7185	3.7466	3.58420	3.6812	3.7466	3.57300	3.57300	3.7466	3.7466
			3.7176	3.7475	3.58395	3.6803	3.7475	3.57325	3.57275	3.7475	3.7475
		3A	3.7219	3.7500	3.58760	3.6874	3.7500	3.57920	3.57920	3.7500	3.7500
			3.7210	3.7509	3.58735	3.6865	3.7509	3.57945	3.57895	3.7509	3.7509
3¾-8	N	2A	3.7302	3.7473	3.66610	3.7112	3.7473	3.65710	3.65710	3.7473	3.7473
			3.7295	3.7480	3.66585	3.7105	3.7480	3.65735	3.65685	3.7480	3.7480
		3A	3.7329	3.7500	3.66880	3.7162	3.7500	3.66210	3.66210	3.7500	3.7500
			3.7322	3.7507	3.66855	3.7155	3.7507	3.66235	3.66185	3.7507	3.7507
3¾-12	UN	2A	3.7352	3.7481	3.69400	3.7237	3.7481	3.68760	3.68760	3.7481	3.7481
			3.7346	3.7487	3.69375	3.7231	3.7487	3.68785	3.68735	3.7487	3.7487
		3A	3.7371	3.7500	3.69590	3.7272	3.7500	3.69110	3.69110	3.7500	3.7500
			3.7365	3.7506	3.69565	3.7266	3.7506	3.69135	3.69085	3.7506	3.7506
3¾-16	UN	2A	3.7378	3.7483	3.70770	3.7290	3.7483	3.70190	3.70190	3.7483	3.7483
			3.7372	3.7489	3.70745	3.7284	3.7489	3.70215	3.70165	3.7489	3.7489
		3A	3.7395	3.7500	3.70940	3.7322	3.7500	3.70510	3.70510	3.7500	3.7500
			3.7389	3.7506	3.70915	3.7316	3.7506	3.70535	3.70485	3.7506	3.7506
3⅞-12	UN	2A	3.8601	3.8730	3.81900	3.8485	3.8730	3.81240	3.81240	3.8730	3.8730
			3.8595	3.8736	3.81875	3.8479	3.8736	3.81265	3.81215	3.8736	3.8736
		3A	3.8621	3.8750	3.82090	3.8521	3.8750	3.81600	3.81600	3.8750	3.8750
			3.8615	3.8756	3.82065	3.8515	3.8756	3.81625	3.81575	3.8756	3.8756
3⅞-16	UN	2A	3.8627	3.8732	3.83270	3.8538	3.8732	3.82670	3.82670	3.8732	3.8732
			3.8621	3.8738	3.83245	3.8532	3.8738	3.82695	3.82645	3.8738	3.8738
		3A	3.8645	3.8750	3.83440	3.8571	3.8750	3.83000	3.83000	3.8750	3.8750
			3.8639	3.8756	3.83415	3.8565	3.8756	3.83025	3.82975	3.8756	3.8756
4-4	UNC	1A	3.9685	3.9966	3.83420	3.9254	3.9966	3.81720	3.81720	3.9966	3.9966
			3.9676	3.9975	3.83395	3.9245	3.9975	3.81745	3.81695	3.9975	3.9975
		2A	3.9685	3.9966	3.83420	3.9312	3.9966	3.82290	3.82290	3.9966	3.9966
			3.9676	3.9975	3.83395	3.9303	3.9975	3.82315	3.82265	3.9975	3.9975
		3A	3.9719	4.0000	3.83760	3.9371	4.0000	3.82910	3.82910	4.0000	4.0000
			3.9710	4.0009	3.83735	3.9365	4.0009	3.82935	3.82885	4.0009	4.0009
4-8	N	2A	3.9802	3.9973	3.91610	3.9611	3.9973	3.90700	3.90700	3.9973	3.9973
			3.9795	3.9980	3.91585	3.9604	3.9980	3.90725	3.90675	3.9980	3.9980
		3A	3.9829	4.0000	3.91880	3.9661	4.0000	3.91200	3.91200	4.0000	4.0000
			3.9822	4.0007	3.91855	3.9654	4.0007	3.91225	3.91175	4.0007	4.0007
4-12	UN	2A	3.9851	3.9980	3.94400	3.9735	3.9980	3.93760	3.93760	3.9980	3.9980
			3.9845	3.9986	3.94375	3.9729	3.9986	3.93785	3.93735	3.9986	3.9986
		3A	3.9871	4.0000	3.94590	3.9771	4.0000	3.94100	3.94100	4.0000	4.0000
			3.9865	4.0006	3.94565	3.9765	4.0006	3.94125	3.94075	4.0006	4.0006

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
4-16	UN	2A	3.9877	3.9982	3.95760	3.9788	3.9982	3.95170	3.95170	3.9982	3.9982
			3.9871	3.9988	3.95735	3.9782	3.9988	3.95195	3.95145	3.9988	3.9988
		3A	3.9895	4.0000	3.95940	3.9821	4.0000	3.95500	3.95500	4.0000	4.0000
			3.9889	4.0006	3.95915	3.9815	4.0006	3.95525	3.95475	4.0006	4.0006
4¼-8	N	2A	4.2301	4.2472	4.1660	4.2108	4.2472	4.1567	4.1567	4.2472	4.2472
			4.2290	4.2483	4.1657	4.2097	4.2483	4.1570	4.1564	4.2483	4.2483
		3A	4.2329	4.2500	4.1688	4.2159	4.2500	4.1618	4.1618	4.2500	4.2500
			4.2318	4.2511	4.1685	4.2148	4.2511	4.1621	4.1615	4.2511	4.2511
4¼-12	UN	2A	4.2351	4.2480	4.1939	4.2235	4.2480	4.1874	4.1874	4.2480	4.2480
			4.2342	4.2489	4.1936	4.2226	4.2489	4.1877	4.1871	4.2489	4.2489
		3A	4.2371	4.2500	4.1959	4.2271	4.2500	4.1910	4.1910	4.2500	4.2500
			4.2362	4.2509	4.1956	4.2262	4.2509	4.1913	4.1907	4.2509	4.2509
4¼-16	UN	2A	4.2377	4.2482	4.2076	4.2288	4.2482	4.2017	4.2017	4.2482	4.2482
			4.2368	4.2491	4.2073	4.2279	4.2491	4.2020	4.2014	4.2491	4.2491
		3A	4.2395	4.2500	4.2094	4.2321	4.2500	4.2050	4.2050	4.2500	4.2500
			4.2386	4.2509	4.2091	4.2312	4.2509	4.2053	4.2047	4.2509	4.2509
4½-8	N	2A	4.4801	4.4972	4.4160	4.4607	4.4972	4.4066	4.4066	4.4972	4.4972
			4.4790	4.4983	4.4157	4.4596	4.4983	4.4069	4.4063	4.4983	4.4983
		3A	4.4829	4.5000	4.4188	4.4658	4.5000	4.4117	4.4117	4.5000	4.5000
			4.4818	4.5011	4.4185	4.4647	4.5011	4.4120	4.4114	4.5011	4.5011
4½-12	UN	2A	4.4851	4.4980	4.4439	4.4735	4.4980	4.4374	4.4374	4.4980	4.4980
			4.4842	4.4989	4.4436	4.4726	4.4989	4.4377	4.4371	4.4989	4.4989
		3A	4.4871	4.5000	4.4459	4.4771	4.5000	4.4410	4.4410	4.5000	4.5000
			4.4862	4.5009	4.4456	4.4762	4.5009	4.4413	4.4407	4.5009	4.5009
4½-16	UN	2A	4.4877	4.4982	4.4576	4.4788	4.4982	4.4517	4.4517	4.4982	4.4982
			4.4868	4.4991	4.4573	4.4779	4.4991	4.4520	4.4514	4.4991	4.4991
		3A	4.4895	4.5000	4.4594	4.4821	4.5000	4.4550	4.4550	4.5000	4.5000
			4.4886	4.5009	4.4591	4.4812	4.5009	4.4553	4.4547	4.5009	4.5009
4¾-8	N	2A	4.7300	4.7471	4.6659	4.7105	4.7471	4.6564	4.6564	4.7471	4.7471
			4.7289	4.7482	4.6656	4.7094	4.7482	4.6567	4.6561	4.7482	4.7482
		3A	4.7329	4.7500	4.6688	4.7157	4.7500	4.6616	4.6616	4.7500	4.7500
			4.7318	4.7511	4.6685	4.7146	4.7511	4.6619	4.6613	4.7511	4.7511
4¾-12	UN	2A	4.7351	4.7480	4.6939	4.7233	4.7480	4.6872	4.6872	4.7480	4.7480
			4.7342	4.7489	4.6936	4.7224	4.7489	4.6875	4.6869	4.7489	4.7489
		3A	4.7371	4.7500	4.6959	4.7270	4.7500	4.6909	4.6909	4.7500	4.7500
			4.7362	4.7509	4.6956	4.7261	4.7509	4.6912	4.6906	4.7509	4.7509
4¾-16	UN	2A	4.7377	4.7482	4.7076	4.7286	4.7482	4.7015	4.7015	4.7482	4.7482
			4.7368	4.7491	4.7073	4.7277	4.7491	4.7018	4.7012	4.7491	4.7491
		3A	4.7395	4.7500	4.7094	4.7320	4.7500	4.7049	4.7049	4.7500	4.7500
			4.7386	4.7509	4.7091	4.7311	4.7509	4.7052	4.7046	4.7509	4.7509
5-8	N	2A	4.9800	4.9971	4.9159	4.9603	4.9971	4.9062	4.9062	4.9971	4.9971
			4.9789	4.9982	4.9156	4.9592	4.9982	4.9065	4.9059	4.9982	4.9982
		3A	4.9829	5.0000	4.9188	4.9657	5.0000	4.9116	4.9116	5.0000	5.0000
			4.9818	5.0011	4.9185	4.9646	5.0011	4.9119	4.9113	5.0011	5.0011
5-12	UN	2A	4.9851	4.9980	4.9439	4.9733	4.9980	4.9372	4.9372	4.9980	4.9980
			4.9842	4.9989	4.9436	4.9724	4.9989	4.9375	4.9369	4.9989	4.9989
		3A	4.9871	5.0000	4.9459	4.9770	5.0000	4.9409	4.9409	5.0000	5.0000
			4.9862	5.0009	4.9456	4.9761	5.0009	4.9412	4.9406	5.0009	5.0009
5-16	UN	2A	4.9877	4.9982	4.9576	4.9786	4.9982	4.9515	4.9515	4.9982	4.9982
			4.9868	4.9991	4.9573	4.9777	4.9991	4.9518	4.9512	4.9991	4.9991
		3A	4.9895	5.0000	4.9594	4.9820	5.0000	4.9549	4.9549	5.0000	5.0000
			4.9886	5.0009	4.9591	4.9811	5.0009	4.9552	4.9546	5.0009	5.0009
5¼-8	N	2A	5.2300	5.2471	5.1659	5.2102	5.2471	5.1561	5.1561	5.2471	5.2471
			5.2289	5.2482	5.1656	5.2091	5.2482	5.1564	5.1558	5.2482	5.2482
		3A	5.2329	5.2500	5.1688	5.2156	5.2500	5.1615	5.1615	5.2500	5.2500
			5.2318	5.2511	5.1685	5.2145	5.2511	5.1618	5.1612	5.2511	5.2511
5¼-12	UN	2A	5.2351	5.2480	5.1939	5.2233	5.2480	5.1872	5.1872	5.2480	5.2480
			5.2342	5.2489	5.1936	5.2224	5.2489	5.1875	5.1869	5.2489	5.2489
		3A	5.2371	5.2500	5.1959	5.2270	5.2500	5.1909	5.1909	5.2500	5.2500
			5.2362	5.2509	5.1956	5.2261	5.2509	5.1912	5.1906	5.2509	5.2509
5¼-16	UN	2A	5.2377	5.2482	5.2076	5.2286	5.2482	5.2015	5.2015	5.2482	5.2482
			5.2368	5.2491	5.2073	5.2277	5.2491	5.2018	5.2012	5.2491	5.2491
		3A	5.2395	5.2500	5.2094	5.2320	5.2500	5.2049	5.2049	5.2500	5.2500
			5.2386	5.2509	5.2091	5.2311	5.2509	5.2052	5.2046	5.2509	5.2509
5½-8	N	2A	5.4799	5.4970	5.4158	5.4600	5.4970	5.4059	5.4059	5.4970	5.4970
			5.4788	5.4981	5.4155	5.4589	5.4981	5.4062	5.4056	5.4981	5.4981
		3A	5.4829	5.5000	5.4188	5.4655	5.5000	5.4114	5.4114	5.5000	5.5000
			5.4818	5.5011	5.4185	5.4644	5.5011	5.4117	5.4111	5.5011	5.5011

See footnotes at end of table.

TABLE III.13.—*Setting plug gages, Unified and American screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tolerance gage	Minus tolerance gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
5½-12	UN	2A	5.4851	5.4980	5.4439	5.4733	5.4980	5.4372	5.4372	5.4980	5.4980
			5.4842	5.4989	5.4436	5.4724	5.4989	5.4375	5.4369	5.4989	5.4989
		3A	5.4871	5.5000	5.4459	5.4770	5.5000	5.4409	5.4409	5.5000	5.5000
			5.4862	5.5009	5.4456	5.4761	5.5009	5.4412	5.4406	5.5009	5.5009
5½-16	UN	2A	5.4877	5.4982	5.4576	5.4786	5.4982	5.4515	5.4515	5.4982	5.4982
			5.4868	5.4991	5.4573	5.4777	5.4991	5.4518	5.4512	5.4991	5.4991
		3A	5.4895	5.5000	5.4594	5.4820	5.5000	5.4549	5.4549	5.5000	5.5000
			5.4886	5.5009	5.4591	5.4811	5.5009	5.4552	5.4546	5.5009	5.5009
5¾-8	N	2A	5.7299	5.7470	5.6658	5.7099	5.7470	5.6558	5.6558	5.7470	5.7470
			5.7288	5.7481	5.6655	5.7088	5.7481	5.6561	5.6555	5.7481	5.7481
		3A	5.7329	5.7500	5.6688	5.7154	5.7500	5.6613	5.6613	5.7500	5.7500
			5.7318	5.7511	5.6685	5.7143	5.7511	5.6616	5.6610	5.7511	5.7511
5¾-12	UN	2A	5.7350	5.7479	5.6938	5.7230	5.7479	5.6869	5.6869	5.7479	5.7479
			5.7341	5.7488	5.6935	5.7221	5.7488	5.6872	5.6866	5.7488	5.7488
		3A	5.7371	5.7500	5.6959	5.7268	5.7500	5.6907	5.6907	5.7500	5.7500
			5.7362	5.7509	5.6956	5.7259	5.7509	5.6910	5.6904	5.7509	5.7509
5¾-16	UN	2A	5.7376	5.7481	5.7075	5.7284	5.7481	5.7013	5.7013	5.7481	5.7481
			5.7367	5.7490	5.7072	5.7275	5.7490	5.7016	5.7010	5.7490	5.7490
		3A	5.7395	5.7500	5.7094	5.7318	5.7500	5.7047	5.7047	5.7500	5.7500
			5.7386	5.7509	5.7091	5.7309	5.7509	5.7050	5.7044	5.7509	5.7509
6-8	N	2A	5.9799	5.9970	5.9158	5.9597	5.9970	5.9056	5.9056	5.9970	5.9970
			5.9788	5.9981	5.9155	5.9586	5.9981	5.9059	5.9053	5.9981	5.9981
		3A	5.9829	6.0000	5.9188	5.9653	6.0000	5.9112	5.9112	6.0000	6.0000
			5.9818	6.0011	5.9185	5.9642	6.0011	5.9115	5.9109	6.0011	6.0011
6-12	UN	2A	5.9850	5.9979	5.9438	5.9730	5.9979	5.9369	5.9369	5.9979	5.9979
			5.9841	5.9988	5.9435	5.9721	5.9988	5.9372	5.9366	5.9988	5.9988
		3A	5.9871	6.0000	5.9459	5.9768	6.0000	5.9407	5.9407	6.0000	6.0000
			5.9862	6.0009	5.9456	5.9759	6.0009	5.9410	5.9404	6.0009	6.0009
6-16	UN	2A	5.9876	5.9981	5.9575	5.9784	5.9981	5.9513	5.9513	5.9981	5.9981
			5.9867	5.9990	5.9572	5.9775	5.9990	5.9516	5.9510	5.9990	5.9990
		3A	5.9895	6.0000	5.9594	5.9818	6.0000	5.9547	5.9547	6.0000	6.0000
			5.9888	6.0009	5.9591	5.9809	6.0009	5.9550	5.9544	6.0009	6.0009

[1] Pitch diameter limits of W basic-crest setting plug gages are given in column 6 of this table. Pitch diameter limits of X basic-crest setting plug gages are given in column 4 of table III.12.

[2] Pitch diameter limits of W basic-crest setting plug gages are given in columns 9 and 10 of this table. Pitch diameter limits of X basic-crest setting plug gages are given in columns 6 and 7 of table III.12.

8. SIZES OF TAP DRILLS

When it is important that the minor diameter of an internal thread conform to specified limits it may be necessary to use a reamer to finish the hole. However, a drill often can be made to cut sufficiently accurately for this requirement. A variety of factors enter into the production of a clean, round, straight hole of the correct diameter. For a discussion of these and other data on drilling and tapping reference should be made to "Drilled Holes for Tapping," published by the Drill and Reamer Division and the Tap and Die Division of the Metal Cutting Tool Institute.[6]

Table III.14 gives minor diameter limits and corresponding percentages of basic thread height, ¾H, for all standard series threads to and including 3¾ in. diameter, classes 1B and 2B. Table III.15 is a similar table for class 3B. These tables also list sizes of drills that may be expected to drill holes within or near the specified minor diameter limits. The diameter of the drill, the probable hole size, and the corresponding percentages of basic thread height are tabulated.

As a drill may normally be expected to cut oversize, probable hole sizes are tabulated that are derived from probable mean oversizes, also tabulated. The following is quoted from the above-mentioned report: "These oversizes were determined from a series of tests conducted by a number of drill manufacturers. Using six sizes of drills ranging from ⅛ to 1 in. a total of 2,808 holes were drilled in cast iron and steel. Commercial high speed drills were used and the drilling equipment was of the same type and condition that is normally encountered in metal working shops. The average depth of hole drilled was equal to 1½ times the drill diameter, and the measurement of the hole was made at the midpoint of the depth drilled. . . . With good drilling practices and with reasonable care in the resharpening of drills the average user may expect to drill oversize in the same manner."

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[6] Address: 3114 Chrysler Bldg., 405 Lexington Ave., New York 17, N. Y.

TABLE III.14.—*Tap drill sizes, Unified and American screw threads, classes 1B and 2B*

Thread size		Threads per inch	Designation	Classes 1B and 2B minor diameter, internal threads				Tap drills and percent basic thread height					
				Minimum	Percent basic thread height	Maximum	Percent basic thread height	Nominal size	Diameter	Theoretical percent of thread	Probable oversize, mean	Probable hole size	Percent of thread
No.	*in.*			*in.*		*in.*			*in.*		*in.*	*in.*	
0	0.060	80	NF	0.0465	83.1	0.0514	52.9	#56	0.0465	83	0.0015	0.0480	74
								3/64 in.	.0469	81	.0015	.0484	71
‡1	.073	64	NC	.0561	83.3	.0623	52.7	#54	.0550	89	.0015	.0565	81
								#53	.0595	67	.0015	.0610	59
‡1	.073	72	NF	.0580	83.1	.0635	52.7	#53	.0595	75	.0015	.0610	67
								1/16 in.	.0625	58	.0015	.0640	50
2	.086	56	NC	.0667	83.2	.0737	53.0	#51	.0670	82	.0017	.0687	75
								#50	.0700	69	.0017	.0717	62
								#49	.0730	56	.0017	.0747	49
2	.086	64	NF	.0691	83.3	.0753	52.7	#50	.0700	79	.0017	.0717	70
								#49	.0730	64	.0017	.0747	56
3	.099	48	NC	.0764	83.5	.0845	53.6	#48	.0760	85	.0019	.0779	78
								5/64 in.	.0781	77	.0019	.0800	70
								#47	.0785	76	.0019	.0804	69
								#46	.0810	67	.0019	.0829	60
								#45	.0820	63	.0019	.0839	56
3	.099	56	NF	.0797	83.2	.0865	53.9	#46	.0810	78	.0019	.0829	69
								#45	.0820	73	.0019	.0839	65
								#44	.0860	56	.0019	.0879	48
4	.112	40	NC	.0849	83.4	.0939	55.7	#44	.0860	80	.0019	.0879	74
								#43	.0890	71	.0020	.0910	65
								#42	.0935	57	.0020	.0955	51
								3/32 in.	.0938	56	.0020	.0958	50
4	.112	48	NF	.0894	83.5	.0968	56.2	#43	.0890	85	.0020	.0910	78
								#42	.0935	68	.0020	.0955	61
								3/32 in.	.0938	67	.0020	.0958	60
								#41	.0960	59	.0020	.0980	52
5	.125	40	NC	.0979	83.4	.1062	57.9	#40	.0980	83	.0023	.1003	76
								#39	.0995	79	.0023	.1018	71
								#38	.1015	72	.0023	.1038	65
								#37	.1040	65	.0023	.1063	58
5	.125	44	NF	.1004	83.3	.1079	57.9	#38	.1015	80	.0023	.1038	72
								#37	.1040	71	.0023	.1063	63
								#36	.1065	63	.0023	.1088	55
6	.138	32	NC	.104	83.8	.114	59.1	#37	.1040	84	.0023	.1063	78
								#36	.1065	78	.0023	.1088	72
								7/64 in.	.1094	70	.0026	.1120	64
								#35	.1100	69	.0026	.1126	63
								#34	.1110	67	.0026	.1136	60
								#33	.1130	62	.0026	.1156	55
6	.138	40	NF	.111	83.1	.119	58.5	#34	.1110	83	.0026	.1136	75
								#33	.1130	77	.0026	.1156	69
								#32	.1160	68	.0026	.1186	60
8	.164	32	NC	.130	83.8	.139	61.6	#29	.1360	69	.0029	.1389	62
8	.164	36	NF	.134	83.1	.142	61.0	#29	.1360	78	.0029	.1389	70
								#28	.1405	65	.0029	.1434	57
								9/64 in.	.1406	65	.0029	.1435	57
10	.190	24	NC	.145	83.1	.156	62.8	#27	.1440	85	.0032	.1472	79
								#26	.1470	79	.0032	.1502	74
								#25	.1495	75	.0032	.1527	69
								#24	.1520	70	.0032	.1552	64
								#23	.1540	66	.0032	.1572	61
10	.190	32	NF	.156	83.8	.164	64.1	5/32 in.	.1562	83	.0032	.1594	75
								#22	.1570	81	.0032	.1602	73
								#21	.1590	76	.0032	.1622	68
								#20	.1610	71	.0032	.1642	64
12	.216	24	NC	.171	83.1	.181	64.7	11/64 in.	.1719	82	.0035	.1754	75
								#17	.1730	79	.0035	.1765	73
								#16	.1770	72	.0035	.1805	66
								#15	.1800	67	.0035	.1835	60
12	.216	28	NF	.177	84.1	.186	64.7	#16	.1770	84	.0035	.1805	77
								#15	.1800	78	.0035	.1835	70
								#14	.1820	73	.0035	.1855	66
								#13	.1850	67	.0035	.1885	59
12	.216	32	NEF	.182	83.8	.190	64.0	#14	.1820	84	.0035	.1855	75
								#13	.1850	76	.0035	.1885	68
								3/16 in.	.1875	70	.0035	.1910	62
								#12	.1890	67	.0035	.1925	58
	1/4	20	UNC	.196	83.1	.207	66.2	#9	.1960	83	.0038	.1998	77
								#8	.1990	79	.0038	.2028	73
								#7	.2010	75	.0038	.2048	70
								13/64 in.	.2031	72	.0038	.2069	66
								#6	.2040	71	.0038	.2078	65
								#5	.2055	69	.0038	.2093	63
	1/4	28	UNF	.211	84.1	.220	64.7	#3	.2130	80	.0038	.2168	72
								7/32 in.	.2188	67	.0038	.2226	59
	1/4	32	NEF	.216	83.8	.224	64.1	7/32 in.	.2188	77	.0038	.2226	67
								#2	.2210	71	.0038	.2248	62
	1/4	36	UNS	.220	83.1	.226	66.5	#2	.2210	80	.0038	.2248	70
	5/16	18	UNC	.252	83.8	.265	65.8	F	.2570	77	.0038	.2608	72
								G	.2610	71	.0041	.2651	66
	5/16	24	UNF	.267	84.1	.277	65.6	H	.2660	86	.0041	.2701	78
								I	.2720	75	.0041	.2761	67
								J	.2770	66	.0041	.2811	58
	5/16	32	NEF	.279	82.5	.286	65.3	K	.2810	78	.0042	.2852	67
								9/32 in.	.2812	77	.0042	.2854	67
	5/16	36	UNS	.292	84.5	.299	65.1	7.25 mm	.2854	75	.0042	.2896	63
	3/8	16	UNC	.307	83.8	.321	66.5	5/16 in.	.3125	77	.0044	.3169	72
								O	.3160	73	.0044	.3204	67
	3/8	24	UNF	.330	83.1	.340	64.7	Q	.3320	79	.0044	.3364	71
								R	.3390	67	.0044	.3434	58
	3/8	32	NEF	.341	83.8	.349	64.1	11/32 in.	.3438	77	.0045	.3483	66
								S	.3480	67	.0045	.3525	55

TABLE III.14.—*Tap drill sizes, Unified and American screw threads, classes 1B and 2B*—Continued

Thread size	Threads per inch	Designation	Classes 1B and 2B minor diameter, internal threads				Tap drills and percent basic thread height					
			Minimum	Percent basic thread height	Maximum	Percent basic thread height	Nominal size	Diameter	Theoretical percent of thread	Probable oversize, mean	Probable hole size	Percent of thread
No. in.			in.		in.			in.		in.	in.	
3/8	36	UNS	0.345	83.1	0.352	63.7	S	0.3480	75	0.0045	0.3525	62
7/16	14	UNC	.360	83.5	.376	66.3	T	.3580	86	.0046	.3626	81
							23/64 in.	.3594	84	.0046	.3640	79
7/16	20	UNF	.383	83.9	.395	65.4	W	.3860	79	.0046	.3906	72
							25/64 in.	.3906	72	.0046	.3952	65
7/16	28	UNEF	.399	83.0	.407	65.7	Y	.4040	72	.0046	.4086	62
1/2	12	N	.410	83.1	.428	66.5	Z	.4130	80	.0047	.4177	76
							27/64 in.	.4219	72	.0047	.4266	68
1/2	13	UNC	.417	83.1	.434	66.1	27/64 in.	.4219	78	.0047	.4266	73
1/2	20	UNF	.439	83.1	.457	66.2	29/64 in.	.4531	72	.0047	.4578	65
1/2	28	UNEF	.461	84.1	.470	64.7	15/32 in.	.4688	67	.0048	.4736	57
9/16	12	UNC	.472	83.6	.490	67.0	15/32 in.	.4688	87	.0048	.4736	82
							31/64 in.	.4844	72	.0048	.4892	68
9/16	18	UNF	.502	83.8	.515	65.8	1/2 in.	.5000	87	.0048	.5048	80
							0.5062 in.	.5062	78	.0048	.5110	71
9/16	24	NEF	.517	84.1	.527	65.6	33/64 in.	.5156	87	.0048	.5204	78
							0.5203 in.	.5203	78	.0048	.5251	69
9/16	28	UNS	.524	83.0	.532	65.7	17/32 in.	.5312	67	.0049	.5361	57
							0.5263 in.	.5263	78	.0049	.5312	67
5/8	11	UNC	.527	83.0	.546	66.9	17/32 in.	.5312	79	.0049	.5362	75
5/8	12	N	.535	83.1	.553	66.5	35/64 in.	.5469	72	.0049	.5518	68
5/8	18	UNF	.565	83.1	.578	65.1	9/16 in.	.5625	87	.0049	.5674	80
							0.5687 in.	.5687	78	.0049	.5736	71
5/8	24	NEF	.580	83.1	.590	64.7	37/64 in.	.5781	87	.0049	.5830	78
							0.5828 in.	.5828	78	.0049	.5877	69
5/8	28	UNS	.586	84.1	.595	64.7	19/32 in.	.5938	67	.0049	.5987	57
11/16	12	N	.597	83.6	.615	67.0	19/32 in.	.5938	87	.0049	.5987	82
							39/64 in.	.6094	72	.0049	.6143	68
11/16	24	NEF	.642	84.1	.652	65.6	41/64 in.	.6406	87	.0050	.6456	77
3/4	10	UNC	.642	83.1	.663	67.0	41/64 in.	.6406	84	.0050	.6456	80
							21/32 in.	.6562	72	.0050	.6612	65
3/4	12	N	.660	83.1	.678	66.5	21/32 in.	.6562	87	.0050	.6612	82
							43/64 in.	.6719	72	.0050	.6769	68
3/4	16	UNF	.682	83.8	.696	66.5	11/16 in.	.6875	77	.0050	.6925	71
3/4	20	UNEF	.696	83.1	.707	66.2	45/64 in.	.7031	72	.0051	.7082	64
3/4	28	UNS	.711	84.1	.720	64.7	23/32 in.	.7188	67	.0051	.7239	56
13/16	12	N	.722	83.6	.740	67.0	47/64 in.	.7344	72	.0051	.7395	67
13/16	16	UN	.745	83.1	.759	65.9	3/4 in.	.7500	77	.0052	.7552	71
13/16	20	UNEF	.758	83.9	.770	65.4	49/64 in.	.7656	72	.0052	.7708	64
7/8	9	UNC	.755	83.1	.778	67.2	49/64 in.	.7656	76	.0052	.7708	72
7/8	12	N	.785	83.1	.803	66.5	25/32 in.	.7812	87	.0052	.7864	82
							51/64 in.	.7969	72	.0052	.8021	67
7/8	14	UNF	.798	83.0	.814	65.7	51/64 in.	.7969	84	.0052	.8021	79
							0.8024 in.	.8024	78	.0052	.8076	[illegible]
							13/16 in.	.8125	67	.0052	.8177	62
7/8	16	UN	.807	83.8	.821	66.5	13/16 in.	.8125	77	.0053	.8178	70
7/8	20	UNEF	.821	83.1	.832	66.2	53/64 in.	.8281	72	.0054	.8335	64
7/8	28	UNS	.836	84.1	.845	64.7	27/32 in.	.8438	67	.0055	.8493	55
15/16	12	UN	.847	83.6	.865	67.0	27/32 in.	.8438	87	.0055	.8493	81
							55/64 in.	.8594	72	.0056	.8650	67
15/16	16	UN	.870	83.1	.884	65.9	7/8 in.	.8750	77	.0057	.8807	70
15/16	20	UNEF	.883	83.9	.895	65.4	57/64 in.	.8906	72	.0059	.8965	63
1	8	UNC	.865	83.1	.890	67.7	55/64 in.	.8594	87	.0059	.8653	83
							7/8 in.	.8750	77	.0059	.8809	73
1	12	UNF	.910	83.1	.928	66.5	29/32 in.	.9062	87	.0060	.9123	81
							59/64 in.	.9219	72	.0060	.9279	67
1	14	NS	.923	83.0	.938	66.8	59/64 in.	.9219	84	.0060	.9279	78
							0.9274 in.	.9274	78	.0061	.9335	72
1	16	UN	.932	83.8	.946	66.5	15/16 in.	.9375	77	.0062	.9437	69
1	20	UNEF	.946	83.1	.957	66.2	61/64 in.	.9531	72	.0063	.9594	62
1	28	UNS	.961	84.1	.970	64.7	31/32 in.	.9688	67	.0065	.9753	53
1 1/16	12	UN	.972	83.6	.990	67.0	31/32 in.	.9688	87	.0065	.9753	81
							63/64 in.	.9844	72	.0067	.9911	66
1 1/16	16	UN	.995	83.1	1.009	65.9	1 in.	1.0000	77	.0069	1.0069	68
1 1/16	18	NEF	1.002	83.8	1.015	65.8	1 in.	1.0000	87	.0069	1.0069	77
1 1/8	7	UNC	.970	83.5	.998	68.4	31/32 in.	.9688	84	.0062	.9750	81
							63/64 in.	.9844	76	.0067	.9911	72
1 1/8	8	N	.990	83.1	1.015	67.7	1 in.	1.0000	77	.0069	1.0069	73
1 1/8	12	UNF	1.035	83.1	1.053	66.5	1 1/32 in.	1.0312	87	.0071	1.0384	80
							1 3/64 in.	1.0469	72	.0072	1.0541	65
1 1/8	16	UN	1.057	83.8	1.071	66.5	1 1/16 in.	1.0625	77	.0074	1.0699	68
1 1/8	18	NEF	1.065	83.1	1.078	65.1	1 1/16 in.	1.0625	87	......	......	......
							1 5/64 in.	1.0781	65	......	......	......
1 1/8	20	UNS	1.071	83.1	1.082	66.2	1 5/64 in.	1.0781	72	......	......	......
1 1/8	28	UNS	1.086	84.1	1.095	64.7	1 3/32 in.	1.0938	67	......	......	......
1 3/16	12	UN	1.097	83.6	1.115	67.0	1 3/32 in.	1.0938	87	......	......	......
1 3/16	16	UN	1.120	83.1	1.134	65.9	1 1/8 in.	1.1250	77	......	......	......
1 3/16	18	NEF	1.127	83.8	1.140	65.8	1 1/8 in.	1.1250	87	......	......	......
							1 9/64 in.	1.1406	65	......	......	......
1 1/4	7	UNC	1.095	83.5	1.123	68.4	1 3/32 in.	1.0938	84	......	......	......
1 1/4	8	N	1.115	83.1	1.140	67.7	1 1/8 in.	1.1250	77	......	......	......
1 1/4	12	UNF	1.160	83.1	1.178	66.5	1 5/32 in.	1.1562	87	......	......	......
							1 11/64 in.	1.1719	72	......	......	......
1 1/4	16	UN	1.182	83.8	1.196	66.5	1 3/16 in.	1.1875	77	......	......	......
1 1/4	18	NEF	1.190	83.1	1.203	65.1	1 3/16 in.	1.1875	87	......	......	......
							1 13/64 in.	1.2031	65	......	......	......
1 1/4	20	UNS	1.196	83.1	1.207	66.2	1 13/64 in.	1.2031	72	......	......	......
1 5/16	12	UN	1.222	83.6	1.240	67.0	1 7/32 in.	1.2188	87	......	......	......
							1 15/64 in.	1.2344	72	......	......	......
1 5/16	16	UN	1.245	83.1	1.259	65.9	1 1/4 in.	1.2500	77	......	......	......
1 5/16	18	NEF	1.252	83.8	1.265	65.8	1 1/4 in.	1.2500	87	......	......	......
							1 17/64 in.	1.2656	65	......	......	......

TABLE III.14.—*Tap drill sizes, Unified and American screw threads, classes 1B and 2B*—Continued

Thread size	Threads per inch	Designation	Classes 1B and 2B minor diameter, internal threads				Tap drills and percent basic thread height					
			Minimum	Percent basic thread height	Maximum	Percent basic thread height	Nominal size	Diameter	Theoretical percent of thread	Probable oversize, mean	Probable hole size	Percent of thread
No. in.			*in.*		*in.*			*in.*		*in.*	*in.*	
1 3/8	6	UNC	1.195	83.1	1.225	69.3	1 3/16 in.	1.1875	87	---	---	---
							1 13/64 in.	1.2031	79	---	---	---
							1 7/32 in.	1.2188	72	---	---	---
1 3/8	8	N	1.240	83.1	1.265	67.7	1 15/64 in.	1.2344	87	---	---	---
							1 1/4 in.	1.2500	77	---	---	---
1 3/8	12	UNF	1.285	83.1	1.303	66.5	1 9/32 in.	1.2812	87	---	---	---
							1 19/64 in.	1.2969	72	---	---	---
1 3/8	16	UN	1.307	83.8	1.321	66.5	1 5/16 in.	1.3125	77	---	---	---
1 3/8	18	NEF	1.315	83.1	1.328	65.1	1 5/16 in.	1.3125	87	---	---	---
							1 21/64 in.	1.3281	65	---	---	---
1 7/16	12	UN	1.347	83.6	1.360	71.6	1 11/32 in.	1.3438	87	---	---	---
							1 23/64 in.	1.3594	72	---	---	---
1 7/16	16	UN	1.370	83.1	1.384	65.9	1 3/8 in.	1.3750	77	---	---	---
1 7/16	18	NEF	1.377	83.8	1.390	65.8	1 3/8 in.	1.3750	87	---	---	---
1 1/2	6	UNC	1.320	83.1	1.350	69.3	1 5/16 in.	1.3125	87	---	---	---
							1 21/64 in.	1.3281	79	---	---	---
1 1/2	8	N	1.365	83.1	1.390	67.7	1 23/64 in.	1.3594	87	---	---	---
							1 3/8 in.	1.3750	77	---	---	---
1 1/2	12	UNF	1.410	83.1	1.428	66.5	1 13/32 in.	1.4062	87	---	---	---
							1 27/64 in.	1.4219	72	---	---	---
1 1/2	16	UN	1.432	83.8	1.446	66.5	1 7/16 in.	1.4375	77	---	---	---
1 1/2	18	NEF	1.440	83.1	1.452	66.5	1 7/16 in.	1.4375	87	---	---	---
1 1/2	20	UNS	1.446	83.1	1.457	66.2	1 29/64 in.	1.4531	72	---	---	---
1 9/16	16	N	1.495	83.1	1.509	65.9	1 1/2 in.	1.5000	77	---	---	---
1 9/16	18	NEF	1.502	83.8	1.515	65.8	1 1/2 in.	1.5000	87	---	---	---
							1 33/64 in.	1.5156	65	---	---	---
1 5/8	8	N	1.490	83.1	1.515	67.7	1 31/64 in.	1.4844	87	---	---	---
							1 1/2 in.	1.5000	77	---	---	---
1 5/8	12	UN	1.535	83.1	1.553	66.5	1 17/32 in.	1.5312	87	---	---	---
							1 35/64 in.	1.5469	72	---	---	---
1 5/8	16	UN	1.557	83.8	1.571	66.5	1 9/16 in.	1.5625	77	---	---	---
1 5/8	18	NEF	1.565	83.1	1.578	65.1	1 9/16 in.	1.5625	87	---	---	---
							1 37/64 in.	1.5781	65	---	---	---
1 11/16	16	N	1.620	83.1	1.634	65.9	1 5/8 in.	1.6250	77	---	---	---
1 11/16	18	NEF	1.627	83.8	1.640	65.8	1 5/8 in.	1.6250	87	---	---	---
							1 41/64 in.	1.6406	65	---	---	---
1 3/4	5	UNC	1.534	83.1	1.568	76.1	1 17/32 in.	1.5312	84	---	---	---
							1 35/64 in.	1.5469	78	---	---	---
1 3/4	8	N	1.615	83.1	1.640	67.7	1 39/64 in.	1.6094	87	---	---	---
							1 5/8 in.	1.6250	77	---	---	---
							1 41/64 in.	1.6406	67	---	---	---
1 3/4	12	UN	1.660	83.1	1.678	66.5	1 21/32 in.	1.6562	87	---	---	---
							1 43/64 in.	1.6719	72	---	---	---
1 3/4	16	UNEF	1.682	83.8	1.696	66.5	1 11/16 in.	1.6875	77	---	---	---
1 3/4	20	UNS	1.696	83.1	1.707	66.2	1 45/64 in.	1.7031	72	---	---	---
1 13/16	16	N	1.745	83.1	1.759	65.9	1 3/4 in.	1.7500	77	---	---	---
1 7/8	8	N	1.740	83.1	1.765	67.7	1 3/4 in.	1.7500	77	---	---	---
1 7/8	12	UN	1.785	83.1	1.803	66.5	1 25/32 in.	1.7812	87	---	---	---
							1 51/64 in.	1.7969	72	---	---	---
1 7/8	16	UN	1.807	83.8	1.821	66.5	1 13/16 in.	1.8125	77	---	---	---
1 15/16	16	N	1.870	83.1	1.884	65.9	1 7/8 in.	1.8750	77	---	---	---
2	4 1/2	UNC	1.759	83.5	1.795	71.0	1 25/32 in.	1.7812	76	---	---	---
2	8	N	1.865	83.1	1.890	67.7	1 7/8 in.	1.8750	77	---	---	---
2	12	UN	1.910	83.1	1.928	66.5	1 29/32 in.	1.9062	87	---	---	---
							1 59/64 in.	1.9219	72	---	---	---
2	16	UNEF	1.932	83.8	1.946	66.5	1 15/16 in.	1.9375	77	---	---	---
2	20	UNS	1.946	83.1	1.957	66.2	1 61/64 in.	1.9531	72	---	---	---
2 1/16	16	N	1.995	83.1	2.009	65.9	2 in.	2.0000	77	---	---	---
2 1/8	8	N	1.990	83.1	2.015	67.7	2 in.	2.0000	77	---	---	---
2 1/8	12	UN	2.035	83.1	2.053	66.5	2 1/32 in.	2.0312	87	---	---	---
2 1/8	16	UN	2.057	83.8	2.071	66.5	2 1/16 in.	2.0625	77	---	---	---
2 3/16	16	N	2.120	83.1	2.134	65.9	2 1/8 in.	2.1250	77	---	---	---
2 1/4	4 1/2	UNC	2.009	83.5	2.045	71.0	2 in.	2.0000	87	---	---	---
							2 1/32 in.	2.0312	76	---	---	---
2 1/4	8	N	2.115	83.1	2.140	67.7	2 1/8 in.	2.1250	77	---	---	---
2 1/4	12	UN	2.160	83.1	2.178	66.5	2 5/32 in.	2.1562	87	---	---	---
2 1/4	16	UN	2.182	83.8	2.196	66.5	2 3/16 in.	2.1875	77	---	---	---
2 1/4	20	UNS	2.196	83.1	2.207	66.2	2 3/16 in.	2.1875	96	---	---	---
2 5/16	16	N	2.245	83.1	2.259	65.9	2 1/4 in.	2.2500	77	---	---	---
2 3/8	12	UN	2.285	83.1	2.303	66.5	---	---	---	---	---	---
2 3/8	16	UN	2.307	83.8	2.321	66.5	2 5/16 in.	2.3125	77	---	---	---
2 7/16	16	N	2.370	83.1	2.384	65.9	2 3/8 in.	2.3750	77	---	---	---
2 1/2	4	UNC	2.229	83.4	2.267	71.7	2 7/32 in.	2.2188	87	---	---	---
							2 1/4 in.	2.2500	77	---	---	---
2 1/2	8	N	2.365	83.1	2.390	67.7	2 3/8 in.	2.3750	77	---	---	---
2 1/2	12	UN	2.410	83.1	2.428	66.5	---	---	---	---	---	---
2 1/2	16	UN	2.432	83.8	2.446	66.5	2 7/16 in.	2.4375	77	---	---	---
2 5/8	12	UN	2.535	83.1	2.553	66.5	---	---	---	---	---	---
2 5/8	16	UN	2.557	83.8	2.571	66.5	2 9/16 in.	2.5625	77	---	---	---
2 3/4	4	UNC	2.479	83.4	2.517	71.7	2 1/2 in.	2.5000	77	---	---	---
2 3/4	8	N	2.615	83.1	2.640	67.7	2 5/8 in.	2.6250	77	---	---	---
2 3/4	12	UN	2.660	83.1	2.678	66.5	---	---	---	---	---	---
2 3/4	16	UN	2.682	83.8	2.696	66.5	2 11/16 in.	2.6875	77	---	---	---
2 7/8	12	UN	2.785	83.1	2.803	66.5	2 3/4 in.	2.7500	115	---	---	---
2 7/8	16	UN	2.807	83.8	2.821	66.5	2 13/16 in.	2.8125	77	---	---	---
3	4	UNC	2.729	83.4	2.767	71.7	2 3/4 in.	2.7500	77	---	---	---
3	8	N	2.865	83.1	2.890	67.7	2 7/8 in.	2.8750	77	---	---	---
3	12	UN	2.910	83.1	2.928	66.5	---	---	---	---	---	---
3	16	UN	2.932	83.8	2.946	66.5	2 15/16 in.	2.9375	77	---	---	---
3 1/4	4	UNC	2.979	83.4	3.017	71.7	3 in.	3.0000	77	---	---	---
3 1/2	4	UNC	3.229	83.4	3.267	71.7	3 1/4 in.	3.2500	77	---	---	---
3 3/4	4	UNC	3.479	83.4	3.517	71.7	3 1/2 in.	3.5000	77	---	---	---

TABLE III.15.—*Tap drill sizes, Unified and American screw threads, class 3B*

Thread size		Threads per inch	Designation	Class 3B minor diameter, internal threads				Tap drills and percent basic thread height					
				Minimum	Percent basic thread height	Maximum	Percent basic thread height	Nominal size	Diameter	Theoretical percent of thread	Probable oversize, mean	Probable hole size	Percent of thread
No.	*in.*			*in.*		*in.*			*in.*		*in.*	*in.*	
0	0.060	80	NF	0.0465	83.1	0.0514	52.9	#56	0.0465	83	0.0015	0.0480	74
								3/64 in.	.0469	81	.0015	.0484	71
1	.073	64	NC	.0561	83.3	.0623	52.7	#54	.0550	89	.0015	.0565	81
								#53	.0595	67	.0015	.0610	59
1	.073	72	NF	.0580	83.1	.0635	52.7	#53	.0595	75	.0015	.0610	67
								1/16 in.	.0625	58	.0015	.0640	50
2	.086	56	NC	.0667	83.2	.0737	53.0	#51	.0670	82	.0017	.0687	75
								#50	.0700	69	.0017	.0717	62
								#49	.0730	56	.0017	.0747	49
2	.086	64	NF	.0691	83.3	.0753	52.7	#50	.0700	79	.0017	.0717	70
								#49	.0730	64	.0017	.0747	56
3	.099	48	NC	.0764	83.5	.0845	53.6	#48	.0760	85	.0019	.0779	78
								5/64 in.	.0781	77	.0019	.0800	70
								#47	.0785	76	.0019	.0804	69
								#46	.0810	67	.0019	.0829	60
								#45	.0820	63	.0019	.0839	56
3	.099	56	NF	.0797	83.2	.0865	53.9	#46	.0810	78	.0019	.0829	69
								#45	.0820	73	.0019	.0839	65
								#44	.0860	56	.0019	.0879	48
4	.112	40	NC	.0849	83.4	.0939	55.7	#44	.0860	80	.0019	.0879	74
								#43	.0890	71	.0020	.0910	65
								#42	.0935	57	.0020	.0955	51
								3/32 in.	.0938	56	.0020	.0958	50
4	.112	48	NF	.0894	83.5	.0968	56.2	#43	.0890	85	.0020	.0910	78
								#42	.0935	68	.0020	.0955	61
								3/32 in.	.0938	67	.0020	.0958	60
								#41	.0960	59	.0020	.0980	52
5	.125	40	NC	.0979	83.4	.1062	57.9	#40	.0980	83	.0023	.1003	76
								#39	.0995	79	.0023	.1018	71
								#38	.1015	72	.0023	.1038	65
								#37	.1040	65	.0023	.1063	58
5	.125	44	NF	.1004	83.3	.1079	57.0	#38	.1015	80	.0023	.1038	72
								#37	.1040	71	.0023	.1063	63
								#36	.1065	63	.0023	.1088	55
6	.138	32	NC	.1040	83.8	.1140	59.1	#37	.1040	84	.0023	.1063	78
								#36	.1065	78	.0023	.1088	72
								7/64 in.	.1094	70	.0026	.1120	64
								#35	.1100	69	.0026	.1126	63
								#34	.1110	67	.0026	.1136	60
								#33	.1130	62	.0026	.1156	55
6	.138	40	NF	.1110	83.1	.1186	59.7	#34	.1110	83	.0026	.1136	75
								#33	.1130	77	.0026	.1156	69
								#32	.1160	68	.0026	.1186	60
8	.164	32	NC	.1300	83.8	.1389	61.8	#29	.1360	69	.0029	.1389	62
8	.164	36	NF	.1340	83.1	.1416	62.1	#29	.1360	78	.0029	.1389	70
								#28	.1405	65	.0029	.1434	57
								9/64 in.	.1406	65	.0029	.1435	57
10	.190	24	NC	.1450	83.1	.1555	63.7	#27	.1440	85	.0032	.1472	79
								#26	.1470	79	.0032	.1502	74
								#25	.1495	75	.0032	.1527	69
								#24	.1520	70	.0032	.1552	64
								#23	.1540	66	.0032	.1572	61
10	.190	32	NF	.1560	83.8	.1641	63.8	5/32 in.	.1562	83	.0032	.1594	76
								#22	.1570	81	.0032	.1602	73
								#21	.1590	76	.0032	.1622	68
								#20	.1610	71	.0032	.1642	64
12	.216	24	NC	.1710	83.1	.1807	65.2	11/64 in.	.1719	82	.0035	.1754	76
								#17	.1730	79	.0035	.1765	73
								#16	.1770	72	.0035	.1805	66
								#15	.1800	67	.0035	.1835	60
12	.216	28	NF	.1770	84.1	.1857	65.3	#16	.1770	84	.0035	.1805	77
								#15	.1800	78	.0035	.1835	70
								#14	.1820	73	.0035	.1855	66
								#13	.1850	67	.0035	.1885	59
12	.216	32	NEF	.1820	83.8	.1895	65.3	#14	.1820	84	.0035	.1855	75
								#13	.1850	76	.0035	.1885	68
								3/16 in.	.1875	70	.0035	.1910	62
								#12	.1890	67	.0035	.1925	58
	1/4	20	UNC	.1960	83.1	.2067	66.7	#9	.1960	83	.0038	.1998	77
								#8	.1990	79	.0038	.2028	73
								#7	.2010	75	.0038	.2048	70
								13/64 in.	.2031	72	.0038	.2069	68
								#6	.2040	71	.0038	.2078	66
								#5	.2055	69	.0038	.2093	63
	1/4	28	UNF	.2110	84.1	.2190	66.8	#3	.2130	80	.0038	.2168	72
								7/32 in.	.2188	67	.0038	.2226	59
	1/4	32	NEF	.2160	83.8	.2229	66.8	7/32 in.	.2188	77	.0038	.2226	67
								#2	.2210	71	.0038	.2248	62
	5/16	18	UNC	.2520	83.8	.2630	68.6	F	.2570	77	.0038	.2608	72
								G	.2610	71	.0041	.2651	66
	5/16	24	UNF	.2670	84.1	.2754	68.5	H	.2660	86	.0041	.2701	78
								I	.2720	75	.0041	.2761	67
	5/16	32	NEF	.2700	82.5	.2847	68.5	K	.2810	78	.0042	.2852	67
								9/32 in.	.2812	77	.0042	.2854	67
	3/8	16	UNC	.3070	83.5	.3182	70.0	5/16 in.	.3125	77	.0044	.3169	72
								O	.3160	73	.0044	.3204	67
	3/8	24	UNF	.3300	83.1	.3372	69.8	Q	.3320	79	.0044	.3364	71
	3/8	32	NEF	.3410	83.8	.3469	69.2	11/32 in.	.3438	77	.0045	.3483	66
	7/16	14	UNC	.3600	83.5	.3717	70.9	T	.3580	86	.0046	.3626	81
								23/64 in.	.3594	84	.0046	.3640	79
	7/16	20	UNF	.3830	83.9	.3916	70.7	W	.3860	79	.0046	.3906	72
								25/64 in.	.3906	72	.0046	.3952	65

TABLE III.15.—*Tap drill sizes, Unified and American screw threads, class 3B*—Continued

Thread size	Threads per inch	Designation	Class 3B minor diameter, internal threads				Tap drills and percent basic thread height					
			Minimum	Percent basic thread height	Maximum	Percent basic thread height	Nominal size	Diameter	Theoretical percent of thread	Probable oversize, mean	Probable hole size	Percent of thread
No. *in.*			*in.*		*in.*			*in.*		*in.*	*in.*	
7/16	28	UNEF	0.3990	83.0	0.4051	69.8	Y	0.4040	72	0.0048	0.4086	62
1/2	12	N	.4100	83.1	.4223	71.8	Z 27/64 in.	.4130 .4219	80 72	.0047 .0047	.4177 .4236	70 68
1/2	13	UNC	.4170	83.1	.4284	71.7	27/64 in.	.4219	78	.0047	.4266	73
1/2	20	UNF	.4460	83.1	.4537	71.3	29/64 in.	.4531	72	.0047	.4578	65
1/2	28	UNEF	.4610	84.1	.4676	69.8	-----	-----	-----	-----	-----	-----
9/16	12	UNC	.4720	83.6	.4843	72.2	15/32 in. 31/64 in.	.4688 .4844	87 72	.0048 .0048	.4736 .4892	82 68
9/16	18	UNF	.5020	83.8	.5106	71.9	1/2 in. 0.5062 in.	.5000 .5062	87 78	.0048 .0048	.5048 .5110	80 71
9/16	24	NEF	.5170	84.1	.5244	70.4	33/64 in. 0.5203 in.	.5156 .5203	87 78	.0048 .0048	.5204 .5251	78 69
5/8	11	UNC	.5270	83.0	.5391	72.7	17/32 in.	.5312	79	.0049	.5362	75
5/8	12	N	.5350	83.1	.5463	72.7	35/64 in.	.5469	72	.0049	.5518	68
5/8	18	UNF	.5650	83.1	.5730	72.1	9/16 in. 0.5687 in.	.5625 .5687	87 78	.0049 .0049	.5674 .5736	80 71
5/8	24	NEF	.5800	83.1	.5869	70.4	37/64 in. 0.5828 in.	.5781 .5828	87 78	.0049 .0049	.5830 .5877	78 69
11/16	12	N	.5970	83.6	.6085	73.0	19/32 in.	.5938	87	.0049	.5987	82
11/16	24	NEF	.6420	84.1	.6494	70.4	41/64 in.	.6406	87	.0050	.6456	77
3/4	10	UNC	.6420	83.1	.6545	73.5	41/64 in.	.6406	84	.0050	.6456	80
3/4	12	N	.6600	83.1	.6707	73.3	21/32 in.	.6562	87	.0050	.6612	82
3/4	16	UNF	.6820	83.8	.6908	72.9	11/16 in.	.6875	77	.0050	.6925	71
3/4	20	UNEF	.6960	83.1	.7037	71.3	45/64 in.	.7031	72	.0051	.7082	64
13/16	12	N	.7220	83.6	.7329	73.5	18.5 mm	.7283	78	.0051	.7334	73
13/16	16	UN	.7450	83.1	.7533	72.9	3/4 in.	.7500	77	.0052	.7552	71
13/16	20	UNEF	.7580	83.9	.7662	71.3	49/64 in.	.7656	72	.0052	.7706	64
7/8	9	UNC	.7550	83.1	.7681	74.1	49/64 in.	.7656	76	.0052	.7708	72
7/8	12	N	.7850	83.1	.7952	72.7	25/32 in.	.7812	87	.0052	.7864	82
7/8	14	UNF	.7980	83.0	.8068	73.5	51/64 in. 0.8024 in.	.7969 .8024	84 78	.0052 .0052	.8021 .8076	79 73
7/8	16	UN	.8070	83.8	.8158	72.9	13/16 in.	.8125	77	.0053	.8178	70
7/8	20	UNEF	.8210	83.1	.8287	71.3	53/64 in.	.8281	72	.0054	.8335	64
15/16	12	UN	.8470	83.6	.8575	73.9	27/32 in.	.8438	87	.0055	.8493	81
15/16	16	UN	.8700	83.1	.8783	72.9	7/8 in.	.8750	77	.0057	.8807	70
15/16	20	UNEF	.8830	83.9	.8912	71.3	57/64 in.	.8006	72	.0059	.8965	63
1	8	UNC	.8650	83.1	.8797	74.1	55/64 in. 7/8 in.	.8594 .8750	87 77	.0059 .0059	.8653 .8809	83 73
1	12	UNF	.9100	83.1	.9198	74.1	29/32 in.	.9062	87	.0060	.9123	81
1	14	NS	.9230	83.0	.9315	73.8	59/64 in. 0.9274 in.	.9219 .9274	84 78	.0060 .0061	.9279 .9335	78 72
1	16	UN	.9320	83.8	.9408	72.9	15/16 in.	.9375	77	.0062	.9437	69
1	20	UNEF	.9460	83.1	.9537	71.3	61/64 in.	.9531	72	.0063	.9594	63
1 1/16	12	UN	.9720	83.6	.9823	74.1	31/32 in.	.9688	87	.0065	.9753	81
1 1/16	16	UN	.9950	83.1	1.0033	72.9	1 in.	1.0000	77	.0069	1.0069	68
1 1/16	18	NEF	1.0020	83.8	1.0105	72.1	1 in.	1.0000	87	.0069	1.0069	77
1 1/8	7	UNC	.9700	83.5	.9875	74.1	31/32 in. 63/64 in.	.9688 .9844	84 76	.0062 .0067	.9750 .9911	81 72
1 1/8	8	N	.9900	83.1	1.0047	74.1	1 in.	1.0000	77	.0069	1.0069	73
1 1/8	12	UNF	1.0350	83.1	1.0448	74.1	1 1/32 in.	1.0312	87	.0071	1.0384	80
1 1/8	16	UN	1.0570	83.8	1.0658	72.9	1 1/16 in.	1.0625	77	.0074	1.0699	68
1 1/8	18	NEF	1.0650	83.1	1.0730	72.1	1 1/16 in.	1.0625	87	-----	-----	-----
1 3/16	12	UN	1.0970	83.6	1.1073	74.1	1 3/32 in.	1.0938	87	-----	-----	-----
1 3/16	16	UN	1.1200	83.1	1.1283	72.9	1 1/8 in.	1.1250	77	-----	-----	-----
1 3/16	18	NEF	1.1270	83.8	1.1355	72.1	1 1/8 in.	1.1250	87	-----	-----	-----
1 1/4	7	UNC	1.0950	83.6	1.1125	74.1	1 3/32 in.	1.0938	84	-----	-----	-----
1 1/4	8	N	1.1150	83.1	1.1297	74.1	1 1/8 in.	1.1250	77	-----	-----	-----
1 1/4	12	UNF	1.1600	83.1	1.1698	74.1	1 5/32 in.	1.1562	87	-----	-----	-----
1 1/4	16	UN	1.1820	83.8	1.1908	72.9	1 3/16 in.	1.1875	77	-----	-----	-----
1 1/4	18	NEF	1.1900	83.1	1.1980	72.1	1 3/16 in.	1.1875	87	-----	-----	-----
1 5/16	12	UN	1.2220	83.6	1.2323	74.1	1 7/32 in.	1.2188	87	-----	-----	-----
1 5/16	16	UN	1.2450	83.1	1.2533	72.9	1 1/4 in.	1.2500	77	-----	-----	-----
1 5/16	18	NEF	1.2520	83.8	1.2605	72.1	1 1/4 in.	1.2500	87	-----	-----	-----
1 3/8	6	UNC	1.1950	83.1	1.2146	74.1	1 3/16 in. 1 13/64 in.	1.1875 1.2031	87 79	----- -----	----- -----	----- -----
1 3/8	8	N	1.2400	83.1	1.2547	74.1	1 15/64 in. 1 1/4 in.	1.2344 1.2500	87 77	----- -----	----- -----	----- -----
1 3/8	12	UNF	1.2850	83.1	1.2948	74.1	1 9/32 in.	1.2812	87	-----	-----	-----
1 3/8	16	UN	1.3070	83.8	1.3158	72.9	1 5/16 in.	1.3125	77	-----	-----	-----
1 3/8	18	NEF	1.3150	83.1	1.3230	72.1	1 5/16 in.	1.3125	87	-----	-----	-----
1 7/16	12	UN	1.3470	83.6	1.3573	74.1	1 11/32 in.	1.3438	87	-----	-----	-----
1 7/16	16	UN	1.3700	83.1	1.3783	72.9	1 3/8 in.	1.3750	77	-----	-----	-----
1 7/16	18	NEF	1.3770	83.8	1.3855	72.1	1 3/8 in.	1.3750	87	-----	-----	-----
1 1/2	6	UNC	1.3200	83.1	1.3396	74.1	1 5/16 in. 1 21/64 in.	1.3125 1.3281	87 79	----- -----	----- -----	----- -----
1 1/2	8	N	1.3650	83.1	1.3797	74.1	1 23/64 in. 1 3/8 in.	1.3594 1.3750	87 77	----- -----	----- -----	----- -----
1 1/2	12	UNF	1.4100	83.1	1.4198	74.1	1 13/32 in.	1.4062	87	-----	-----	-----
1 1/2	16	UN	1.4320	83.8	1.4408	72.9	1 7/16 in.	1.4375	77	-----	-----	-----
1 1/2	18	NEF	1.4400	83.1	1.4490	72.1	1 7/16 in.	1.4375	87	-----	-----	-----
1 9/16	16	N	1.4950	83.1	1.5033	72.9	1 1/2 in.	1.5000	77	-----	-----	-----
1 9/16	18	NEF	1.5020	83.8	1.5105	72.1	1 1/2 in.	1.5000	87	-----	-----	-----
1 5/8	8	N	1.4900	83.1	1.5047	74.1	1 31/64 in. 1 1/2 in.	1.4844 1.5000	87 77	----- -----	----- -----	----- -----
1 5/8	12	UN	1.5300	83.1	1.5448	74.1	1 17/32 in.	1.5312	87	-----	-----	-----
1 5/8	16	UN	1.5570	83.8	1.5658	72.9	1 9/16 in.	1.5625	77	-----	-----	-----
1 5/8	18	NEF	1.5650	83.1	1.5730	72.1	1 9/16 in.	1.5625	87	-----	-----	-----
1 11/16	16	N	1.6200	83.1	1.6283	72.9	1 5/8 in.	1.6250	77	-----	-----	-----
1 11/16	18	NEF	1.6270	83.8	1.6355	72.1	1 5/8 in.	1.6250	87	-----	-----	-----

TABLE III.14.—*Tap drill sizes, Unified and American screw threads, classes 1B and 2B*—Continued

Thread size	Threads per inch	Designation	Classes 1B and 2B minor diameter, internal threads				Tap drills and percent basic thread height					
			Minimum	Percent basic thread height	Maximum	Percent basic thread height	Nominal size	Diameter	Theoretical percent of thread	Probable oversize, mean	Probable hole size	Percent of thread
No. in.			in.		in.			in.		in.	in.	
1⅜	6	UNC	1.195	83.1	1.225	69.3	1 3/16 in. 1 13/64 in. 1 7/32 in.	1.1875 1.2031 1.2188	87 79 72	---------- ---------- ----------	---------- ---------- ----------	---------- ---------- ----------
1⅜	8	N	1.240	83.1	1.265	67.7	1 15/64 in. 1¼ in.	1.2344 1.2500	87 77	---------- ----------	---------- ----------	---------- ----------
1⅜	12	UNF	1.285	83.1	1.303	66.5	1 9/32 in. 1 19/64 in.	1.2812 1.2969	87 72	---------- ----------	---------- ----------	---------- ----------
1⅜	16	UN	1.307	83.8	1.321	66.5	1 5/16 in.	1.3125	77	----------	----------	----------
1⅜	18	NEF	1.315	83.1	1.328	65.1	1 5/16 in. 1 21/64 in.	1.3125 1.3281	87 65	---------- ----------	---------- ----------	---------- ----------
1 7/16	12	UN	1.347	83.6	1.360	71.6	1 11/32 in. 1 23/64 in.	1.3438 1.3594	87 72	---------- ----------	---------- ----------	---------- ----------
1 7/16	16	UN	1.370	83.1	1.384	65.9	1⅜ in.	1.3750	77	----------	----------	----------
1 7/16	18	NEF	1.377	83.8	1.390	65.8	1⅜ in.	1.3750	87	----------	----------	----------
1½	6	UNC	1.320	83.1	1.350	69.3	1 5/16 in. 1 21/64 in.	1.3125 1.3281	87 79	---------- ----------	---------- ----------	---------- ----------
1½	8	N	1.365	83.1	1.390	67.7	1 23/64 in. 1⅜ in.	1.3594 1.3750	87 77	---------- ----------	---------- ----------	---------- ----------
1½	12	UNF	1.410	83.1	1.428	66.5	1 13/32 in. 1 27/64 in.	1.4062 1.4219	87 72	---------- ----------	---------- ----------	---------- ----------
1½	16	UN	1.432	83.8	1.446	66.5	1 7/16 in.	1.4375	77	----------	----------	----------
1½	18	NEF	1.440	83.1	1.452	66.5	1 7/16 in.	1.4375	87	----------	----------	----------
1½	20	UNS	1.446	83.1	1.457	66.2	1 29/64 in.	1.4531	72	----------	----------	----------
1 9/16	16	N	1.495	83.1	1.509	65.9	1½ in.	1.5000	77	----------	----------	----------
1 9/16	18	NEF	1.502	83.8	1.515	65.8	1½ in. 1 33/64 in.	1.5000 1.5156	87 65	---------- ----------	---------- ----------	---------- ----------
1⅝	8	N	1.490	83.1	1.515	67.7	1 31/64 in. 1½ in.	1.4844 1.5000	87 77	---------- ----------	---------- ----------	---------- ----------
1⅝	12	UN	1.535	83.1	1.553	66.5	1 17/32 in. 1 35/64 in.	1.5312 1.5469	87 72	---------- ----------	---------- ----------	---------- ----------
1⅝	16	UN	1.557	83.8	1.571	66.5	1 9/16 in.	1.5625	77	----------	----------	----------
1⅝	18	NEF	1.565	83.1	1.578	65.1	1 9/16 in. 1 37/64 in.	1.5625 1.5781	87 65	---------- ----------	---------- ----------	---------- ----------
1 11/16	16	N	1.620	83.1	1.634	65.9	1⅝ in.	1.6250	77	----------	----------	----------
1 11/16	18	NEF	1.627	83.8	1.640	65.8	1⅝ in. 1 41/64 in.	1.6250 1.6406	87 65	---------- ----------	---------- ----------	---------- ----------
1¾	5	UNC	1.534	83.1	1.568	70.1	1 17/32 in. 1 35/64 in.	1.5312 1.5469	84 78	---------- ----------	---------- ----------	---------- ----------
1¾	8	N	1.615	83.1	1.640	67.7	1 39/64 in. 1⅝ in. 1 41/64 in.	1.6094 1.6250 1.6406	87 77 67	---------- ---------- ----------	---------- ---------- ----------	---------- ---------- ----------
1¾	12	UN	1.660	83.1	1.678	66.5	1 21/32 in. 1 43/64 in.	1.6562 1.6719	87 72	---------- ----------	---------- ----------	---------- ----------
1¾	16	UNEF	1.682	83.8	1.696	66.5	1 11/16 in.	1.6875	77	----------	----------	----------
1¾	20	UNS	1.696	83.1	1.707	66.2	1 45/64 in.	1.7031	72	----------	----------	----------
1 13/16	16	N	1.745	83.1	1.759	65.9	1¾ in.	1.7500	77	----------	----------	----------
1⅞	8	N	1.740	83.1	1.765	67.7	1¾ in.	1.7500	77	----------	----------	----------
1⅞	12	UN	1.785	83.1	1.803	66.5	1 25/32 in. 1 51/64 in.	1.7812 1.7969	87 72	---------- ----------	---------- ----------	---------- ----------
1⅞	16	UN	1.807	83.8	1.821	66.5	1 13/16 in.	1.8125	77	----------	----------	----------
1 15/16	16	N	1.870	83.1	1.884	65.9	1⅞ in.	1.8750	77	----------	----------	----------
2	4½	UNC	1.759	83.5	1.795	71.0	1 25/32 in.	1.7812	76	----------	----------	----------
2	8	N	1.865	83.1	1.890	67.7	1⅞ in.	1.8750	77	----------	----------	----------
2	12	UN	1.910	83.1	1.928	66.5	1 29/32 in. 1 59/64 in.	1.9062 1.9219	87 72	---------- ----------	---------- ----------	---------- ----------
2	16	UNEF	1.932	83.8	1.946	66.5	1 15/16 in.	1.9375	77	----------	----------	----------
2	20	UNS	1.946	83.1	1.957	66.2	1 61/64 in.	1.9531	72	----------	----------	----------
2 1/16	16	N	1.995	83.1	2.009	65.9	2 in.	2.0000	77	----------	----------	----------
2⅛	8	N	1.990	83.1	2.015	67.7	2 in.	2.0000	77	----------	----------	----------
2⅛	12	UN	2.035	83.1	2.053	66.5	2 1/32 in.	2.0312	87	----------	----------	----------
2⅛	16	UN	2.057	83.8	2.071	66.5	2 1/16 in.	2.0625	77	----------	----------	----------
2 3/16	16	N	2.120	83.1	2.134	65.9	2⅛ in.	2.1250	77	----------	----------	----------
2¼	4½	UNC	2.009	83.5	2.045	71.0	2 in. 2 1/32 in.	2.0000 2.0312	87 76	---------- ----------	---------- ----------	---------- ----------
2¼	8	N	2.115	83.1	2.140	67.7	2⅛ in.	2.1250	77	----------	----------	----------
2¼	12	UN	2.160	83.1	2.178	66.5	2 5/32 in.	2.1562	87	----------	----------	----------
2¼	16	UN	2.182	83.8	2.196	66.5	2 3/16 in.	2.1875	77	----------	----------	----------
2¼	20	UNS	2.196	83.1	2.207	66.2	2 3/16 in.	2.1875	96	----------	----------	----------
2 5/16	16	N	2.245	83.1	2.259	65.9	2¼ in.	2.2500	77	----------	----------	----------
2⅜	12	UN	2.285	83.1	2.303	66.5	----------	----------	----------	----------	----------	----------
2⅜	16	UN	2.307	83.8	2.321	66.5	2 5/16 in.	2.3125	77	----------	----------	----------
2 7/16	16	N	2.370	83.1	2.384	65.9	2⅜ in.	2.3750	77	----------	----------	----------
2½	4	UNC	2.229	83.4	2.267	71.7	2 7/32 in. 2¼ in.	2.2188 2.2500	87 77	---------- ----------	---------- ----------	---------- ----------
2½	8	N	2.365	83.1	2.390	67.7	2⅜ in.	2.3750	77	----------	----------	----------
2½	12	UN	2.410	83.1	2.428	66.5	----------	----------	----------	----------	----------	----------
2½	16	UN	2.432	83.8	2.446	66.5	2 7/16 in.	2.4375	77	----------	----------	----------
2⅝	12	UN	2.535	83.1	2.553	66.5	----------	----------	----------	----------	----------	----------
2⅝	16	UN	2.557	83.8	2.571	66.5	2 9/16 in.	2.5625	77	----------	----------	----------
2¾	4	UNC	2.479	83.4	2.517	71.7	2½ in.	2.5000	77	----------	----------	----------
2¾	8	N	2.615	83.1	2.640	67.7	2⅝ in.	2.6250	77	----------	----------	----------
2¾	12	UN	2.660	83.1	2.678	66.5	----------	----------	----------	----------	----------	----------
2¾	16	UN	2.682	83.8	2.696	66.5	2 11/16 in.	2.6875	77	----------	----------	----------
2⅞	12	UN	2.785	83.1	2.803	66.5	2¾ in.	2.7500	115	----------	----------	----------
2⅞	16	UN	2.807	83.8	2.821	66.5	2 13/16 in.	2.8125	77	----------	----------	----------
[illegible]	4	UNC	2.729	83.4	2.767	71.7	2¾ in.	2.7500	77	----------	----------	----------
[illegible]	8	N	2.865	83.1	2.890	67.7	2⅞ in.	2.8750	77	----------	----------	----------
[illegible]	12	UN	2.910	83.1	2.928	66.5	----------	----------	----------	----------	----------	----------
[illegible]	16	UN	2.932	83.8	2.946	66.5	2 15/16 in.	2.9375	77	----------	----------	----------
[illegible]	4	UNC	2.979	83.4	3.017	71.7	3 in.	3.0000	77	----------	----------	----------
[illegible]	4	UNC	3.229	83.4	3.267	71.7	3¼ in.	3.2500	77	----------	----------	----------
[illegible]	4	UNC	3.479	83.4	3.517	71.7	3½ in.	3.5000	77	----------	----------	----------

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ameters and pitches, allowances and tolerances, and detailed directions for specifying special threads on drawings. A discussion of factors affecting the design of special threads is presented in appendix 5, p. 200.

2. UNIFIED FORM OF THREAD

The Unified form of thread profile as specified in section III shall be used.

3. PREFERRED DIAMETERS AND PITCHES

The use, wherever possible, of the standard thread series in section III is recommended for all applications. Whenever sizes and pitches in the Unified or American Standard coarse, fine, or extra-fine, or the 8-, 12-, 16-thread series are not suitable, the designer can usually select a diameter or pitch from a preferred list. See table IV. 12, p. 99.

1. PREFERRED DIAMETERS.—Whenever possible, the basic diameter should be selected from series of diameter increments as follows:

Range	Diameter increments	
	First choice	Second choice
in.	*in.*	*in.*
1/4 to 5/8	1/16	-------------
5/8 to 1 1/2	1/8	1/16
1 1/2 to 6	1/4	0.1
6 to 16	1/2	1/4
16 to 24	1	1/4

It is recommended that diameters less than 1/4 inch conform to the numbered sizes of screws as there is virtually no necessity for the selection of a diameter not included in the numbered sizes. Furthermore, the coarse and fine thread series provide ample choice as to diameter-pitch combinations.

2. PREFERRED PITCHES.—Whenever possible, the pitch should be selected from the series 40, 36, 32, 28, 24, 20, 16, 12, 10, 8, 6, and 4 threads per inch. Intermediate pitches should be used only when absolutely necessary. Pitches coarser than 4 threads per inch are not recommended.

There are practical limits to both the largest and smallest diameters suitable for any pitch. The curves of figure 5.2, p. 202, stop at such limits.

3. BASIC THREAD DATA.—Basic thread data for standard pitches are given in table IV.1. These are to be used in conjunction with the directions for specifying special threads on drawings, as given on p. 98.

4. CLASSIFICATION AND TOLERANCES

[illegible] established for general use six distinct [illegible] of screw thread tolerances and two classes [illegible] specified in the following brief [illegible], together with the recom[illegible] for the purpose of [illegible] manufacture of screw thread parts. This standard includes Unified classes 1A, 2A, and 3A, applied to external threads only, and classes 1B, 2B, and 3B applied to internal threads only. In addition, it includes American class 1AR, applied to external threads only, 16 threads per inch and coarser, produced by combining the American National class 1 allowances with class 1A tolerances. The requirements for a screw thread fit for specific applications can be met by specifying the proper combinations of classes for the components. For example, an external thread made to class 2A limits can be used with tapped holes made to classes 1B, 2B, or 3B limits for specific applications.

(a) GENERAL

The following general specifications apply to all classes specified for applications of the Unified form of thread.

1. UNIFORM MINIMUM INTERNAL THREAD.—The minimum major, pitch, and minor diameters of the internal thread are, respectively, the same for classes 1B, 2B, and 3B.

2. DIRECTION AND SCOPE OF TOLERANCES.—

(*a*) The tolerance on the internal thread is plus, and is applied from the basic size to above basic size.

(*b*) The tolerance on the external thread is minus, and is applied from the maximum (or design) size to below the maximum size.

(*c*) The tolerances specified represent the extreme variations permitted on the product.

3. BASIC FORMULA FOR ALLOWANCES AND TOLERANCES.—The basic formula, from which allowances on all diameters and tolerances on pitch diameter are derived, is

$$\text{Tolerance (or allowance)} = C(0.0015\sqrt[3]{D} + 0.0015\sqrt{L_e} + 0.015\sqrt[3]{p^2}),$$

where

C=a factor which differs for the allowance or tolerance for each class
D=basic major diameter
L_e=length of engagement
p=pitch

This formula is based on the accuracy of present day threading practice, and is applicable to all reasonable combinations of diameter, pitch, and length of engagement. Numerical values of the increments in the formula for standard diameters, pitches, and lengths of engagement are given in table III.9, p. 20.

4. ALLOWANCES.—Allowances are applied only to external threads. The values of the factor C (par. 3 above) for allowances are as follows:

Class	Factor C
1A	0.300
2A	.300
3A	.000

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TABLE IV.1.—*Thread data, Unified and American thread form*

Threads per inch, n	Pitch, p	Flat at internal thread crest, $F_{cn}=p/4=0.25p$	Flat at internal thread root and external thread crest, $F_{rn}=F_{cs}=p/8=0.125p$	Height of sharp V-thread, $H=0.866025p$	Truncation of internal thread root and external thread crest, $f_{rn}=f_{cs}=H/8=0.10825p$	Truncation of external thread root, $f_{rs}=H/6=0.14434p$	Half addendum of external thread, $\frac{3}{16}H=0.16238p$	Truncation of internal thread crest, $f_{cn}=H/4=0.21651p$	Addendum of external thread, $h_{as}=\frac{3}{8}H=0.32476p$	Height of internal thread and depth of thread engagement, $h_n=h_e=\frac{5}{8}H=0.54127p$	Height of external thread, $h_s=\frac{17}{24}H=0.61343p$	Twice the external thread addendum,[a] $h_b=2h_{as}=\frac{3}{4}H=0.649519p$	Difference between max. major and pitch diameters of internal thread, $\frac{11}{12}H=0.79386p$	Double height of internal thread, $2h_n=1\frac{1}{4}H=1.08253p$	Double height of external thread, $1\frac{5}{12}H=1.22687p$
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	0.012500	0.00312	0.00156	0.010825	0.00135	0.00180	0.00203	0.00271	0.00406	0.00677	0.00767	0.008119	0.00992	0.01353	0.01534
72	.013889	.00347	.00174	.012028	.00150	.00200	.00226	.00301	.00451	.00752	.00852	.009021	.01103	.01504	.01704
64	.015625	.00391	.00195	.013532	.00169	.00226	.00254	.00338	.00507	.00846	.00958	.010149	.01240	.01691	.01917
56	.017857	.00446	.00223	.015465	.00193	.00258	.00290	.00387	.00580	.00967	.01095	.011599	.01418	.01933	.02191
48	.020833	.00521	.00260	.018042	.00226	.00301	.00338	.00451	.00677	.01128	.01278	.013532	.01654	.02255	.02556
44	.022727	.00568	.00284	.019682	.00246	.00328	.00369	.00492	.00738	.01230	.01394	.014762	.01804	.02460	.02788
40	.025000	.00625	.00312	.021651	.00271	.00361	.00406	.00541	.00812	.01353	.01534	.016238	.01985	.02706	.03067
36	.027778	.00694	.00347	.024056	.00301	.00401	.00451	.00601	.00902	.01504	.01704	.018042	.02205	.03007	.03408
32	.031250	.00781	.00391	.027063	.00338	.00451	.00507	.00677	.01015	.01691	.01917	.020297	.02481	.03383	.03834
28	.035714	.00893	.00446	.030929	.00387	.00515	.00580	.00773	.01160	.01933	.02191	.023197	.02835	.03866	.04382
27	.037037	.00926	.00463	.032075	.00401	.00535	.00601	.00802	.01203	.02005	.02272	.024056	.02940	.04009	.04544
24	.041667	.01042	.00521	.036084	.00451	.00601	.00677	.00902	.01353	.02255	.02556	.027063	.03308	.04511	.05112
20	.050000	.01250	.00625	.043301	.00541	.00722	.00812	.01083	.01624	.02706	.03067	.032476	.03969	.05413	.06134
18	.055556	.01389	.00694	.048113	.00601	.00802	.00902	.01203	.01804	.03007	.03408	.036084	.04410	.06014	.06816
16	.062500	.01562	.00781	.054127	.00677	.00902	.01015	.01353	.02030	.03383	.03834	.040595	.04962	.06766	.07668
14	.071429	.01786	.00893	.061859	.00773	.01031	.01160	.01546	.02320	.03866	.04382	.046394	.05670	.07732	.08763
12	.083333	.02083	.01042	.072169	.00902	.01203	.01353	.01804	.02706	.04511	.05112	.054127	.06615	.09021	.10224
10	.100000	.02500	.01250	.086603	.01083	.01443	.01624	.02165	.03248	.05413	.06134	.064952	.07939	.10825	.12269
8	.125000	.03125	.01562	.108253	.01353	.01804	.02030	.02706	.04059	.06766	.07668	.081190	.09923	.13532	.15336
6	.166667	.04167	.02083	.144338	.01804	.02406	.02706	.03608	.05413	.09021	.10224	.108253	.13231	.18042	.20448
4	.250000	.06250	.03125	.216506	.02706	.03608	.04059	.05413	.08119	.13532	.15336	.162380	.19846	.27063	.30672

[a] Equivalent to the "basic height" h of the original American National form.

NOTE.—$h_{an}=f_{cn}=\frac{H}{4}$.

$h_{dn}=h_{as}=\frac{3}{8}H$.

The formula on p. 75 is not applicable to class 1AR as this class is produced by combining the American National class 1 allowances with class 1A tolerances. These allowances are larger than those for classes 1A and 2A and provide for ready assembly under adverse conditions. Numerical values of allowances for each pitch are given in tables IV.2 and IV.2A.

5. MAJOR DIAMETER TOLERANCES.—(*a*) *External threads.*—The tolerance on major diameter for special threads is not specified, as it must be determined in relation to the requirements of a given design in accordance with the procedure outlined on p. 201. Preferred tolerances equal to $0.060\sqrt[3]{p^2}$ for classes 2A and 3A, and equal to $0.090\sqrt[3]{p^2}$ for classes 1A and 1AR are given in table IV.3.

(*b*) *Internal threads.*—The tolerance on major diameter is for reference only. It is equal to $H/6$ plus the pitch diameter tolerance of the class of thread involved. The maximum major diameter of the internal thread may be determined by adding $0.7939p$ ($=11/12H$, table IV.1) to the maximum pitch diameter of the internal thread. In dimensioning internal threads the maximum major diameter is not specified, being established by the crest of an unworn tool. In practice, the major diameter of an internal thread is satisfactory when accepted by a gage or gaging method that represents the maximum material condition of an external thread which has no allowance.

6. MINOR DIAMETER TOLERANCES.—(*a*) *External threads.*—The tolerance on minor diameter of external threads is for reference only. At the nominal minor diameter, that is at the intersection of the rounded root with its center line (see figure III.1, p. 11) it equals the pitch diameter tolerance plus $H/12$ and applies only where the rounded root is a requirement of the design. Otherwise the tolerance shall be $H/4$ plus the pitch diameter tolerance. The minimum minor diameter of the external thread may be determined by subtracting $0.6495p$ ($=3/4H$, table IV.1) from the minimum pitch diameter of the external thread. In dimensioning external threads the minimum minor diameter is not specified, being established by the crest of an unworn tool. In practice, the minor diameter of an external thread is satisfactory when accepted by a gage or gaging method that represents the maximum material condition of the internal thread less the allowances, if any.

TABLE IV.2.—*Allowances for external threads of special diameters and pitches, classes 1A and 2A*

(UNS and NS threads, see subsection 5, p. 98)

Threads per inch	Major, pitch, and minor diameter allowances [a]											
	1/16 0.0600 to 0.0781	3/32 0.0782 to 0.1094	1/8 0.1095 to 0.1563	3/16 0.1564 to 0.2188	1/4 0.2189 to 0.3125	3/8 0.3126 to 0.4375	1/2 0.4376 to 0.5625	5/8 0.5626 to 0.6875	3/4 0.6876 to 0.8750	1 0.8751 to 1.1250	1 1/4 1.1251 to 1.3750	1 1/2 1.3751 to 1.6250
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	0.0006	0.0006	0.0006	0.0007	0.0007	-----	-----	-----	-----	-----	-----	-----
72	.0006	.0006	.0006	.0007	.0007	0.0007	-----	-----	-----	-----	-----	-----
64	.0006	.0007	.0007	.0007	.0007	.0008	0.0008	-----	-----	-----	-----	-----
56	-----	.0007	.0007	.0007	.0008	.0008	.0008	0.0009	0.0009	-----	-----	-----
48	-----	.0007	.0008	.0008	.0008	.0009	.0009	.0009	.0009	-----	-----	-----
44	-----	.0008	.0008	.0008	.0008	.0009	.0009	.0009	.0010	0.0010	-----	-----
40	-----	-----	.0008	.0009	.0009	.0009	.0010	.0010	.0010	.0010	-----	-----
36	-----	-----	.0009	.0009	.0009	.0010	.0010	.0010	.0010	.0011	0.0011	0.0012
32	-----	-----	.0009	.0009	.0010	.0010	.0010	.0011	.0011	.0011	.0012	.0012
28	-----	-----	-----	.0010	.0010	.0011	.0011	.0011	.0012	.0012	.0012	.0013
27	-----	-----	-----	.0010	.0010	.0011	.0011	.0011	.0012	.0012	.0012	.0013
24	-----	-----	-----	.0011	.0011	.0011	.0012	.0012	.0012	.0013	.0013	.0013
20	-----	-----	-----	-----	.0012	.0012	.0013	.0013	.0013	.0014	.0014	.0014
18	-----	-----	-----	-----	-----	.0013	.0013	.0014	.0014	.0014	.0015	.0015
16	-----	-----	-----	-----	-----	.0014	.0014	.0014	.0015	.0015	.0015	.0016
14	-----	-----	-----	-----	-----	-----	.0015	.0015	.0016	.0016	.0016	.0017
12	-----	-----	-----	-----	-----	-----	.0016	.0016	.0017	.0017	.0017	.0018
10	-----	-----	-----	-----	-----	-----	-----	-----	.0018	.0018	.0019	.0019
8	-----	-----	-----	-----	-----	-----	-----	-----	-----	.0021	.0021	.0021
6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	.0024
4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Threads per inch	Major, pitch, and minor diameter allowances [a]										
	1 3/4 1.6251 to 1.8750	2 1.8751 to 2.2500	2 1/2 2.2501 to 2.7500	3 2.7501 to 3.2500	3 1/2 3.2501 to 3.7500	4 3.7501 to 4.5000	5 4.5001 to 5.5000	6 5.5001 to 7.0000	8 7.0001 to 9.0000	10 9.0001 to 11.0000	12 11.0001 to 13.0000
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
72	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
64	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
56	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
48	-----	-----	-----	-----	Classes 1A and 2A allowances are determined by multiplying class 2A pitch diameter tolerances (computed to six decimal places) by 0.3 and are based on lengths of engagement of nine pitches.						
44	-----	-----	-----	-----							
40	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
36	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
32	0.0012	0.0013	0.0013	0.0013	-----	-----	-----	-----	-----	-----	-----
28	.0013	.0013	.0014	.0014	0.0014	0.0015	-----	-----	-----	-----	-----
27	.0013	.0013	.0014	.0014	.0014	.0015	0.0015	0.0016	-----	-----	-----
24	.0014	.0014	.0014	.0015	.0015	.0015	.0016	.0016	-----	-----	-----
20	.0015	.0015	.0015	.0016	.0016	.0016	.0017	.0017	-----	-----	-----
18	.0015	.0015	.0016	.0016	.0017	.0017	.0017	.0018	0.0019	-----	-----
16	.0016	.0016	.0017	.0017	.0017	.0018	.0018	.0019	.0019	0.0020	-----
14	.0017	.0017	.0017	.0018	.0018	.0018	.0019	.0020	.0020	.0021	0.0022
12	.0018	.0018	.0019	.0019	.0019	.0020	.0020	.0021	.0021	.0022	.0023
10	.0019	.0020	.0020	.0020	.0021	.0021	.0022	.0022	.0023	.0024	.0024
8	.0021	.0022	.0022	.0023	.0023	.0023	.0024	.0024	.0025	.0026	.0026
6	.0025	.0025	.0025	.0026	.0026	.0026	.0027	.0027	.0028	.0029	.0029
4	-----	.0030	.0031	.0031	.0031	.0032	.0032	.0033	.0034	.0034	.0035

[a] Allowances are based on diameters given in common fractions, which are the means of the diameter ranges expressed in decimals.

TABLE IV.2A.—*Allowances, class 1A R*

Threads per inch, *n*	Allowance, *G*, classes 1 and 1A R [1]
	in.
40	(0.0010)
36	(.0011)
32	(.0011)
28	(.0012)
24	(.0013)
20	(.0015)
18	(.0016)
16	.0018
14	.0021
12	.0024
10	.0028
8	.0034
6	.0044
4	.0064

[1] For values in parentheses there is no class 1A R as these are identical with those for class 1A.

(*b*) *Internal threads.*—Internal thread minor diameter tolerances specified in tables IV.10 and IV.11 are based on the use of materials of equal tensile strength for screw or bolt and nut or tapped hole and a length of engagement equal to the nominal diameter. See p. 5. For general applications these tolerances are suitable for lengths of engagement up to 1½ diameters. They are based on formulas as follows:

Classes 1B and 2B:

All special threads in sizes less than ¼ in.,

$$\text{tolerance} = 0.05\sqrt[3]{p^2} + 0.03p/D - 0.002 \text{ in.},$$

within the following limitations:

Tolerances shall not be greater than $0.394p$. (This corresponds to 53 percent of the basic thread height and applies in the range of the smallest number sizes of the NC and NF thread series.)

Table IV.3.—*Major diameter tolerances for external threads of special diameters, pitches, and lengths of engagement, classes 1A, 1AR, 2A, and 3A*

(UNS and NS threads, see subsection 5, p. 98)

Threads per inch	Major diameter tolerance	
	Classes 1A and 1AR, $0.090\sqrt[3]{p^2}$	Classes 2A and 3A, $0.060\sqrt[3]{p^2}$
	in.	*in.*
80	------------	0.0032
72	------------	.0035
64	------------	.0038
56	------------	.0041
48	------------	.0045
44	------------	.0048
40	0.0077	.0051
36	.0083	.0055
32	.0089	.0060
28	.0098	.0065
27	.0100	.0067
24	.0108	.0072
20	.0122	.0081
18	.0131	.0087
16	.0142	.0094
14	.0155	.0103
12	.0172	.0114
10	.0194	.0129
8	.0225	.0150
6	.0273	.0182
4	.0357	.0238

Tolerances shall not be less than $0.25p-0.4p^2$. (This corresponds to a thread height of 65 percent for 80 to 24 threads per inch.)

The formulas are suitable for general applications having lengths of engagement up to 1½ diameters. For specific applications within this range or for longer lengths of engagement see table IV.10, p. 92, and table 3.1, p. 187.

All special threads ¼ in. and larger, 80 to 4 threads per inch, inclusive,[7]

tolerance$=0.25p-0.4p^2$.

(This corresponds to a thread height of 64.5 percent for 80 threads per inch graduating to 71.8 percent for 4 threads per inch.)

Class 3B, all special threads:

Tolerance$=0.05\sqrt[3]{p^2}+0.03p/D-0.002$ in., within the following limitations:

Tolerance shall not be greater than $0.394p$. (This corresponds to 53 percent of the basic thread height and applies in the range of the smallest numbered sizes of the UNC, UNF, NC and NF thread series.)

Tolerance shall not be less than:

For 80 to 13 threads per inch, inclusive, $0.23p-1.5p^2$. (This corresponds to a thread height of 67 percent for 80 threads per inch, graduating to 74 percent for 13 threads per inch.)

For 12 threads per inch and coarser, tolerance$=0.120p$. (This corresponds to a thread height of 74 per cent and is the tolerance for all sizes 12 threads and coarser and 1 in. and larger.)

The formulas are suitable for general applications having lengths of engagement up to 1½ diameters. For specific applications within this range or for longer lengths of engagement see table IV.11, p. 94 and table 3.2, p. 190.

Some thread applications have lengths of engagement which are greater than 1½ diameters or less than 1 diameter. For applications having shorter or longer lengths of engagement it may be advantageous to decrease or increase the tolerance, respectively, as explained below.

The principal practical factors that govern these tolerances are tapping difficulties, particularly tap breakage in the small sizes, availability of standard drill sizes in the medium and large sizes, and depth of engagement. Depth of engagement correlates with the stripping strength of the thread assembly, and thus also with the length of engagement. It also correlates with the tendency toward disengagement of the threads on one side when assembly is eccentric. The amount of possible eccentricity is one half of the sum of the pitch diameter allowance and tolerance on both mating threads. For a given pitch or height of thread this sum increases with the diameter, and accordingly this factor would require a decrease in minor diameter tolerance with increase in diameter. However, such decrease in tolerance often is not feasible without requiring special drill sizes; therefore, to be able to use as many as possible of the available standard drill sizes listed in ASA B5.12, the minor diameter tolerance for classes 1B and 2B of a given pitch for ¼ in. diameter and larger is constant, in accordance with a formula given above.

There may be applications where the lengths of engagement of the mating threads or the combination of materials used for mating threads are such that the maximum tolerance may not provide the desired strength of the fastening. Experience has shown that for lengths of engagement less than ⅔D (the minimum thickness of standard nuts) the minor diameter tolerance may be reduced without causing tapping difficulties.

In other applications the length of engagement of mating threads may be long because of design considerations or the combination of materials used for mating threads. As the threads engaged increase in number, their depth of engagement may be shallower and still develop stripping strength greater than the external thread breaking strength. In these cases the maximum tolerance should be increased to reduce the possibility of tapping difficulties.

To reduce the number of minor diameter tolerances to a practical minimum, tolerances for all recommended diameters, lengths of engagement, and selected pitches are given in table IV.10 for classes 1B and 2B and in table IV.11 for class 3B.

In these tables, the tolerances for lengths of engagement less than ⅓D are ½ the formula values. For lengths of engagement from ⅓D to ⅔D, the tolerances are three quarters of the formula values; for lengths of engagement from ⅔D to 1½D, the tolerances are equal to the formula values; and for lengths of engagement over 1½D, the tolerances are 1¼ times the formula values. Where the tolerance value so computed is more than $0.394p$,

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[7] Formula is not applicable to threads coarser than 4 tpi. For such threads [illegible] 0.15p.

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which corresponds to a resulting minimum thread height of 53 percent, the value is adjusted to equal 0.394*p*.

7. PITCH DIAMETER TOLERANCES.—(*a*) *Values of factor C.*—The values of factor *C* (par. 3 above) for pitch diameter tolerances are as follows:

Class	Factor *C*
1A and 1AR	1.500
1B	1.950
2A	1.000
2B	1.300
3A	0.750
3B	.975

It will be noted that the factor *C* is 30 percent greater for internal than for external threads of a given class number on account of the relative difficulties of manufacture.

(*b*) *Limits of size.*—With respect to the pitch diameter limits of size, it is intended, except as hereinafter qualified, that no portion of the complete thread be permitted to project beyond the envelope defined by the maximum material limits on the one hand, or beyond that defined by the minimum-material limits on the other, and thus be outside of the tolerance zone as illustrated in figures III.3 and III.4, pp. 24 and 25.[7a] Also, the diameter equivalent of the variation in any given element except pitch diameter shall not exceed one-half of the pitch diameter tolerance. Deviations from specified size and profile include variations in lead, uniformity of helix, flank angle, taper, out-of-roundness, and surface defects.[8]

The diameter equivalents of variations in lead, uniformity of helix, and flank angle are always in the direction toward maximum material, that is they increase the virtual diameter of the external thread and decrease that of the internal thread. Thus, the maximum-material pitch diameter limits are a limitation of the virtual diameter (effective size) *and are so specified herein for all thread classes.*

Variations in taper and roundness of the pitch diameter, together with variations of the pitch diameter as a whole, may be in the direction of minimum material, and thus the minimum-material pitch diameter limit may be specified as a limitation of the pitch diameter as a single element. However, in view of the interrelation of the pitch diameter, variation in lead and flank angle, etc., together with practical considerations relating to established production processes, product application, and inspection procedures, it is customary to interpret the minimum pitch diameter of the external thread and the maximum pitch diameter of the internal thread as virtual diameters (effective sizes) in classes 1A, 2A, 1B, 2B, and 3B, for application to various mass-produced bolts, nuts, screws, and other similar threaded fasteners, and to some custom threaded parts where design requirements are fulfilled. See "Limit gages" and "Acceptability of threads," section VI, pp. 108 and 118.

(*c*) *Tables of pitch diameter tolerances.*—Numerical values of pitch diameter tolerances for classes 1A, 1AR, 1B, 2A, 2B, 3A, and 3B are given in tables IV.4 to IV.9, inclusive. Two sets of tolerances are given: Those for 5 to 15 pitches length of engagement, based on lengths of 9 pitches, and those for 16 to 30 pitches length of engagement, based on lengths of 20 pitches. If excessively small or large lengths of engagement are encountered, the thread tolerances *may* be calculated from the formulas, if considered advisable. Also, for threads per inch not included in the tables, tolerances should be calculated by applying the formulas.

(b) SCREW THREAD CLASSES

1. CLASSES 1A, 1AR, and 1B.—(*a*) *Definition.*—The combinations of classes 1A or 1AR and 1B are intended to cover the manufacture of threaded parts where quick and easy assembly is necessary, and where an allowance is required to permit ready assembly, even when the threads are slightly bruised or dirty.

Maximum diameters of class 1A (external) threads are less than basic by the amount of the same allowance as applied to class 2A. For the intended applications in American practice the allowance is not available for plating or coating. Where the thread is plated or coated, special provisions are necessary. The minimum diameters of class 1B (internal) threads, whether or not plated or coated, are basic, affording no allowance or clearance for assembly with maximum metal external thread components having maximum diameters which are basic.

(*b*) *Allowances and tolerances.*—Allowances for all diameters and pitch diameter tolerances are specified in table IV.2, IV.2A, IV.4, and IV.7, and their application is shown in figure III.3 p. 24.

2. CLASSES 2A and 2B.—(*a*) *Definition.*—Classes 2A for external threads and 2B for internal threads are designed for general use. A moderate allowance is provided for class 2A threads.

The maximum diameters of class 2A (external) uncoated threads are less than basic by the amount of the allowance. The allowance minimizes galling and seizing in high-cycle wrench assembly, or it can be used to accommodate plated finishes or other coating. However, for threads with additive finish, the maximum diameters of class 2A may be exceeded by the amount of the allowance; i.e., the 2A maximum diameters apply to an unplated part or

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[7a] The full tolerance cannot, therefore, be used on pitch diameter unless [illegible] other thread elements are zero.

[8] In [illegible] with this requirement, values are given in table III.11, p. [illegible] thread series and classes, of one-half of the pitch diameter [illegible] deviations in lead and flank angle which are equivalent [illegible] equivalents are based on a depth of thread engage- [illegible] see section III, p. 22. For aeronautical applica- [illegible] from those here specified. See Military Specifi- [illegible]

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TABLE IV.4.—*Pitch diameter tolerances for external threads of special*

(UNS and NS threads.

Threads per inch	Lengths of engagement: Number of pitches	Lengths of engagement: Inches	Pitch diameter tolerances ª: 1/16 0.0600 to 0.0781	3/32 0.0782 to 0.1094	1/8 0.1095 to 0.1563	3/16 0.1564 to 0.2188	1/4 0.2189 to 0.3125	3/8 0.3126 to 0.4375	1/2 0.4376 to 0.5625	5/8 0.5626 to 0.6875	3/4 0.6876 to 0.8750	1 0.8751 to 1.1250
				in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	5 to 15	0.06 to 0.19	......	......	......	......	......	......	......	......	......	......
	16 to 30	0.191 to 0.38	......	......	......	......	......	......	......	......	......	......
72	5 to 15	0.07 to 0.21	......	......	......	......	......	......	......	......	......	......
	16 to 30	0.211 to 0.42	......	......	......	......	......	......	......	......	......	......
64	5 to 15	0.08 to 0.23	......	......	......	......	......	......	......	......	......	......
	16 to 30	0.231 to 0.46	......	......	......	......	......	......	......	......	......	......
56	5 to 15	0.09 to 0.27	......	......	......	......	......	......	......	......	......	......
	16 to 30	0.271 to 0.54	......	......	......	......	......	......	......	......	......	......
48	5 to 15	0.10 to 0.31	......	......	......	......	......	......	......	......	......	......
	16 to 30	0.311 to 0.62	......	......	......	......	......	......	......	......	......	......
44	5 to 15	0.11 to 0.34	......	0.0038	0.0039	0.0041	0.0042	0.0044	0.0046	0.0047	0.0049	0.0051
	16 to 30	0.341 to 0.68	......	.0043	.0044	.0046	.0047	.0049	.0051	.0052	.0054	.0056
40	5 to 15	0.12 to 0.38	......	......	.0041	.0043	.0044	.0046	.0048	.0049	.0050	.0052
	16 to 30	0.381 to 0.76	......	......	.0046	.0048	.0049	.0051	.0053	.0054	.0056	.0058
36	5 to 15	0.14 to 0.42	......	......	.0043	.0045	.0046	.0048	.0050	.0051	.0052	.0054
	16 to 30	0.421 to 0.84	......	......	......	.0050	.0052	.0054	.0056	.0057	.0058	.0060
32	5 to 15	0.16 to 0.47	......	......	.0045	.0047	.0048	.0050	.0052	.0053	.0055	.0057
	16 to 30	0.471 to 0.94	......	......	......	.0053	.0054	.0056	.0058	.0059	.0061	.0063
28	5 to 15	0.18 to 0.54	......	......	......	.0050	.0051	.0053	.0055	.0056	.0058	.0060
	16 to 30	0.541 to 1.08	......	......	......	.0056	.0058	.0060	.0061	.0063	.0064	.0066
27	5 to 15	0.19 to 0.56	......	......	......	.0051	.0052	.0054	.0056	.0057	.0058	.0060
	16 to 30	0.561 to 1.12	......	......	......	.0057	.0059	.0061	.0062	.0064	.0065	.0067
24	5 to 15	0.21 to 0.62	......	......	......	.0054	.0055	.0057	.0059	.0060	.0061	.0063
	16 to 30	0.621 to 1.24	......	......	......	......	.0062	.0064	.0065	.0067	.0068	.0070
20	5 to 15	0.25 to 0.75	......	......	......	......	.0060	.0062	.0063	.0065	.0066	.0068
	16 to 30	0.751 to 1.50	......	......	......	......	.0067	.0069	.0071	.0072	.0073	.0076
18	5 to 15	0.28 to 0.83	......	......	......	......	......	.0065	.0067	.0068	.0069	.0071
	16 to 30	0.831 to 1.66	......	......	......	......	......	.0073	.0074	.0076	.0077	.0079
16	5 to 15	0.31 to 0.94	......	......	......	......	......	.0069	.0070	.0072	.0073	.0075
	16 to 30	0.941 to 1.88	......	......	......	......	......	.0077	.0078	.0080	.0081	.0083
14	5 to 15	0.36 to 1.07	......	......	......	......	......	......	.0075	.0076	.0077	.0079
	16 to 30	1.071 to 2.14	......	......	......	......	......	......	.0083	.0085	.0086	.0088
12	5 to 15	0.42 to 1.25	......	......	......	......	......	......	.0080	.0082	.0083	.0085
	16 to 30	1.251 to 2.50	......	......	......	......	......	......	.0090	.0091	.0092	.0094
10	5 to 15	0.50 to 1.50	......	......	......	......	......	......	......	......	.0090	.0092
	16 to 30	1.501 to 3.00	......	......	......	......	......	......	......	......	.0101	.0103
8	5 to 15	0.62 to 1.88	......	......	......	......	......	......	......	......	......	.0103
	16 to 30	1.881 to 3.76	......	......	......	......	......	......	......	......	......	.0114
6	5 to 15	0.83 to 2.50	......	......	......	......	......	......	......	......	......	......
	16 to 30	2.501 to 5.00	......	......	......	......	......	......	......	......	......	......
4	5 to 15	1.25 to 3.75	......	......	......	......	......	......	......	......	......	......
	16 to 30	3.751 to 7.50	......	......	......	......	......	......	......	......	......	......

ª Tolerances are based on diameters given in common fractions, which are the means of the diameter ranges expressed in decimals.

diameters, pitches, and lengths of engagement, classes 1A and 1AR

See subsection 5, p. 98.)

LEGENDS

1. These values do not agree with and shall not be used in place of any tabulated values for the UNC, UNF, and 8N thread series, in table III.10.
2. Formula:
   Class 1A tolerances for external threads are determined by multiplying class 2A tolerances (computed to six decimal places) by 1.500. See legend 2, table IV.5, for formula for class 2A tolerances.
3. Length of engagement increments included in the tabulated tolerances for lengths of engagement of from 5 to 15 pitches are based on lengths of 9 pitches; those for lengths of engagement greater than 15 to 30 pitches are based on lengths of 20 pitches. For lengths of engagement not tabulated, the formula in legend 2 should be applied.
4. Pitches listed are those used most commonly and are recommended. Where intermediate pitches are specified, the formula in legend 2 should be applied.
5. Tolerances are tabulated only for combinations of diameter, pitch, and length of engagement which are considered to be generally used. For other combinations encountered, see Design of Special Threads, appendix 5, p. 200.

Pitch diameter tolerances •—Continued													Threads per inch
1¼ 1.1251 to 1.3750	1½ 1.3751 to 1.6250	1¾ 1.6251 to 1.8750	2 1.8751 to 2.2500	2½ 2.2501 to 2.7500	3 2.7501 to 3.2500	3½ 3.2501 to 3.7500	4 3.7501 to 4.5000	5 4.5001 to 5.5000	6 5.5001 to 7.0000	8 7.0001 to 9.0000	10 9.0001 to 11.0000	12 11.0001 to 13.0000	
in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
---------- ----------	---------- ----------	---------- ----------											80
---------- ----------	---------- ----------	---------- ----------											72
---------- ----------	---------- ----------	---------- ----------											64
---------- ----------	---------- ----------	---------- ----------											56
---------- ----------	---------- ----------	---------- ----------											48
---------- ----------	---------- ----------	---------- ----------											44
---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	40
0.0056 .0062	0.0058 .0063	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	36
.0058 .0064	.0060 .0066	0.0061 .0067	0.0063 .0068	0.0065 .0071	0.0067 .0073	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	32
.0061 .0068	.0063 .0069	.0064 .0071	.0066 .0072	.0068 .0074	.0070 .0076	0.0071 .0078	0.0073 .0079	---------- ----------	---------- ----------	---------- ----------	---------- ----------	---------- ----------	28
.0061 .0069	.0064 .0070	.0065 .0071	.0066 .0073	.0069 .0075	.0070 .0077	.0072 .0079	.0074 .0080	0.0076 .0083	0.0079 .0085	---------- ----------	---------- ----------	---------- ----------	27
.0065 .0072	.0067 .0073	.0068 .0075	.0069 .0076	.0071 .0078	.0073 .0080	.0075 .0082	.0077 .0083	.0079 .0086	.0082 .0088	---------- ----------	---------- ----------	---------- ----------	24
.0070 .0077	.0071 .0079	.0073 .0080	.0074 .0081	.0076 .0084	.0078 .0085	.0080 .0087	.0081 .0089	.0084 .0092	.0087 .0094	---------- ----------	---------- ----------	---------- ----------	20
.0073 .0081	.0074 .0082	.0076 .0084	.0077 .0085	.0079 .0087	.0081 .0089	.0083 .0091	.0084 .0092	.0087 .0095	.0090 .0097	0.0094 .0101	---------- ----------	---------- ----------	18
.0077 .0085	.0078 .0086	.0079 .0087	.0081 .0089	.0083 .0091	.0085 .0093	.0086 .0095	.0088 .0096	.0091 .0099	.0093 .0101	.0097 .0106	0.0101 .0109	---------- ----------	16
.0081 .0090	.0083 .0091	.0084 .0093	.0085 .0094	.0087 .0096	.0089 .0098	.0091 .0100	.0092 .0101	.0095 .0104	.0098 .0107	.0102 .0111	.0105 .0114	0.0108 .0117	14
.0087 .0096	.0088 .0098	.0090 .0099	.0091 .0100	.0093 .0103	.0095 .0104	.0097 .0106	.0098 .0108	.0101 .0110	.0103 .0113	.0107 .0117	.0111 .0120	.0114 .0123	12
.0094 .0105	.0096 .0106	.0097 .0107	.0098 .0109	.0100 .0111	.0102 .0113	.0104 .0114	.0106 .0116	.0108 .0119	.0111 .0121	.0115 .0125	.0118 .0129	.0121 .0132	10
.0104 .0116	.0106 .0118	.0107 .0119	.0108 .0120	.0111 .0122	.0113 .0124	.0114 .0126	.0116 .0128	.0119 .0130	.0121 .0133	.0125 .0137	.0129 .0140	.0132 .0143	8
---------- ----------	.0121 .0135	.0123 .0136	.0124 .0138	.0126 .0140	.0128 .0142	.0130 .0143	.0131 .0145	.0134 .0148	.0137 .0150	.0141 .0154	.0144 .0158	.0147 .0161	6
---------- ----------	---------- ----------	---------- ----------	.0151 .0168	.0154 .0170	.0155 .0172	.0157 .0174	.0159 .0175	.0162 .0178	.0164 .0180	.0168 .0185	.0172 .0188	.0175 .0191	4

TABLE IV.5.—*Pitch diameter tolerances for external threads of*

(UNS and NS threads.

Threads per inch	Lengths of engagement		Pitch diameter tolerances [a]									
	Number of pitches	Inches	1/16 0.0600 to 0.0781	3/32 0.0782 to 0.1094	1/8 0.1095 to 0.1563	3/16 0.1564 to 0.2188	1/4 0.2189 to 0.3125	3/8 0.3126 to 0.4375	1/2 0.4376 to 0.5625	5/8 0.5626 to 0.6875	3/4 0.6876 to 0.8750	1 0.8751 to 1.1250
			in	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	5 to 15	0.06 to 0.19	0.0019	0.0020	0.0021	0.0022	0.0023	----------	----------	----------	----------	----------
	16 to 30	0.191 to 0.38	.0022	.0022	.0023	.0024	.0025	----------	----------	----------	----------	----------
72	5 to 15	0.07 to 0.21	.0020	.0021	.0021	.0023	.0023	0.0025	----------	----------	----------	----------
	16 to 30	0.211 to 0.42	----------	.0023	.0024	.0025	.0026	.0027	----------	----------	----------	----------
64	5 to 15	0.08 to 0.23	.0021	.0022	.0022	.0024	.0024	.0026	0.0027	----------	----------	----------
	16 to 30	0.231 to 0.46	----------	.0025	.0025	.0026	.0027	.0029	.0030	----------	----------	----------
56	5 to 15	0.09 to 0.27	----------	.0023	.0024	.0025	.0026	.0027	.0028	0.0029	0.0030	----------
	16 to 30	0.271 to 0.54	----------	.0026	.0027	.0028	.0029	.0030	.0031	.0032	.0033	----------
48	5 to 15	0.10 to 0.31	----------	.0025	.0025	.0026	.0027	.0029	.0030	.0031	.0031	----------
	16 to 30	0.311 to 0.62	----------	----------	.0029	.0030	.0030	.0032	.0033	.0034	.0035	----------
44	5 to 15	0.11 to 0.34	----------	.0026	.0026	.0027	.0028	.0030	.0031	.0032	.0032	0.0034
	16 to 30	0.341 to 0.68	----------	----------	.0030	.0031	.0032	.0033	.0034	.0035	.0036	.0037
40	5 to 15	0.12 to 0.38	----------	----------	.0027	.0029	.0029	.0031	.0032	.0033	.0034	.0035
	16 to 30	0.381 to 0.76	----------	----------	.0031	.0032	.0033	.0034	.0035	.0036	.0037	.0038
36	5 to 15	0.14 to 0.42	----------	----------	.0029	.0030	.0031	.0032	.0033	.0034	.0035	.0036
	16 to 30	0.421 to 0.84	----------	----------	----------	.0034	.0034	.0036	.0037	.0038	.0039	.0040
32	5 to 15	0.16 to 0.47	----------	----------	.0030	.0031	.0032	.0034	.0035	.0036	.0036	.0038
	16 to 30	0.471 to 0.94	----------	----------	----------	.0035	.0036	.0038	.0039	.0040	.0040	.0042
28	5 to 15	0.18 to 0.54	----------	----------	----------	.0033	.0034	.0036	.0037	.0038	.0038	.0040
	16 to 30	0.541 to 1.08	----------	----------	----------	.0038	.0038	.0040	.0041	.0042	.0043	.0044
27	5 to 15	0.19 to 0.56	----------	----------	----------	.0034	.0035	.0036	.0037	.0038	.0039	.0040
	16 to 30	0.561 to 1.12	----------	----------	----------	.0038	.0039	.0040	.0041	.0042	.0043	.0045
24	5 to 15	0.21 to 0.62	----------	----------	----------	.0036	.0037	.0038	.0039	.0040	.0041	.0042
	16 to 30	0.621 to 1.24	----------	----------	----------	----------	.0041	.0043	.0044	.0045	.0045	.0047
20	5 to 15	0.25 to 0.75	----------	----------	----------	----------	.0040	.0041	.0042	.0043	.0044	.0045
	16 to 30	0.751 to 1.50	----------	----------	----------	----------	.0045	.0046	.0047	.0048	.0049	.0050
18	5 to 15	0.28 to 0.83	----------	----------	----------	----------	----------	.0043	.0044	.0045	.0046	.0047
	16 to 30	0.831 to 1.66	----------	----------	----------	----------	----------	.0048	.0050	.0050	.0051	.0053
16	5 to 15	0.31 to 0.94	----------	----------	----------	----------	----------	.0046	.0047	.0048	.0049	.0050
	16 to 30	0.941 to 1.88	----------	----------	----------	----------	----------	.0051	.0052	.0053	.0054	.0055
14	5 to 15	0.36 to 1.07	----------	----------	----------	----------	----------	----------	.0050	.0051	.0051	.0053
	16 to 30	1.071 to 2.14	----------	----------	----------	----------	----------	----------	.0056	.0057	.0057	.0059
12	5 to 15	0.42 to 1.25	----------	----------	----------	----------	----------	----------	.0054	.0054	.0055	.0057
	16 to 30	1.251 to 2.50	----------	----------	----------	----------	----------	----------	.0060	.0061	.0062	.0063
10	5 to 15	0.50 to 1.50	----------	----------	----------	----------	----------	----------	----------	----------	.0060	.0062
	16 to 30	1.501 to 3.00	----------	----------	----------	----------	----------	----------	----------	----------	.0067	.0069
8	5 to 15	0.62 to 1.88	----------	----------	----------	----------	----------	----------	----------	----------	----------	.0068
	16 to 30	1.881 to 3.76	----------	----------	----------	----------	----------	----------	----------	----------	----------	.0076
6	5 to 15	0.83 to 2.50	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
	16 to 30	2.501 to 5.00	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
4	5 to 15	1.25 to 3.75	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
	16 to 30	3.751 to 7.50	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

[a] Tolerances are based on diameters given in common fractions, which are the means of the diameter ranges expressed in decimals.

special diameters, pitches, and lengths of engagement, class 2A

See subsection 5, p. 98.)

Pitch diameter tolerances ⁴—Continued													Threads per inch
1¼ 1.1251 to 1.3750	1½ 1.3751 to 1.6250	1¾ 1.6251 to 1.8750	2 1.8751 to 2.2500	2½ 2.2501 to 2.7500	3 2.7501 to 3.2500	3½ 3.2501 to 3.7500	4 3.7501 to 4.5000	5 4.5001 to 5.5000	6 5.5001 to 7.0000	8 7.0001 to 9.0000	10 9.0001 to 11.0000	12 11.0001 to 13.0000	
in.	*in.*	*in.*											
--------- ---------	--------- ---------	--------- ---------											80
--------- ---------	--------- ---------	--------- ---------											72
--------- ---------	--------- ---------	--------- ---------											64
--------- ---------	--------- ---------	--------- ---------											56
--------- ---------	--------- ---------	--------- ---------											48
--------- ---------	--------- ---------	--------- ---------											44
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	
--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	40
0.0037 .0041	0.0038 .0042	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	36
.0039 .0043	.0040 .0044	0.0041 .0045	0.0042 .0046	0.0043 .0047	0.0044 .0048	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	32
.0041 .0045	.0042 .0046	.0043 .0047	.0044 .0048	.0045 .0049	.0046 .0051	0.0048 .0052	0.0049 .0053	--------- ---------	--------- ---------	--------- ---------	--------- ---------	--------- ---------	28
.0041 .0046	.0042 .0047	.0043 .0048	.0044 .0048	.0046 .0050	.0047 .0051	.0048 .0052	.0049 .0053	0.0051 .0055	0.0053 .0057	--------- ---------	--------- ---------	--------- ---------	27
.0043 .0048	.0044 .0049	.0045 .0050	.0046 .0051	.0048 .0052	.0049 .0053	.0050 .0054	.0051 .0056	.0053 .0057	.0054 .0059	--------- ---------	--------- ---------	--------- ---------	24
.0047 .0052	.0048 .0053	.0048 .0053	.0049 .0054	.0051 .0056	.0052 .0057	.0053 .0058	.0054 .0059	.0056 .0061	.0058 .0063	--------- ---------	--------- ---------	--------- ---------	20
.0049 .0054	.0050 .0055	.0051 .0056	.0051 .0057	.0053 .0058	.0054 .0059	.0055 .0060	.0056 .0061	.0058 .0063	.0060 .0065	0.0062 .0068	--------- ---------	--------- ---------	18
.0051 .0057	.0052 .0058	.0053 .0058	.0054 .0059	.0055 .0061	.0056 .0062	.0058 .0063	.0059 .0064	.0061 .0066	.0062 .0068	.0065 .0070	0.0067 .0073	--------- ---------	16
.0054 .0060	.0055 .0061	.0056 .0062	.0057 .0063	.0058 .0064	.0059 .0065	.0061 .0067	.0062 .0068	.0064 .0069	.0065 .0071	.0068 .0074	.0070 .0076	0.0072 .0078	14
.0058 .0064	.0059 .0065	.0060 .0066	.0061 .0067	.0062 .0068	.0063 .0070	.0064 .0071	.0065 .0072	.0067 .0074	.0069 .0075	.0072 .0078	.0074 .0080	.0076 .0082	12
.0063 .0070	.0064 .0071	.0065 .0072	.0065 .0072	.0037 .7074	.0068 .0075	.0069 .0076	.0079 .0077	.0072 .0079	.0074 .0081	.0077 .0084	.0079 .0086	.0081 .0088	10
.0070 .0077	.0071 .0078	.0071 .0079	.0072 .0080	.0074 .0082	.0075 .0083	.0076 .0084	.0077 .0085	.0079 .0087	.0081 .0088	.0083 .0091	.0086 .0094	.0088 .0096	8
--------- ---------	.0081 .0090	.0082 .0091	.0083 .0092	.0084 .0093	.0085 .0094	.0087 .0096	.0088 .0097	.0089 .0098	.0091 .0100	.0094 .0103	.0096 .0105	.0098 .0107	6
--------- ---------	--------- ---------	--------- ---------	.0101 .0112	.0102 .0113	.0104 .0115	.0195 .0116	.0106 .0117	.0108 .0119	.0109 .0120	.0112 .0123	.0114 .0125	.0116 .0127	4

LEGENDS

1. These values do not agree with and shall not be used in place of any tabulated values for the UNC, UNF and 8N thread series, in table III.10.
2. Formula:
   Class 2A tolerances $=0.0015\sqrt[3]{D}+0.0015\sqrt{L_e}+0.015\sqrt[3]{p^2}$ where
   D = basic major diameter
   L_e = length of engagement
   p = pitch
3. Length of engagement increments included in the tabulated tolerances for lengths of engagement of from 5 to 15 pitches are based on lengths of 9 pitches; those for lengths of engagement greater than 15 to 30 pitches are based on lengths of 20 pitches. For lengths of engagement not tabulated, the formula in legend 2 should be applied.
4. Pitches listed are those used most commonly and are recommended. Where intermediate pitches are specified, the formula in legend 2 should be applied.
5. Tolerances are tabulated only for combinations of diameter, pitch and length of engagement which are considered to be generally used. For other combinations encountered, see Design of Special Threads, appendix 5, p. 200.

TABLE IV.6.—*Pitch diameter tolerances for external threads of*

(UNS and NS threads.

Threads per inch	Lengths of engagement		Pitch diameter tolerances •									
	Number of pitches	Inches	1/16 0.0600 to 0.0781	5/64 0.0782 to 0.1094	1/8 0.1095 to 0.1563	3/16 0.1564 to 0.2188	1/4 0.2189 to 0.3125	3/8 0.3126 to 0.4375	1/2 0.4376 to 0.5625	5/8 0.5626 to 0.6875	3/4 0.6876 to 0.8750	1 0.8751 to 1.1250
			in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
80	5 to 15	0.06 to 0.19	0.0014	0.0015	0.0015	0.0016	0.0017	--------	--------	--------	--------	--------
	16 to 30	0.191 to 0.38	.0016	.0017	.0017	.0018	.0019	--------	--------	--------	--------	--------
72	5 to 15	0.07 to 0.21	.0015	.0016	.0016	.0017	.0018	0.0019	--------	--------	--------	--------
	16 to 30	0.211 to 0.42	--------	.0018	.0018	.0019	.0020	.0021	--------	--------	--------	--------
64	5 to 15	0.08 to 0.23	.0016	.0016	.0017	.0018	.0018	.0019	0.0020	--------	--------	--------
	16 to 30	0.231 to 0.46	--------	.0018	.0019	.0020	.0020	.0021	.0022	--------	--------	--------
56	5 to 15	0.09 to 0.27	--------	.0017	.0018	.0019	.0019	.0020	.0021	0.0022	0.0022	--------
	16 to 30	0.271 to 0.54	--------	.0020	.0020	.0021	.0021	.0023	.0023	.0024	.0025	--------
48	5 to 15	0.10 to 0.31	--------	.0019	.0019	.0020	.0020	.0022	.0022	.0023	.0024	--------
	16 to 30	0.311 to 0.62	--------	--------	.0021	.0022	.0023	.0024	.0025	.0025	.0026	--------
44	5 to 15	0.11 to 0.34	--------	.0019	.0020	.0021	.0021	.0022	.0023	.0024	.0024	0.0025
	16 to 30	0.341 to 0.68	--------	--------	.0022	.0023	.0024	.0025	.0026	.0026	.0027	.0028
40	5 to 15	0.12 to 0.38	--------	--------	.0021	.0021	.0022	.0023	.0024	.0025	.0025	.0026
	16 to 30	0.381 to 0.76	--------	--------	.0023	.0024	.0025	.0026	.0027	.0027	.0028	.0029
36	5 to 15	0.14 to 0.42	--------	--------	.0022	.0022	.0023	.0024	.0025	.0026	.0026	.0027
	16 to 30	0.421 to 0.84	--------	--------	--------	.0025	.0026	.0027	.0028	.0028	.0029	.0030
32	5 to 15	0.16 to 0.47	--------	--------	.0023	.0024	.0024	.0025	.0026	.0027	.0027	.0028
	16 to 30	0.471 to 0.94	--------	--------	--------	.0026	.0027	.0028	.0029	.0030	.0030	.0031
28	5 to 15	0.18 to 0.54	--------	--------	--------	.0025	.0026	.0027	.0028	.0028	.0029	.0030
	16 to 30	0.541 to 1.08	--------	--------	--------	.0028	.0029	.0030	.0031	.0031	.0032	.0033
27	5 to 15	0.19 to 0.56	--------	--------	--------	.0025	.0026	.0027	.0028	.0029	.0029	.0030
	16 to 30	0.561 to 1.12	--------	--------	--------	.0029	.0029	.0030	.0031	.0032	.0032	.0033
24	5 to 15	0.21 to 0.62	--------	--------	--------	.0027	.0028	.0029	.0029	.0030	.0031	.0032
	16 to 30	0.621 to 1.24	--------	--------	--------	--------	.0031	.0032	.0033	.0033	0034	.0035
20	5 to 15	0.25 to 0.75	--------	--------	--------	--------	.0030	.0031	.0032	.0032	.0033	.0034
	16 to 30	0.751 to 1.50	--------	--------	--------	--------	.0034	.0035	.0035	.0036	.0037	.0038
18	5 to 15	0.28 to 0.83	--------	--------	--------	--------	--------	.0032	.0033	.0034	.0035	.0036
	16 to 30	0.831 to 1.66	--------	--------	--------	--------	--------	.0036	.0037	.0038	.0038	.0039
16	5 to 15	0.31 to 0.94	--------	--------	--------	--------	--------	.0034	.0035	.0036	.0036	.0037
	16 to 30	0.941 to 1.88	--------	--------	--------	--------	--------	.0038	.0039	.0040	.0041	.0042
14	5 to 15	0.36 to 1.07	--------	--------	--------	--------	--------	--------	.0037	.0038	.0039	.0040
	16 to 30	1.071 to 2.14	--------	--------	--------	--------	--------	--------	.0042	.0042	.0043	.0044
12	5 to 15	0.42 to 1.25	--------	--------	--------	--------	--------	--------	.0040	.0041	.0041	.0042
	16 to 30	1.251 to 2.50	--------	--------	--------	--------	--------	--------	.0045	.0046	.0046	.0047
10	5 to 15	0.50 to 1.50	--------	--------	--------	--------	--------	--------	--------	--------	.0045	.0046
	16 to 30	1.501 to 3.00	--------	--------	--------	--------	--------	--------	--------	--------	.0050	.0051
8	5 to 15	0.62 to 1.88	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0051
	16 to 30	1.881 to 3.76	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0057
6	5 to 15	0.83 to 2.50	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
	16 to 30	2.501 to 5.00	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
4	5 to 15	1.25 to 3.75	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
	16 to 30	3.751 to 7.50	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------

• Tolerances are based on diameters given in common fractions, which are the means of the diameter ranges expressed in decimals.

special diameters, pitches, and lengths of engagement, class 3A

See subsection 5, p. 98.)

Pitch diameter tolerances¹—Continued													
1¼ 1.1251 to 1.3750	1½ 1.3751 to 1.6250	1¾ 1.6251 to 1.8750	2 1.8751 to 2.2500	2½ 2.2501 to 2.7500	3 2.7501 to 3.2500	3½ 3.2501 to 3.7500	4 3.7501 to 4.5000	5 4.5001 to 5.5000	6 5.5001 to 7.0000	8 7.0001 to 9.0000	10 9.0001 to 11.0000	12 11.0001 to 13.0000	Threads per inch
in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	
....	....	....											80
....	....	....											72
....	....	....											64
....	....	....											56
....	....	....											48
....	....	....											44
....	....	....	....	....	....	....	....	....	....	....	....	....	40
0.0028 .0031	0.0029 .0032	....	....	....	....	....	....	....	....	....	....	....	36
.0029 .0032	.0030 .0033	0.0031 .0034	0.0031 .0034	0.0032 .0035	0.0033 .0036	....	....	....	....	....	....	....	32
.0031 .0034	.0031 .0035	.0032 .0035	.0033 .0036	.0034 .0037	.0035 .0038	0.0036 .0039	0.0036 .0040	....	....	....	....	....	28
.0031 .0034	.0032 .0035	.0033 .0036	.0033 .0036	.0034 .0037	.0035 .0038	.0035 .0039	.0037 .0040	0.0038 .0041	0.0039 .0043	....	....	....	27
.0032 .0036	.0033 .0037	.0034 .0037	.0035 .0038	.0036 .0039	.0037 .0040	.0037 .0041	.0038 .0042	.0040 .0043	.0041 .0044	....	....	....	24
.0035 .0039	.0036 .0039	.0036 .0040	.0037 .0041	.0038 .0042	.0039 .0043	.0040 .0044	.0041 .0044	.0042 .0046	.0043 .0047	....	....	....	20
.0036 .0040	.0037 .0041	.0038 .0042	.0039 .0042	.0040 .0044	.0041 .0044	.0041 .0045	.0042 .0046	.0044 .0047	.0045 .0049	0.0047 .0051	....	....	18
.0038 .0042	.0039 .0043	.0040 .0044	.0040 .0044	.0041 .0046	.0042 .0047	.0043 .0047	.0044 .0048	.0045 .0050	.0047 .0051	.0049 .0053	0.0050 .0055	....	16
.0041 .0045	.0041 .0046	.0042 .0046	.0043 .0047	.0044 .0048	.0045 .0049	.0045 .0050	.0046 .0051	.0048 .0052	.0049 .0053	.0051 .0055	.0053 .0057	0.0054 .0059	14
.0043 .0048	.0044 .0049	.0045 .0050	.0045 .0050	.0046 .0051	.0047 .0052	.0048 .0053	.0049 .0054	.0050 .0055	.0052 .0056	.0054 .0058	.0055 .0060	.0057 .0062	12
.0047 .0052	.0048 .0053	.0048 .0054	.0049 .0054	.0050 .0055	.0051 .0056	.0052 .0057	.0053 .0058	.0054 .0059	.0055 .0061	.0057 .0063	.0059 .0064	.0061 .0066	10
.0052 .0058	.0053 .0059	.0054 .0059	.0054 .0060	.0055 .0061	.0056 .0062	.0057 .0063	.0058 .0064	.0059 .0065	.0061 .0066	.0063 .0068	.0064 .0070	.0066 .0072	8
....	.0061 .0067	.0061 .0068	.0062 .0069	.0063 .0070	.0064 .0071	.0065 .0072	.0066 .0072	.0067 .0074	.0068 .0075	.0070 .0077	.0072 .0079	.0074 .0080	6
....	....	....	.0076 .0084	.0077 .0085	.0078 .0086	.0079 .0087	.0079 .0088	.0081 .0089	.0082 .0090	.0084 .0092	.0086 .0094	.0087 .0096	4

LEGENDS

1. These values do not agree with and shall not be used in place of any tabulated values for the UNC, UNF, and 8N thread series, in table III.10.
2. Formula:
   Class 3A tolerances for external threads are determined by multiplying class 2A tolerances (computed to six decimal places) by 0.750. See legend 2, table IV.5, for formula for class 2A tolerances.
3. Length of engagement increments included in the tabulated tolerances for lengths of engagement from 5 to 15 pitches are based on lengths of 9 pitches; those for lengths of engagement greater than 15 to 30 pitches are based on lengths of 20 pitches. For lengths of engagement not tabulated, the formula in legend 2 should be applied.
4. Pitches listed are those used most commonly and are recommended. Where intermediate pitches are specified, the formula in legend 2 should be applied.
5. Tolerances are tabulated only for combinations of diameter, pitch, and length of engagement which are considered to be generally used. For other combinations encountered, see Design of Special Threads, appendix 5, p. 200.

TABLE IV.7.—*Pitch diameter tolerances for internal threads of*

(UNS and NS threads.

Threads per inch	Lengths of engagement: Number of pitches	Lengths of engagement: Inches	Pitch diameter tolerances [a]: 1/16 0.0600 to 0.0781	3/32 0.0782 to 0.1094	1/8 0.1095 to 0.1563	3/16 0.1564 to 0.2188	1/4 0.2189 to 0.3125	3/8 0.3126 to 0.4375	1/2 0.4376 to 0.5625	5/8 0.5626 to 0.6875	3/4 0.6876 to 0.8750	1 0.8751 to 1.1250
				in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	5 to 15	0.06 to 0.19	......	......	......	......	......	......	......	......	......	......
	16 to 30	0.191 to 0.38	......	......	......	......	......	......	......	......	......	......
72	5 to 15	0.07 to 0.21	......	......	......	......	......	......	......	......	......	......
	16 to 30	0.211 to 0.42	......	......	......	......	......	......	......	......	......	......
64	5 to 15	0.08 to 0.23	......	......	......	......	......	......	......	......	......	......
	16 to 30	0.231 to 0.46	......	......	......	......	......	......	......	......	......	......
56	5 to 15	0.09 to 0.27	......	......	......	......	......	......	......	......	......	......
	16 to 30	0.271 to 0.54	......	......	......	......	......	......	......	......	......	......
48	5 to 15	0.10 to 0.31	......	......	......	......	......	......	......	......	......	......
	16 to 30	0.311 to 0.62	......	......	......	......	......	......	......	......	......	......
44	5 to 15	0.11 to 0.34	......	0.0050	0.0051	0.0053	0.0055	0.0058	0.0060	0.0062	0.0063	0.0066
	16 to 30	0.341 to 0.68	......	.0056	.0058	.0060	.0062	.0064	.0066	.0068	.0070	.0072
40	5 to 15	0.12 to 0.38	......	......	.0054	.0056	.0057	.0060	.0062	.0064	.0065	.0068
	16 to 30	0.381 to 0.76	......	......	.0060	.0062	.0064	.0067	.0069	.0071	.0072	.0075
36	5 to 15	0.14 to 0.42	......	......	.0056	.0058	.0060	.0063	.0065	.0066	.0068	.0071
	16 to 30	0.421 to 0.84	......	......	......	.0065	.0067	.0070	.0072	.0074	.0075	.0078
32	5 to 15	0.16 to 0.47	......	......	.0059	.0061	.0063	.0066	.0068	.0070	.0071	.0074
	16 to 30	0.471 to 0.94	......	......	......	.0069	.0071	.0073	.0075	.0077	.0079	.0081
28	5 to 15	0.18 to 0.54	......	......	......	.0065	.0067	.0069	.0072	.0073	.0075	.0078
	16 to 30	0.541 to 1.08	......	......	......	.0073	.0075	.0078	.0080	.0081	.0083	.0086
27	5 to 15	0.19 to 0.56	......	......	......	.0066	.0068	.0070	.0073	.0074	.0076	.0079
	16 to 30	0.561 to 1.12	......	......	......	.0074	.0076	.0079	.0081	.0083	.0084	.0087
24	5 to 15	0.21 to 0.62	......	......	......	.0070	.0072	.0074	.0076	.0078	.0080	.0082
	16 to 30	0.621 to 1.24	......	......	......	......	.0080	.0083	.0085	.0087	.0088	.0091
20	5 to 15	0.25 to 0.75	......	......	......	......	.0078	.0080	.0083	.0084	.0086	.0089
	16 to 30	0.751 to 1.50	......	......	......	......	.0087	.0090	.0092	.0094	.0096	.0098
18	5 to 15	0.28 to 0.83	......	......	......	......	......	.0084	.0087	.0088	.0090	.0093
	16 to 30	0.831 to 1.66	......	......	......	......	......	.0095	.0097	.0098	.0100	.0103
16	5 to 15	0.31 to 0.94	......	......	......	......	......	.0089	.0091	.0093	.0095	.0097
	16 to 30	0.941 to 1.88	......	......	......	......	......	.0100	.0102	.0104	.0105	.0108
14	5 to 15	0.36 to 1.07	......	......	......	......	......	......	.0097	.0099	.0100	.0103
	16 to 30	1.071 to 2.14	......	......	......	......	......	......	.0109	.0110	.0112	.0115
12	5 to 15	0.42 to 1.25	......	......	......	......	......	......	.0104	.0106	.0108	.0110
	16 to 30	1.251 to 2.50	......	......	......	......	......	......	.0117	.0119	.0120	.0123
10	5 to 15	0.50 to 1.50	......	......	......	......	......	......	......	......	.0117	.0120
	16 to 30	1.501 to 3.00	......	......	......	......	......	......	......	......	.0131	.0134
8	5 to 15	0.62 to 1.88	......	......	......	......	......	......	......	......	......	.0133
	16 to 30	1.881 to 3.76	......	......	......	......	......	......	......	......	......	.0149
6	5 to 15	0.83 to 2.50	......	......	......	......	......	......	......	......	......	......
	16 to 30	2.501 to 5.00	......	......	......	......	......	......	......	......	......	......
4	5 to 15	1.25 to 3.75	......	......	......	......	......	......	......	......	......	......
	16 to 30	3.751 to 7.50	......	......	......	......	......	......	......	......	......	......

[a] Tolerances are based on diameters given in common fractions, which are the means of the diameter ranges expressed in decimals.

special diameters, pitches, and lengths of engagement, class 1B

See subsection 5, p. 98.)

Pitch diameter tolerances ᵃ—Continued													Threads per inch
1¼ 1.1251 to 1.3750	1½ 1.3751 to 1.6250	1¾ 1.6251 to 1.8750	2 1.8751 to 2.2500	2½ 2.2501 to 2.7500	3 2.7501 to 3.2500	3½ 3.2501 to 3.7500	4 3.7501 to 4.5000	5 4.5001 to 5.5000	6 5.5001 to 7.0000	8 7.0001 to 9.0000	10 9.0001 to 11.0000	12 11.0001 to 13.0000	
in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	
-------- --------	-------- --------	-------- --------											80
-------- --------	-------- --------	-------- --------											72
-------- --------	-------- --------	-------- --------											64
-------- --------	-------- --------	-------- --------											56
-------- --------	-------- --------	-------- --------											48
-------- --------	-------- --------	-------- --------											44
-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	40
0.0073 .0080	0.0075 .0082	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	36
.0076 .0084	.0078 .0086	0.0080 .0087	0.0081 .0089	0.0084 .0092	0.0087 .0094	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	32
.0080 .0088	.0082 .0090	.0084 .0092	.0085 .0093	.0088 .0096	.0090 .0099	0.0093 .0101	0.0095 .0103	-------- --------	-------- --------	-------- --------	-------- --------	-------- --------	28
.0080 .0089	.0083 .0091	.0085 .0093	.0085 .0095	.0089 .0097	.0092 .0100	.0094 .0102	.0096 .0104	0.0099 .0108	0.0103 .0111	-------- --------	-------- --------	-------- --------	27
.0085 .0093	.0087 .0095	.0088 .0097	.0090 .0099	.0093 .0102	.0095 .0104	.0097 .0106	.0100 .0108	.0103 .0112	.0106 .0115	-------- --------	-------- --------	-------- --------	24
.0091 .0100	.0093 .0102	.0095 .0104	.0096 .0106	.0099 .0109	.0101 .0111	.0104 .0113	.0106 .0115	.0109 .0119	.0112 .0122	-------- --------	-------- --------	-------- --------	20
.0095 .0105	.0097 .0107	.0099 .0109	.0100 .0110	.0103 .0113	.0105 .0116	.0108 .0118	.0110 .0120	.0113 .0123	.0116 .0127	0.0122 .0132	-------- --------	-------- --------	18
.0100 .0110	.0101 .0112	.0103 .0114	.0105 .0116	.0108 .0118	.0110 .0121	.0112 .0123	.0114 .0125	.0118 .0129	.0121 .0132	.0126 .0137	0.0131 .0142	-------- --------	16
.0105 .0117	.0107 .0119	.0109 .0121	.0111 .0122	.0114 .0125	.0116 .0127	.0118 .0130	.0120 .0132	.0124 .0135	.0127 .0138	.0132 .0144	.0137 .0148	0.0141 .0152	14
.0113 .0125	.0115 .0127	.0116 .0129	.0118 .0130	.0121 .0133	.0123 .0136	.0126 .0138	.0128 .0140	.0131 .0144	.0134 .0147	.0140 .0152	.0144 .0157	.0148 .0161	12
.0122 .0136	.0124 .0138	.0126 .0140	.0128 .0141	.0130 .0144	.0133 .0147	.0135 .0149	.0137 .0151	.0141 .0154	.0144 .0158	.0149 .0163	.0154 .0167	.0158 .0171	10
.0136 .0151	.0138 .0153	.0139 .0155	.0141 .0156	.0144 .0159	.0146 .0162	.0149 .0164	.0151 .0166	.0154 .0169	.0157 .0173	.0163 .0178	.0167 .0182	.0171 .0186	8
-------- --------	.0158 .0175	.0160 .0177	.0161 .0179	.0164 .0182	.0167 .0184	.0169 .0186	.0171 .0188	.0174 .0192	.0178 .0195	.0183 .0200	.0187 .0205	.0191 .0209	6
-------- --------	-------- --------	-------- --------	.0197 .0218	.0200 .0221	.0202 .0224	.0204 .0226	.0206 .0228	.0210 .0232	.0213 .0235	.0218 .0240	.0223 .0245	.0227 .0248	4

LEGENDS

1. These values do not agree with and shall not be used in place of any tabulated values for the UNC, UNF, and 8N thread series, in table III.10.
2. Formula:
   Class 1B tolerances for internal threads are 1.5 times class 2B tolerances and are determined by multiplying 2A tolerances (computed to six decimal places) by 1.950. See Legend 2, table IV.5, for formula for class 2A tolerances.
3. Length of engagement increments included in the tabulated tolerances for lengths of engagement from 5 to 15 pitches are based on lengths of 9 pitches; those for lengths of engagement greater than 15 to 30 pitches are based on lengths of 20 pitches. For lengths of engagement not tabulated, the formula in legend 2 should be applied.
4. Pitches listed are those used most commonly and are recommended. Where intermediate pitches are specified, the formula in legend 2 should be applied.
5. Tolerances are tabulated only for combinations of diameter, pitch, and length of engagement which are considered to be generally used. For other combinations encountered, see Design of Special Threads, appendix 5, p. 200.

TABLE IV.8.—*Pitch diameter tolerances for internal threads of*

(UNS and NS threads.

Threads per inch	Lengths of engagement		Pitch diameter tolerances *									
	Number of pitches	Inches	1/16 0.0600 to 0.0781	3/32 0.0782 to 0.1094	1/8 0.1095 to 0.1563	3/16 0.1564 to 0.2188	1/4 0.2189 to 0.3125	3/8 0.3126 to 0.4375	1/2 0.4376 to 0.5625	5/8 0.5626 to 0.6875	3/4 0.6876 to 0.8750	1 0.8751 to 1.1250
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	5 to 15	0.06 to 0.19	0.0025	0.0026	0.0027	0.0028	0.0029	---------	---------	---------	---------	---------
	16 to 30	0.191 to 0.38	.0028	.0029	.0030	.0031	.0033	---------	---------	---------	---------	---------
72	5 to 15	0.07 to 0.21	.0026	.0027	.0028	.0029	.0030	0.0032	---------	---------	---------	---------
	16 to 30	0.211 to 0.42	---------	.0030	.0031	.0033	.0034	.0036	---------	---------	---------	---------
64	5 to 15	0.08 to 0.23	.0027	.0028	.0029	.0031	.0032	.0034	0.0035	---------	---------	---------
	16 to 30	0.231 to 0.46	---------	.0032	.0033	.0034	.0035	.0037	.0039	---------	---------	---------
56	5 to 15	0.09 to 0.27	---------	.0030	.0031	.0032	.0033	.0035	.0037	0.0038	0.0039	---------
	16 to 30	0.271 to 0.54	---------	.0034	.0035	.0036	.0037	.0039	.0040	.0042	.0043	---------
48	5 to 15	0.10 to 0.31	---------	.0032	.0033	.0034	.0036	.0037	.0039	.0040	.0041	---------
	16 to 30	0.311 to 0.62	---------	---------	.0037	.0039	.0040	.0041	.0043	.0044	.0045	---------
44	5 to 15	0.11 to 0.34	---------	.0033	.0034	.0036	.0037	.0039	.0040	.0041	.0042	0.0044
	16 to 30	0.341 to 0.68	---------	---------	.0039	.0040	.0041	.0043	.0044	.0045	.0047	.0048
40	5 to 15	0.12 to 0.38	---------	---------	.0036	.0037	.0038	.0040	.0041	.0043	.0044	.0045
	16 to 30	0.381 to 0.76	---------	---------	.0040	.0042	.0043	.0045	.0046	.0047	.0048	.0050
36	5 to 15	0.14 to 0.42	---------	---------	.0037	.0039	.0040	.0042	.0043	.0044	.0045	.0047
	16 to 30	0.421 to 0.84	---------	---------	---------	.0044	.0045	.0046	.0048	.0049	.0050	.0052
32	5 to 15	0.16 to 0.47	---------	---------	.0039	.0041	.0042	.0044	.0045	.0046	.0047	.0049
	16 to 30	0.471 to 0.94	---------	---------	---------	.0046	.0047	.0049	.0050	.0051	.0052	.0054
28	5 to 15	0.18 to 0.54	---------	---------	---------	.0043	.0044	.0046	.0048	.0049	.0050	.0052
	16 to 30	0.541 to 1.08	---------	---------	---------	.0049	.0050	.0052	.0053	.0054	.0055	.0057
27	5 to 15	0.19 to 0.56	---------	---------	---------	.0044	.0045	.0047	.0048	.0050	.0051	.0052
	16 to 30	0.561 to 1.12	---------	---------	---------	.0050	.0051	.0053	.0054	.0055	.0056	.0058
24	5 to 15	0.21 to 0.62	---------	---------	---------	.0047	.0048	.0049	.0051	.0052	.0053	.0055
	16 to 30	0.621 to 1.24	---------	---------	---------	---------	.0054	.0055	.0057	.0058	.0059	.0061
20	5 to 15	0.25 to 0.75	---------	---------	---------	---------	.0052	.0054	.0055	.0056	.0057	.0059
	16 to 30	0.751 to 1.50	---------	---------	---------	---------	.0058	.0060	.0061	.0063	.0064	.0065
18	5 to 15	0.28 to 0.83	---------	---------	---------	---------	---------	.0056	.0058	.0059	.0060	.0062
	16 to 30	0.831 to 1.66	---------	---------	---------	---------	---------	.0063	.0064	.0066	.0067	.0068
16	5 to 15	0.31 to 0.94	---------	---------	---------	---------	---------	.0059	.0061	.0062	.0063	.0065
	16 to 30	0.941 to 1.88	---------	---------	---------	---------	---------	.0067	.0068	.0069	.0070	.0072
14	5 to 15	0.36 to 1.07	---------	---------	---------	---------	---------	---------	.0065	.0066	.0067	.0069
	16 to 30	1.071 to 2.14	---------	---------	---------	---------	---------	---------	.0072	.0074	.0075	.0076
12	5 to 15	0.42 to 1.25	---------	---------	---------	---------	---------	---------	.0070	.0071	.0072	.0074
	16 to 30	1.251 to 2.50	---------	---------	---------	---------	---------	---------	.0078	.0079	.0080	.0082
10	5 to 15	0.50 to 1.50	---------	---------	---------	---------	---------	---------	---------	---------	.0078	.0080
	16 to 30	1.501 to 3.00	---------	---------	---------	---------	---------	---------	---------	---------	.0087	.0089
8	5 to 15	0.62 to 1.88	---------	---------	---------	---------	---------	---------	---------	---------	---------	.0089
	16 to 30	1.881 to 3.76	---------	---------	---------	---------	---------	---------	---------	---------	---------	.0099
6	5 to 15	0.[illegible] to 2.50	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------
	16 to 30	2.501 to 5.00	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------
4	5 to 15	1.25 to 3.75	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------
	16 to 30	3.751 to 7.50	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------

* Tolerances are based on diameters given in common fractions, which are the means of the diameter ranges expressed in decimals.

special diameters, pitches, and lengths of engagement, class 2B

See subsection 5, p. 98.)

Pitch diameter tolerances ᵃ—Continued													Threads per inch
1¼ 1.1251 to 1.3750	1½ 1.3751 to 1.6250	1¾ 1.6251 to 1.8750	2 1.8751 to 2.2500	2½ 2.2501 to 2.7500	3 2.7501 to 3.2500	3½ 3.2501 to 3.7500	4 3.7501 to 4.5000	5 4.5001 to 5.5000	6 5.5001 to 7.0000	8 7.0001 to 9.0000	10 9.0001 to 11.0000	12 11.0001 to 13.0000	
in.	*in.*	*in.*											
													80
													72
													64
													56
													48
													44
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	
													40
0.0049	0.0050												36
.0053	.0055												
.0051	.0052	0.0053	0.0054	0.0056	0.0058								32
.0056	.0057	.0058	.0059	.0061	.0063								
.0053	.0055	.0056	.0057	.0059	.0060	0.0062	0.0063						28
.0059	.0060	.0061	.0062	.0064	.0066	.0067	.0069						
.0053	.0055	.0056	.0057	.0059	.0061	.0063	.0064	0.0066	0.0068				27
.0059	.0061	.0062	.0063	.0065	.0067	.0068	.0069	.0072	.0074				
.0056	.0058	.0059	.0060	.0062	.0064	.0065	.0066	.0069	.0071				24
.0062	.0064	.0065	.0066	.0068	.0069	.0071	.0072	.0075	.0077				
.0061	.0062	.0063	.0064	.0066	.0068	.0069	.0070	.0073	.0075				20
.0067	.0068	.0069	.0071	.0072	.0074	.0076	.0077	.0079	.0081				
.0063	.0065	.0066	.0067	.0069	.0070	.0072	.0073	.0076	.0078	0.0081			18
.0070	.0071	.0072	.0074	.0075	.0077	.0079	.0080	.0082	.0084	.0088			
.0066	.0068	.0069	.0070	.0072	.0073	.0075	.0076	.0079	.0081	.0084	0.0087		16
.0074	.0075	.0076	.0077	.0079	.0081	.0082	.0083	.0086	.0088	.0092	.0095		
.0070	.0072	.0073	.0074	.0076	.0077	.0079	.0080	.0083	.0085	.0088	.0091	0.0094	14
.0078	.0079	.0080	.0081	.0083	.0085	.0086	.0088	.0090	.0092	.0096	.0099	.0102	
.0075	.0076	.0078	.0079	.0081	.0082	.0084	.0085	.0087	.0090	.0093	.0096	.0099	12
.0083	.0085	.0086	.0087	.0089	.0090	.0092	.0093	.0096	.0098	.0101	.0104	.0107	
.0082	.0083	.0084	.0085	.0087	.0089	.0090	.0091	.0094	.0096	.0100	.0103	.0105	10
.0091	.0092	.0093	.0094	.0096	.0098	.0099	.0101	.0103	.0105	.0109	.0112	.0114	
.0090	.0092	.0093	.0094	.0096	.0098	.0099	.0100	.0103	.0105	.0108	.0111	.0114	8
.0101	.0102	.0103	.0104	.0106	.0108	.0109	.0111	.0113	.0115	.0119	.0122	.0124	
	.0105	.0106	.0108	.0109	.0111	.0113	.0114	.0116	.0118	.0122	.0125	.0128	6
	.0117	.0118	.0119	.0121	.0123	.0124	.0126	.0128	.0130	.0134	.0137	.0139	
			.0131	.0133	.0135	.0136	.0138	.0140	.0142	.0146	.0149	.0151	4
			.0146	.0147	.0149	.0151	.0152	.0154	.0156	.0160	.0163	.0166	

LEGENDS

1. These values do not agree with and shall not be used in place of any tabulated values for the UNC, UNF and 8N thread series, in table III.10.
2. Formula:
   Class 2B tolerances are determined by multiplying class 2A tolerances (computed to six decimal places) by 1.300. See legend 2, table IV.5, for formula for class 2A tolerances.
3. Length of engagement increments included in the tabulated tolerances for lengths of engagement from 5 to 15 pitches are based on lengths of 9 pitches; those for lengths of engagement greater than 15 to 30 pitches are based on lengths of 20 pitches. For lengths of engagement not tabulated, the formula in legend 2 should be applied.
4. Pitches listed are those used most commonly and are recommended. Where intermediate pitches are specified, the formula in legend 2 should be applied.
5. Tolerances are tabulated only for combinations of diameter, pitch, and length of engagement which are considered to be generally used. For other combinations encountered, see Design of Special Threads, appendix 5, p. 200.

TABLE IV.9.—*Pitch diameter tolerances for internal threads of*

(UNS and NS threads

Threads per inch	Lengths of engagement: Number of pitches	Lengths of engagement: Inches	Pitch diameter tolerances ᵃ: 1/16 0.0600 to 0.0781	3/32 0.0782 to 0.1094	1/8 0.1095 to 0.1563	3/16 0.1564 to 0.2188	1/4 0.2189 to 0.3125	3/8 0.3126 to 0.4375	1/2 0.4376 to 0.5625	5/8 0.5626 to 0.6875	3/4 0.6876 to 0.8750	1 0.8751 to 1.1250
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	5 to 15	0.06 to 0.19	0.0019	0.0019	0.0020	0.0021	0.0022					
	16 to 30	0.191 to 0.38	.0021	.0022	.0023	.0024	.0024					
72	5 to 15	0.07 to 0.21	.0019	.0020	.0021	.0022	.0023	0.0024				
	16 to 30	0.211 to 0.42		.0023	.0023	.0025	.0025	.0027				
64	5 to 15	0.08 to 0.23	.0020	.0021	.0022	.0023	.0024	.0025	0.0026			
	16 to 30	0.231 to 0.46		.0024	.0025	.0026	.0027	.0028	.0029			
56	5 to 15	0.09 to 0.27		.0023	.0023	.0024	.0025	.0026	.0027	0.0028	0.0029	
	16 to 30	0.271 to 0.54		.0025	.0026	.0027	.0028	.0029	.0030	.0031	.0032	
48	5 to 15	0.10 to 0.31		.0024	.0025	.0026	.0027	.0028	.0029	.0030	.0031	
	16 to 30	0.311 to 0.62			.0028	.0029	.0030	.0031	.0032	.0033	.0034	
44	5 to 15	0.11 to 0.34		.0025	.0026	.0027	.0028	.0029	.0030	.0031	.0032	0.0033
	16 to 30	0.341 to 0.68			.0029	.0030	.0031	.0032	.0033	.0034	.0035	.0036
40	5 to 15	0.12 to 0.38			.0027	.0028	.0029	.0030	.0031	.0032	.0033	.0034
	16 to 30	0.381 to 0.76			.0030	.0031	.0032	.0033	.0034	.0035	.0036	.0037
36	5 to 15	0.14 to 0.42			.0028	.0029	.0030	.0031	.0052	.0033	.0034	.0035
	16 to 30	0.421 to 0.84				.0033	.0034	.0035	.0036	.0037	.0038	.0039
32	5 to 15	0.16 to 0.47			.0030	.0031	.0031	.0033	.0034	.0035	.0036	.0037
	16 to 30	0.471 to 0.94				.0034	.0035	.0037	.0038	.0039	.0039	.0041
28	5 to 15	0.18 to 0.54				.0033	.0033	.0035	.0036	.0037	.0037	.0039
	16 to 30	0.541 to 1.08				.0037	.0037	.0039	.0040	.0041	.0042	.0043
27	5 to 15	0.19 to 0.56				.0033	.0034	.0035	.0036	.0037	.0038	.0039
	16 to 30	0.561 to 1.12				.0037	.0038	.0039	.0040	.0041	.0042	.0043
24	5 to 15	0.21 to 0.62				.0035	.0036	.0037	.0038	.0039	.0040	.0041
	16 to 30	0.621 to 1.24					.0040	.0041	.0043	.0042	.0044	.0046
20	5 to 15	0.25 to 0.75					.0039	.0040	.0041	.0042	.0043	.0044
	16 to 30	0.751 to 1.50					.0044	.0045	.0046	.0047	.0048	.0049
18	5 to 15	0.28 to 0.83						.0042	.0043	.0044	.0045	.0046
	16 to 30	0.831 to 1.66						.0047	.0048	.0049	.0050	.0051
16	5 to 15	0.31 to 0.94						.0045	.0046	.0046	.0047	.0049
	16 to 30	0.941 to 1.88						.0050	.0051	.0052	.0053	.0054
14	5 to 15	0.36 to 1.07							.0049	.0049	.0050	.0052
	16 to 30	1.071 to 2.14							.0054	.0055	.0056	.0057
12	5 to 15	0.42 to 1.25							.0052	.0053	.0054	.0055
	16 to 30	1.251 to 2.50							.0058	.0059	.0060	.0061
10	5 to 15	0.50 to 1.50									.0059	.0060
	16 to 30	1.501 to 3.00									.0065	.0067
8	5 to 15	0.62 to 1.88										.0067
	16 to 30	1.881 to 3.76										.0074
6	5 to 15	0.83 to 2.50										
	16 to 30	2.501 to 5.00										
4	5 to 15	1.25 to 3.75										
	16 to 30	3.751 to 7.50										

ᵃ Tolerances are based on diameters given in common fractions, which are the means of the diameter ranges expressed in decimals.

special diameters, pitches, and lengths of engagement, class 3B

See subsection 5, p. 98.)

Pitch diameter tolerances [a]—Continued													Threads per inch
1¼ 1.1251 to 1.3750	1½ 1.3751 to 1.6250	1¾ 1.6251 to 1.8750	2 1.8751 to 2.2500	2½ 2.2501 to 2.7500	3 2.7501 to 3.2500	3½ 3.2501 to 3.7500	4 3.7501 to 4.5000	5 4.5001 to 5.5000	6 5.5001 to 7.0000	8 7.0001 to 9.0000	10 9.0001 to 11.0000	12 11.0001 to 13.0000	
in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	
----- -----	----- -----	----- -----											80
----- -----	----- -----	----- -----											72
----- -----	----- -----	----- -----											64
----- -----	----- -----	----- -----											56
----- -----	----- -----	----- -----											48
----- -----	----- -----	----- -----											44
----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	40
0.0036 .0040	0.0037 .0041	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	36
.0038 .0042	.0039 .0043	0.0040 .0044	0.0041 .0044	0.0042 .0046	0.0043 .0047	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	----- -----	32
.0040 .0044	.0041 .0045	.0042 .0046	.0043 .0047	.0044 .0048	.0045 .0049	0.0046 .0050	0.0047 .0051	----- -----	----- -----	----- -----	----- -----	----- -----	28
.0040 .0045	.0041 .0046	.0042 .0046	.0043 .0047	.0045 .0049	.0046 .0050	.0047 .0051	.0048 .0052	0.0050 .0054	0.0051 .0055	----- -----	----- -----	----- -----	27
.0042 .0047	.0043 .0048	.0044 .0049	.0045 .0049	.0046 .0051	.0048 .0052	.0049 .0053	.0050 .0054	.0052 .0056	.0053 .0058	----- -----	----- -----	----- -----	24
.0045 .0050	.0046 .0051	.0047 .0052	.0048 .0053	.0050 .0054	.0051 .0056	.0052 .0057	.0053 .0058	.0055 .0059	.0056 .0061	----- -----	----- -----	----- -----	20
.0047 .0052	.0048 .0053	.0049 .0054	.0050 .0055	.0051 .0057	.0053 .0058	.0054 .0059	.0055 .0060	.0057 .0062	.0058 .0063	0.0061 .0066	----- -----	----- -----	18
.0050 .0055	.0051 .0056	.0052 .0057	.0052 .0058	.0054 .0059	.0055 .0060	.0056 .0062	.0057 .0063	.0059 .0064	.0061 .0066	.0063 .0069	0.0066 .0071	----- -----	16
.0053 .0058	.0054 .0059	.0055 .0060	.0056 .0061	.0057 .0063	.0058 .0064	.0059 .0065	.0060 .0066	.0062 .0068	.0063 .0069	.0066 .0072	.0068 .0074	0.0070 .0076	14
.0056 .0063	.0057 .0064	.0058 .0064	.0059 .0065	.0060 .0067	.0062 .0068	.0063 .0069	.0064 .0070	.0066 .0072	.0067 .0073	.0070 .0076	.0072 .0078	.0074 .0080	12
.0061 .0068	.0062 .0069	.0063 .0070	.0064 .0071	.0065 .0072	.0066 .0073	.0068 .0074	.0069 .0075	.0070 .0077	.0072 .0079	.0075 .0081	.0077 .0084	.0079 .0086	10
.0068 .0075	.0069 .0076	.0070 .0077	.0071 .0078	.0072 .0080	.0073 .0081	.0074 .0082	.0075 .0083	.0077 .0085	.0079 .0086	.0081 .0089	.0084 .0091	.0086 .0093	8
----- -----	.0079 .0088	.0080 .0089	.0081 .0089	.0082 .0091	.0083 .0092	.0084 .0093	.0085 .0094	.0087 .0096	.0089 .0098	.0091 .0100	.0094 .0103	.0096 .0104	6
----- -----	----- -----	----- -----	.0098 .0109	.0100 .0111	.0101 .0112	.0102 .0113	.0103 .0114	.0105 .0116	.0107 .0117	.0109 .0120	.0111 .0122	.0113 .0124	4

LEGENDS

1. These values do not agree with and shall not be used in place of any tabulated values for the UNC, UNF, and 8N thread series, in table III.10.
2. Formula:
   Class 3B tolerances for internal threads are 0.75 times class 2B tolerances and are determined by multiplying class 2A tolerances (computed to six decimal places) by 0.975. See legend 2, table IV.5 for formula for class 2A tolerances.
3. Length of engagement increments included in the tabulated tolerances for lengths of engagement from 5 to 15 pitches are based on lengths of 9 pitches; those for lengths of engagement greater than 15 to 30 pitches are based on lengths of 20 pitches. For lengths of engagement not tabulated, the formula in legend 2 should be applied.
4. Pitches listed are those used most commonly and are recommended. Where intermediate pitches are specified the formula in legend 2 should be applied.
5. Tolerances are tabulated only for combinations of diameter, pitch, and length of engagement which are considered to be generally used. For other combinations encountered, see Design of Special Threads, appendix 5, p. 200.

TABLE IV.10.—*Minor diameter tolerances for internal special screw threads, classes 1B and 2B*

(UNS and NS threads. See subsection 5, p. 98.)

Threads per inch	Tolerance ratios	Lengths of engagement in terms of diameter [a]		Minor diameter tolerances [b] for thread sizes having basic major diameters:										
		Tolerances based on→		0.060	0.073	0.086	0.099	0.112	0.125	0.138	0.164	0.190	0.216	All larger diameters
		↓ Above→		0.053	0.066	0.079	0.092	0.105	0.118	0.131	0.151	0.177	0.203	
			↓ to→ and including	0.066	0.079	0.092	0.105	0.118	0.131	0.151	0.177	0.203	0.233	
				in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	½	......	⅓ *D*	0.0035	0.0029	0.0025	0.0022	0.0020	0.0018	0.0017	0.0016	0.0016	0.0016	0.0016
	¾	⅓ *D*	⅔ *D*	.0049	.0041	.0038	.0031	.0030	.0028	.0026	.0023	.0023	.0023	.0023
	1	⅔ *D*	1½ *D*	.0049	.0049	.0049	.0045	.0040	.0037	.0034	.0031	.0031	.0031	.0031
	1¼	1½ *D*	3 *D*	.0049	.0049	.0049	.0049	.0049	.0046	.0043	.0039	.0039	.0039	.0039
72	½	......	⅓ *D*	.0039	.0033	.0029	.0026	.0023	.0021	.0020	.0017	.0017	.0017	.0017
	¾	⅓ *D*	⅔ *D*	.0055	.0049	.0043	.0038	.0035	.0032	.0029	.0026	.0026	.0026	.0026
	1	⅔ *D*	1½ *D*	.0055	.0055	.0055	.0051	.0046	.0042	.0039	.0034	.0034	.0034	.0034
	1¼	1½ *D*	3 *D*	.0055	.0055	.0055	.0055	.0055	.0053	.0049	.0043	.0042	.0042	.0042
64	½	......	⅓ *D*	.0045	.0038	.0033	.0029	.0027	.0024	.0023	.0020	.0019	.0019	.0019
	¾	⅓ *D*	⅔ *D*	.0062	.0057	.0049	.0044	.0040	.0037	.0034	.0030	.0028	.0028	.0028
	1	⅔ *D*	1½ *D*	.0062	.0062	.0062	.0059	.0053	.0049	.0045	.0040	.0038	.0038	.0038
	1¼	1½ *D*	3 *D*	.0062	.0062	.0062	.0062	.0062	[illegible]	.0057	.0050	.0048	.0048	.0048
56	½	......	⅓ *D*	......	.0044	.0038	.0034	.0031	.0029	.0026	.0023	.0022	.0022	.0022
	¾	⅓ *D*	⅔ *D*	......	.0066	.0057	.0051	.0046	.0043	.0040	.0035	.0032	.0032	.0032
	1	⅔ *D*	1½ *D*	......	.0070	.0070	.0068	.0062	.0057	.0053	.0047	.0043	.0043	.0043
	1¼	1½ *D*	3 *D*	......	.0070	.0070	.0070	.0070	.0070	.0066	.0059	.0054	.0054	.0054
48	½	......	⅓ *D*	......	......	.0045	.0040	.0037	.0034	.0032	.0028	.0025	.0025	.0025
	¾	⅓ *D*	⅔ *D*	......	......	.0068	.0061	.0055	.0051	.0047	.0042	.0038	.0038	.0038
	1	⅔ *D*	1½ *D*	......	......	.0082	.0081	.0074	.0068	.0063	.0056	.0051	.0050	.0050
	1¼	1½ *D*	3 *D*	......	......	.0082	.0082	.0082	.0082	.0079	.0070	.0063	.0062	.0062
44	½	......	⅓ *D*	......	......	.0050	.0044	.0040	.0038	.0035	.0031	.0028	.0028	.0028
	¾	⅓ *D*	⅔ *D*	......	......	.0074	.0067	.0061	.0056	.0052	.0046	.0042	.0041	.0041
	1	⅔ *D*	1½ *D*	......	......	.0089	.0089	.0081	.0075	.0070	.0062	.0056	.0055	.0055
	1¼	1½ *D*	3 *D*	......	......	.0089	.0089	.0089	.0089	.0088	.0078	.0070	.0069	.0069
40	½	......	⅓ *D*	......	......	......	.0049	.0045	.0041	.0039	.0034	.0031	.0030	.0030
	¾	⅓ *D*	⅔ *D*	......	......	......	.0074	.0067	.0062	.0058	.0051	.0047	.0045	.0045
	1	⅔ *D*	1½ *D*	......	......	......	.0098	.0090	.0083	.0077	.0068	.0062	.0060	.0060
	1¼	1½ *D*	3 *D*	......	......	......	.0098	.0098	.0098	.0098	.0086	.0078	.0075	.0075
36	½	......	⅓ *D*	......	......	......	......	.0050	.0046	.0043	.0038	.0035	.0033	.0033
	¾	⅓ *D*	⅔ *D*	......	......	......	......	.0075	.0069	.0065	.0058	.0052	.0050	.0050
	1	⅔ *D*	1½ *D*	......	......	......	......	.0100	.0093	.0086	.0077	.0070	.0066	.0066
	1¼	1½ *D*	3 *D*	......	......	......	......	.0109	.0109	.0108	.0096	.0087	.0082	.0082
32	½	......	⅓ *D*	......	......	......	......	......	......	.0049	.0043	.0039	.0037	.0037
	¾	⅓ *D*	⅔ *D*	......	......	......	......	......	......	.0073	.0065	.0059	.0056	[illegible]
	1	⅔ *D*	1½ *D*	......	......	......	......	......	......	.0098	.0087	.0079	.0074	[illegible]
	1¼	1½ *D*	3 *D*	......	......	......	......	......	......	.0122	.0108	.0099	.0092	.0092
28	½	......	⅓ *D*	......	......	......	......	......	......	......	......	.0045	.0042	.0042
	¾	⅓ *D*	⅔ *D*	......	......	......	......	......	......	......	......	.0068	.0063	.0063
	1	⅔ *D*	1½ *D*	......	......	......	......	......	......	......	......	.0091	.0084	.0084
	1¼	1½ *D*	3 *D*	......	......	......	......	......	......	......	......	.0113	.0105	.0105

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[a] Tolerances for lengths of engagement in terms of pitch should be selected from equivalent lengths of engagement in terms of diameter ranges.

[b] Revised minor diameter tolerances for classes 1B and 2B are in process of ratification as Unified Standard.

NOTE.—If the minor diameter tolerance as selected from this table is less than the pitch diameter tolerance, use the latter. See "Design of Special Threads," appendix 5.

TABLE IV.10.—*Minor diameter tolerances for internal special screw threads, classes 1B and 2B*—Continued

(UNS and NS threads. See subsection 5, p. 98.)

Threads per inch	Tolerance ratios	Lengths of engagement in terms of diameter [a]		Minor diameter tolerances[b] for thread sizes having basic major diameters:										
		Tolerances based on→		0.060	0.073	0.086	0.099	0.112	0.125	0.138	0.164	0.190	0.216	All larger diameters
		↓ Above→		0.053	0.066	0.079	0.092	0.105	0.118	0.131	0.151	0.177	0.203	
			↓ to→ and including	0.066	0.079	0.092	0.105	0.118	0.131	0.151	0.177	0.203	0.233	
												in.	*in.*	*in.*
27	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	0.0047	0.0044	0.0044
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	.0071	.0065	.0065
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	.0094	.0087	.0087
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	.0118	.0109	.0109
24	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	.0053	.0049	.0048
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	.0079	.0073	.0073
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	.0106	.0098	.0097
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	.0132	.0122	.0121
20	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0058
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0086
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0115
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0144
18	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0064
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0095
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0127
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0159
16	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0070
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0106
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0141
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0176
14	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0079
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0118
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0158
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0198
12	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0090
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0135
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0180
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0225
10	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0105
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0158
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0210
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0262
8	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0125
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0188
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0250
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0312
6	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0153
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0230
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0306
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0382
4	1/2	--------	1/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0188
	3/4	1/3 D	2/3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0281
	1	2/3 D	1 1/2 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0375
	1 1/4	1 1/2 D	3 D	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	.0469

[a] Tolerances for lengths of engagement in terms of pitch should be selected from equivalent lengths of engagement in terms of diameter ranges.

[b] Revised minor diameter tolerances for Classes 1B and 2B are in process of ratification as Unified Standard.

NOTE.—If the minor diameter tolerance as selected from this table is less than the pitch diameter tolerance, use the latter. See "Design of Special Threads," appendix 5.

TABLE IV.11.—*Minor diameter tolerances*

(UNS and NS threads.

Threads per inch	Tolerance ratios	Lengths of engagement in terms of diameter *		Minor diameter tolerances for thread sizes having basic major diameters.								
		Tolerances based on →		0.060	0.073	0.086	0.099	0.112	0.125	0.138	0.164	0.190
		↓ Above →		0.055	0.066	0.079	0.092	0.105	0.118	0.131	0.151	0.177
			↓ to → and including	0.066	0.079	0.092	0.105	0.118	0.131	0.151	0.177	0.203
				in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	½	....	⅓ *D*	0.0035	0.0029	0.0025	0.0022	0.0020	0.0018	0.0017	0.0015	0.0013
	¾	⅓ *D*	⅔ *D*	.0049	.0044	.0038	.0034	.0030	.0028	.0026	.0022	.0020
	1	⅔ *D*	1½ *D*	.0049	.0049	.0049	.0045	.0040	.0037	.0034	.0030	.0027
	1¼	1½ *D*	3 *D*	.0049	.0049	.0049	.0049	.0049	.0046	.0043	.0037	.0033
72	½	....	⅓ *D*	.0039	.0033	.0029	.0026	.0023	.0021	.0020	.0017	.0015
	¾	⅓ *D*	⅔ *D*	.0055	.0049	.0043	.0038	.0035	.0032	.0029	.0026	.0023
	1	⅔ *D*	1½ *D*	.0055	.0055	.0055	.0051	.0046	.0042	.0039	.0034	.0031
	1¼	1½ *D*	3 *D*	.0055	.0055	.0055	.0055	.0055	.0053	.0049	.0043	.0039
64	½	....	⅓ *D*	.0045	.0038	.0033	.0029	.0027	.0024	.0023	.0020	.0018
	¾	⅓ *D*	⅔ *D*	.0062	.0057	.0049	.0044	.0040	.0037	.0034	.0030	.0027
	1	⅔ *D*	1½ *D*	.0062	.0062	.0062	.0059	.0053	.0049	.0045	.0040	.0036
	1¼	1½ *D*	3 *D*	.0062	.0062	.0062	.0062	.0062	.0061	.0057	.0050	.0045
56	½	....	⅓ *D*	....	.0044	.0038	.0034	.0031	.0029	.0026	.0023	.0021
	¾	⅓ *D*	⅔ *D*	....	.0066	.0057	.0051	.0046	.0043	.0040	.0035	.0032
	1	⅔ *D*	1½ *D*	....	.0070	.0070	.0068	.0062	.0057	.0053	.0047	.0042
	1¼	1½ *D*	3 *D*	....	.0070	.0070	.0070	.0070	.0070	.0066	.0059	.0053
48	½	....	⅓ *D*	....	....	.0045	.0040	.0037	.0034	.0032	.0028	.0025
	¾	⅓ *D*	⅔ *D*	....	....	.0068	.0061	.0055	.0051	.0047	.0042	.0038
	1	⅔ *D*	1½ *D*	....	....	.0082	.0081	.0074	.0068	.0063	.0056	.0051
	1¼	1½ *D*	3 *D*	....	....	.0082	.0082	.0082	.0082	.0079	.0070	.0063
44	½	....	⅓ *D*	....	....	.0050	.0044	.0041	.0037	.0035	.0031	.0028
	¾	⅓ *D*	⅔ *D*	....	....	.0075	.0067	.0061	.0056	.0052	.0046	.0042
	1	⅔ *D*	1½ *D*	....	....	.0090	.0088	.0081	.0075	.0070	.0062	.0056
	1¼	1½ *D*	3 *D*	....	....	.0090	.0090	.0090	.0090	.0087	.0077	.0070
40	½	....	⅓ *D*	....	....	....	.0049	.0045	.0041	.0039	.0034	.0031
	¾	⅓ *D*	⅔ *D*	....	....	....	.0074	.0067	.0062	.0058	.0051	.0047
	1	⅔ *D*	1½ *D*	....	....	....	.0098	.0090	.0083	.0077	.0068	.0062
	1¼	1½ *D*	3 *D*	....	....	....	.0098	.0098	.0098	.0096	.0086	.0078
36	½	....	⅓ *D*	....	....	....	....	.0050	.0046	.0043	.0038	.0035
	¾	⅓ *D*	⅔ *D*	....	....	....	....	.0075	.0069	.0065	.0058	.0052
	1	⅔ *D*	1½ *D*	....	....	....	....	.0100	.0093	.0086	.0077	.0070
	1¼	1½ *D*	3 *D*	....	....	....	....	.0109	.0109	.0108	.0096	.0087
32	½	....	⅓ *D*	....	....	....	....	....	....	.0049	.0043	.0039
	¾	⅓ *D*	⅔ *D*	....	....	....	....	....	....	.0073	.0065	.0059
	1	⅔ *D*	1½ *D*	....	....	....	....	....	....	.0098	.0087	.0079
	1¼	1½ *D*	3 *D*	....	....	....	....	....	....	.0122	.0108	.0099
28	½	....	⅓ *D*	....	....	....	....	....	....	....	....	.0045
	¾	⅓ *D*	⅔ *D*	....	....	....	....	....	....	....	....	.0068
	1	⅔ *D*	1½ *D*	....	....	....	....	....	....	....	....	.0091
	1¼	1½ *D*	3 *D*	....	....	....	....	....	....	....	....	.0113
27	½	....	⅓ *D*	....	....	....	....	....	....	....	....	.0047
	¾	⅓ *D*	⅔ *D*	....	....	....	....	....	....	....	....	.0071
	1	⅔ *D*	1½ *D*	....	....	....	....	....	....	....	....	.0094
	1¼	1½ *D*	3 *D*	....	....	....	....	....	....	....	....	.0118
24	½	....	⅓ *D*	....	....	....	....	....	....	....	....	.0053
	¾	⅓ *D*	⅔ *D*	....	....	....	....	....	....	....	....	.0079
	1	⅔ *D*	1½ *D*	....	....	....	....	....	....	....	....	.0106
	1¼	1½ *D*	3 *D*	....	....	....	....	....	....	....	....	.0132

* Tolerances for lengths of engagement in terms of pitch should be selected from equivalent lengths of engagement in terms of diameter ranges.

NOTE.—If the minor diameter tolerance as selected from this table is less than the pitch diameter tolerance, use the latter. See Design of Special Threads, appendix 5.

for internal special screw threads, class 3B

See subsection 5, p. 98.)

Minor diameter tolerances for thread sizes having basic major diameters:														Threads per inch
0.216	0.250	0.3125	0.375	0.4375	0.500	0.5625	0.625	0.6875	0.750	0.8125	0.875	0.9375	All larger diameters	
0.203	0.233	0.281	0.344	0.406	0.469	0.531	0.594	0.656	0.719	0.781	0.844	0.906		
0.233	0.281	0.344	0.406	0.469	0.531	0.594	0.656	0.719	0.781	0.844	0.906	0.969		
in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	
0.0013	0.0013	0.0013	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	80
.0020	.0020	.0020	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
.0026	.0026	.0026	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
.0033	.0033	.0033	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
.0015	.0015	.0015	0.0015	0.0015	-----	-----	-----	-----	-----	-----	-----	-----	-----	72
.0022	.0022	.0022	.0022	.0022	-----	-----	-----	-----	-----	-----	-----	-----	-----	
.0029	.0029	.0029	.0029	.0029	-----	-----	-----	-----	-----	-----	-----	-----	-----	
.0036	.0036	.0036	.0036	.0036	-----	-----	-----	-----	-----	-----	-----	-----	-----	
.0016	.0016	.0016	.0016	.0016	0.0016	0.0016	-----	-----	-----	-----	-----	-----	-----	64
.0025	.0024	.0024	.0024	.0024	.0024	.0024	-----	-----	-----	-----	-----	-----	-----	
.0033	.0032	.0032	.0032	.0032	.0032	.0032	-----	-----	-----	-----	-----	-----	-----	
.0041	.0040	.0040	.0040	.0040	.0040	.0040	-----	-----	-----	-----	-----	-----	-----	
.0019	.0018	.0018	.0018	.0018	.0018	.0018	0.0018	0.0018	0.0018	0.0018	0.0018	-----	-----	56
.0029	.0027	.0027	.0027	.0027	.0027	.0027	.0027	.0027	.0027	.0027	.0027	-----	-----	
.0039	.0036	.0036	.0036	.0036	.0036	.0036	.0036	.0036	.0036	.0036	.0036	-----	-----	
.0040	.0045	.0045	.0045	.0045	.0045	.0045	.0045	.0045	.0045	.0045	.0045	-----	-----	
.0023	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	.0021	-----	-----	48
.0035	.0032	.0031	.0031	.0031	.0031	.0031	.0031	.0031	.0031	.0031	.0031	-----	-----	
.0047	.0043	.0041	.0041	.0041	.0041	.0041	.0041	.0041	.0041	.0041	.0041	-----	-----	
.0059	.0054	.0052	.0052	.0052	.0052	.0052	.0052	.0052	.0052	.0052	.0052	-----	-----	
.0026	.0024	.0022	.0022	.0022	.0022	.0022	.0022	.0022	.0022	.0022	.0022	0.0022	-----	44
.0039	.0036	.0033	.0033	.0033	.0033	.0033	.0033	.0033	.0033	.0033	.0033	.0033	-----	
.0052	.0047	.0045	.0045	.0045	.0045	.0045	.0045	.0045	.0045	.0045	.0045	.0045	-----	
.0065	.0059	.0056	.0056	.0056	.0056	.0056	.0056	.0056	.0056	.0056	.0056	.0056	-----	
.0029	.0026	.0024	.0024	.0024	.0024	.0024	.0024	.0024	.0024	.0024	.0024	.0024	0.0024	40
.0043	.0040	.0036	.0036	.0036	.0036	.0036	.0036	.0036	.0036	.0036	.0036	.0036	.0036	
.0057	.0053	.0048	.0048	.0048	.0048	.0048	.0048	.0048	.0048	.0048	.0048	.0048	.0048	
.0072	.0066	.0062	.0062	.0060	.0060	.0060	.0060	.0060	.0060	.0060	.0060	.0060	.0060	
.0032	.0030	.0026	.0026	.0026	.0026	.0026	.0026	.0026	.0026	.0026	.0026	.0026	.0026	36
.0048	.0044	.0039	.0039	.0039	.0039	.0039	.0039	.0039	.0039	.0039	.0039	.0039	.0039	
.0064	.0059	.0053	.0052	.0052	.0052	.0052	.0052	.0052	.0052	.0052	.0052	.0052	.0052	
.0081	.0074	.0066	.0065	.0065	.0065	.0065	.0065	.0065	.0065	.0065	.0065	.0065	.0065	
.0036	.0034	.0030	.0029	.0029	.0029	.0029	.0029	.0029	.0029	.0029	.0029	.0029	.0029	32
.0055	.0050	.0045	.0043	.0043	.0043	.0043	.0043	.0043	.0043	.0043	.0043	.0043	.0043	
.0073	.0067	.0060	.0057	.0057	.0057	.0057	.0057	.0057	.0057	.0057	.0057	.0057	.0057	
.0091	.0084	.0075	.0072	.0072	.0072	.0072	.0072	.0072	.0072	.0072	.0072	.0072	.0072	
.0042	.0039	.0034	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0032	28
.0063	.0058	.0051	.0047	.0047	.0047	.0047	.0047	.0047	.0047	.0047	.0047	.0047	.0047	
.0084	.0077	.0069	.0063	.0063	.0063	.0063	.0063	.0063	.0063	.0063	.0063	.0063	.0063	
.0105	.0096	.0086	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	.0079	
.0044	.0040	.0036	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0032	.0032	27
.0065	.0060	.0053	.0048	.0048	.0048	.0048	.0048	.0048	.0048	.0048	.0048	.0048	.0048	
.0087	.0080	.0071	.0065	.0065	.0065	.0065	.0065	.0065	.0065	.0065	.0065	.0065	.0065	
.0109	.0100	.0089	.0081	.0081	.0081	.0081	.0081	.0081	.0081	.0081	.0081	.0081	.0081	
.0049	.0045	.0040	.0037	.0035	.0035	.0035	.0035	.0035	.0035	.0035	.0035	.0035	.0035	24
.0073	.0068	.0060	.0055	.0052	.0052	.0052	.0052	.0052	.0052	.0052	.0052	.0052	.0052	
.0098	.0090	.0080	.0073	.0070	.0070	.0070	.0070	.0070	.0070	.0070	.0070	.0070	.0070	
.0122	.0113	.0100	.0092	.0087	.0087	.0087	.0087	.0087	.0087	.0087	.0087	.0087	.0087	

TABLE IV.11.—*Minor diameter tolerances for*

(UNS and NS threads.

Threads per inch	Tolerance ratios	Lengths of engagement in terms of diameter		Minor diameter tolerances for thread sizes having basic major diameters:								
		Tolerances based on →		0.060	0.073	0.086	0.099	0.112	0.125	0.138	0.164	0.190
		↓ Above →		0.053	0.066	0.079	0.092	0.105	0.118	0.131	0.151	0.177
			↓ to → and including	0.066	0.079	0.092	0.105	0.118	0.131	0.151	0.177	0.203
20	½	--------	⅓ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	¾	⅓ *D*	⅔ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1	⅔ *D*	1½ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1¼	1½ *D*	3 *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
18	½	--------	⅓ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	¾	⅓ *D*	⅔ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1	⅔ *D*	1½ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1¼	1½ *D*	3 *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
16	½	--------	⅓ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	¾	⅓ *D*	⅔ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1	⅔ *D*	1½ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1¼	1½ *D*	3 *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
14	½	--------	⅓ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	¾	⅓ *D*	⅔ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1	⅔ *D*	1½ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1¼	1½ *D*	3 *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
12	½	--------	⅓ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	¾	⅓ *D*	⅔ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1	⅔ *D*	1½ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1¼	1½ *D*	3 *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
10	½	--------	⅓ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	¾	⅓ *D*	⅔ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1	⅔ *D*	1½ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1¼	1½ *D*	3 *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
8	½	--------	⅓ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	¾	⅓ *D*	⅔ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1	⅔ *D*	1½ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1¼	1½ *D*	3 *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
7	½	--------	⅓ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	¾	⅓ *D*	⅔ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1	⅔ *D*	1½ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1¼	1½ *D*	3 *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
6	½	--------	⅓ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	¾	⅓ *D*	⅔ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1	⅔ *D*	1½ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1¼	1½ *D*	3 *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
4	½	--------	⅓ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	¾	⅓ *D*	⅔ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1	⅔ *D*	1½ *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------
	1¼	1½ *D*	3 *D*	--------	--------	--------	--------	--------	--------	--------	--------	--------

[a] Tolerances for lengths of engagement in terms of pitch should be selected from equivalent lengths of engagement in terms of diameter ranges.

NOTE.—If the minor-diameter tolerance as selected from the table is less than pitch-diameter tolerance, use the latter. See "Design of Special Threads," appendix 5.

Internal special screw threads, class 3B—Continued

(See subsection 5, p. 98.)

Minor diameter tolerances for thread sizes having basic major diameters:														
0.216	0.250	0.3125	0.375	0.4375	0.500	0.5625	0.625	0.6875	0.750	0.8125	0.875	0.9375	All larger diameters	Threads per inch
0.203	0.233	0.281	0.344	0.406	0.469	0.531	0.594	0.656	0.719	0.781	0.844	0.906		
0.233	0.281	0.344	0.406	0.469	0.531	0.594	0.656	0.719	0.781	0.844	0.906	0.969		
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	
....	0.0054	0.0048	0.0044	0.0041	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039	20
....	.0081	.0072	.0066	.0062	.0058	.0058	.0058	.0058	.0058	.0058	.0058	.0058	.0058	
....	.0108	.0096	.0088	.0082	.0078	.0078	.0078	.0078	.0078	.0078	.0078	.0078	.0078	
....	.0135	.0120	.0110	.0103	.0097	.0097	.0097	.0097	.0097	.0097	.0097	.0097	.0097	
....	....	.0053	.0049	.0045	.0043	.0041	.0041	.0041	.0041	.0041	.0041	.0041	.0041	18
....	....	.0080	.0073	.0068	.0065	.0062	.0061	.0061	.0061	.0061	.0061	.0061	.0061	
....	....	.0106	.0097	.0091	.0086	.0082	.0081	.0081	.0081	.0081	.0081	.0081	.0081	
....	....	.0133	.0122	.0114	.0108	.0103	.0102	.0102	.0102	.0102	.0102	.0102	.0102	
....	....	....	.0054	.0051	.0048	.0046	.0044	.0043	.0043	.0043	.0043	.0043	.0043	16
....	....	....	.0082	.0076	.0072	.0069	.0067	.0064	.0064	.0064	.0064	.0064	.0064	
....	....	....	.0109	.0102	.0096	.0092	.0089	.0086	.0085	.0085	.0085	.0085	.0085	
....	....	....	.0136	.0127	.0120	.0115	.0111	.0108	.0106	.0106	.0106	.0106	.0106	
....	....	....	....	.0058	.0054	.0052	.0050	.0049	.0047	.0046	.0045	.0044	.0044	14
....	....	....	....	.0086	.0082	.0078	.0075	.0073	.0071	.0069	.0068	.0067	.0066	
....	....	....	....	.0115	.0109	.0104	.0100	.0097	.0095	.0092	.0091	.0089	.0088	
....	....	....	....	.0144	.0136	.0130	.0125	.0122	.0118	.0116	.0113	.0111	.0110	
....	....	....	....	....	.0063	.0060	.0058	.0056	.0054	.0053	.0052	.0051	.0050	12
....	....	....	....	....	.0094	.0090	.0087	.0084	.0082	.0080	.0078	.0077	.0075	
....	....	....	....	....	.0125	.0120	.0115	.0112	.0109	.0106	.0104	.0102	.0100	
....	....	....	....	....	.0157	.0150	.0144	.0140	.0136	.0133	.0130	.0128	.0125	
....	....	....	....	....	....	....	....	.0066	.0064	.0062	.0061	.0060	.0060	10
....	....	....	....	....	....	....	....	.0098	.0096	.0093	.0092	.0090	.0090	
....	....	....	....	....	....	....	....	.0131	.0128	.0125	.0122	.0120	.0120	
....	....	....	....	....	....	....	....	.0164	.0160	.0156	.0153	.0150	.0150	
....	....	....	....	....	....	....	....	....	....	.0075	.0075	.0075	.0075	8
....	....	....	....	....	....	....	....	....	....	.0112	.0112	.0112	.0112	
....	....	....	....	....	....	....	....	....	....	.0150	.0150	.0150	.0150	
....	....	....	....	....	....	....	....	....	....	.0188	.0188	.0188	.0188	
....	....	....	....	....	....	....	....	....	....	....	....	.0086	.0086	7
....	....	....	....	....	....	....	....	....	....	....	....	.0129	.0129	
....	....	....	....	....	....	....	....	....	....	....	....	.0171	.0171	
....	....	....	....	....	....	....	....	....	....	....	....	.0214	.0214	
....	....	....	....	....	....	....	....	....	....	....	....	....	.0100	6
....	....	....	....	....	....	....	....	....	....	....	....	....	.0150	
....	....	....	....	....	....	....	....	....	....	....	....	....	.0200	
....	....	....	....	....	....	....	....	....	....	....	....	....	.0250	
....	....	....	....	....	....	....	....	....	....	....	....	....	.0150	4
....	....	....	....	....	....	....	....	....	....	....	....	....	.0225	
....	....	....	....	....	....	....	....	....	....	....	....	....	.0300	
....	....	....	....	....	....	....	....	....	....	....	....	....	.0375	

to a part before plating, whereas the basic diameters (the 2A maximum diameter plus allowance) apply to a part after plating. The minimum diameters of class 2B (internal) threads, whether or not plated or coated, are basic, affording no allowance or clearance in assembly at maximum material limits.

(*b*) *Allowances and tolerances.*—Allowances for all diameters and pitch diameter tolerances are specified in tables IV.2, IV.2A, IV.5, and IV.8, and their application is shown in figure III.3, p. 24.

3. Classes 3A and 3B.—(*a*) *Definition.*—Classes 3A for external threads and 3B for internal threads provides for applications where closeness of fit and accuracy of lead and angle of thread are important. They are obtainable consistently only by the use of high quality production equipment supported by a very efficient system of gaging and inspection. The maximum diameters of class 3A (external) threads and the minimum diameters of class 3B (internal) threads, whether or not plated or coated, are basic, affording no allowance or clearance for assembly of maximum metal components.

(*b*) *Allowances and tolerances.*—No allowance is provided, but since the tolerances on "go" gages are within the limits of size of the product, the gages will assure a slight clearance between product made to the maximum-metal limits. Pitch diameter tolerances are specified in tables IV.6 and IV.9 and their application is shown in figure III. 4, p. 25.

4. Selection of Class of Thread.—Consideration should first be given to the use of a class 2A external thread with a class 2B internal thread since these classes are designed for general use. The use of class 2A provides that there will always be a small clearance between maximum-material parts except when the external thread is plated. Plated parts are intended to be gaged with basic-size "go" gages. In either case, it is expected that parts will assemble readily without galling or seizing. Tolerances are sufficiently large so that ordinary production methods are generally applicable.

Past experience with similar designs may indicate that a more accurately made or closer fitting thread is required than that which is permitted by classes 2A and 2B tolerances. In such cases consideration should be given to the use of classes 3A and 3B. If these tolerances are not sufficiently close, it may be necessary to apply the American National class 3 tolerances. The necessary increase in cost should not be overlooked.

In some designs there may be advantages in providing for greater average looseness of fit than that obtained with classes 2A and 2B. Such greater average looseness is provided by classes 1A and 1B or the assembly of class 1A external threads with class 2B internal threads. The minimum looseness, however, is the same as for classes 2A and 2B except that a positive allowance is provided for plated parts. When a greater minimum looseness is requisite to provide for adverse conditions of assembly, class 1AR is available, which is not a Unified class and is based on the American National class 1 allowance combined with class 1A tolerance. These classes also provide larger tolerances to the manufacturer, which may be of advantage if the thread is difficult to produce.

It should be noted that any class of external thread may be associated with any class of internal thread, there being no requirement to combine classes of like number.

5. METHOD OF DESIGNATING

1. Standard Method of Designating.—The method of designating a special thread is by the use of the letters UNS or NS, as indicated in tables IV. 2 to IV. 11, inclusive, preceded by the diameter in inches and the number of threads per inch, all in Arabic characters, and followed by the tolerance classification, with or without pitch diameter tolerances or limits of size. See "Method of designating a screw thread," p. 26.

The symbol "UNS" is applicable to each of 69 Unified special diameter-pitch combinations listed in table IV.12 which are common to the lists of preferred combinations of the American, British, and Canadian standards.

An example of an external thread designation and its meaning is given as follows:

Example: ¼—36 UNS—2A
Class.
Unified special thread.
Number of threads per inch (*n*).
Nominal size.

The designation "NS" applies only to threads not listed in table III.2 or IV.12 for which the limits of size are computed from the tables of this section, or increment tables (table III.2), or threads derived from the Unified formulations for all elements.

For all "NS" threads, specifications of the thread class and the pitch diameter limits are required. In addition the specification of the length of engagement is required.

Example:
¼—24NS—3A (*Required*)
PD 0.2229—0.2198 (*Required*)
Length of engagement 0.875 (*Required*)

2. Modified Threads.—It is occasionally necessary to modify the limits of size of the major diameter of an external thread or the minor diameter of an internal thread from the limits established for special threads in order to fit a specific purpose but without change in class of thread or pitch diameter limits. Such threads should be specified with the established thread designation followed by a statement of the modified diameter limits and the designation "MOD."

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Table IV.12.—*Unified special diameter-pitch combinations*

UNS

Preferred diameters	Preferred pitches, threads per inch					
	36	28	20	8	6	4
1/4	36					
5/16	36					
3/8	36					
7/16		28				
5/8		28				
3/4		28				
7/8		28				
1		28				
1 1/8		28	20			
1 1/4			20			
1 3/8				8		
1 1/2			20	8		
1 5/8			20	8	6	
1 3/4			20	8	6	
1 7/8			20	8	6	
2			20	8	6	
2 1/8				8		
2 1/4			20	8	6	
2 1/2			20	8	6	
2 3/4				8	6	
3				8	6	
3 1/4				8	6	
3 1/2				8	6	
3 3/4				8	6	
4				8	6	
4 1/4				8	6	4
4 1/2				8	6	4
4 3/4				8	6	4
5				8	6	4
5 1/4				8	6	4
5 1/2				8	6	4
5 3/4				8	6	4
6				8	6	4

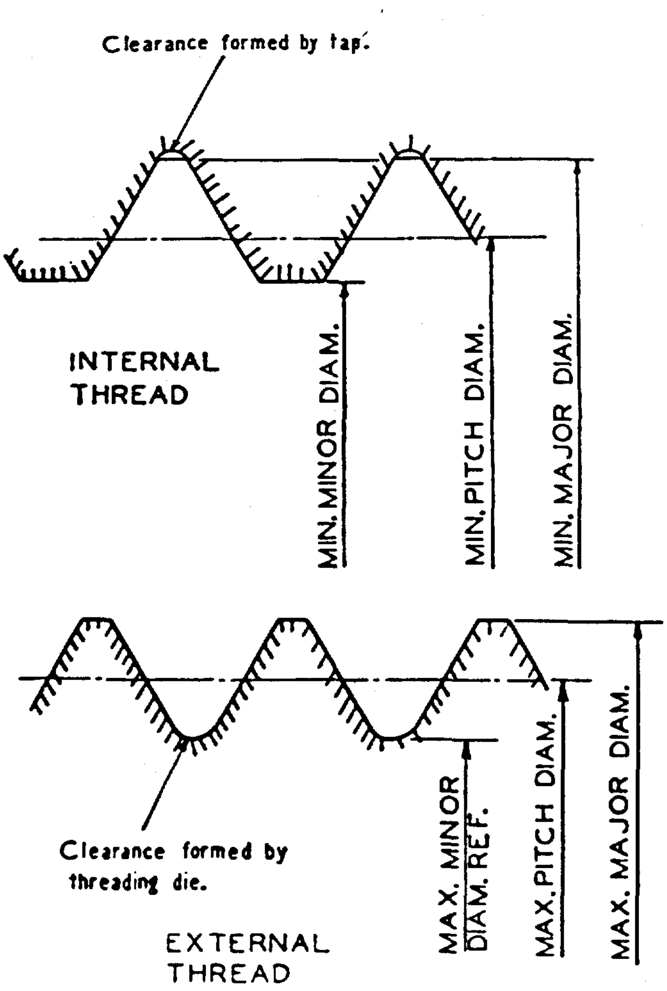

Figure IV.1.—*Thread dimensions to be determined for a special thread.*

Table IV.13.—*Consolidated method for the calculation of dimensions of special threads*

Thread element	External thread				Internal thread		
	Class 1A	Class 1AR	Class 2A	Class 3A	Class 1B	Class 2B	Class 3B
1	2	3	4	5	6	7	8
Major diameter	Nominal size minus allowance			Nominal size	Nominal size		
	Table IV. 2	Table IV. 2A	Table IV. 2				
Tolerance on major diameter	Use value in table IV. 3 or compute in accordance with directions for designing special threads p. 200. Apply minus				None specified as the maximum is established by the crest of an unworn tool		
Pitch diameter	Subtract 3/4H, table IV. 1, col. 13 from maximum major diameter				Subtract 3/4H, table IV. 1, col. 13 from basic major diameter		
Tolerance on pitch diameter	Table IV. 4 Apply minus	Table IV. 4 Apply minus	Table IV. 5 Apply minus	Table IV. 6 Apply minus	Table IV. 7 Apply plus	Table IV. 8 Apply plus	Table IV. 9 Apply plus
Minor diameter	Subtract 1 5/12H, table IV.1, col. 16 from maximum major diameter. This is a reference dimension only				‡Subtract 1 1/4H, table IV.1, col. 15 from the basic major diameter and round off to the nearest 0.001 inch for sizes 0.138 inch and larger. For class 3B a cipher is added to yield four decimal places.		
Tolerance on minor diameter	None specified as the minimum is established by the crest of an unworn tool				‡For general applications use value for 2/3D to 1½D length of engagement from table IV.10 or IV.11; for specific applications use values for applicable length of engagement or compute in accordance with directions for designing special threads p. 200. Apply plus to four-place value of min minor diameter and round off for classes 1B and 2B values to the nearest 0.001 inch for sizes 0.138 inch and larger; class 3B values are to be rounded off to the nearest 0.0001 inch.		

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EXAMPLES:
External thread:
2—14 NS—2A MOD.
Major diameter 1.995–1.985 MOD.
Internal thread:
1¼—10 NS—3 MOD.
Minor diameter 1.398–1.408 MOD.

3. **Threads Otherwise Altered**—If a standard series or special thread is altered in any respect other than major or minor diameter, as above stated, it is designated in accordance with the following examples:

Special external thread:
7/16—24 Am. Nat. form—SPECIAL
Major diameter 0.4340–0.4280 SPL.
Pitch diameter 0.4065–0.4025 SPL.
Length of engagement ⅝ in. min.
Special form external thread:
⅞—18 SPECIAL FORM
Thread angle 60°
Major diameter 0.8750–0.8668
Pitch diameter 0.8384–0.8343
Max. minor diameter 0.8068 (as gaged)
Length of engagement 11/16 in. min.

6. DIRECTIONS FOR DETERMINING LIMITS OF SIZE OF SPECIAL THREADS

The following directions are intended to simplify the task of the designer or specification writer in preparing the specification for a special thread:

The procedure to be followed in determining values for the essential thread elements, as shown in figure IV.1, and the associated tolerances, is outlined in table IV.13. The application of this and other tables is illustrated by the following example:

Internal thread, 1½–28UNS–2B
Length of engagement, 1 inch

Min major diameter____________________ = 1.5000 inches
Min pitch diameter = basic major diameter − 3/4H, table IV.1, = 1.5000 − 0.0232____________________ = 1.4768
Max pitch diameter = min pitch diameter + tolerance, table IV.8, = 1.4768 + 0.0060____________________ = 1.4828
Min minor diameter = basic major diameter − 1¼H, table IV.1, = 1.5000 − 0.0387____________________ = 1.461
Max minor diameter = min minor diameter + tolerance, table IV.10, = 1.4613 + 0.0063____________________ = 1.468

The dimensions of the above internal thread may be stated on the drawing as follows:

Major diameter, 1.5000 min
Pitch diameter, $1.4768^{+0.0060}_{-0.0000}$
Minor diameter, $1.461^{+0.0063}_{-0.0000}$

External thread, 1½–28UNS–2A
To mate with the above thread

Max major diameter = basic major diameter − allowance, table IV.2, = 1.5000 − 0.0013_____ = 1.4987
Min major diameter = max major diameter − tolerance, table IV.3, = 1.4987 − 0.0065__________ = 1.4922
Max pitch diameter = max major diameter − 3/4H, table IV.1, = 1.4987 − 0.0232_______ = 1.4755
Min pitch diameter = max pitch diameter − tolerance, table IV.5, = 1.4755 − 0.0046__________ = 1.4709
Nom minor diameter = max major diameter − 1 5/12H, table IV.1, = 1.4987 − 0.0438__________ = 1.4549

The dimensions of the above external thread may be stated on the drawing as follows:

Major diameter, $1.4987^{+0.0000}_{-0.0065}$
Pitch diameter, $1.4755^{+0.0000}_{-0.0046}$
Minor diameter, 1.4549 nominal.

The design of a special thread usually requires that consideration be given to various factors in order that the thread assembly will function properly. These factors are discussed in appendix 5. It is to be noted particularly that deviations from the preferred tolerances for major diameter of the external thread and for minor diameter of the internal thread may be necessary in order to arrive at the optimium design.

7. GAGES

The specifications for gages as presented in section VI apply also to gages for special threads. With regard to the marking of gages, each gage shall be plainly marked, for identification, with the diameter, number of threads per inch, and class of thread. **Note**: No class is put on marking for "go" thread plug gages (all classes) and "go" thread ring gages, classes 2, 3, and 3A, because these are basic gages.

SECTION V. NATIONAL MINIATURE SCREW THREADS

1. INTRODUCTION

This standard presents a new thread series to be known as National Miniature Screw Threads and is intended for general purpose fastening screws and similar uses in watches, instruments, and miniature mechanisms.[8] The series covers a diameter range from 0.30 to 1.40 mm (0.0118 to 0.0551 in.) and thus supplements the Unified and American thread series that begin at 0.060 in. (No. 0 of the machine screw series).

The 14 sizes are systematically distributed, providing a uniformly proportioned selection over the entire range. They are alternately separated into two categories. The sizes shown in italics are selections made in the interest of simplification and are those to which it is recommended that usage be confined wherever the circumstances of design permit. For more restrictive conditions the intermediate sizes shown in light type are available.

The diameter-pitch combinations have been determined to provide both maximum strength against stripping and optimum conditions for manufacture on an interchangeable basis.

---

[8] This standard is identical in all technical features with the current draft standard developed by subcommittee No. 4 of ASA Sectional Committee B1 on the Standardization and Unification of Screw Threads. The thread sizes are those endorsed by the American-British-Canadian Conference as the basis for a unified standard among the inch-using countries and coincide with the corresponding range of sizes in ISO (International Organization for Standardization) Recommendation No. 84. Additionally, it utilizes thread forms which are compatible in all significant respects with both the Unified and ISO basic thread profiles. Thus, this thread series is in both the American-British-Canadian and the ISO standardization programs.

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The values of all dimensions are supplied in both metric and inch units. The standard being basically metric, only the metric values of the nominal diameters and pitches are rational. Consequently, metric units are stipulated for all formulas and the inch dimensions derived by conversion of the unrounded metric values, using the conversion factor 25.4 mm/in.[10]

Use of this series is recommended on all new products in place of the many improvised and unsystematized sizes now in existence that have never arrived at broad acceptance nor recognition by any standardization bodies.

2. FORM OF THREAD

1. Basic Thread Form.—The theoretical profile on which the design forms of the threads covered by this standard are based is, except for one element, the Unified and American basic thread form as specified in section III and shown in figure V. 1. In exception is thread height, for which a basic value of $0.52p$ is used instead of $0.54127p$ ($=5\,H/8$). Selection of this value is based on the extensive simplification that it affords throughout the calculations for this standard. Resulting coefficients in the formulas for many of the other thread dimensions derived from this property thereby become simple, finite multiples of the lowest common denominator (40) of the fractional equivalents of all but two of the metric pitches, thus yielding values for the majority of metric dimensions that are finite within the decimal place limits of the tables. Also, the calculation of inch equivalents from the terminal metric values is thereby simplified and discrepancies between the metric and inch tables kept to a minimum. This modification will not affect interchangeability with product made to any other standards retaining $0.54127p$, as the resulting difference is negligible and completely offset by practical considerations in tapping, full internal thread heights being invariably avoided in these small sizes to escape excessive tap breakage.

2. Design Forms of Threads.—The design forms (maximum material condition) of external and internal National Miniature threads are shown in figure V.2.

3. Basic Thread Data.—(a) *Thread form.*—The formulas for the various features of the thread form are as follows:

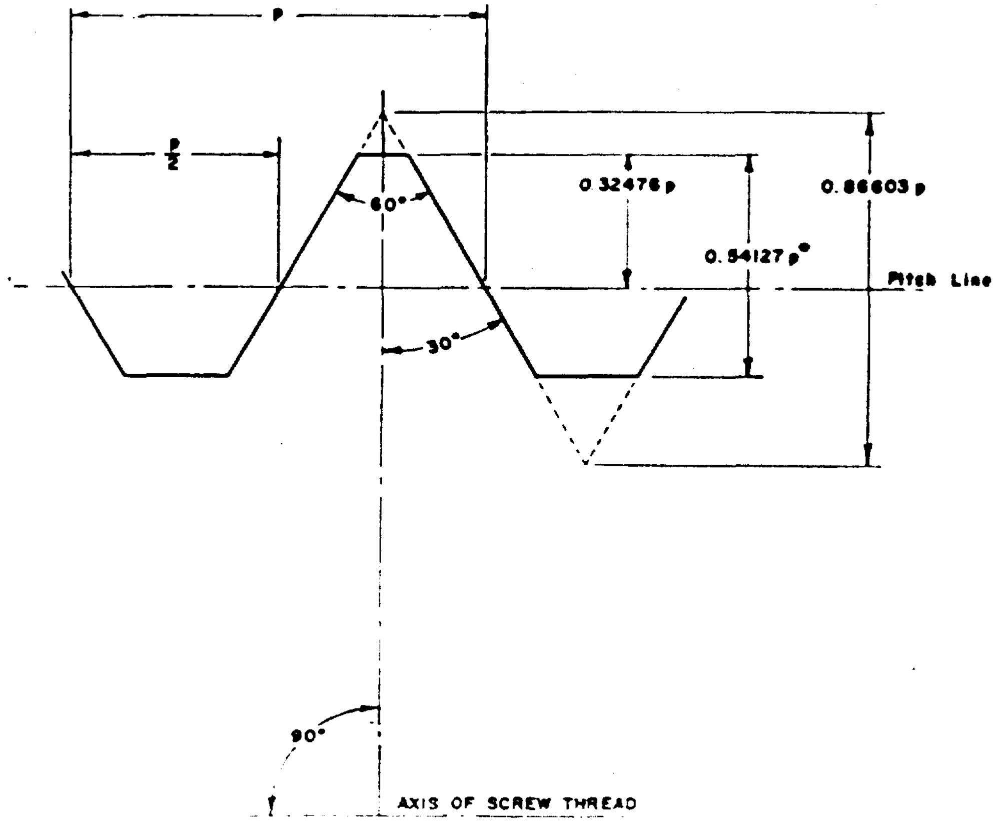

FIGURE V.1.—*Basic thread form, National Miniature threads.*

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[10] American Standard ASA B48.1-1933.

Dimension	Symbol	Formula [a]
Basic thread form		
Angle of thread	2α	60°.
Half angle of thread	α	30°.
Pitch of thread	p	
No. of threads per inch	n	$25.4/p$.
Height of sharp-V thread	H	$0.866025p$.
Addendum of basic thread	h_{ab}	$0.32476p$.
Height of basic thread (Unified and ISO)[b].	h_b	$0.54127p$.
Height of basic thread (NM series).	h_b	$0.52p$.
Design thread form		
Addendum of external thread.	h_{as}	$0.32476p$.
Height of external thread	h_s	$0.60p$.
Flat at crest of external thread.	F_{cs}	$0.125p$.
Radius at root of external thread.	r_{rs}	$0.158p$ (approx.).
Depth of thread engagement.	h_e, h_t	$0.52p$.
Height of internal thread	h_n	$0.556p$.
Flat at crest of internal thread.	F_{cn}	$0.27456p$.
Radius at root of internal thread.	r_{rn}	$0.072p$ (approx.).

---

[a] The formulas are applied to the metric values of p. Tabulated inch dimensions are derived from the unrounded metric dimensions.

[b] This item is listed for reference only. For the present standard all dependent details of thread form and dimensions are based on a height of $0.52p$.

The corresponding thread data for the various standard pitches are shown in table V.1.

(*b*) *Thread sizes.* The formulas for basic and design thread sizes are as follows:

Dimension	Symbol	Formula
Major diameter, nominal and basic.	D	
Major diameter of external thread.	D_s	D.
Major diameter of internal thread.	D_n	$D-2h_b+2h_n=$ $D+0.072p$.
Pitch diameter, basic	E	$D-2h_{ab}=$ $D-0.64952p$.
Pitch diameter of external thread.	E_s	E.
Pitch diameter of internal thread.	E_n	E.
Minor diameter, basic	K	$D-2h_b=D-1.04p$.
Minor diameter of external thread.	K_s	$D-2h_s=D-1.20p$.
Minor diameter of internal thread.	K_n	K.

Table V.1. *Thread form data, National Miniature screw threads*

Basic				External thread						Internal thread		
Threads per inch [a] n	Pitch, p	Height of sharp V thread, $H=0.866025p$	Height, $h_b=0.52p$	Addendum, $h_{ab}=h_{as}=0.32476p$	Height, $h_s=0.60p$	Flat at crest, $F_{cs}=0.125p$	Radius at root, $r_{rs}=0.158p$	Basis for minimum flat at root, $0.64p$	Min. flat at root, $F_{rs}=0.136p$	Height, $h_n=0.556p$	Flat at crest, $F_{cn}=0.27456p$	Radius at root, $r_{rn}=0.072p$
1	2	3	4	5	6	7	8	9	10	11	12	13
	mm	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*
----------	0.080	0.0693	0.0416	0.0260	0.048	0.0100	0.0126	0.0512	0.0109	0.0445	0.0220	0.0058
----------	.090	.0779	.0468	.0292	.054	.0112	.0142	.0576	.0122	.0500	.0247	.0065
----------	.100	.0866	.0520	.0325	.060	.0125	.0158	.0640	.0136	.0556	.0275	.0072
----------	.125	.1083	.0650	.0406	.075	.0156	.0198	.0800	.0170	.0695	.0343	.0090
----------	.150	.1299	.0780	.0487	.090	.0188	.0237	.0960	.0204	.0834	.0412	.0108
----------	.175	.1516	.0910	.0568	.105	.0219	.0277	.1120	.0238	.0973	.0480	.0126
----------	.200	.1732	.1040	.0650	.120	.0250	.0316	.1280	.0272	.1112	.0549	.0144
----------	.225	.1949	.1170	.0731	.135	.0281	.0356	.1440	.0306	.1251	.0618	.0162
----------	.250	.2165	.1300	.0812	.150	.0312	.0395	.1600	.0340	.1390	.0686	.0180
----------	.300	.2598	.1560	.0974	.180	.0375	.0474	.1920	.0408	.1668	.0824	.0216
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
317½	0.003150	0.00273	0.00164	0.00102	0.00189	0.00039	0.00050	0.00202	0.00043	0.00175	0.00086	0.00023
282 2/9	.003543	.00307	.00184	.00115	.00213	.00044	.00056	.00227	.00048	.00197	.00097	.00026
254	.003937	.00341	.00205	.00128	.00236	.00049	.00062	.00252	.00054	.00219	.00108	.00028
203⅕	.004921	.00426	.00256	.00160	.00295	.00062	.00078	.00315	.00067	.00274	.00135	.00035
169⅓	.005906	.00511	.00307	.00192	.00354	.00074	.00093	.00378	.00080	.00328	.00162	.00043
145 1/7	.006890	.00597	.00358	.00224	.00413	.00086	.00109	.00441	.00094	.00383	.00189	.00050
127	.007874	.00682	.00409	.00256	.00472	.00098	.00124	.00504	.00107	.00438	.00216	.00057
112 8/9	.008858	.00767	.00461	.00288	.00531	.00111	.00140	.00567	.00120	.00493	.00243	.00064
101⅗	.009843	.00852	.00512	.00320	.00591	.00123	.00156	.00630	.00134	.00547	.00270	.00071
84⅔	.011811	.01023	.00614	.00384	.00709	.00148	.00187	.00756	.00161	.00657	.00324	.00085

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[a] In all subsequent tables these values are rounded to the nearest whole number.

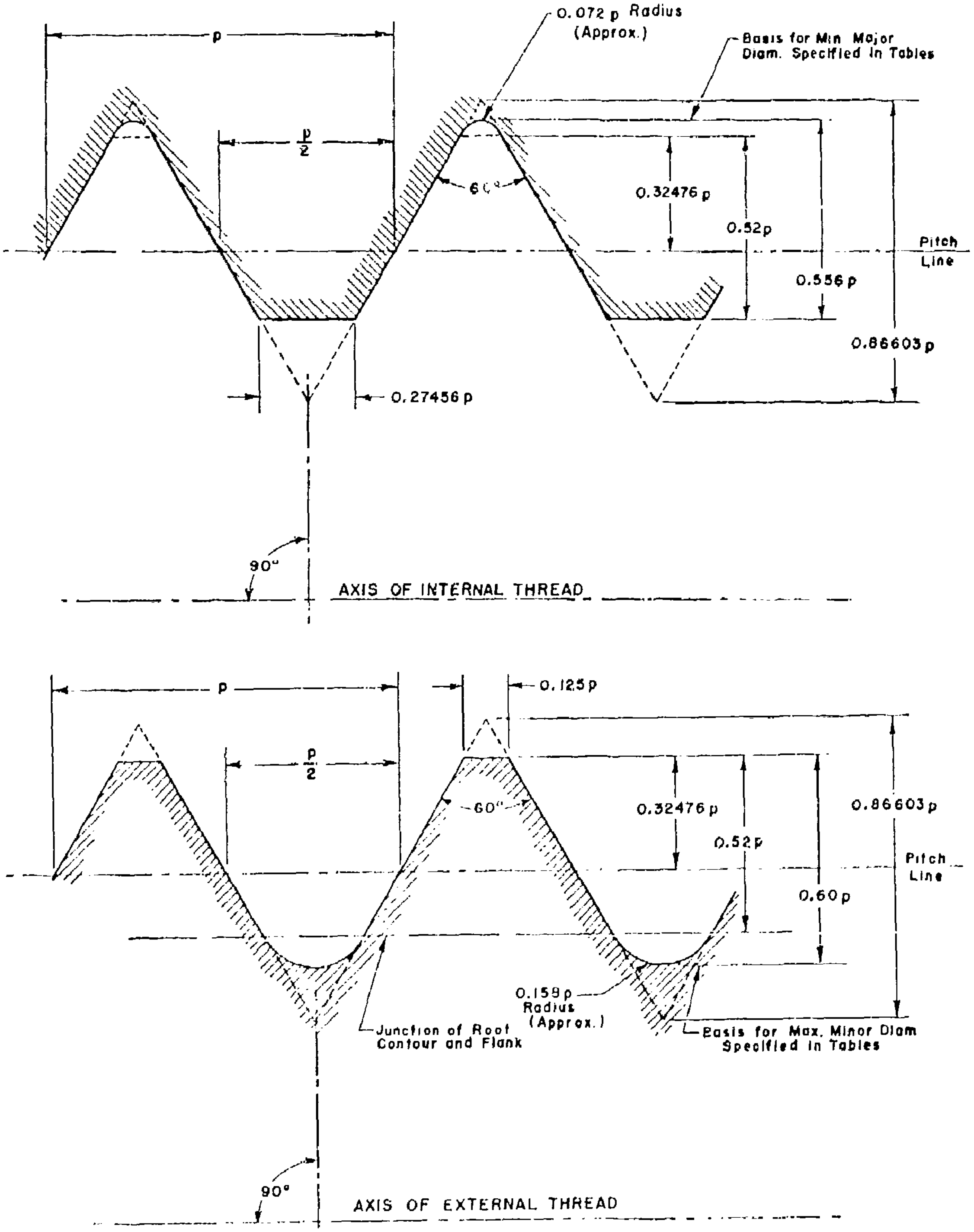
p
0.072 p Radius (Approx.)
Basis for Min Major Diam. Specified in Tables
p/2
60°
0.32476 p
0.52p
0.556 p
Pitch Line
0.86603 p
0.27456 p
90°
AXIS OF INTERNAL THREAD
p
0.125 p
p/2
60°
0.32476 p
0.86603 p
0.52p
Pitch Line
0.60 p
0.159 p Radius (Approx.)
Junction of Root Contour and Flank
Basis for Max. Minor Diam Specified in Tables
90°
AXIS OF EXTERNAL THREAD

FIGURE V.2.—*National Miniature internal and external screw thread design forms (maximum material condition).*

3. NATIONAL MINIATURE THREAD SERIES

The diameter-pitch combinations which constitute the National Miniature thread series, and the design sizes, are those shown in table V.2, p. 104. All threads are of the single (single-start) type.

4. CLASSIFICATION AND TOLERANCES

1. Classification.—There is established herein only one class of thread, with zero allowance on all diameters.

2. Tolerances.—All tolerances governing limits of size are based on functions of the pitch only and apply to lengths of engagement from ⅔ to 1½ times the nominal diameter. (See note, table V.3, p. 107.) The limits of size resulting from the application of the specified tolerances are illustrated in figure V.3, p. 106. Length of engagement and nominal diameter have not been incorporated in any of the tolerance formulas in view of the following: (1) In the small thread sizes covered by this standard, lengths of engagement appreciably below or above the range covered by the formulas are seldom employed. (2) Functional fitness in these small sizes is dependent principally upon the properties of the thread rather than the size of the threaded member. (3) Total tolerances are too small to permit the imposition of minor order modifications.

(a) *Tolerances on external threads.*—Tolerances on external threads are applied to the design sizes in the minus direction. They are tabulated in table V.3, p. 105, and are based on the following formulas:

Tolerances on major diameter are equal to $0.12p+0.006$.[11]
Tolerances on pitch diameter are equal to $0.08p+0.008$.[11]
Tolerances on minor diameter are equal to $0.16p+0.008$.[11]

The third formula is for reference only. In practice, the form of the threading tool is relied upon for controlling the minimum minor diameter, and this limit is not gaged, except in confirming new tools.

(b) *Tolerances on internal threads.*—Tolerances on internal threads are applied to the design sizes in the plus direction. They are tabulated in table V.3, p. 105.

Tolerances on major diameter are equal to $0.168p+0.008$.[11] This formula is for reference only and is comprised of the pitch diameter tolerance and an extension of the thread form of $0.08p$ beyond the basic major diameter. In practice, this limit is applied to the threading tool (tap) and is not gaged on the product.

Tolerances on pitch diameter are equal to $0.08p+0.008$.[11]
Tolerances on minor diameter are equal to $0.32p+0.012$.[11]

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[11] Metric units (millimeters) apply in these formulas. Inch tolerances are not derived by direct conversion of the metric values but are the differences between the rounded-off limits of size in inch units.

Table V.2. *Basic and design sizes, National Miniature thread series*

Size designation	Pitch, p	Basic major diameter, D	Basic pitch diameter, $E = D - 0.64952p$	Minor diameter external threads, $K_s = D - 1.20p$	Minor diameter internal threads, $K_n = D - 1.04p$	Major diameter internal threads, $D_n = D + 0.072p$	Lead angle at basic pitch diameter, λ		Sectional area at minor diameter at $D - 1.28p$
1	2	3	4	5	6	7	8		9
	mm	*mm*	*mm*	*mm*	*mm*	*mm*	*deg*	*min*	*mm²*
30NM	0.080	0.300	0.248	0.204	0.217	0.306	5	52	0.0307
35NM	.090	.350	.292	.242	.256	.356	5	37	.0433
40NM	.100	.400	.335	.280	.296	.407	5	26	.0581
45NM	.100	.450	.385	.330	.346	.457	4	44	.0814
50NM	.125	.500	.419	.350	.370	.509	5	26	.0908
55NM	.125	.550	.469	.400	.420	.559	4	51	.1195
60NM	.150	.600	.503	.420	.444	.611	5	26	.1307
70NM	.175	.700	.586	.490	.518	.713	5	25	.1780
80NM	.200	.800	.670	.560	.592	.814	5	26	.232
90NM	.225	.900	.754	.630	.666	.916	5	26	.294
100NM	.250	1.000	.838	.700	.740	1.018	5	26	.363
110NM	.250	1.100	.938	.800	.840	1.118	4	51	.478
120NM	.250	1.200	1.038	.900	.940	1.218	4	23	.608
140NM	.300	1.400	1.205	1.040	1.088	1.422	4	32	.811
	threads per inch	*in.*	*in.*	*in.*	*in.*	*in.*	*deg*	*min*	*sq in. × 10⁻⁴*
30NM	318	0.0118	0.0098	0.0080	0.0085	0.0120	5	52	0.475
35NM	282	.0138	.0115	.0095	.0101	.0140	5	37	.671
40NM	254	.0157	.0132	.0110	.0117	.0160	5	26	.901
45NM	254	.0177	.0152	.0130	.0136	.0180	4	44	1.262
50NM	203	.0197	.0165	.0138	.0146	.0200	5	26	1.407
55NM	203	.0217	.0185	.0157	.0165	.0220	4	51	1.852
60NM	169	.0236	.0198	.0165	.0175	.0240	5	26	2.03
70NM	145	.0276	.0231	.0193	.0204	.0281	5	26	2.76
80NM	127	.0315	.0264	.0220	.0233	.0321	5	26	3.60
90NM	113	.0354	.0297	.0248	.0262	.0361	5	26	4.56
100NM	102	.0394	.0330	.0276	.0291	.0401	5	26	5.63
110NM	102	.0433	.0369	.0315	.0331	.0440	4	51	7.41
120NM	102	.0472	.0409	.0354	.0370	.0480	4	23	9.43
140NM	85	.0551	.0474	.0409	.0428	.0560	4	32	12.57

3. Root Flats.—The width of flat at the root of external threads, F_{rs}, at the minimum-material condition is $0.136p$, corresponding to a thread height of $0.64p$. Values for the various pitches are given in table V.1, page 102.

4. Coated Threads.—It is not within the scope of this standard to make recommendations for thicknesses of, or to specify limits for, coatings. However, it is obvious that in these small sizes any coatings applied must be kept thin because of the smallness of the threads. Generally, the coatings employed in practice are confined to those of the electroplated or oxide types and are limited to a flash thickness. For applications where these coatings are inadequate the product is usually made of a corrosion-resistant material, thereby avoiding the problems attendant to providing for heavier coatings. However, where coatings of a measurable thickness are required, it is essential that they be included within the maximum-material limits since no allowance is provided between these limits of the external and internal thread. In other words, the maximum material limits given in this standard apply to both uncoated and coated threads.

5. THREAD DESIGNATIONS

Screw threads of this series shall be designated on engineering drawings, in specifications, and on tools and gages (when space permits) by the size designations shown in the first column of table V.2, in which the symbol "NM" designates the National Miniature series. To these designations may be affixed, in parentheses, the inch equivalent of the basic major diameter, but this addition is optional. Thus, for example, the thread size identified by the designation 80 NM may also be designated 80 NM (0.0315).

6. LIMITS OF SIZE

The limits of size of both external and internal threads, resulting from the application of the specified tolerances, are given in table V.3, p. 105, in both the metric and English systems and are illustrated in figure V.3. For hole size limits before tapping, see appendix 3, table 3.3 and figure 3.2, pp. 186, 193.

Table V.3.—*Limits of size and tolerances, National Miniature thread series*

Size designation [a]	Pitch	External threads								Internal threads							
		Major diameter limits			Pitch diameter limits			Minor diameter limits		Minor diameter limits			Pitch diameter limits			Major diameter limits	
		Max.	Min.	Tol.	Max.	Min.	Tol.	Max.[b]	Min.[c]	Min.	Max.	Tol.	Min.	Max.	Tol.	Min.[d]	Max.[c]
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	mm	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*
30NM	0.080	0.300	0.284	0.016	0.248	0.234	0.014	0.204	0.183	0.217	0.254	0.037	0.248	0.262	0.014	0.306	0.327
35NM	.090	.350	.333	.017	.292	.277	.015	.242	.220	.256	.297	.041	.292	.307	.015	.356	.380
40NM	.100	.400	.382	.018	.335	.319	.016	.280	.256	.296	.340	.044	.335	.351	.016	.407	.432
45NM	.100	.450	.432	.018	.385	.369	.016	.330	.306	.346	.390	.044	.385	.401	.016	.457	.482
50NM	.125	.500	.479	.021	.419	.401	.018	.350	.322	.370	.422	.052	.419	.437	.018	.509	.538
55NM	.125	.550	.529	.021	.469	.451	.018	.400	.372	.420	.472	.052	.469	.487	.018	.559	.588
60NM	.150	.600	.576	.024	.503	.483	.020	.420	.388	.444	.504	.060	.503	.523	.020	.611	.644
70NM	.175	.700	.673	.027	.586	.564	.022	.490	.454	.518	.586	.068	.586	.608	.022	.713	.750
80NM	.200	.800	.770	.030	.670	.646	.024	.560	.520	.592	.668	.076	.670	.694	.024	.814	.856
90NM	.225	.900	.867	.033	.754	.728	.026	.630	.586	.666	.750	.084	.754	.780	.026	.916	.962
100NM	.250	1.000	.964	.036	.838	.810	.028	.700	.652	.740	.832	.092	.838	.866	.028	1.018	1.068
110NM	.250	1.100	1.064	.036	.938	.910	.028	.800	.752	.840	.932	.092	.938	.966	.028	1.118	1.168
120NM	.250	1.200	1.164	.036	1.038	1.010	.028	.900	.852	.940	1.032	.092	1.038	1.066	.028	1.218	1.268
140NM	.300	1.400	1.358	.042	1.205	1.173	.032	1.040	.984	1.088	1.196	.108	1.205	1.237	.032	1.422	1.480
	threads per in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
30NM	318	0.0118	0.0112	0.0006	0.0098	0.0092	0.0006	0.0080	0.0072	0.0085	0.0100	0.0015	0.0098	0.0104	0.0006	0.0120	0.0129
35NM	282	.0138	.0131	.0007	.0115	.0109	.0006	.0095	.0086	.0101	.0117	.0016	.0115	.0121	.0006	.0140	.0149
40NM	254	.0157	.0150	.0007	.0132	.0126	.0006	.0110	.0101	.0117	.0134	.0017	.0132	.0138	.0006	.0160	.0170
45NM	254	.0177	.0170	.0007	.0152	.0145	.0007	.0130	.0120	.0136	.0154	.0018	.0152	.0158	.0006	.0180	.0190
50NM	203	.0197	.0189	.0008	.0165	.0158	.0007	.0138	.0127	.0146	.0166	.0020	.0165	.0172	.0007	.0200	.0212
55NM	203	.0217	.0208	.0009	.0185	.0177	.0008	.0157	.0146	.0165	.0186	.0021	.0185	.0192	.0007	.0220	.0231
60NM	169	.0236	.0227	.0009	.0198	.0190	.0008	.0165	.0153	.0175	.0198	.0023	.0198	.0206	.0008	.0240	.0254
70NM	145	.0276	.0265	.0011	.0231	.0222	.0009	.0193	.0179	.0204	.0231	.0027	.0231	.0240	.0009	.0281	.0295
80NM	127	.0315	.0303	.0012	.0264	.0254	.0010	.0220	.0205	.0233	.0263	.0030	.0264	.0273	.0009	.0321	.0337
90NM	113	.0354	.0341	.0013	.0297	.0287	.0010	.0248	.0231	.0262	.0295	.0033	.0297	.0307	.0010	.0361	.0379
100NM	102	.0394	.0380	.0014	.0330	.0319	.0011	.0276	.0257	.0291	.0327	.0036	.0330	.0341	.0011	.0401	.0420
110NM	102	.0433	.0419	.0014	.0369	.0358	.0011	.0315	.0296	.0331	.0367	.0036	.0369	.0380	.0011	.0440	.0460
120NM	102	.0472	.0458	.0014	.0409	.0397	.0012	.0354	.0335	.0370	.0406	.0036	.0409	.0420	.0011	.0480	.0499
140NM	85	.0551	.0535	.0016	.0474	.0462	.0012	.0409	.0387	.0428	.0471	.0043	.0474	.0487	.0013	.0560	.0583

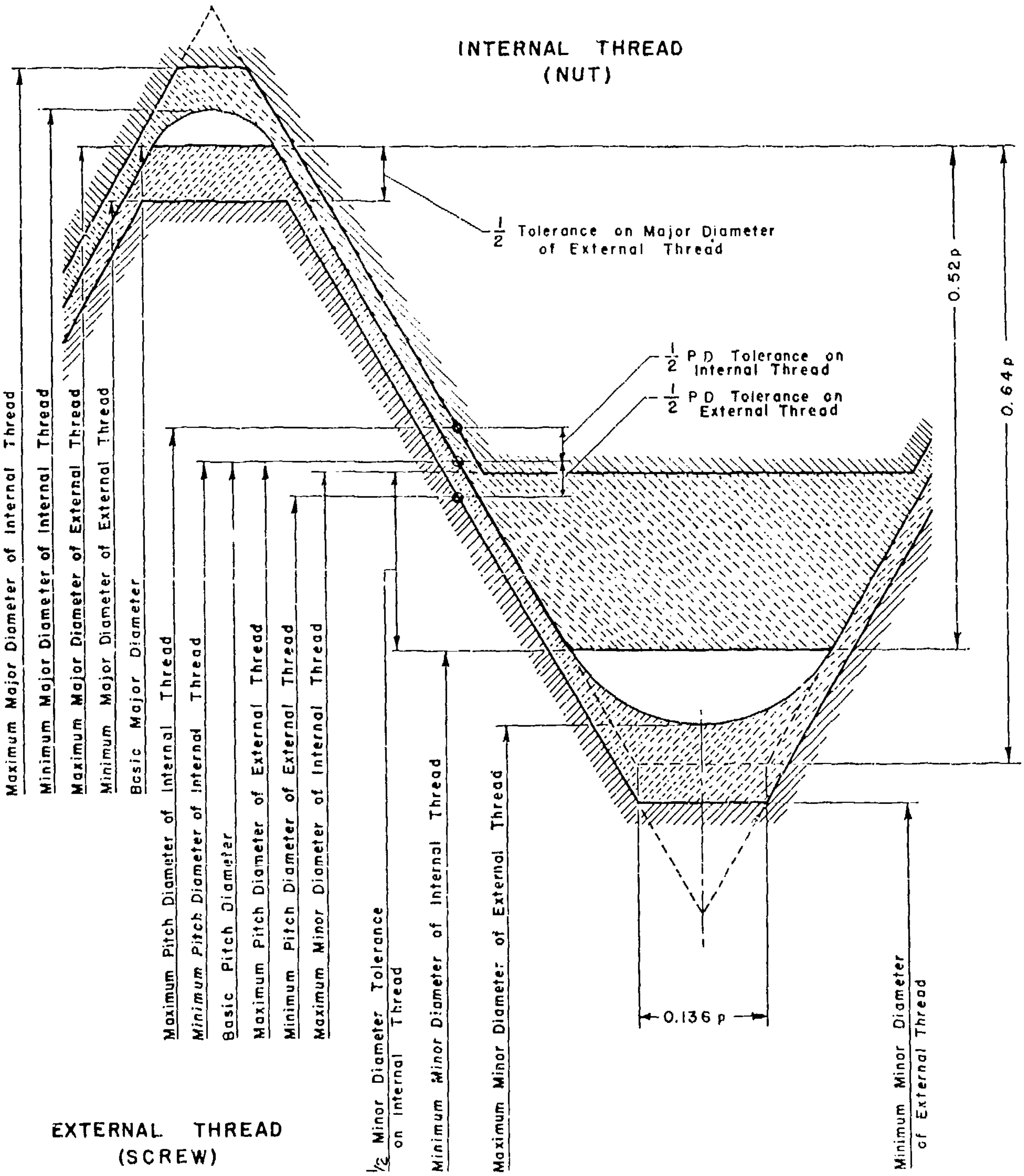
[a] Sizes shown in italics are preferred. It is recommended that selections be confined to these sizes insofar as possible.

[b] This limit, in conjunction with root form shown in figure V.2, is advocated for use when optical projection methods of gaging are employed. For mechanical gaging the minimum minor diameter of the internal thread is applied.

[c] This limit is provided for reference only. In practice, the form of the threading tool is relied upon for this limit. Control by gaging is not imposed.

[d] This limit is provided for reference only, and is not gaged. For gaging, the maximum major diameter of the external thread is applied.

Note. Inch limits in this table have been determined by direct conversion of corresponding metric dimensions prior to rounding off. Inch tolerances are the differences between the inch limits and, consequently, differ in some instances by 0.0001 in. from the inch equivalent of the metric tolerance.



INTERNAL THREAD
(NUT)
$\frac{1}{2}$ Tolerance on Major Diameter of External Thread
$\frac{1}{2}$ P D Tolerance on Internal Thread
$\frac{1}{2}$ P D Tolerance on External Thread
0.52 p
0.64 p
0.136 p
Maximum Major Diameter of Internal Thread
Minimum Major Diameter of Internal Thread
Maximum Major Diameter of External Thread
Minimum Major Diameter of External Thread
Basic Major Diameter
Maximum Pitch Diameter of Internal Thread
Minimum Pitch Diameter of Internal Thread
Basic Pitch Diameter
Maximum Pitch Diameter of External Thread
Minimum Pitch Diameter of External Thread
Maximum Minor Diameter of Internal Thread
$\frac{1}{2}$ Minor Diameter Tolerance on Internal Thread
Minimum Minor Diameter of Internal Thread
Maximum Minor Diameter of External Thread
Minimum Minor Diameter of External Thread
EXTERNAL THREAD
(SCREW)

FIGURE V.3.—*Disposition of tolerances and crest clearances, National Miniature threads.*

7. GAGES AND GAGING

The development of a gaging standard for National Miniature threads is anticipated after the accumulation of more experience with this new standard. The following procedures are at present being successfully used by some producers:

1. Gaging of External Threads.—The major diameter of the external thread is inspected by either contact gaging or optical projection. All other dimensions, such as pitch diameter, lead, thread form, and minor diameter are inspected by optical projection methods. There is presented in figure V.4 an illustration of a chart which has been found very satisfactory for the optical projection method of inspection of external threads. Inspection at a magnification of 100 is recommended and at this scale the charts should be accurate to within ±0.01 in. on all diameters and ‡ on pitches cumulatively up to five.

2. Gaging of Internal Threads.—The minor diameter of the internal thread is gaged with "go" and "not go" plain cylindrical plug gages. All other elements are checked only for assembleability limits by means of a "go" thread plug gage. For the minimum-material limit of the internal thread the accuracy and performance of the tap is relied upon. This implies that the major and pitch diameters of the tap do not exceed the maximum internal thread limits for these elements and disregards overcutting, which is rarely incurred because of the flexibility of these small taps and the manner in which they are generally fluted.

SECTION VI. GAGES AND GAGING FOR UNIFIED, AMERICAN, AND AMERICAN NATIONAL THREADS

1. INTRODUCTION

Gaging of screw threads is the process of investigating or determining the extent to which they conform dimensionally to prescribed limits of size. Dimensional gages are the means applied for that purpose.

This standard for gages and gaging practice is supplementary to sections III and IV, and appendixes 1 and 2, and is intended to facilitate adherence to the limits of size specified therein without in any sense restricting the requirements more severely than those specified. Adherence to the gaging principles laid down, which have been tested by many years of practical use, will assure assembleability of threads interchangeably, the acceptance of satisfactory threads, and segregation or rejection of threads that are significantly outside of prescribed limitations.

There are two general methods of approach to the dimensional inspection of threads, namely inspection by attributes and inspection by variables. Inspection by attributes involves the application of limit gages to assure that the product is within the prescribed limits of size, whereas inspection by variables involves the application of indicating gages or measuring instruments to measure the extent of deviation of the elements of screw threads from prescribed

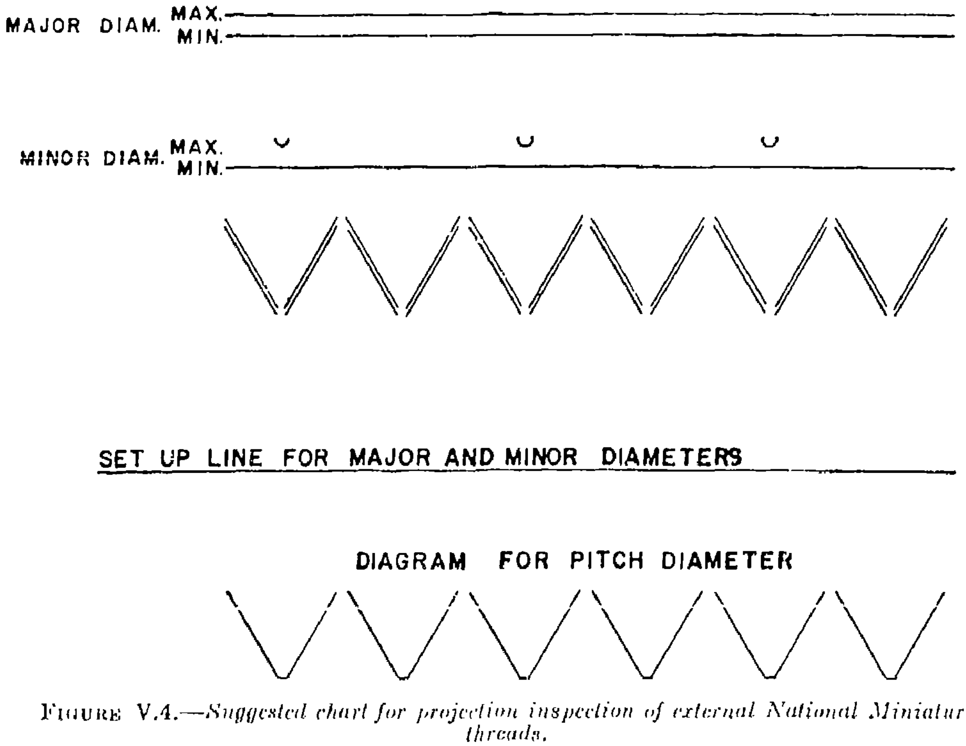

MAJOR DIAM.
MAX.
MIN.
MINOR DIAM.
MAX.
MIN.
SET UP LINE FOR MAJOR AND MINOR DIAMETERS
DIAGRAM FOR PITCH DIAMETER

Figure V.4.—*Suggested chart for projection inspection of external National Miniature threads.*

limits of size. Inspection by variables is primarily useful in the control of production tools and processes. Such inspection may be applied, when necessary, to enforce the limits on deviations of individual thread elements, stated on pp. 22, 79, and 130, or to collect data for the analysis of screw thread defects. However, inspection by attributes generally forms the basis for the acceptance or rejection of threads with respect to conformity to specified limits of size.

2. FUNDAMENTALS

1. Gage Classification.—The limits of size of the threads to be produced should be represented in: (1) Gages used in checking the threads as they are produced, known as "working gages"; (2) gages for use in the acceptance of the product, known as "inspection gages"; and (3) gages used to determine the accuracy of the two preceding classes of gages, known as "master" and "setting gages."

2. Gages for Reference.—(*a*) *Master gage.*—The master gage is a thread plug gage which represents the physical dimensions of the basic size of the part. It clearly establishes the minimum size of the internal thread and the maximum size of the external thread at the point at which interference between mating parts begins when no allowance is provided. A master gage shall be accompanied by a record of its measurement.

(*b*) *Setting gage (check gage).*—(1) *Threaded setting gages.*—A setting gage is a thread plug gage to which adjustable thread ring gages, thread snap gages, and other thread comparators are set to size. Threaded setting plug gages are of two standard designs, which are designated as "basic-crest setting plugs" and "truncated setting plugs."

The basic-crest setting plug is one having a width of flat at the crest equal to $p/8$. It is commonly used for setting thread snap gages and is also used for setting adjustable thread ring gages to size, when adequate facilities are available for checking the thread form and clearance at the major diameter. (See "procedure," p. 118.)

The truncated setting plug of standard design[12] is the same as the basic-crest setting plug except that the crest of the thread is truncated for one-half of the length of the gage, giving a full-form portion and a truncated portion, as specified in par. 2 (*a*) p. 111. In setting thread gages to size, the truncated portion controls the pitch diameter, and the full-form portion assures that proper clearance is provided at the major diameter of the ring gage. Also, the use of the full-form portion in conjunction with the truncated portion checks to some degree the flank angle of the thread gage.

(2) *Plain cylindrical plug acceptance check gages.*—"Go" and "not go" plain cylindrical plug acceptance check gages are required to check the minor diameter limits of thread ring gages of the smaller sizes, after the gage has been properly set to the thread setting plug gage. Standard measuring equipment is usually employed in lieu of plain cylindrical plug gages for sizes larger than $\frac{3}{8}$ in. nominal diameter thread.

3. Limit Gages.—Limit gages are of two categories, namely (1) maximum-metal-limit gages, designated "go" gages, and (2) minimum-metal-limit gages, designated "not go" gages.

(*a*) *Maximum-metal or "go" gages.*—The maximum-metal-limit or "go" gages check or control the extent of the tolerance, as applied to a specific screw thread, in the direction of the limit of maximum material and represent the maximum limit of external threads and the minimum limit of internal threads. The ideal maximum-metal-limit or "go" gage is a threaded counterpart of the thread, made exactly to its prescribed maximum-material limits and in length equal to the length of engagement of the thread with its mating thread. Such gages would most nearly duplicate the assembly conditions of threads. They control the virtual diameter (or effective size) at the maximum-material limit. See "Acceptability of Threads," p. 118.

(*b*) *Minimum-metal or "not go" gages.*—The minimum-metal gages control the extent of the tolerance in the direction of the limit of minimum material and represent the minimum limit of external threads and the maximum limit of internal threads.

As stated on p. 22, the minimum-material pitch diameter limits are necessarily a limitation of the pitch diameter as a single thread element. Also, it is a principle of limit gaging that each element or dimension can be checked only singly by a minimum-metal-limit gage. Accordingly, separate gages are required to check pitch, major, and minor diameters at minimum-material limits. That is, for external threads two gages are necessary, one to check the major diameter and the other, pitch diameter; internal threads require a gage to check the pitch diameter and the other, minor diameter. A third factor in minimum-material-limit gaging is nontechnical but of practical importance, namely the economies of the gaging means and procedures, as thorough checking of a thread requires several individual gaging operations along and around the thread. It is not feasible, therefore, to establish an ideal gage design for gaging pitch diameter and approach that ideal closely in practice, as is done for maximum-metal-limit gages.

As a result, two distinct gaging practices are widely used, as follows:

(1) The use of "not go" thread plug and ring gages provides a satisfactory means of gaging when proper functioning of the thread assembly only requires control of the virtual diameter (or effective size) of the threads at the minimum material limits. The use of such gages is referred to as "virtual diameter (or effective size) gaging practice." See "Acceptability of Threads," p. 118.

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[12] See Commercial Standard CS8, for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. The latest revision should be consulted when referring to such standards.

(2) The use of "not go" thread snap or indicating gages conforming to the thread length requirements stated on p. 114, controls to a close degree the pitch diameter at the minimum-material limit as a single element. Thus, without further checking, their use provides an economical means of control over such other variables as lead, uniformity of helix, flank angle, taper, roundness, and surface condition. The use of such gages, however, is referred to as "single element gaging practice." See "Acceptability of Threads," p. 118.

4. DIRECTION OF TOLERANCES ON GAGES.—The dimensions of all gages used for the *production* of screw threads and "go" gages used for inspection shall be within the extreme limits of size of the product. The limits of size specified for screw threads represent the extreme limitation of an acceptable product. The tolerances are those necessary to include all errors or variations in the sizes of *production* tools, gages, and all other manufacturing variations. However, in order to avoid needless controversy on parts close to the minimum-material sizes or "not go" limits, because of possible small differences in sizes of the gages used, the pitch diameter tolerances on all "not go" gages used for *final inspection* and for inspection of purchased product may be outside the product limits *if specifically authorized.*

5. TEMPERATURE AT WHICH GAGES SHALL BE STANDARD.—*The nominal dimensions of gages and product shall be correct at a temperature of 68° F (20° C).* As gages and products are ordinarily checked at room temperature, whatever it may happen to be, it is desirable that the coefficient of thermal expansion of gages be the same as that of the product on which they are used. Inasmuch as the majority of threaded products consist of iron and steel, and as screw-thread gages are ordinarily made of hardened steel, this condition is ordinarily fulfilled without giving it special attention.

6. MEASURING PRESSURE FOR WIRE MEASUREMENTS.[13] In measuring the pitch diameter of hardened screw-thread gages by means of wires, and in measuring the wires themselves, the same contact load should be used. A contact load of 1 lb is recommended for pitches finer than 20 threads per inch and 2½ lb for 20 threads per inch and coarser. It is also recommended as standard practice that wires be measured between a flat contact and a cylindrical contact 0.750 in. in diameter. The contacts shall be of hardened steel, accurately ground and lapped.

3. SPECIFICATIONS FOR GAGE ELEMENTS

The design of gages is specified in this section only to the extent that it affects the results obtained in the gaging of threads. Other details of design and dimensions are left to the discretion of individual departments and agencies of the Government. However, to serve their intended purposes satisfactorily, thread gages should be produced by employing only the latest and best manufacturing techniques. The type of steel or wear-resistant material selected, together with the heat-treating and stabilization processes, should provide for maximum wear life and reduce the dimensional instability to a minimum, thereby insuring that the gages will remain within the tolerances specified over a maximum period. Thread gages should be precision plug or ring lapped to insure adequate refinement of surface finish, removal of amorphous or smear metal after grinding, and uniformity of thread form over the entire length of the gaging member.

(a) GENERAL DESIGN

1. DESIGN OF GAGE BLANKS.—Designs of standard blanks for thread plug and ring gages, setting plug gages, plain cylindrical plug and ring gages, and plain snap gages have been developed by the American Gage Design Committee. The designs have proved satisfactory in many years of use and have been published in Commercial Standard CS8, Gage Blanks (see footnote 12).

‡2. REMOVAL OF SHARP END THREADS.—To avoid feather edges on "go" and "not go" thread plug and ring gages and thread setting plug gages, the partial thread at both ends of the gage shall be removed to a blunt start (see definition 26, p. 4.) Not more than one complete turn of the thread shall be removed to the point where the full thread form is obtained. On thread ring gages of ½ in. nominal size or smaller or of 20 threads per inch and finer, and on all thread plug gages and setting plug gages of 28 threads per inch and finer, a 60° chamfer from the axis of the gage is permitted in lieu of removal of the partial thread. On truncated thread setting plugs of 28 threads per inch or coarser, where the truncated portion meets the full portion, the feather edge shall be completely removed.

3. CHIP GROOVES IN "GO" THREAD PLUG GAGES.—Each "go" thread plug gage, except in sizes 0.150 in. and smaller, shall be provided with a chip groove at the entering end. On reversible gages a chip groove is required at each end. Chip grooves are acceptable that are in accordance with general commercial practice such as a longitudinal groove cut parallel with the axis and extending the complete length of the gaging member, or a groove cut at an angle with the axis. The groove shall be located circumferentially at the start of the full thread and in all cases the depth shall extend below the root of the first full thread space. The widths recommended for chip grooves are as follows: Over 0.150 to 0.385 in. nominal diameter, 1/32 in.; above 0.385 to and including 2.010 in. nominal diameter, 1/16 in.; and above 2.010 in. nominal diameter, 3/32 in. "Go" thread ring gages of the adjustable type (AGD standard) do not require chip grooves as the adjusting slots serve this purpose

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[13] Methods of measuring pitch diameter of thread plug gages are described, and specifications for wires are given in appendix 4, p. 194.

(b) SPECIFICATIONS FOR THREAD FORM

1. Thread Form of "Go" and "Not Go" Thread Gages.—The specifications for thread form of thread gages applicable to both external and internal threads, as exemplified by thread plug and ring gages, are stated in detail below, and are summarized in table VI.1 and figure VI.1. These specifications for thread form apply over the entire circumference and length of the gaging element.

(a) *"Go" thread gages.*—(1) *Thread crests.*—The major diameter of the "go" thread plug gage shall be the same as the minimum (basic) major diameter of the internal thread, with a plus gage tolerance. The minor diameter of the "go" thread ring gage shall be equal to the maximum pitch diameter of the external thread minus $H/2$, with a minus gage tolerance. The thread crests of plug and ring gages shall be flat in an axial section and parallel to the axis.

(2) *Thread roots.*—The minor diameter of the "go" thread plug gage shall be cleared beyond a $p/8$ width of flat either by an extension of the sides of the thread toward a sharp V or by an undercut to any dimension no wider than the width resulting from $p/8$ maximum width either side of the center-line of the thread space (see fig. VI.1). The major diameter of the "go" thread ring gage shall be cleared by a clearance cut of substantially $p/8$ width and approximately central.

(3) *Concentricity of pitch and major or minor diameters.*—The pitch and major diameters of "go" thread plug gages, and the pitch and minor diameters of "go" thread ring gages shall be concentric. On thread plug gages an eccentric condition produces an oversize effective major diameter, having a width of flat less than $p/8$, which may encroach on the minimum permissible limit for the root profile of the internal thread. Similarly, on thread ring gages an eccentric condition produces an undersize effective minor diameter,

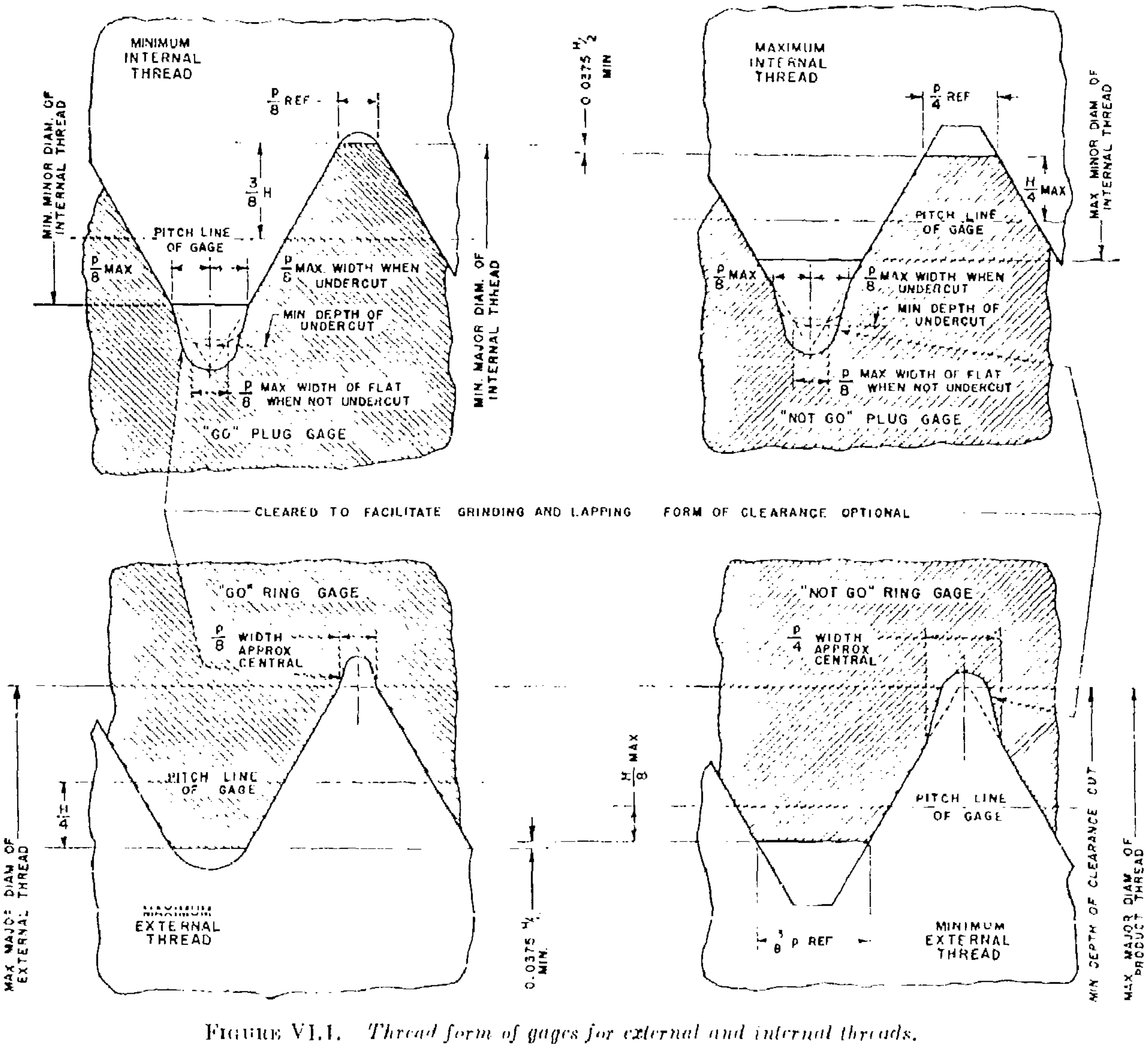
MINIMUM INTERNAL THREAD
MIN. MINOR DIAM. OF INTERNAL THREAD
P/8 REF
3/8 H
PITCH LINE OF GAGE
P/8 MAX
P/8 MAX. WIDTH WHEN UNDERCUT
MIN DEPTH OF UNDERCUT
P/8 MAX WIDTH OF FLAT WHEN NOT UNDERCUT
"GO" PLUG GAGE
MIN. MAJOR DIAM. OF INTERNAL THREAD
0.0275 H/2 MIN
MAXIMUM INTERNAL THREAD
P/4 REF
H/4 MAX
PITCH LINE OF GAGE
P/8 MAX
P/8 MAX WIDTH WHEN UNDERCUT
MIN DEPTH OF UNDERCUT
P/8 MAX WIDTH OF FLAT WHEN NOT UNDERCUT
"NOT GO" PLUG GAGE
MAX. MINOR DIAM. OF INTERNAL THREAD
CLEARED TO FACILITATE GRINDING AND LAPPING   FORM OF CLEARANCE OPTIONAL
"GO" RING GAGE
P/8 WIDTH APPROX CENTRAL
PITCH LINE OF GAGE
H/4
MAX MAJOR DIAM OF EXTERNAL THREAD
MAXIMUM EXTERNAL THREAD
0.0375 H/2 MIN
H/8 MAX
"NOT GO" RING GAGE
P/4 WIDTH APPROX CENTRAL
PITCH LINE OF GAGE
3/8 P REF
MINIMUM EXTERNAL THREAD
MIN DEPTH OF CLEARANCE CUT
MAX MAJOR DIAM OF PRODUCT THREAD

Figure VI.1. *Thread form of gages for external and internal threads.*

having a width of flat less than $p/4$, which may encroach on the maximum permissible limit for the root profile of the external thread. The following are the permissible maximum effective major and minimum effective minor diameters as determined by measurements of runout (total indicator reading) with respect to the pitch cylinder:

"Go" thread plug gage: maximum effective major diameter = maximum major diameter specified

"Go" thread ring gage: minimum effective minor diameter = measured minor diameter [14] − (pitch diameter gage tolerance + minor diameter gage tolerance)

(*b*) *"Not go" thread gages.*—(1) *Thread crests.*—The maximum major diameter of the "not go" thread plug or equivalent gage shall be equal to the maximum pitch diameter of the internal thread plus $H/2$. This corresponds to a width of flat at the crest of the gage equal to one-fourth of the pitch. However, the maximum major diameter of the "not go" thread plug gage shall not exceed [15] the minimum major diameter of the internal thread minus $0.0375H$ $(=0.05\ h_b)$.

The minimum minor diameter of the "not go" thread ring or equivalent gage shall be equal to the minimum pitch diameter of the external thread minus $H/4$. This corresponds to a width of flat at the crest of the gage equal to three-eighths of the pitch. However, the minimum minor diameter of the "not go" thread ring gage shall not be less than the minimum minor diameter of the "go" thread ring gage plus $0.0375H$ $(=0.05h_b)$. This requirement is necessary to insure that the minor diameter of the "not go" thread ring gage is not less than the minor diameter of the "go" ring gage, which may occur with a three-eighths pitch flat on the "not go" thread ring crest when there is a pitch diameter allowance on the external thread combined with a large pitch diameter tolerance.[15]

(2) *Thread roots.*—The minor diameter of the "not go" thread plug gage shall be cleared beyond a $p/4$ width of flat by an undercut to any dimension no wider than the width resulting from $p/8$ maximum width either side of the centerline of the thread space (see fig. VI.1). In small diameters and fine pitches this relief may be an extension of the sides of the thread from the position corresponding to this approximate width toward a sharp V. The major diameter of the "not go" thread ring gage shall be cleared by a clearance cut of substantially $p/4$ width and approximately central. The "not go" thread ring gage shall clear the maximum major diameter of the external thread or the maximum major diameter of the full-form portion of the truncated thread setting plug for the "not go" thread ring gage, whichever is the greater.

Thus contact of the thread gage can occur on the sides of the threads, but not on the crest or root. Also the effect of angle deviation on the fit of the gage with the thread is minimized.

(3) *Concentricity of pitch and major or minor diameters.* The pitch and major diameters of "not go" thread plug gages, and the pitch and minor diameters of "not go" thread ring gages shall be concentric. On thread plug gages an eccentric condition produces an oversize effective major diameter, having a width of flat less than $p/4$, which may encroach on the minimum permissible limit for the root profile of the internal thread. Similarly, on thread ring gages an eccentric condition produces an undersize effective minor diameter, having a width of flat less than $3p/8$, which may encroach on the maximum permissible limit for the root profile of the external thread. The following are the permissible maximum effective major and minimum effective minor diameters as determined by measurements of runout (total indicator reading) with respect to the pitch cylinder:

"Not go" thread plug gage: maximum effective major diameter = maximum major diameter specified.

"Not go" thread ring gage: minimum effective minor diameter = measured minor diameter[14] − 2 (pitch diameter gage tolerance + minor diameter gage tolerance).

2. THREAD FORM OF SETTING PLUG GAGES.—The specifications for thread form of setting plug gages are stated in detail below, and are summarized in table VI.2 and figures VI.2 and VI.3.

(*a*) *Truncated and basic-crest maximum-metal-limit ("go") thread setting plugs.*—(1) *Thread crests.*—The major diameter of the basic-crest setting plug, and of the full-form portion of the truncated maximum-metal-limit thread setting plug shall correspond to the maximum major diameter of the external thread (one-eighth pitch flat).

The major diameter of the truncated portion of the truncated maximum-metal-limit setting plug is equal to the maximum major diameter of the external thread (or the minimum major diameter of the full-form portion of the plug) minus $(0.060\sqrt[3]{p^2}+0.017p)$.

(2) *Thread roots.*—The minor diameter of maximum-metal-limit ("go") thread setting plug shall be cleared beyond a $p/8$ width of flat either by an extension of the sides of the thread toward a sharp V or by an undercut no wider than a width obtained from $p/8$ maximum width either side of the centerline of the thread space (see figs. VI.2 and VI.3.).

(*b*) *Truncated and basic-crest minimum-metal-limit ("not go") thread setting plugs.*—(1) *Thread crests.*—The major diameter of the truncated portion of the minimum-metal-limit ("not go") thread setting plug shall be equal to the minimum pitch diameter of the external thread plus $H/2$. The major diameter of the basic-crest setting

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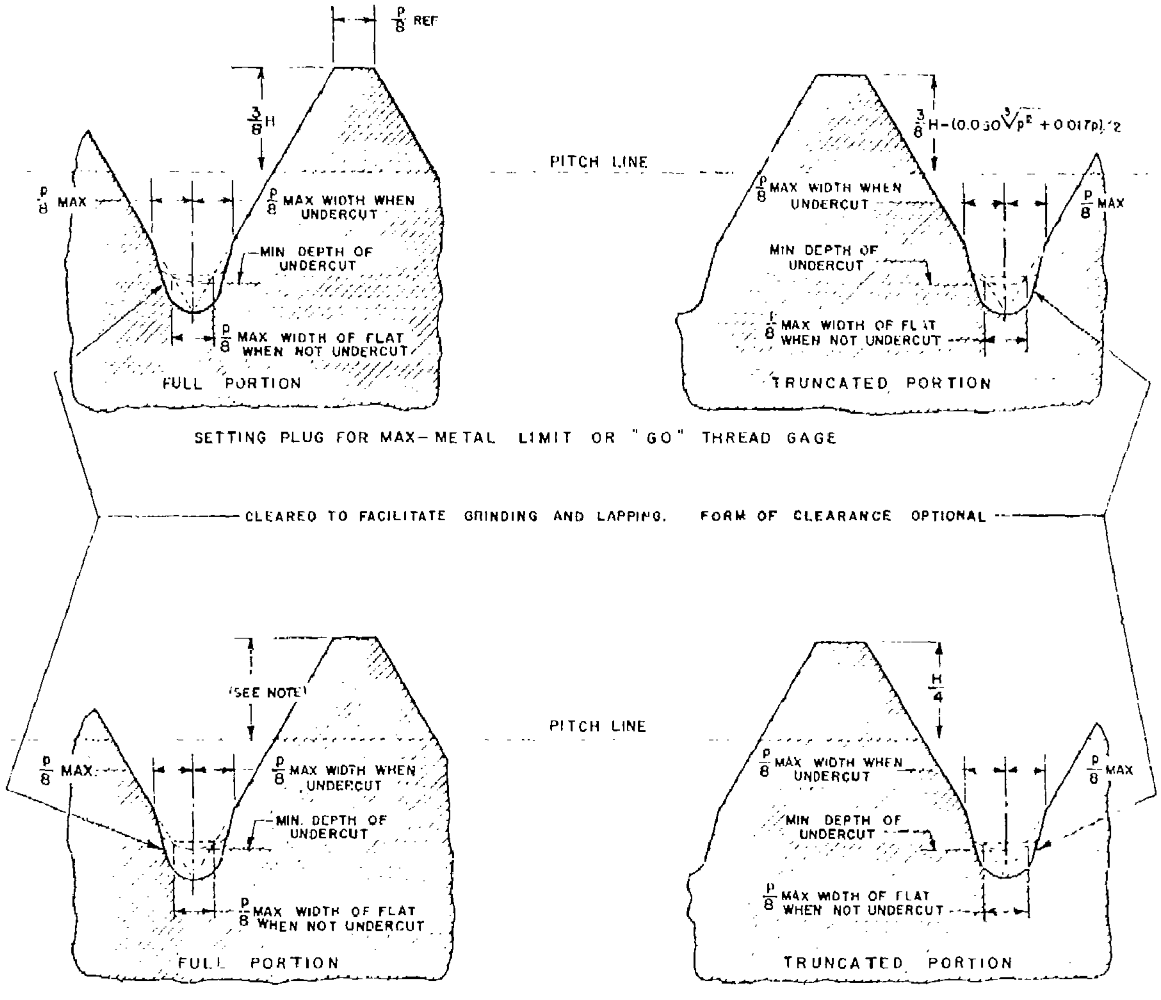
[14] Required to be within the specified tolerance.

[15] This condition occurs in connection with small sizes of class 1 coarse and fine series threads and may occur for extreme combinations of large diameter and fine pitch of class 1 threads of special diameters, pitches, and lengths of engagement.

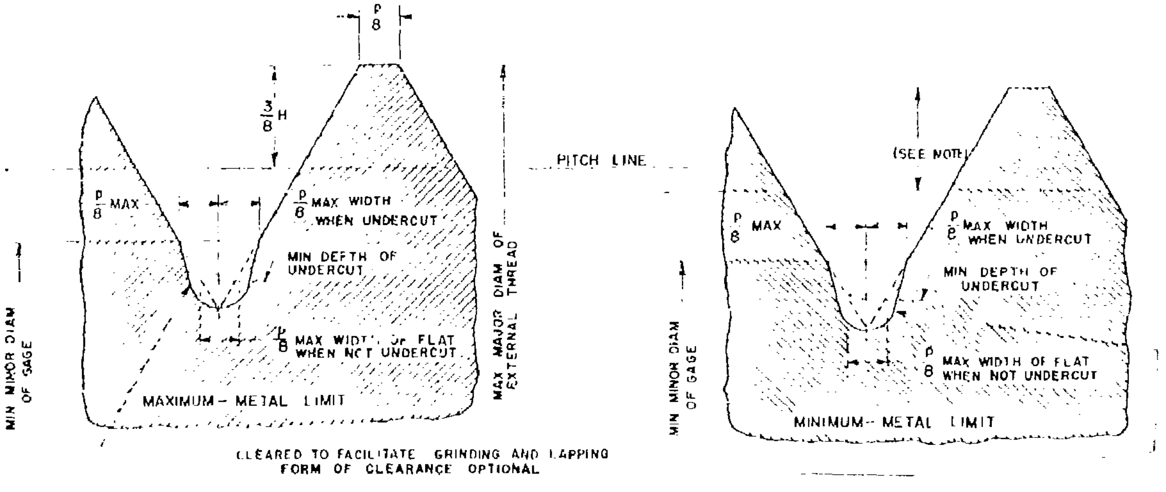

P/8 REF
3/8 H
3/8 H-(0.030 ∛P² + 0.017P)/2
PITCH LINE
P/8 MAX
P/8 MAX WIDTH WHEN UNDERCUT
MIN DEPTH OF UNDERCUT
P/8 MAX WIDTH OF FLAT WHEN NOT UNDERCUT
FULL PORTION
TRUNCATED PORTION
CLEARED TO FACILITATE GRINDING AND LAPPING. FORM OF CLEARANCE OPTIONAL
(SEE NOTE)
H/4

SETTING PLUG FOR MAX-METAL LIMIT OR "GO" THREAD GAGE

SETTING PLUG FOR MIN-METAL LIMIT OR "NOT GO" THREAD GAGE

‡ FIGURE VI.2.—*Thread form of truncated thread setting plug gages.*

NOTE.—See table VI.2, column 13.


P/8
3/8 H
PITCH LINE
P/8 MAX
P/8 MAX WIDTH WHEN UNDERCUT
MIN DEPTH OF UNDERCUT
P/8 MAX WIDTH OF FLAT WHEN NOT UNDERCUT
MAXIMUM-METAL LIMIT
MINIMUM-METAL LIMIT
MIN MINOR DIAM OF GAGE
MAX MAJOR DIAM OF EXTERNAL THREAD
(SEE NOTE)
CLEARED TO FACILITATE GRINDING AND LAPPING FORM OF CLEARANCE OPTIONAL

SETTING PLUG FOR MAX-METAL LIMIT OR GO THREAD GAGE

SETTING PLUG FOR MIN METAL LIMIT OR "NOT GO" THREAD GAGE

‡ FIGURE VI.3.—*Thread form of basic-crest thread setting plug gages.*

NOTE.—See table VI.2, column 13.

TABLE VI.1.—*Specifications and format for tables of limits of size of threaded and plain gages for Unified, American, and American National external and internal threads*

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			Thread gages					Plain gages for major diameter			Thread gages					Plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tol. gage	Minus tol. gage								Minus tol. gage	Plus tol. gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			Max. pitch diameter of external thread. (Gage tolerance minus. When wear allowance is required, subtract the applicable wear allowance from the max. pitch diameter and then apply the gage tolerance minus.	Max. pitch diameter of external thread minus $H/2$. (Gage tolerance minus.	Min. pitch diameter of external thread. (Gage tolerance plus.	Min. pitch diameter of external thread. (Gage tolerance minus, (optional), see par. 4, p. 109.	Min. pitch diameter of external thread minus $H/4$ but not less than min. minor diameter of "go" thread gage for external thread plus $0.0375H(=0.05h)$. (Gage tolerance plus.	Max. major diameter of external thread. (Gage tolerance minus.	Min. major diameter of external thread. (Gage tolerance plus.	Min. major diameter of external thread of hot-rolled material in UNC-2A, NC-2A, NC-2, 8N-2A, and 8N-2. (Gage tolerance plus.	Min. major diameter of internal thread. (Gage tolerance plus.	Min. pitch diameter of internal thread. (Gage tolerance plus. When wear allowance is required, add the applicable wear allowance to the min. pitch diameter and then apply the gage tolerance plus.	Max. pitch diameter of internal thread plus $H/2$, but not to exceed min. major diameter of "go" thread gage for internal thread minus $0.0375H(=0.05h)$. (Gage tolerance minus.	Max. pitch diameter of internal thread. (Gage tolerance minus.	Max. pitch diameter of internal thread. (Gage tolerance plus, (optional), see par. 4, p. 109.	Min. minor diameter of internal thread. (Gage tolerance plus.	Max. minor diameter of internal thread. (Gage tolerance minus.			

TABLE VI.2.—*Specifications and format for tables of limits of size of threaded setting plug gages for Unified, American, and American National external threads*

Nominal size and threads per inch	Series designation	Class	Truncated setting plugs							Basic-crest setting plugs				
			Plug for Go			Plug for Not go				Plug for Go		Plug for Not go		
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Major diameter	Pitch diameter	Major diameter	Pitch diameter	
			Truncated	Full-form		Truncated	Full-form	Plus tol. gage	Minus tol. gage				Plus tol. gage	Minus tol. gage
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
			Max. major diameter of external thread (=min. major diameter of full portion of "go" setting plug, see col. 5) minus $(0.060\sqrt[3]{p^2}+0.017p)$. Gage tolerance minus.	Max. major diameter of external thread. Gage tolerance plus.	Max. pitch diameter of external thread. Gage tolerance minus. When wear allowance is required subtract the applicable wear allowance from the max. pitch diameter and then apply the gage tolerance minus.	Min. pitch diameter of external thread plus $H/2$. Gage tolerance minus.	Same as column 12.	Min. pitch diameter of external thread. Gage tolerance plus.	Min. pitch diameter of external thread. Gage tolerance minus (optional), see par. 4, p. 109.	Max. major diameter of external thread. Gage tolerance plus.	Same as column 6.	Max. major diameter of external thread provided that the min. major diameter corresponds to a truncation of not less than $0.067H$ and the max. major diameter of the gage corresponds to a truncation of not less than 0.0009 in. Gage tolerance plus. See footnote 16, p. 114.	Min. pitch diameter of external thread. Gage tolerance plus.	Min. pitch diameter of external thread. Gage tolerance minus (optional), see par. 4, p. 109.

plug and of the full form portion of the truncated minimum-metal-limit ("not go") thread setting plug equal to the maximum major diameter of the external thread (equals that of the maximum-metal-limit ("go") thread setting plug for the same external thread), provided that the minimum major diameter of the plug corresponds to a truncation of not less than $0.067H$ (width of flat equals $0.067p$). An additional requirement is that the maximum major diameter of the plug shall correspond to a truncation of not less than 0.0009 in. (width of flat equals 0.001 in.). When the latter requirement controls the maximum, the minimum of both *X* and *W* gages is less than this maximum by the amount of the *X* tolerance.[16]

(2) *Thread roots.* The minor diameter of the minimum metal limit ("not go") thread setting plug shall be cleared beyond a $p/8$ width of flat either by an extension of the sides of the thread toward a sharp V or by an undercut no wider than a width obtained from $p/8$ maximum width either side of the centerline of the thread space (see figs. VI.2 and VI.3).

(c) *Pitch diameter straightness.* To effect proper setting of a thread gage, the pitch cylinder[17] of the setting plug is required to be straight. The maximum permissible taper over the entire length of the setting plug shall be within the following limits: For sizes to and including 4 in. nominal diameter maximum taper equals 0.0001 in., except that for threads coarser than 16 threads per inch the maximum taper equals 0.00015 in. For sizes larger than 4 in. nominal diameter, maximum taper equals 0.0002 in. The permissible taper should be back taper (largest diameter at entering end) and shall be confined within the pitch diameter limits.

3. SPECIFICATIONS FOR LIMITS OF SIZE.—The specifications and format for tables of limits of size of thread gages and setting plugs are summarized in tables VI.1 and VI.2 (see tables III.12, III.13, III.16, and III.17).

Constants for the various standard thread pitches which are required to determine gage dimensions are tabulated in table VI.3.

(c) SPECIFICATIONS FOR THREAD LENGTH

1. "GO" GAGES.—The ideal "go" thread gage, as stated in par. 3 (*a*), p. 108, should have a length equal to the length of engagement of the thread with its mating thread. The proper control of deviations from correct lead and zero taper requires (1) a length equal to the length of engagement and (2) that the gage should assemble its full length with the thread under inspection. In practice, the lengths of "go" gages made from standard blanks are usually about as long as the length of engagement, but exceptionally long engagements, or short engagements as for fine-pitch threads, may require modifications of the gage length. In specifying "go" thread gages, reference should be made to Commercial Standard CS8 (see footnote

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[16] The procedure for computing the maximum and minimum major diameters is as follows: Minimum major diameter of *X* and *W* setting plug equals maximum pitch diameter of external thread plus $3H/4$. If this is greater than minimum pitch diameter of external thread plus $4H/5$, use the lesser sum. Then add the *X* major diameter tolerance and compare the sum with the minimum pitch diameter of the external thread plus *H* minus 0.0018 in. If the latter is the smaller of the two values, it will be the maximum major diameter and subtract the *X* major diameter tolerance to obtain a new minimum for both *X* and *W* setting plugs. Then apply *W* tolerance plus for the *W* setting plug and the *X* tolerance plus for the *X* setting plug.

[17] See definition 17, p. 4.

TABLE VI.3. *Constants for computing thread gage dimensions*

Threads per inch, n	Pitch, p	$\frac{3}{4}p = 0.75p$	$p/4 = 0.25p$	$p/8 = 0.125p$	$0.067p$	$0.10048p$	$0.060\sqrt[3]{p^2}$	$0.017p$	$0.060\sqrt[3]{p^2} + 0.017p$	Height of sharp V-thread, $H = 0.866025p$	$\frac{3}{4}H = 0.649519p$	$H/2 = 0.43301p$	$H/4 = 0.21651p$	$0.13395H = 0.116p = (2 \times 0.058p)$	$0.0375H = 0.05h_b = 0.03248p$
1		3	4	5	6	7	8	9	10	11	12	13	14	15	16
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	0.012500	0.00938	0.00312	0.00156	0.00084	0.00126	0.00323	0.00021	0.0034	0.010825	0.008119	0.00541	0.00271	0.00145	0.00041
72	.013889	.01042	.00347	.00174	.00093	.00140	.00347	.00024	.0037	.012028	.009021	.00601	.00301	.00161	.00045
64	.015625	.01172	.00391	.00195	.00105	.00157	.00375	.00027	.0040	.013532	.010149	.00677	.00338	.00181	.00051
56	.017857	.01339	.00446	.00223	.00120	.00179	.00410	.00030	.0044	.015465	.011599	.00773	.00387	.00207	.00058
48	.020833	.01562	.00521	.00260	.00140	.00209	.00454	.00035	.0049	.018042	.013532	.00902	.00451	.00242	.00068
44	.022727	.01705	.00568	.00284	.00152	.00228	.00482	.00039	.0052	.019682	.014762	.00984	.00492	.00264	.00074
40	.025000	.01875	.00625	.00312	.00168	.00251	.00513	.00042	.0056	.021651	.016238	.01083	.00541	.00290	.00081
36	.027778	.02083	.00694	.00347	.00186	.00279	.00550	.00047	.0060	.024056	.018042	.01203	.00601	.00322	.00090
32	.031250	.02344	.00781	.00391	.00209	.00314	.00595	.00053	.0065	.027063	.020297	.01353	.00677	.00362	.00101
28	.035714	.02679	.00893	.00446	.00239	.00359	.00651	.00061	.0071	.030929	.023197	.01546	.00773	.00414	.00116
27	.037037	.02778	.00926	.00463	.00248	.00372	.00667	.00063	.0073	.032075	.024056	.01604	.00802	.00430	.00120
24	.041667	.03125	.01042	.00521	.00279	.00419	.00721	.00071	.0079	.036084	.027063	.01804	.00902	.00483	.00135
20	.050000	.03750	.01250	.00625	.00335	.00502	.00814	.00085	.0090	.043301	.032476	.02165	.01083	.00580	.00162
18	.055556	.04167	.01389	.00694	.00372	.00558	.00874	.00094	.0097	.048113	.036084	.02406	.01203	.00644	.00180
16	.062500	.04688	.01562	.00781	.00419	.00628	.00945	.00106	.0105	.054127	.040595	.02706	.01353	.00725	.00203
14	.071429	.05357	.01786	.00893	.00479	.00718	.01033	.00121	.0115	.061859	.046394	.03093	.01546	.00829	.00232
13	.076923	.05769	.01923	.00962	.00515	.00773	.01085	.00131	.0122	.066617	.049963	.03331	.01665	.00892	.00250
12	.083333	.06250	.02083	.01042	.00558	.00837	.01145	.00142	.0129	.072169	.054127	.03608	.01804	.00967	.00271
11½	.086957	.06522	.02174	.01087	.00583	.00874	.01178	.00148	.0133	.075307	.056480	.03765	.01883	.01009	.00282
11	.090909	.06818	.02273	.01136	.00609	.00913	.01213	.00155	.0137	.078730	.059047	.03936	.01968	.01055	.00295
10	.100000	.07500	.02500	.01250	.00670	.01005	.01293	.00170	.0146	.086603	.064952	.04330	.02165	.01160	.00325
9	.111111	.08333	.02778	.01389	.00744	.01116	.01387	.00189	.0158	.096225	.072169	.04811	.02406	.01289	.00361
8	.125000	.09375	.03125	.01562	.00838	.01256	.01500	.00212	.0171	.108253	.081190	.05413	.02706	.01450	.00406
7	.142857	.10714	.03571	.01786	.00957	.01435	.01640	.00243	.0188	.123718	.092788	.06186	.03093	.01657	.00464
6	.166667	.12500	.04167	.02083	.01117	.01675	.01817	.00283	.0210	.144338	.108253	.07217	.03608	.01933	.00541
5	.200000	.15000	.05000	.02500	.01340	.02010	.02052	.00340	.0239	.173205	.129904	.08660	.04330	.02320	.00650
4½	.222222	.16667	.05556	.02778	.01489	.02233	.02201	.00378	.0258	.192450	.144338	.09623	.04811	.02578	.00722
4	.250000	.18750	.06250	.03125	.01675	.02512	.02381	.00425	.0281	.216506	.162380	.10825	.05413	.02900	.00812

TABLE VI.4.—*Lengths of standard taperlock and trilock thread plug gage blanks*

Thread sizes				Thread lengths			
Nominal range, inclusive		Decimal range		Thread plug gages		Fine-pitch instrument thread plug gages	
From—	To—	Above—	To and including—	Go (see notes)	Not go	Go	Not go
1	2	3	4	5	6	7	8
		in.	*in.*	*in.*	*in.*	*in.*	*in.*
#0	#3	0.059	0.105	1/4	3/16	3/16	1/8
#4	#6	.105	.150	5/16	7/32	7/32	5/32
#8	#12	.150	.240	13/32	9/32	9/32	7/32
1/4	5/16	.240	.365	1/2	5/16	5/16	1/4
3/8	1/2	.365	.510	3/4	3/8	3/8	5/16
9/16	3/4	.510	.825	7/8	1/2	1/2	3/8
7/8	1 1/8	.825	1.135	1	5/8	5/8	7/16
1 1/4	1 1/2	1.135	1.510	[1] 1 [2] 1 1/4	3/4	3/4	1/2
1 1/2	2	1.510	2.010	[3] 1 7/8 [4] 1 1/4 [5] 7/8	7/8	3/4	5/8
2	2 1/2	2.010	2.510	[3] 2 [4] 1 5/8 [5] 7/8	7/8	3/4	5/8
2 1/2	3	2.510	3.010	[3] 2 1/8 [4] 1 1/2 [5] 1	1		—
3	12	3.010	12.010	[3] 2 1/4 [4] 1 1/2 [5] 1	1	—	—

[1] For 12 threads per inch and finer.
[2] For threads coarser than 12 per inch.
[3] For 7 threads per inch and coarser.
[4] For threads finer than 7 and coarser than 16 per inch.
[5] For 16 threads per inch and finer.

TABLE VI.5.—*Lengths of standard thread ring gage blanks and total thread lengths of standard truncated setting plug gage blanks*

Thread sizes				Lengths of thread ring gages		Thread lengths of truncated thread setting plugs	
Nominal range, inclusive		Decimal range					
From	To	Above—	To and including	Thin ring [1]	Thick ring	For thin ring	For thick ring
1	2	3	4	5	6	7	8
		in.	*in.*	*in.*	*in.*	*in.*	*in.*
#0	#2	0.059	0.090	[2] 1/4	—	7/32	—
#3	#3	.090	.105	[2] 1/4	—	3/8	—
#4	#6	.105	.150	[2] 1/4	—	3/8	—
#8	#12	.150	.240	[2] 1/4	—	13/32	—
1/4	5/16	.240	.365	11/32	—	3/4	—
3/8	1/2	.365	.510	7/16	—	1	—
9/16	3/4	.510	.825	9/16	3/4	1 1/4	1 7/8
7/8	1 1/8	.825	1.135	11/16	15/16	1 1/2	2 1/8
1 3/16	1 1/2	1.135	1.510	3/4	1 1/8	1 5/8	2 3/8
1 1/2	2	1.510	2.010	13/16	1 1/4	1 7/8	2 7/8
2	2 1/2	2.010	2.510	7/8	1 5/16	2	3
2 1/2	3	2.510	3.010	7/8	1 3/8	1 7/8	3
3	3 1/2	3.010	3.510	15/16	1 7/16	2	3 1/8
3 1/2	4	3.510	4.010	15/16	1 1/2	2	3 1/4
4	6 1/4	4.010	6.260	1	1 1/2	2 1/8	3 1/4
6 1/4	12 1/4	6.260	12.260	1	1 1/2	—	—

[1] Also applicable to fine-pitch instrument thread ring gages in the range from 1/4 to 2 1/2 in., inclusive.
[2] These sizes of thread ring gages have counterbored ends, so that the thread length of Nos. 0 to 2 is 1/8 in. and of Nos. 3 to 6 is 3/16 in.

12) which gives lengths of standard gage blanks. If such lengths are not satisfactory, the required lengths of gages should be specified. Tables VI.4 and VI.5 are the pertinent tables taken from the current edition of CS8.

Similarly, the lengths of plain "go" gages, used to check major and minor diameters, should be such that the thread may be checked for taper throughout its length.

Where indicating gages are used as either threaded or plain "go" gages, the contact elements should engage the thread both along and around the thread over an area approximately equivalent to that of the "go" plug or ring gages.

2. "Not Go" Gages.—(*a*) *Thread plug and ring gages.*—As "not go" gages are intended to check only the pitch diameter at the minimum-material limit, the length of the "not go" thread plug gage need be no more than the number of threads required to obtain an accurate three-wire measurement of pitch diameter—about three full threads. The lengths of standard blanks for "not go" gages, as in tables VI.4 and VI.5, are less than those for "go" gages.

As "not go" thread plug and ring gages normally check only the end threads of the threads under inspection, and as such end threads are not usually representative of the entire thread, a standard practice has been adopted with respect to permissible entry when plug and ring gages are used, as follows:

Threads are acceptable as within the minimum material limits if, when using plug and ring thread gages, the "not go" plug gage does not enter or the "not go" ring gage is not entered. Threads may be accepted if all complete threads can enter in, or be entered by the "not go" gage, provided that a definite drag results from metal to metal contact on or before the third turn of entry. Neither working nor final inspection "not go" gages should be forced after the drag is definite. The requirements of extreme applications such as exceptionally thin or ductile material, small number of threads, etc., may necessitate modification of this practice, and in such cases the "not go" gaging practice shall be as specified by the responsible department or agency of the Government.

(*b*) *Thread snap gages.*—Thread snap gages are generally adjustable and have contact anvils consisting of cone-points, wedge-shaped prisms with rounded edges, serrated or grooved plates, or grooved or threaded cylinders adjustably mounted and suitably spaced in a U-shaped frame. The positions of the anvils are set to a threaded setting plug gage, and the anvils are then clamped in position and sealed. The foregoing specifications for thread form are applicable to contact anvils, but the permissible eccentricity of the pitch and minor diameters of thread ring gages is not applicable to the anvils or rolls of thread snap gages.

"Not go" thread snap gages shall engage the thread over a length of two pitches. They permit checking the thread at various positions along and around the thread. Thus, their use provides a more critical check than that of thread ring gages and definite information regarding other than the end threads.

(*c*) *Indicating thread gages.*—Indicating gages, having contact elements corresponding to the anvils specified for "not go" thread snap gages, provide an approximately equivalent check of the minimum-material pitch diameter limit. Indicating gages measure by electrical, optical, mechanical, or other indicating and amplifying means the dimensions or deviations in the dimensions of threads. Indicating gages are also extensively used as limit gages.

3. Setting Plug Gages.—The lengths of truncated setting plugs shall be such as to provide engagement of the full length of thread of the ring or other gage being checked with the truncated threads and with the full threads. The lengths of basic-crest setting plugs shall similarly provide for full engagement. Lengths of standard blanks for truncated setting plugs are given in Commercial Standard CS8. (See footnote 12.) Table VI.5 is taken from the current edition of CS8.

(d) MARKING OF GAGES

Each gage shall be plainly and permanently marked with the minimum marking essential for positive identification. In the cases of thread plug and thread setting plug gages it may be desirable to identify both the gaging element and the handle. Recommended marking practices are as follows:

1. Thread Plug Gages.—The "go" thread plug gage members are common to all classes of threads, both standard and special, and are identified by the nominal size, threads per inch, "GO," and pitch diameter. Example: "¼-20, GO, PD .2175." The "not go" thread plug gage members may be marked with: Nominal size, threads per inch, class, "NOT GO" and pitch diameter. Example: "¼ 20-2B, NOT GO, PD .2223."

2. Plain Plug Gages for Minor Diameter.—The "go" plain plug gage members are common to all classes of threads and as such may be marked with: Nominal size, threads per inch, "GO," and minor diameter. Example: "¼ 20, GO, .1960."

The "not go" plain plug gage member may be marked with: Nominal size, threads per inch, "NOT GO," and minor diameter. Example: "¼ 20, NOT GO, .2067."

3. Thread Ring Gages and Setting Plugs.—The "go" thread ring gages, and setting plug gage members therefor, may be marked with: Nominal size, threads per inch, "GO," and pitch diameter. Example: "¼ 20, GO, PD .2175." *Gages for classes 2, 3, and 3A are basic. Gages for classes* 1A, 2A, and in some instances class 1, are common.

The "not go" thread ring or snap gages, and setting plug gage members therefor, may be marked with: Nominal size, threads per inch, "NOT GO," and pitch diameter. Example: "¼-20, NOT GO, PD .2127."

4. PLAIN GAGES FOR MAJOR DIAMETER.—The "go" gages for major diameter of external threads may be marked with: Nominal size, threads per inch, "GO," and diameter. Example: "¼-20, GO, .2500."

The "not go" gages for major diameters may be marked with: Nominal size, threads per inch "NOT GO," and diameter. Example: "¼-20, NOT GO, .2408."

5. PLAIN PLUG ACCEPTANCE CHECK GAGES.—The "go" plain plug acceptance check gage members may be marked: "GO ACCEPT CHK FOR DIA. XXXX."

The "not go" plain plug acceptance check gage members may be marked: "NOT GO ACCEPT CHK FOR DIA. XXXX."

4. GAGE TOLERANCES AND WEAR ALLOWANCES

1. STANDARD TOLERANCE CLASSES.—Standard tolerances for thread plug and ring gages and threaded setting plugs are of three classes: (1) *W* tolerances, shown in table VI.6, which represent the highest commercial grade of accuracy or workmanship and which are required especially for truncated setting plugs, (2) *X* tolerances, shown in table VI.7, which are larger than *W* tolerances and are an economical compromise among such factors as gage cost, amount of product tolerance consumed by gage tolerances, and possible observational errors in the measurement of gages with generally available measuring equipment[18]; and (3) *Y* tolerances, shown in table VI.8, which include a wear allowance and are applicable only to UNS and NS threads in classes 1, 1A, 1B, 2A, and 2B.

2 TOLERANCE SPECIFICATIONS.—(*a*) *Direction of tolerances*[19].—The directions of tolerances for the individual elements of the various types of gages are specified in tables VI.1 and VI.2.

(*b*) *Tolerances on lead.*—Tolerances on lead (pitch and helix) are specified as an allowable variation between any two threads not farther apart than the length of the standard gage, shown in CS8, Gage Blanks (see footnote 12), omitting one full turn at each end of the gage, except that in the case of setting plugs, the length shall be that of the thread in the mating ring gage. On truncated setting plugs, the sign of any lead error present shall be the same on the full-form portion

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[18] While *X* tolerances on gages are generally acceptable, occasionally a combination of gage and tool errors may cut seriously into product limits, especially in the finer threads. When trouble is encountered in securing class 3 limits on 20 threads per inch or finer, a careful inspection of tools and gages is suggested. A change to "*W*" gages may be economical as the closer tolerance gage may leave enough more of the working tolerance to ease the problem.

[19] See par. 4, p. 165.

TABLE VI.6.—*Tolerances for W "go" and "not go" thread gages*

Threads per inch	Tolerance on lead [1]		Tolerance on half angle of thread	Tolerance on major or minor diameters			Tolerance on pitch diameter				
	To and including ½ in. diam	Above ½ in. diam		To and including ½ in. diam	Above ½ in. to 4 in. diam	Above 4 in. diam	To and including ½ in. diam	Above ½ in. to 1½ in. diam	Above 1½ in. to 4 in. diam	Above 4 in. to 8 in. diam	Above 8 in. to 12 in. diam [2]
1	2	3	4	5	6	7	8	9	10	11	12
	in. ±	in. ±	deg min ±	in.	in.	in.	in.	in.	in.	in.	in.
80	0.0001	0.00015	0 20	0.0002	0.0003	....	0.0001	0.00015	....	....	....
72	.0001	.00015	0 20	.0003	.0003	....	.0001	.00015	....	....	....
64	.0001	.00015	0 20	.0003	.0004	....	.0001	.00015	....	....	....
56	.0001	.00015	0 20	.0003	.0004	....	.0001	.00015	0.0002	....	....
48	.0001	.00015	0 18	.0003	.0004	....	.0001	.00015	.0002	....	....
44	.0001	.00015	0 15	.0003	.0004	....	.0001	.00015	.0002	....	
40	.0001	.00015	0 15	.0003	.0004	....	.0001	.00015	.0002	....	....
36	.0001	.00015	0 12	.0003	.0004	....	.0001	.00015	.0002	....	....
32	.0001	.00015	0 12	.0003	.0005	0.0007	.0001	.00015	.0002	0.00025	0.0003
28	.00015	.00015	0 8	.0005	.0005	.0007	.0001	.00015	.0002	.00025	.0003
27	.00015	.00015	0 8	.0005	.0005	.0007	.0001	.00015	.0002	.00025	.0003
24	.00015	.00015	0 8	.0005	.0005	.0007	.0001	.00015	.0002	.00025	.0003
20	.00015	.00015	0 8	.0005	.0005	.0007	.0001	.00015	.0002	.00025	.0003
18	.00015	.00015	0 8	.0005	.0005	.0007	.0001	.00015	.0002	.00025	.0003
16	.00015	.00015	0 8	.0006	.0006	.0009	.0001	.0002	.00025	.0003	.0004
14	.0002	.0002	0 6	.0006	.0006	.0009	.00015	.0002	.00025	.0003	.0004
13	.0002	.0002	0 6	.0006	.0006	.0009	.00015	.0002	.00025	.0003	.0004
12	.0002	.0002	0 6	.0006	.0006	.0009	.00015	.0002	.00025	.0003	.0004
11½	.0002	.0002	0 6	.0006	.0006	.0009	.00015	.0002	.00025	.0003	.0004
11	.0002	.0002	0 6	.0006	.0006	.0009	.00015	.0002	.00025	.0003	.0004
10	....	.00025	0 6	....	.0006	.0009	....	.0002	.00025	.0003	.0004
9	....	.00025	0 6	....	.0007	.0011	....	.0002	.00025	.0003	.0004
8	....	.00025	0 5	....	.0007	.0011	....	.0002	.00025	.0003	.0004
7	....	.0003	0 5	....	.0007	.0011	....	.0002	.00025	.0003	.0004
6	....	.0003	0 5	....	.0008	.0013	....	.0002	.00025	.0003	.0004
5	....	.0003	0 4	....	.0008	.0013	....		.00025	.0003	.0004
4½	....	.0003	0 4	....	.0008	.0013	....	....	.00025	.0003	.0004
4	....	.0003	0 4	....	.0009	.0015	....	....	.00025	.0003	.0004

[1] Allowable variation in lead between any 2 threads not farther apart than the length of the standard gage, shown in CS8, omitting 1 full thread at each end of the gage.

[2] Above 12 in. the tolerance is directly proportional to the tolerance in this column, in the ratio of the diameter to 12 in.

and the truncated portion, and such error shall be uniform within 0.0001 in. over any portion equivalent to the length of the thread ring gage.

(*c*) *Tolerances on flank angle.*—Tolerances are specified for the flank angles rather than the included angle to assure that the bisector of the included angle will be perpendicular to the axis of the thread within proper limits. The equivalent of the deviation from the true thread form caused by such irregularities as convex or concave flanks, rounded crests, or slight projections on the thread form, should not exceed the tolerances permitted on flank angle.

(*d*) *Tolerances not cumulative.*—Tolerances on lead, flank angle, and pitch diameter are not cumulative; that is, the tolerance on any one element may not be exceeded even though the errors in the other two elements are smaller than the respective tolerances.

(*e*) *Tolerances for plain gages.*—Standard tolerances for plain plug gages for minor diameter of internal threads and for gages for major diameter of external threads are *Z* tolerances, as shown in table VI.9.

TABLE VI.7.—*Tolerances for X "go" and "not go" thread gages*

Threads per inch	Tolerance on lead [1]	Tolerance on half angle of thread	Tolerance on major or minor diameters		Tolerance on pitch diameter			
			To and including 4 in. diam	Above 4 in. diam	To and including 1½ in. diam	Above 1½ to 4 in. diam	Above 4 to 8 in. diam	Above 8 to 12 in. diam [2]
1	2	3	4	5	6	7	8	9
	in. ±	*deg min* ±	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	0.0002	0 30	0.0003	......	0.0002	......	......	......
72	.0002	0 30	.0003	......	.0002	......	......	......
64	.0002	0 30	.0004	......	.0002	......	......	......
56	.0002	0 30	.0004	......	.0002	0.0003	......	......
48	.0002	0 30	.0004	......	.0002	.0003	......	......
44	.0002	0 20	.0004	......	.0002	.0003	......	......
40	.0002	0 20	.0004	......	.0002	.0003	......	......
36	.0002	0 20	.0004	......	.0002	.0003	......	......
32	.0003	0 15	.0005	0.0007	.0003	.0004	0.0005	0.0006
28	.0003	0 15	.0005	.0007	.0003	.0004	.0005	.0006
27	.0003	0 15	.0005	.0007	.0003	.0004	.0005	.0006
24	.0003	0 15	.0005	.0007	.0003	.0004	.0005	.0006
20	.0003	0 15	.0005	.0007	.0003	.0004	.0005	.0006
18	.0003	0 10	.0005	.0007	.0003	.0004	.0005	.0006
16	.0003	0 10	.0006	.0009	.0003	.0004	.0006	.0008
14	.0003	0 10	.0006	.0009	.0003	.0004	.0006	.0008
13	.0003	0 10	.0006	.0009	.0003	.0004	.0006	.0008
12	.0003	0 10	.0006	.0009	.0003	.0004	.0006	.0008
11½	.0003	0 10	.0006	.0009	.0003	.0004	.0006	.0008
11	.0003	0 10	.0006	.0009	.0003	.0004	.0006	.0008
10	.0003	0 10	.0006	.0009	.0003	.0004	.0006	.0008
9	.0003	0 10	.0007	.0011	.0003	.0004	.0006	.0008
8	.0004	0 5	.0007	.0011	.0004	.0005	.0006	.0008
7	.0004	0 5	.0007	.0011	.0004	.0005	.0006	.0008
6	.0004	0 5	.0008	.0013	.0004	.0005	.0006	.0008
5	.0004	0 5	.0008	.0013	......	.0005	.0006	.0008
4½	.0004	0 5	.0008	.0013	......	.0005	.0006	.0008
4	.0004	0 5	.0009	.0015	......	.0005	.0006	.0008

[1] Allowable variation in lead between any two threads not farther apart than the length of the standard gage, shown in CS8, omitting one full thread at each end of the gage.

[2] Above 12 in., the tolerance is directly proportional to the tolerance in this column, in the ratio of the diameter to 12 in.

NOTE. When a wear allowance is wanted on "go" gages, it is recommended that the *X* pitch diameter tolerance be divided, one-half for wear and one-half for tolerance.

5. RECOMMENDED GAGE PRACTICES

1. ACCEPTABILITY OF THREADS.—(*a*) *At maximum-material limits.*—In case of question, the acceptability of threads at the maximum-material limits shall be based on gaging with "go" thread plug and ring gages conforming as closely as practicable to the limits of size of the thread and to the thread form and length specified for such gages (see par. 3(*a*), Maximum-metal or "go" gages, p. 108.)

(*b*) *At minimum-material limits.*—A choice of either of two gaging practices is available, as outlined under par. 3(*b*), p. 108. The practice to be chosen and applied will depend on whether virtual diameter (or effective size) gaging is specified for the particular application, or whether single element gaging practice is required.

Virtual diameter gaging practice, as previously noted, involving the use of thread plug and ring gages, is specified for all "go" limits of size. Virtual diameter gaging practice is customary for the "not go" limits of classes 1, 1A, 1B, 2, 2A, 2B, and 3B, and 3 internal threads. Single element gaging practice involving the use of thread snap gages, indicating type gages, or their equivalent, is recommended for the "not go" limits of size of all classes 3A and 3 external threads. However, for technical and economical reasons, all classes of external and internal threads larger than 6-in. nominal diameter shall be subject to measurement of the thread elements for acceptance. This is not to preclude the use of gages where economically feasible and acceptable to the producer and consumer.

2. USES OF *W* AND *X* THREAD GAGES.(—*a*) *"Go" and "not go" thread gages.*—It is recommended that *W* tolerances be applied to "go" and "not go" inspection and working thread gages for class 4. *X* tolerances are recommended as applicable to all inspection and working thread gages for classes 1, 1A, 1AR, 1B, 2, 2A, 2B, 3, 3A, and 3B, except as follows: *Y* tolerances, which include a wear allowance are applicable to UNS and NS threads in classes 1, 1A, 1B, 2A, and 2B.

(*b*) *Setting plugs for "go" and "not go" gages.*—It is recommended that *W* tolerances be applied on lead and angle to all setting plugs regardless of class. The pitch diameter tolerances shall be *W* or *X* as specified.

3. BASIC-SIZE "GO" THREAD GAGES.—Basic size "go" thread gages for internal threads are applicable to all internal thread classes. Basic size "go" thread ring gages and setting plugs are applicable to class 2A when coated. They are also applicable to external thread classes 2, 3A, and 3.

4. PROCEDURE IN SETTING ADJUSTABLE THREAD RING GAGES.—In setting an adjustable thread ring gage the sealing compound should be removed and the locking screw loosened. Turning the adjusting screw to the right enlarges the ring so

TABLE VI.8.—*Tolerances for Y "go" thread gages for classes 1, 1A, 1B, 2A, and 2B, NS and UNS threads only*

Threads per inch	Tolerance on lead[1]	Tolerance on half angle of thread	Tolerance on major or minor diameters		Limits on pitch diameter							
			To and including 4 in. diameter	Above 4 in. diameter	To and including 1½ in. diameter		Above 1½ in. to 4 in. diameter		Above 4 in. to 8 in. diameter		Above 8 in. to 12 in. diameter[2]	
					From—	To—	From—	To—	From—	To—	From—	To—
1	2	3	4	5	6	7	8	9	10	11	12	13
	in. ±	*deg min* ±	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	0.0002	0 45	0.0003	----------	0.0001	0.0003	----------	----------	----------	----------	----------	----------
72	.0002	0 45	.0003	----------	.0001	.0003	----------	----------	----------	----------	----------	----------
64	.0002	0 45	.0004	----------	.0001	.0004	----------	----------	----------	----------	----------	----------
56	.0002	0 45	.0004	----------	.0001	.0004	0.0001	0.0006	----------	----------	----------	----------
48	.0002	0 45	.0004	----------	.0001	.0004	.0001	.0006	----------	----------	----------	----------
44	.0002	0 30	.0004	----------	.0001	.0004	.0001	.0006	----------	----------	----------	----------
40	.0002	0 30	.0004	----------	.0001	.0004	.0001	.0006	----------	----------	----------	----------
36	.0002	0 30	.0004	----------	.0001	.0004	.0001	.0006	----------	----------	----------	----------
32	.0003	0 20	.0005	0.0007	.0001	.0004	.0001	.0006	0.0001	0.0008	0.0001	0.0010
28	.0003	0 20	.0005	.0007	.0002	.0005	.0002	.0007	.0002	.0009	.0002	.0011
27	.0003	0 20	.0005	.0007	.0002	.0005	.0002	.0007	.0002	.0009	.0002	.0011
24	.0003	0 20	.0005	.0007	.0002	.0005	.0002	.0007	.0002	.0009	.0002	.0011
20	.0003	0 20	.0005	.0007	.0002	.0005	.0002	.0007	.0002	.0009	.0002	.0011
18	.0003	0 15	.0005	.0007	.0002	.0005	.0002	.0007	.0002	.0009	.0002	.0011
16	.0003	0 15	.0006	.0009	.0002	.0006	.0002	.0008	.0002	.0010	.0002	.0011
14	.0003	0 15	.0006	.0009	.0002	.0006	.0002	.0008	.0002	.0010	.0002	.0012
13	.0003	0 15	.0006	.0009	.0002	.0006	.0002	.0008	.0002	.0010	.0002	.0012
12	.0003	0 10	.0006	.0009	.0002	.0006	.0002	.0008	.0002	.0010	.0002	.0012
11½	.0003	0 10	.0006	.0009	.0002	.0006	.0002	.0008	.0002	.0010	.0002	.0012
11	.0003	0 10	.0006	.0009	.0002	.0006	.0002	.0008	.0002	.0010	.0002	.0012
10	.0003	0 10	.0006	.0009	.0002	.0006	.0002	.0008	.0002	.0010	.0002	.0012
9	.0003	0 10	.0007	.0011	.0002	.0007	.0002	.0009	.0002	.0011	.0002	.0013
8	.0004	0 5	.0007	.0011	.0002	.0007	.0002	.0009	.0002	.0011	.0002	.0013
7	.0004	0 5	.0007	.0011	.0002	.0007	.0002	.0009	.0002	.0011	.0002	.0013
6	.0004	0 5	.0008	.0013	.0003	.0008	.0003	.0010	.0003	.0012	.0003	.0014
5	.0004	0 5	.0008	.0013	----------	----------	.0003	.0010	.0003	.0012	.0003	.0014
4½	.0004	0 5	.0008	.0013	----------	----------	.0003	.0010	.0003	.0012	.0003	.0014
4	.0004	0 5	.0009	.0015	----------	----------	.0003	.0011	.0003	.0013	.0003	.0015

---

[1] Allowable variation in lead between any two threads not farther apart than the length of the standard gage, shown in CS8, omitting one full thread at each end of the gage.

[2] Above 12 in. the tolerance is directly proportional to the tolerance in this column, in the ratio of the diameter to 12 in.

TABLE VI.9.—*Tolerances for plain gages*

Size range		Tolerances				
Above—	To and including	XX	X	Y	Z	ZZ
1	2	3	4	5	6	7
in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
0.029	0.825	0.00002	0.00004	0.00007	0.00010	0.00020
.825	1.510	.00003	.00006	.00009	.00012	.00024
1.510	2.510	.00004	.00008	.00012	.00016	.00032
2.510	4.510	.00005	.00010	.00015	.00020	.00040
4.510	6.510	.000065	.00013	.00019	.00025	.00050
6.510	9.010	.00008	.00016	.00024	.00032	.00064
9.010	12.010	.00010	.00020	.00030	.00040	.00080

that it turns freely onto the setting plug. Alternately adjusting the adjusting screw and tightening the locking screw, a firm fit on the smallest portion of the thread in the ring should result. While making the adjustment the knurled outside diameter and both sides of the ring should be lightly tapped with a soft-tip or plastic hammer to permit the threads of the ring to wrap themselves around the thread of the setting plug. After satisfactory adjustment has been obtained, the ring is to be removed from the plug and the same procedure of tapping is repeated with slightly greater emphasis to the sides. If the thread ring gage possesses proper rigidity, the same feel should be still there when the setting gage again is turned into the ring. A tighter fit or inability to recenter the setting gage denotes a fault of the locking device, that should then be taken apart and checked for dimensional conformity to CS8. It is often advisable to do this before even attempting to adjust the thread ring gage. When proper adjustment has been obtained the gage should be sealed.

In setting to a truncated setting plug the ring gage may be set to either the full or the truncated portion. It is common practice to set slightly freer than a snug fit to the truncated portion and then to check the root clearance and wear of flank angle by screwing the ring onto the full portion. Extreme caution is required when this practice is followed to prevent damage to the thread crest of the setting plug. The opposite practice is to adjust and set the ring to the full portion and then determine the fit of the gage on the truncated portion. If the thread form of the ring gage is satisfactory, there will be a slight or no change of fit. In the case of a worn thread ring gage, the presence of shake or play when on the truncated portion indicates that the sides of the thread are no longer straight near the root, and the gage should be relapped or discarded.

In order to provide maximum wear life of a setting plug, the plug should be threaded into a ring as few times as possible. This will prevent uneven wear and a taper on the truncated end of the plug. When setting plugs are thus used properly they do not wear unevenly. However, when setting plugs are applied repeatedly to check thread ring gages, the criteria for acceptability will vary with the type and application of the ring. A "not go" ring, for example, should be a snug fit at full engagement and provide some resistance to turning at one or two turns engagement. "Go" thread ring gages should also be a snug fit at full engagement. When the length of the product thread permits engagement with the full length of the "go" ring, the requirement as to partial engagement may be relaxed to permit a slightly freer fit. However, there should be no relaxation in the requirements when short product threads, that only partly engage the "go" ring, are being engaged.

If a basic-crest setting plug is used to set a thread ring gage, root clearance of the thread in the ring should be determined by the procedure outlined below.

The ring gage should be given further inspection to determine whether or not the minor diameter is within the specified limits. The minor diameter may be inspected by means of "go" and "not go" plain cylindrical plug acceptance check gages or by direct measurement.

5. PROCEDURE FOR DETERMINING THE CLEARANCE IN THREAD RING GAGES.—The roots of threads of ring gages, particularly "not go" ring gages, frequently do not clear the maximum major diameter of the external thread. To assist the gage maker and gage inspector, the recommended procedure for determining the clearance at root of thread of ring gages is given to supplement, or substitute for, the use of truncated setting plugs described in paragraph 4, above. For this purpose an optical examination of a sulfur-graphite, plaster of Paris, copper-amalgam, or other suitable cast of the thread is made by means of a projection comparator, toolmaker's microscope, or universal measuring microscope. The actual magnification of the instrument as used must be known.

(a) *Methods of making sulfur-graphite casts.*—Sulfur-graphite casts are made from a thorough mixture of finely powdered graphite and crushed lump sulfur which is heated in a ladle until the sulfur is completely melted and becomes viscous. This mixture may be used repeatedly by crushing and remelting. The graphite should constitute about 7 percent of the mixture by weight, although in the practice of various users, the proportion varies from 4 to 20 percent. The graphite is added to eliminate reflections that would be produced by a plain sulfur cast, and to reduce the tendency to shrink upon cooling.

The casting mold may be formed by holding the ring gage between thin plates in the jaws of a vise, the top edge of the plate on one side being well below the thread axis. For small sizes of threads, a convenient arrangement is to use a taper mandrel that is provided with a lengthwise groove having smooth surfaces and an included angle of about 90°, into which the mixture is poured, and in which the cast is later mounted for examination. The bottom of the slot has a slight taper toward the axis at the small end. A square metal stop clamped in the groove serves as a wall in casting. The mandrel is also useful in making copper-amalgam casts, in which case the casting mixture is pressed in.

The sulfur-graphite casting mixture is poured into the mold when the temperature is from 260° to 266° F, and allowed to solidify with slow cooling. The cast may be marked with an identification number with a steel stylus. Sulfur-graphite casts warp considerably after a few hours.

(b) *Method of making plaster of Paris casts.*—A plaster of Paris cast is usually made to determine errors in thread angle, and this cast can usually be used to determine clearance. Such a cast is made by mixing 5 parts (28 g, or 1 oz) of a good grade of dental plaster of Paris with from 4 to 5 (26 ml) parts by weight of potassium-bichromate solution made by dissolving 40 g in 1 liter of water. The potassium bichromate inhibits rusting of the gage. This mixture is applied to the threads inside a mold which may be fashioned from cardboard or a strip of copper, with modeling clay pressed into the threads along the outside bottom edges of the mold. It should be allowed to harden completely before removal. Plaster of Paris casts have less shrinkage than sulfur-graphite, but do not retain dimensions over extended periods of time. They are difficult to remove from rough finish threads without damage.

(c) *Determining clearance of "go" thread ring gages.*—The flat at crest of the *maximum* external thread is one-eighth of the pitch, therefore, if the root of thread of the "go" ring is relieved to a width of one-eighth the pitch, the ring threads clear the maximum major diameter of the thread. If the roots of the "go" ring gage threads are not relieved, they must be to a sharp enough V to clear a flat of one-eighth the pitch. The flanks of the thread should be straight to the point where the ⅛-pitch flat will make contact with the flanks of the thread. The width of flat on the chart, or template, used should be one-eighth of the pitch times the magnification of the comparator.

(d) *Determining clearance of "not go" thread ring gages.*—The flat at the crest of a screw with maximum major diameter and minimum pitch diameter is determined by the formula:

$$\text{Flat}=\frac{p}{2}-h'\tan\ 30°=\frac{p}{2}-0.57735h'$$

for Unified or American National form of thread, where, h'=maximum major diameter minus minimum pitch diameter.

If the "not go" ring gage has a relief of ¼ pitch, as recommended, it is necessary to determine whether or not the relief is deep enough. To do this, make a chart, or template, representing a 60° thread with a flat at crest equal to the flat, as determined by the above formula, times the magnification of the comparator. This chart, or template, should fit the image of the thread and contact the flanks of the thread image without contacting in the relief. If ring threads are not relieved, they must be sharp enough to permit the chart, or template, to contact on the flanks of the image rather than in the root.

APPENDIX 1. AMERICAN NATIONAL FORM OF THREAD AND THREAD SERIES FOR BOLTS, MACHINE SCREWS, NUTS, TAPPED HOLES, AND GENERAL APPLICATIONS

1. INTRODUCTION

The American National standards for thread form and thread series as published in previous editions of this Handbook are republished here in condensed form. Except for class 5 threads they are largely superseded by the Unified and American threads as specified in section III. They are thus made available for continued use in existing design and for applications where Unified threads are considered to be less suitable, or where the application is not covered by Unified and American threads. If American National threads are specified, they shall conform to the requirements herein.

2. AMERICAN NATIONAL FORM OF THREAD

The form of thread profile specified herein, known previously as the "United States standard or Sellers' profile," is known as the "American National form of thread."

(a) SPECIFICATIONS

1. Angle of Thread.—The basic angle of thread (2α) between the sides of the thread measured in an axial plane is 60°. The line bisecting this 60° angle is perpendicular to the axis of the screw thread.

2. Flat at Crest and Root.—The flat at the root and crest of the basic thread form is $\frac{1}{8}\times p$, or $0.125\times p$.

3. Depth of Thread.—The depth of the basic thread form is

$$h=0.649519\times p,\ \text{or}\ h=\frac{0.649519}{n}$$

where

p=pitch in inches
n=number of threads per inch
h=basic depth of thread

4. Clearance at Minor Diameter.—A clearance shall be provided at the minor diameter of the internal thread by removing from the crest of the basic thread form an amount such as to provide a depth of thread not less than 53 to 75 percent (depending on the size), and not more than 83⅓ percent of the basic thread depth.

5. Clearance at Major Diameter.—A clearance shall be provided at the major diameter of the internal thread by making the thread form such that the width of flat shall be less than $\frac{1}{8}\times p$ but not less than $\frac{1}{24}\times p$.

(b) ILLUSTRATION

There are indicated in figure 1.1 the relations as specified herein for the American National form of thread for the minimum internal thread and maximum external thread, classes 2 and 3. These relations are further shown in figures 1.3 and 1.4.

(c) BASIC THREAD DATA

The basic thread data for this form of thread and for all standard pitches are given in table 1.1.

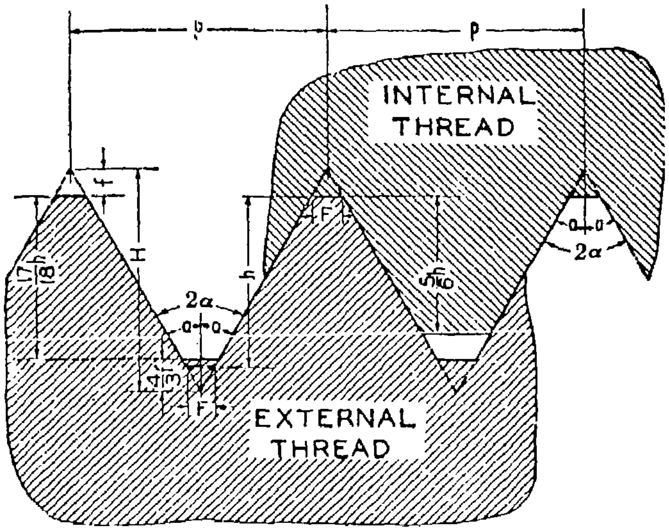


Figure 1.1.—*American National form of thread.*

Note.—No allowance is shown. This condition exists in classes 2 and 3 where both the minimum internal thread and the maximum external thread are basic.

NOTATION

$2\alpha=60°$
$\alpha=30°$
n=number of threads per inch
$H=0.866025\ p$=depth of 60° sharp V thread
$h=0.649519\ p$=depth of American National form of thread
$\frac{5}{6}h=0.541266\ p$=maximum depth of engagement
$\frac{17}{18}h=0.613435\ p$
$F=0.125000\ p$=width of flat at crest and root of American National form
$f=0.108253\ p = \frac{1}{8}H = \frac{1}{6}h$ =depth of truncation

3. THREAD SERIES

It was the aim of the Committee, in establishing thread systems, to eliminate all unnecessary sizes and, in addition, to utilize, as far as possible existing predominating sizes. The coarse-thread and fine-thread series are maintained, the coarse-thread series being the "United States standard" threads, supplemented in the sizes below ¼-in. by sizes taken from the standard established by The American Society of Mechanical Engineers (ASME). The fine-thread series is composed of standards that have been found necessary, and consists of sizes taken from the standards of the Society of Automotive Engineers (SAE) and the fine-thread series of The American Society of Mechanical Engineers.

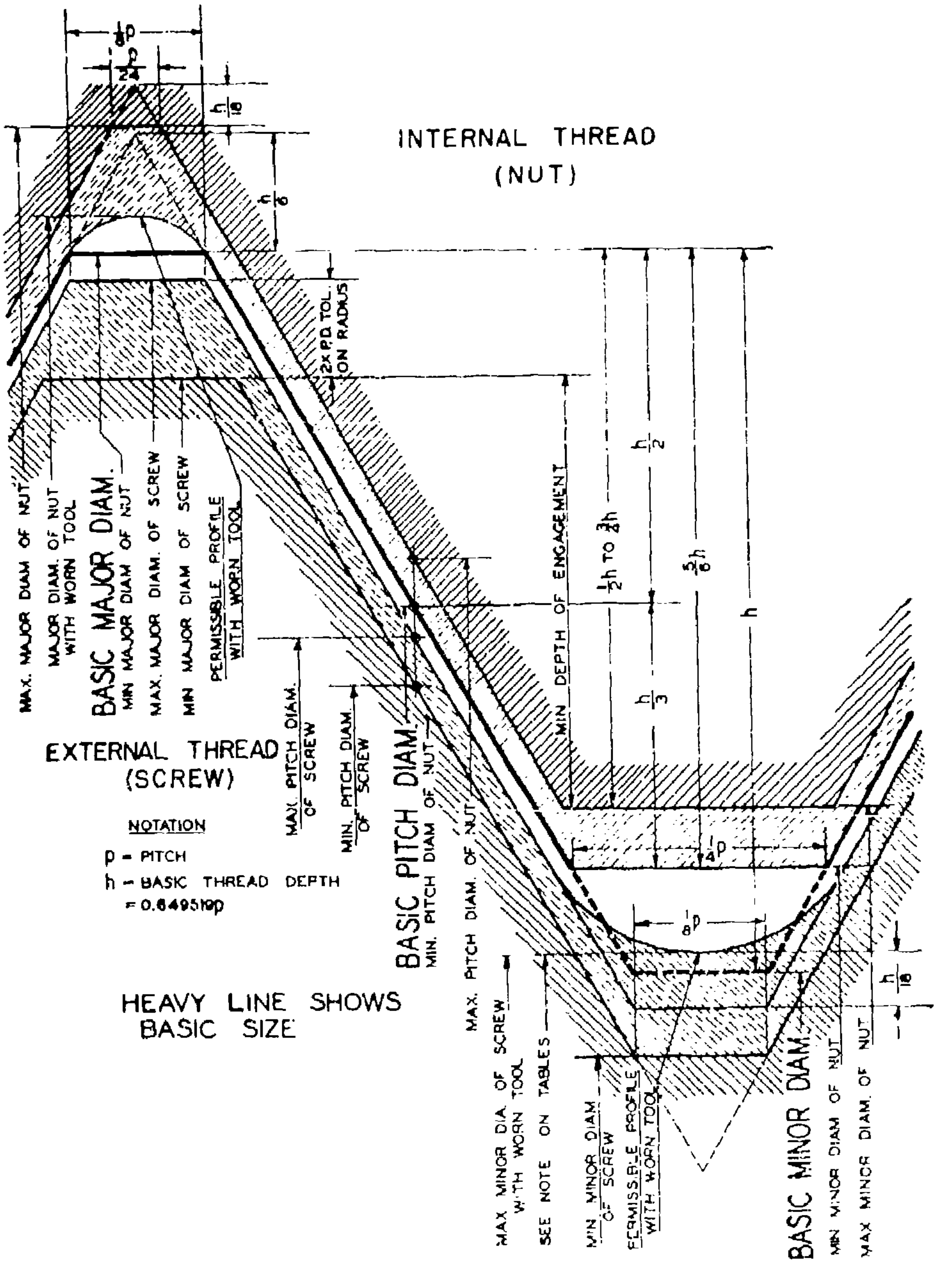
(a) AMERICAN NATIONAL COARSE-THREAD SERIES

In table 1.2 are specified the nominal sizes and basic dimensions of the "American National coarse-thread series."

The American National coarse-thread series is recommended for general use in engineering work, in machine construction where conditions are favorable to the use of bolts, screws, and other threaded components where quick and easy assembly of the parts is desired, and for all work where conditions do not require the use of fine-pitch threads.

(b) AMERICAN NATIONAL FINE-THREAD SERIES

In table 1.3 are specified the nominal sizes and basic dimensions of the "American National fine-thread series."



$\frac{1}{8}p$
$\frac{p}{24}$
$\frac{h}{18}$
$\frac{h}{6}$
INTERNAL THREAD
(NUT)
2xP.D. TOL. ON RADIUS
$\frac{h}{2}$
$\frac{1}{2}h$ TO $\frac{2}{3}h$
$\frac{5}{8}h$
h
MIN. DEPTH OF ENGAGEMENT
$\frac{h}{3}$
MAX. MAJOR DIAM. OF NUT
MAJOR DIAM. OF NUT WITH WORN TOOL
BASIC MAJOR DIAM.
MIN MAJOR DIAM OF NUT
MAX. MAJOR DIAM. OF SCREW
MIN MAJOR DIAM OF SCREW
PERMISSIBLE PROFILE WITH WORN TOOL
EXTERNAL THREAD
(SCREW)
MAX. PITCH DIAM. OF SCREW
MIN. PITCH DIAM. OF SCREW
BASIC PITCH DIAM.
MIN. PITCH DIAM. OF NUT
MAX. PITCH DIAM. OF NUT
NOTATION
p - PITCH
h - BASIC THREAD DEPTH
= 0.649519p
HEAVY LINE SHOWS
BASIC SIZE
$\frac{1}{4}p$
$\frac{1}{8}p$
$\frac{h}{18}$
MAX MINOR DIA. OF SCREW WITH WORN TOOL
SEE NOTE ON TABLES
MIN. MINOR DIAM. OF SCREW
PERMISSIBLE PROFILE WITH WORN TOOL
BASIC MINOR DIAM.
MIN MINOR DIAM OF NUT
MAX MINOR DIAM. OF NUT

FIGURE 1.2.—*Disposition of tolerances, allowance (neutral space), and crest clearances for class 1.*

The American National fine-thread series is recommended for general use in automotive and aircraft work, and where special conditions require a fine thread.

(c) AMERICAN NATIONAL EXTRA-FINE-THREAD SERIES

In table 1.4 are specified the nominal sizes and basic dimensions of the "American National extra-fine-thread series."

The American National extra-fine-thread series is intended for special uses where (1) thin-walled material is to be threaded, (2) thread depth of nuts clearing ferrules, coupling flanges, etc., must be held to a minimum, and (3) a maximum practicable number of threads are required within a given thread length. This thread series is the same as the SAE extra-fine-thread series, but it includes additional sizes.

(d) AMERICAN NATIONAL 8-THREAD SERIES

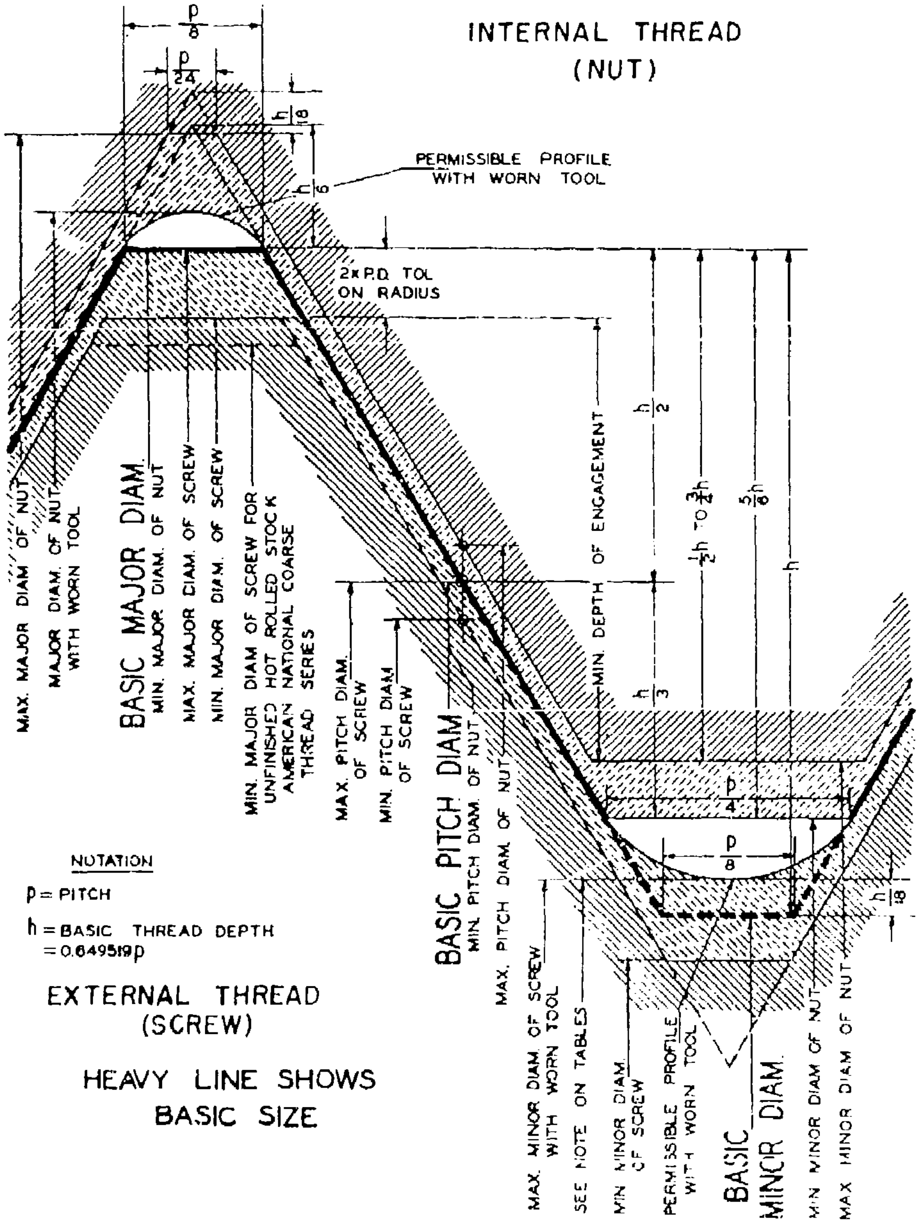
In table 1.5 are specified the nominal sizes and basic dimensions of the "American National 8-thread series."

Bolts for high-pressure pipe flanges, cylinder-head studs, and similar fastenings against pressure require that an initial tension be set up in the fastening, by elastic deformation of the fastening and the components held together, such that the joint will not open up when the steam or other pressure is applied. To secure a proper initial tension it is not practicable that the pitch should increase with the diameter of the thread, as the torque required to assemble the fastening would be excessive. Accordingly, for such purposes the 8-thread series has come into general use.

(e) AMERICAN NATIONAL 12-THREAD SERIES

The nominal sizes and basic dimensions of the "American National 12-thread series" are specified in table 1.6.

Sizes of the 12-thread series from ½ in. to and including 1¾ in. are used in boiler practice, which requires that worn stud holes be retapped with a tap of the next larger size, the increment being ⅛ in. throughout most of the range. Die-head chasers for sizes up to 3 in. are stocked by manufacturers.



INTERNAL THREAD
(NUT)
$\frac{p}{8}$
$\frac{p}{24}$
$\frac{h}{18}$
$\frac{h}{6}$
PERMISSIBLE PROFILE
WITH WORN TOOL
2×P.D. TOL
ON RADIUS
$\frac{h}{2}$
$\frac{h}{3}$
MIN. DEPTH OF ENGAGEMENT
$\frac{1}{2}h$ TO $\frac{3}{4}h$
$\frac{5}{8}h$
h
$\frac{p}{4}$
$\frac{p}{8}$
$\frac{h}{18}$
MAX. MAJOR DIAM OF NUT
MAJOR DIAM. OF NUT
WITH WORN TOOL
BASIC MAJOR DIAM.
MIN. MAJOR DIAM. OF NUT
MAX. MAJOR DIAM. OF SCREW
MIN. MAJOR DIAM. OF SCREW
MIN. MAJOR DIAM OF SCREW FOR
UNFINISHED HOT ROLLED STOCK
AMERICAN NATIONAL COARSE
THREAD SERIES
MAX. PITCH DIAM.
OF SCREW
MIN. PITCH DIAM
OF SCREW
BASIC PITCH DIAM
MIN. PITCH DIAM. OF NUT
MAX. PITCH DIAM. OF NUT
MAX. MINOR DIAM. OF SCREW
WITH WORN TOOL
SEE NOTE ON TABLES
MIN MINOR DIAM.
OF SCREW
PERMISSIBLE PROFILE
WITH WORN TOOL
BASIC
MINOR DIAM.
MIN MINOR DIAM OF NUT
MAX MINOR DIAM OF NUT
NOTATION
p = PITCH
h = BASIC THREAD DEPTH
= 0.649519p
EXTERNAL THREAD
(SCREW)
HEAVY LINE SHOWS
BASIC SIZE

FIGURE 1.3.—*Disposition of tolerances and crest clearances for class 2.*

The 12-thread series is also widely used in machine construction as for thin nuts on shafts and sleeves. It also allows the specification of shoulder diameters in steps of ⅛ in., as from the standpoints of good design and simplification of practice, it is desirable to limit shoulder diameters to ⅛ in. steps. Twelve threads per inch is the coarsest pitch in general use, which will permit a threaded collar which screws onto a threaded shoulder to slip over a shaft, the difference in diameter between shoulder and shaft being ⅛ in.

(f) AMERICAN NATIONAL 16-THREAD SERIES

The nominal sizes and basic dimensions of the "American National 16-thread series" are specified in table 1.7.

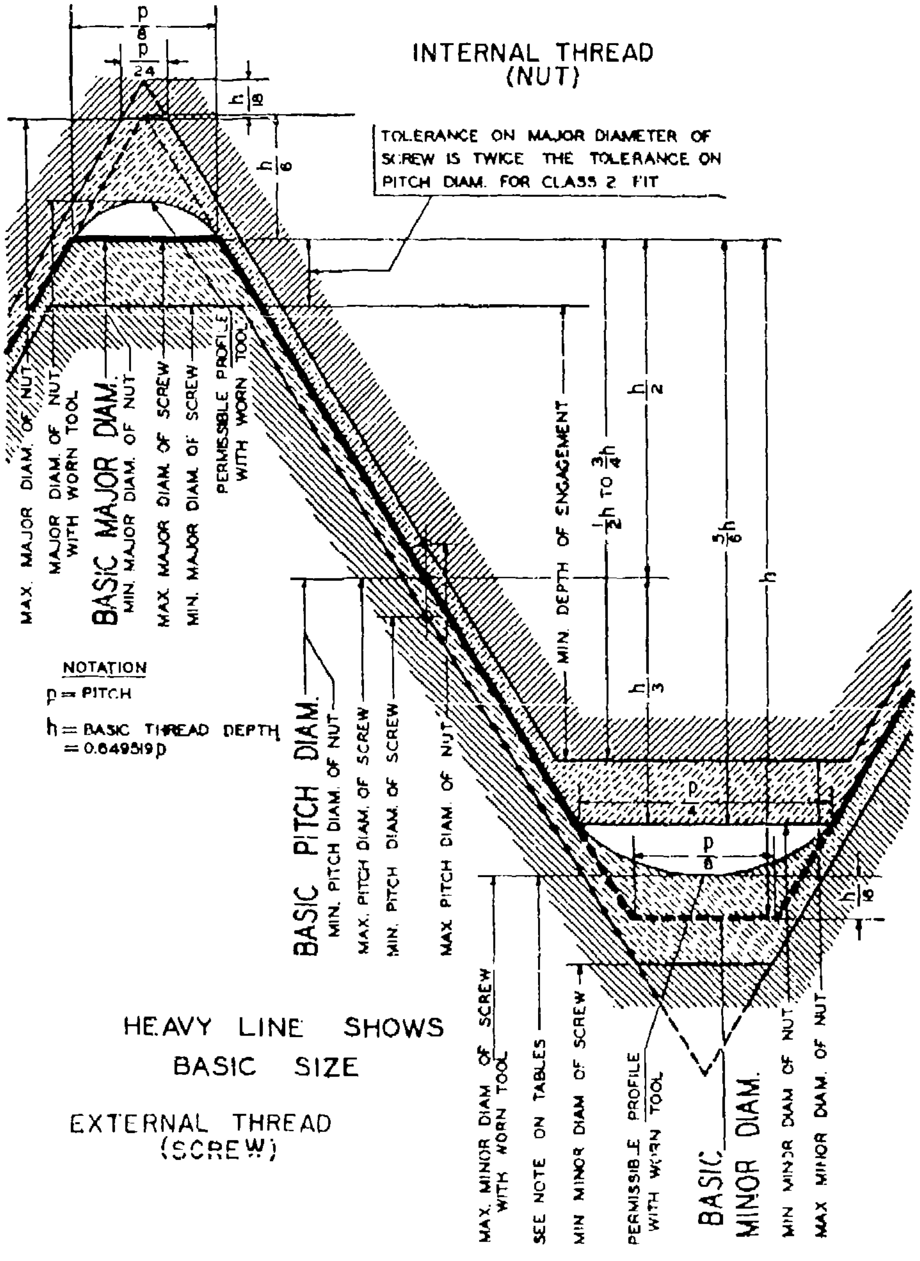
The 16-thread series is a uniform pitch series for such applications as require a relatively fine thread. It is intended primarily for use on threaded adjusting collars and bearing retaining nuts.

4. CLASSIFICATION AND TOLERANCES

Thread classes are distinguished from each other by the amounts of tolerance and allowance. There are established herein for general use four distinct classes of threads as specified in the following brief outline. These four classes, together with the accompanying specifications, are for the purpose of assuring the interchangeable manufacture of screw-thread parts throughout the country.

It is not the intention of the Committee arbitrarily to place a general class or grade of work in a specific class. Each manufacturer and user of screw threads is free to select the class best adapted to his particular needs. The limits of size and tolerances for four classes of threads are given in tables 1.8 to 1.13, inclusive.

Class 1----------	Includes screw-thread work in which the threads must assemble readily.
Class 2----------	Includes the major portion of interchangeable screw-thread work, finished and semifinished bolts and nuts, machine screws, etc.



p/8
p/24
h/18
h/6
INTERNAL THREAD (NUT)
TOLERANCE ON MAJOR DIAMETER OF SCREW IS TWICE THE TOLERANCE ON PITCH DIAM. FOR CLASS 2 FIT
MAX. MAJOR DIAM. OF NUT
MAJOR DIAM. OF NUT WITH WORN TOOL
BASIC MAJOR DIAM.
MIN. MAJOR DIAM. OF NUT
MAX. MAJOR DIAM. OF SCREW
MIN. MAJOR DIAM. OF SCREW
PERMISSIBLE PROFILE WITH WORN TOOL
MIN. DEPTH OF ENGAGEMENT
h/2
1/2h TO 3/4h
5/6h
h
h/3
NOTATION
p = PITCH
h = BASIC THREAD DEPTH = 0.649519p
BASIC PITCH DIAM.
MIN. PITCH DIAM. OF NUT
MAX. PITCH DIAM. OF SCREW
MIN. PITCH DIAM. OF SCREW
MAX. PITCH DIAM. OF NUT
p/4
p/8
h/18
HEAVY LINE SHOWS BASIC SIZE
EXTERNAL THREAD (SCREW)
MAX. MINOR DIAM OF SCREW WITH WORN TOOL
SEE NOTE ON TABLES
MIN MINOR DIAM OF SCREW
PERMISSIBLE PROFILE WITH WORN TOOL
BASIC MINOR DIAM.
MIN MINOR DIAM OF NUT
MAX MINOR DIAM. OF NUT

FIGURE 1.4.—*Disposition of tolerances and crest clearances for class 3.*

Class 3	Includes the highest grade of interchangeable screw-thread work.
Class 4	Includes screw-thread work requiring a fine snug fit, somewhat closer than class 3. In this class selective assembly of parts may be necessary.

It should be noted that, in the classification of screw threads, the class number designates the permissible limits of looseness or tightness. It has no connotations of *quality* in any other sense. Class 1 provides for the greatest permissible looseness between minimum external thread and maximum internal thread; class 4 provides for the smallest permissible looseness. Classes 2 and 3 are between classes 1 and 4 as regards looseness. Each class has its proper place and none should be regarded as superior or inferior provided that there is compliance with specification requirements under which it is manufactured and sold.

An examination of the dimensional specifications for the various classes shows that an external thread made to the tolerances and allowances of one class may be used with an internal thread of some other class. Thus, the requirements for a screw-thread fit for specific applications can be met by specifying the proper combination of classes for the components. For example, an external thread made to class 2 limits can be used with internal threads made to classes 1, 2, or 3 limits for specific applications. It is not the purpose of this standard to limit applications of the various standard classes.

(a) GENERAL SPECIFICATIONS

The following general specifications apply to the four classes of threads specified for applications of the American National form of thread.

1. Uniform Minimum Internal Thread.—The pitch diameter of the minimum internal thread corresponds to the basic size. The minimum major diameter of the

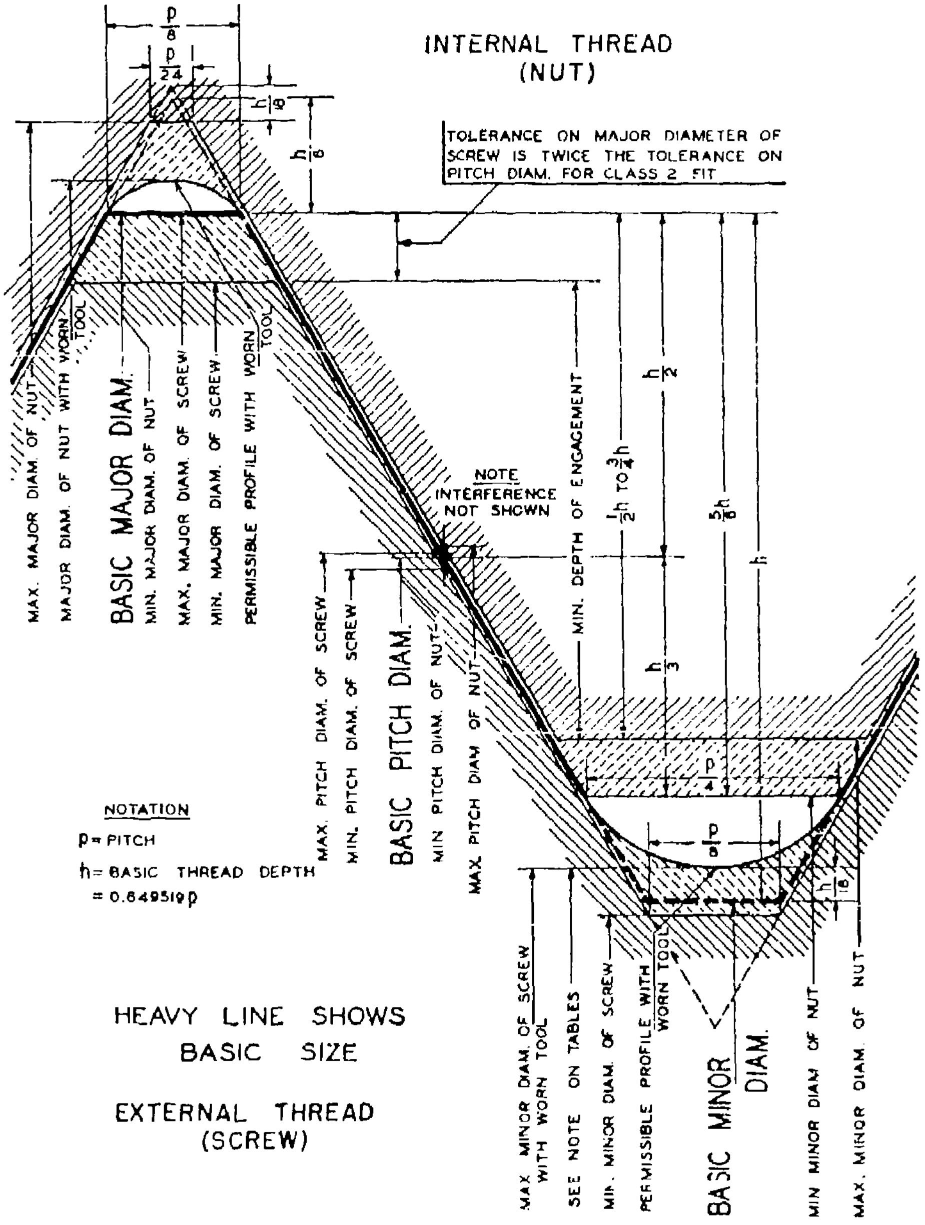

$\frac{p}{8}$
$\frac{p}{24}$
$\frac{h}{8}$
$\frac{h}{6}$
INTERNAL THREAD (NUT)
TOLERANCE ON MAJOR DIAMETER OF SCREW IS TWICE THE TOLERANCE ON PITCH DIAM. FOR CLASS 2 FIT
MAX. MAJOR DIAM. OF NUT
MAJOR DIAM. OF NUT WITH WORN TOOL
BASIC MAJOR DIAM.
MIN. MAJOR DIAM. OF NUT
MAX. MAJOR DIAM. OF SCREW
MIN. MAJOR DIAM. OF SCREW
PERMISSIBLE PROFILE WITH WORN TOOL
NOTE INTERFERENCE NOT SHOWN
MIN. DEPTH OF ENGAGEMENT
$\frac{h}{2}$
$\frac{1}{2}h$ TO $\frac{3}{4}h$
$\frac{5h}{8}$
h
$\frac{h}{3}$
MAX. PITCH DIAM. OF SCREW
MIN. PITCH DIAM. OF SCREW
BASIC PITCH DIAM.
MIN. PITCH DIAM. OF NUT
MAX. PITCH DIAM. OF NUT
NOTATION
p = PITCH
h = BASIC THREAD DEPTH = 0.649519p
$\frac{p}{4}$
$\frac{p}{8}$
$\frac{h}{18}$
HEAVY LINE SHOWS BASIC SIZE
EXTERNAL THREAD (SCREW)
MAX. MINOR DIAM. OF SCREW WITH WORN TOOL
SEE NOTE ON TABLES
MIN. MINOR DIAM. OF SCREW
PERMISSIBLE PROFILE WITH WORN TOOL
BASIC MINOR DIAM.
MIN. MINOR DIAM. OF NUT
MAX. MINOR DIAM. OF NUT

Figure 1.5.—*Disposition of tolerances, allowance (interference), and crest clearances for class 4.*

internal thread is the basic major diameter and is the same for all classes. In no case should the minimum major diameter of the internal thread, as results from a worn tap or cutting tool, be less than specified. The minimum minor diameter of the internal thread is the same for all classes.

2. **Maximum External Thread.**—The major and pitch diameters of the maximum external thread are equal to the respective basic diameters minus the allowance, if any. The maximum minor diameter of an external thread of a given pitch may be such as results from the use of a worn or rounded threading tool, when the pitch diameter is at its maximum value. In no case, however, should the maximum minor diameter of the thread, as results from tool wear, be greater than that corresponding to a $p/4$ width of flat.

3. **Direction and Scope of Tolerances.**—(a) The tolerance on the internal thread is plus, and is applied from the basic size to above basic size.

(b) The tolerance on the external thread is minus, and is applied from the maximum (or design) size to below the maximum size.

(c) The tolerances specified represent the extreme variations permitted on the product.

4. **Major Diameter Tolerances.**—(a) *External threads.*—The tolerances on the major diameters of class 1 or class 2 external threads are twice the tolerance values allowed on the pitch diameters of the same respective classes and pitches with the following exception: On class 2, American National coarse-thread series, externally threaded parts of unfinished, hot-rolled material, the same tolerances on major diameter are applied as on class 1 external threads.

The tolerances on the major diameters of classes 3 and 4 external threads American National coarse-thread series, are the same as those on class 2 finished screws of the same thread series; and for the American National fine-thread series are the same as those on class 2 of that series.

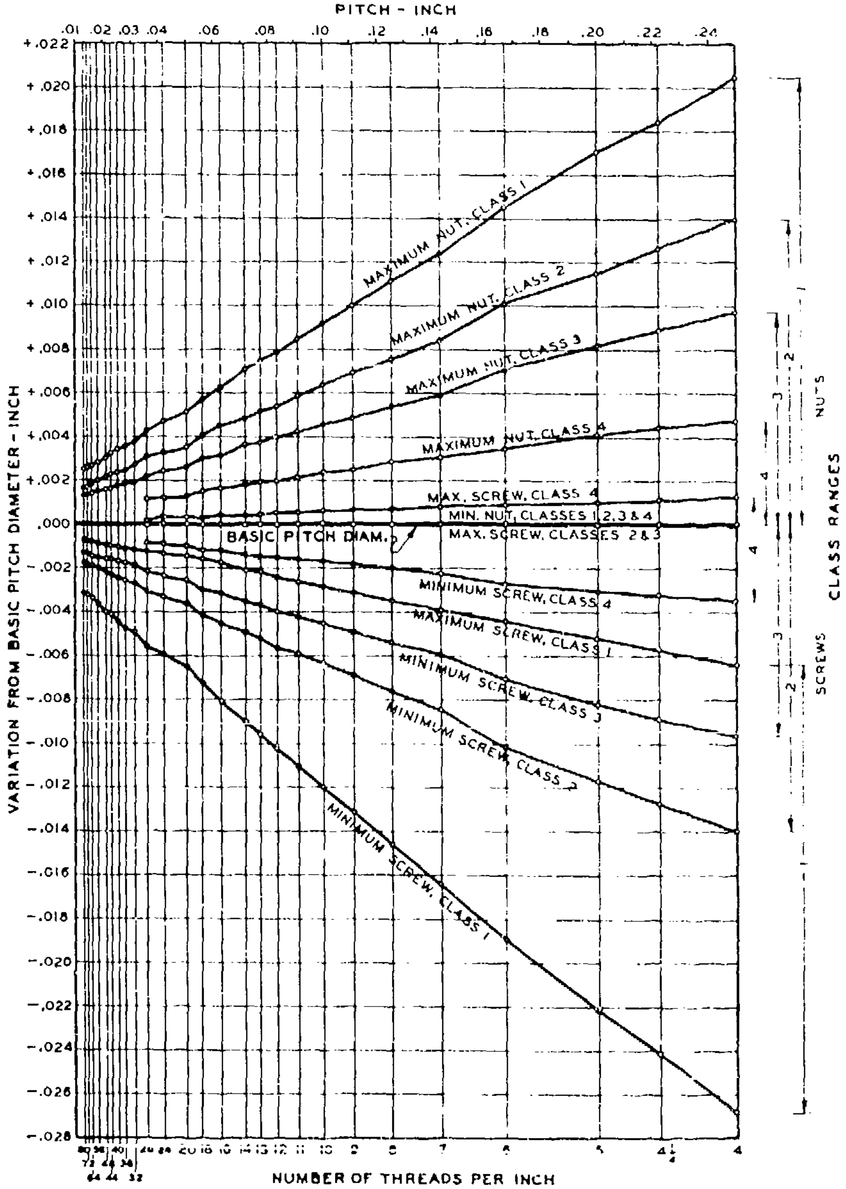


Figure 1.6.—*Relation of maximum and minimum pitch diameters of classes 1, 2, 3, and 4 to basic pitch diameters.*

TABLE 1.1.—*Basic thread data, American National form of thread*

Threads per inch, n	Pitch, p	Basic width of flat, $p/8$	Minimum width of flat at major diameter of nut, $p/24$	Minimum width of flat at minor diameter of nut, $p/4$	Depth of thread, $h=0.649519p$	$5h/6=0.541266p$	$3h/4=0.487139p$	$2h/3=0.433013p$	$h/2=0.324760p$	$5h/12=0.270633p$	$h/3=0.216506p$	$h/6=0.108253p$	$h/9=0.072169p$	$h/18=0.036084p$	Depth of sharp-V thread, $H=0.866025p$
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
80	0.012500	0.00156	0.00052	0.00312	0.008119	0.00677	0.00609	0.00541	0.00406	0.00338	0.00271	0.00135+	0.00090	0.00045+	0.010825
72	.013889	.00174	.00058	.00347	.009021	.00752	.00677	.00601	.00451	.00376	.00301	.00150	.00100	.00050	.012028
64	.015625	.00195+	.00065+	.00391	.010149	.00846	.00761	.00677	.00507	.00423	.00338	.00169	.00113	.00056	.013532
56	.017857	.00223	.00074	.00448	.011599	.00967	.00870	.00773	.00580	.00483	.00387	.00193	.00129	.00064	.015465
48	.020833	.00260	.00087	.00521	.013532	.01128	.01015−	.00902	.00677	.00564	.00451	.00226	.00150	.00075+	.018042
44	.022727	.00284	.00095−	.00568	.014762	.01230	.01107	.00984	.00738	.00615+	.00492	.00246	.00164	.00082	.019682
40	.025000	.00312	.00104	.00625	.016238	.01353	.01218	.01083	.00812	.00677	.00541	.00271	.00180	.00090	.021651
36	.027778	.00347	.00116	.00694	.018042	.01504	.01353	.01203	.00902	.00752	.00601	.00301	.00200	.00100	.024056
32	.031250	.00391	.00130	.00781	.020297	.01691	.01522	.01353	.01015−	.00846	.00677	.00338	.00226	.00113	.027063
28	.035714	.00446	.00149	.00893	.023197	.01933	.01740	.01546	.01160	.00967	.00773	.00387	.00258	.00129	.030929
24	.041667	.00521	.00174	.01042	.027056	.02255+	.02030	.01804	.01353	.01128	.00902	.00451	.00301	.00150	.036084
20	.050000	.00625	.00208	.01250	.032476	.02706	.02436	.02165+	.01624	.01353	.01083	.00541	.00361	.00180	.043301
18	.055556	.00694	.00231	.01389	.036084	.03007	.02706	.02406	.01804	.01504	.01203	.00601	.00401	.00200	.048113
16	.062500	.00781	.00260	.01562	.040595	.03383	.03045−	.02706	.02030	.01691	.01353	.00677	.00451	.00226	.054127
14	.071429	.00893	.00298	.01786	.046394	.03866	.03480	.03093	.02320	.01933	.01546	.00773	.00515+	.00258	.061859
13	.076923	.00962	.00321	.01923	.049963	.04164	.03747	.03331	.02498	.02082	.01665+	.00833	.00555+	.00278	.066617
12	.083333	.01042	.00347	.02083	.054127	.04511	.04059	.03608	.02706	.02255+	.01804	.00902	.00601	.00301	.072169
11½	.086957	.01087	.00362	.02174	.056480	.04707	.04236	.03765+	.02824	.02353	.01883	.00941	.00628	.00314	.075307
11	.090909	.01136	.00379	.02273	.059047	.04921	.04429	.03936	.02952	.02460	.01968	.00984	.00656	.00328	.078730
10	.100000	.01250	.00417	.02500	.064952	.05413	.04871	.04330	.03248	.02706	.02165+	.01083	.00722	.00361	.086603
9	.111111	.01389	.00463	.02778	.072169	.06014	.05413	.04811	.03608	.03007	.02406	.01203	.00802	.00401	.096225
8	.125000	.01562	.00521	.03125	.081190	.06766	.06089	.05413	.04059	.03383	.02706	.01353	.00902	.00451	.108253
7	.142857	.01786	.00595+	.03571	.092788	.07732	.06959	.06186	.04639	.03866	.03093	.01546	.01031	.00515+	.123718
6	.166667	.02083	.00694	.04167	.108253	.09021	.08119	.17217	.05413	.04511	.03608	.01804	.01203	.00601	.144338
5	.200000	.02500	.00833	.05000	.129904	.10825+	.09743	.18660	.06495+	.05413	.04330	.02615+	.01443	.00722	.173205
4½	.222222	.02778	.00926	.05556	.144338	.12028	.10825+	.19623	.07217	.06014	.04811	.02406	.01604	.00802	.192450
4	.250000	.03125	.01042	.06250	.162380	.13532	.12178	.10825+	.08119	.06766	.05413	.02706	.01804	.00902	.216506

TABLE 1.2.—*American National coarse-thread series, NC*

Identification		Basic diameters			Thread data							
Sizes	Threads per inch, *n*	Major diameter, *D*	Pitch diameter, *E*	Minor diameter, *K*	Metric equivalent of major diameter	Pitch, *p*	Depth of thread, *h*	Basic width of flat, *p*/8	Minimum width of flat at major diameter of nut, *p*/24	Lead angle at basic pitch diameter, λ	Sectional area at minor diameter at $D-2h$, $\frac{\pi K^2}{4}$	Tensile stress area, $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
1	2	3	4	5	6	7	8	9	10	11	12	13
No. *in.*		*in.*	*in.*	*in.*	*mm*	*in.*	*in.*	*in.*	*in.*	*deg min*	*in.*^{2}	*in.*^{2}
1 0.073	64	0.073	0.0629	0.0527	1.854	0.01562	0.01015	0.00195	0.00065	4 31	0.00218	0.00263
2 .086	56	.086	.0744	.0628	2.184	.01786	.01160	.00223	.00074	4 22	.00310	.00370
3 .099	48	.099	.0855	.0719	2.515	.02083	.01353	.00260	.00087	4 26	.00406	.00487
4 .112	40	.112	.0958	.0795	2.845	.02500	.01624	.00312	.00104	4 45	.00496	.00604
5 .125	40	.125	.1088	.0925	3.175	.02500	.01624	.00312	.00104	4 11	.00672	.00796
6 .138	32	.138	.1177	.0974	3.505	.03125	.02030	.00391	.00130	4 50	.00745	.00909
8 .164	32	.164	.1437	.1234	4.166	.03125	.02030	.00391	.00130	3 58	.01196	.0140
10 .190	24	.190	.1629	.1359	4.826	.04167	.02706	.00521	.00174	4 39	.01450	.0175
12 .211	24	.216	.1889	.1619	5.486	.04167	.02706	.00521	.00174	4 1	.0206	.0242
¼	20	.2500	.2175	.1850	6.350	.05000	.03248	.00625	.00208	4 11	.0269	.0318
5/16	18	.3125	.2764	.2403	7.938	.05556	.03608	.00694	.00231	3 40	.0454	.0524
⅜	16	.3750	.3344	.2938	9.525	.06250	.04059	.00781	.00260	3 24	.0678	.0775
7/16	14	.4375	.3911	.3447	11.113	.07143	.04639	.00893	.00298	3 20	.0933	.1063
½	13	.5000	.4500	.4001	12.700	.07692	.04996	.00962	.00321	3 7	.1257	.1419
9/16	12	.5625	.5084	.4542	14.288	.08333	.05413	.01042	.00347	2 59	.162	.182
⅝	11	.6250	.5660	.5069	15.875	.09091	.05905	.01136	.00379	2 56	.202	.226
¾	10	.7500	.6850	.6201	19.050	.10000	.06495	.01250	.00417	2 40	.302	.334
⅞	9	.8750	.8028	.7307	22.225	.11111	.07217	.01389	.00463	2 31	.419	.462
1	8	1.0000	.9188	.8376	25.400	.12500	.08119	.01562	.00521	2 29	.551	.606
1⅛	7	1.1250	1.0322	.9394	28.575	.14286	.09279	.01786	.00595	2 31	.693	.763
1¼	7	1.2500	1.1572	1.0644	31.750	.14286	.09279	.01786	.00595	2 15	.890	.969
1⅜	6	1.3750	1.2667	1.1585	34.925	.16667	.10825	.02083	.00694	2 24	1.054	1.155
1½	6	1.5000	1.3917	1.2835	38.100	.16667	.10825	.02083	.00694	2 11	1.294	1.405
1¾	5	1.7500	1.6201	1.4902	44.450	.20000	.12990	.02500	.00833	2 15	1.744	1.90
2	4½	2.0000	1.8557	1.7113	50.800	.22222	.14434	.02778	.00926	2 11	2.30	2.50
2¼	4½	2.2500	2.1057	1.9613	57.150	.22222	.14434	.02778	.00926	1 55	3.02	3.25
2½	4	2.5000	2.3376	2.1752	63.500	.25000	.16238	.03125	.01042	1 57	3.72	4.00
2¾	4	2.7500	2.5876	2.4252	69.850	.25000	.16238	.03125	.01042	1 46	4.62	4.93
3	4	3.0000	2.8376	2.6752	76.200	.25000	.16238	.03125	.01042	1 36	5.62	5.97
3¼	4	3.2500	3.0876	2.9252	82.550	.25000	.16238	.03125	.01042	1 29	6.72	7.10
3½	4	3.5000	3.3376	3.1752	88.900	.25000	.16238	.03125	.01042	1 22	7.92	8.33
3¾	4	3.7500	3.5876	3.4252	95.250	.25000	.16238	.03125	.01042	1 16	9.21	9.66
4	4	4.0000	3.8376	3.0752	101.600	.25000	.16238	.03125	.01042	1 11	10.61	11.08

(b) *Internal threads.*—No tolerance is specified, as the maximum major diameter is established by the crest of an unworn tool. See footnote, tables 1.8 to 1.13, inclusive.

5. BASIS FOR PITCH DIAMETER TOLERANCES.—(a) *NC and NF series, classes 1, 2, 3, and 4.*—The tolerances for screw threads specified for the coarse- and fine-thread series were arrived at by combining two factors, known as the net pitch diameter tolerance and the gage tolerance. The theoretical net tolerances for all threads of a given class bear a definite mathematical relationship to each other, and it was intended that these should in no way be reduced by permissible manufacturing tolerances for master gages; that is, gages within the original gage tolerances in the 1921 NSTC Progress Report, which were approximately equivalent to class X tolerances. Consequently the net tolerances were increased by the equivalent diametrical space required to provide for the gage tolerances on diameter, lead, and angle, to produce the extreme tolerances specified for the product. In practice, the actual net tolerances will depend upon the method of gaging and upon the accuracy of the gages used.

The net pitch diameter tolerances for the various classes are based on the following series for a pitch of 1/20 in.:

	in.
Class 1	0.0045
Class 2	.0030
Class 3	.0020
Class 4	.0010

Pitch diameter tolerances for pitches finer than 1/20 in. are to each other and to the tolerance for 1/20 in. as the 0.6th power of their respective pitches.

Pitch diameter tolerances for pitches coarser than 1/20 in. are to each other and to the tolerance for 1/20 in. as the 0.9th power of their respective pitches.

The exponent 0.6 was chosen for pitches finer than 1/20 in. because the resulting tolerances, except in two instances, do not vary more than 0.0001 in. from the pitch diameter tolerances specified in the original ASME Machine Screw Standard.

The tolerances on pitch diameter for the coarse- and fine-thread series are based on a length of engagement equal to the nominal diameter, but may be used for lengths of engagement up to 1½ diameters.

(b) *NEF, 8N, 12N, and 16N series, classes 2 and 3.*—The class 2 pitch diameter tolerances for the extra-fine-, 8-, 12-, and 16-thread series are equal to $0.002\sqrt{D}+0.00133L_e+0.010\sqrt{p}$, and the class 3 tolerances are 70 percent of the class 2 tolerances. The tolerances for the 8-thread series are based on a length of engagement equal to the nominal diameter and for the extra-fine-, 12-, and 16-thread series on a length of engagement of 9 pitches.

(c) *Limits of size.*—With respect to the pitch diameter limits of size, it is intended, except as hereinafter qualified, that no portion of the complete thread be permitted to project beyond the envelope defined by the maximum-material limits on the one hand, or beyond that defined

TABLE 1.3.—*American National fine-thread series, NF*

Identification			Basic diameters			Thread data							
Sizes		Threads per inch, *n*	Major diameter, *D*	Pitch diameter, *E*	Minor diameter, *K*	Metric equivalent of major diameter	Pitch, *p*	Depth of thread, *h*	Basic width of flat, *p*/8	Minimum width of flat at major diameter of nut, *p*/24	Lead angle at basic pitch diameter, λ	Sectional area at minor diameter at $D-2h$, $=\frac{\pi K^2}{4}$	Tensile stress area, $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
1		2	3	4	5	6	7	8	9	10	11	12	13
No.	*in.*		*in.*	*in.*	*in.*	*mm*	*in.*	*in.*	*in.*	*in.*	*deg min*	*in.*²	*in.*²
0	0.060	80	0.060	0.0519	0.0438	1.524	0.01250	0.00812	0.00156	0.00052	4 23	0.00151	0.00180
1	.073	72	.073	.0640	.0550	1.854	.01389	.00902	.00174	.00058	3 57	.00237	.00278
2	.086	64	.086	.0759	.0357	2.184	.01562	.01015	.00195	.00065	3 45	.00339	.00394
3	.099	56	.099	.0874	.0758	2.515	.01786	.01160	.00223	.00074	3 43	.00451	.00523
4	.112	48	.112	.0985	.0849	2.845	.02083	.01353	.00260	.00087	3 51	.00566	.00661
5	.125	44	.125	.1102	.0955	3.175	.02273	.01476	.00284	.00095	3 45	.00716	.00830
6	.138	40	.138	.1218	.1055	3.505	.02500	.01624	.00312	.00104	3 44	.00874	.01015
8	.164	36	.164	.1460	.1279	4.166	.02778	.01804	.00347	.00116	3 28	.01285	.01474
10	.190	32	.190	.1697	.1494	4.826	.03125	.02030	.00391	.00130	3 21	.0175	.0200
12	.216	28	.216	.1928	.1696	5.486	.03571	.02320	.00446	.00149	3 22	.0226	.0258
	¼	28	.2500	.2268	.2036	6.350	.03571	.02320	.00446	.00149	2 52	.0326	.0364
	5/16	24	.3125	.2854	.2584	7.938	.04167	.02706	.00521	.00174	2 40	.0524	.0580
	⅜	24	.3750	.3479	.3200	9.525	.04167	.02706	.00521	.00174	2 11	.0809	.0878
	7/16	20	.4375	.4050	.3725	11.113	.05000	.03248	.00625	.00208	2 15	.1090	.1187
	½	20	.5000	.4675	.4350	12.700	.05000	.03248	.00625	.00208	1 57	.1486	.1599
	9/16	18	.5625	.5264	.4903	14.288	.05556	.03608	.00694	.00231	1 55	.189	.203
	⅝	18	.6250	.5889	.5528	15.875	.05556	.03608	.00694	.00231	1 43	.240	.256
	¾	16	.7500	.7094	.6688	19.050	.06250	.04059	.00781	.00260	1 36	.351	.373
	⅞	14	.8750	.8286	.7822	22.225	.07143	.04639	.00893	.00298	1 34	.480	.509
	[a]1	14	1.0000	.9536	.9072	25.400	.07143	.04639	.00893	.00298	1 22	.646	.680
	‡1	12	1.0000	.9459	.8978	25.400	.08333	.05413	.01042	.00347	1 36	.625	.663
	1⅛	12	1.1250	1.0709	1.0167	28.575	.08333	.05413	.01042	.00347	1 25	.812	.856
	1¼	12	1.2500	1.1959	1.1417	31.750	.08333	.05413	.01042	.00347	1 16	1.024	1.073
	1⅜	12	1.3750	1.3209	1.2667	34.925	.08333	.05413	.01042	.00347	1 9	1.260	1.315
	1½	12	1.5000	1.4459	1.3917	38.100	.08333	.05413	.01042	.00347	1 3	1.521	1.581

[a] The designation of this size has been changed from "NF" to "NS."

TABLE 1.4.—*American National extra-fine-thread series, NEF*

Identification		Basic diameters			Thread data							
Sizes	Threads per inch, *n*	Major diameter, *D*	Pitch diameter, *E*	Minor diameter, *K*	Metric equivalent of major diameter	Pitch, *p*	Depth of thread, *h*	Basic width of flat, *p*/8	Minimum width of flat at major diameter of nut, *p*/24	Lead angle at basic pitch diameter, λ	Sectional area at minor diameter at $D-2h$, $=\frac{\pi K^2}{4}$	Tensile stress area, $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
1	2	3	4	5	6	7	8	9	10	11	12	13
in.		*in.*	*in.*	*in.*	*mm*	*in.*	*in.*	*in.*	*in.*	*deg min*	*in.*²	*in.*²
¼	32	0.2500	0.2297	0.2094	6.350	0.03125	0.02030	0.00391	0.00130	2 [illegible]	0.0344	0.0379
5/16	32	.3125	.2922	.2719	7.938	.03125	.02030	.00391	.00130	1 57	.0581	.0625
⅜	32	.3750	.3547	.3344	9.525	.03125	.02030	.00391	.00130	1 36	.0878	.0932
7/16	28	.4375	.4143	.3911	11.113	.03571	.02320	.00446	.00149	1 34	.1201	.1274
½	28	.5000	.4768	.4536	12.700	.03571	.02320	.00446	.00149	1 22	.162	.170
9/16	24	.5625	.5354	.5084	14.288	.04167	.02706	.00521	.00174	1 25	.203	.214
⅝	24	.6250	.5979	.5709	15.875	.04167	.02706	.00521	.00174	1 16	.256	.268
11/16	24	.6875	.6604	.6334	17.463	.04167	.02706	.00521	.00174	1 9	.315	.329
¾	20	.7500	.7175	.6850	19.050	.05000	.03248	.00625	.00208	1 16	.369	.388
13/16	20	.8125	.7800	.7475	20.638	.05000	.03248	.00625	.00208	1 10	.439	.458
⅞	20	.8750	.8425	.8100	22.225	.05000	.03248	.00625	.00208	1 4	.515	.536
15/16	20	.9375	.9050	.8725	23.813	.05000	.03248	.00625	.00208	1 0	.598	.620
1	20	1.0000	.9675	.9350	25.400	.05000	.03248	.00625	.00208	0 57	.687	.711
1 1/16	18	1.0625	1.0264	.9903	26.988	.05556	.03608	.00694	.00231	0 59	.770	.799
1⅛	18	1.1250	1.0889	1.0528	28.575	.05556	.03608	.00694	.00231	0 56	.871	.901
1 3/16	18	1.1875	1.1514	1.1153	30.163	.05556	.03608	.00694	.00231	0 53	.977	1.009
1¼	18	1.2500	1.2139	1.1778	31.750	.05556	.03608	.00694	.00231	0 50	1.096	1.123
1 5/16	18	1.3125	1.2764	1.2403	33.338	.05556	.03608	.00694	.00231	0 48	1.208	1.244
1⅜	18	1.3750	1.3389	1.3028	34.925	.05556	.03608	.00694	.00231	0 45	1.333	1.370
1 7/16	18	1.4375	1.4014	1.3653	36.513	.05556	.03608	.00694	.00231	0 43	1.464	1.503
1½	18	1.5000	1.4639	1.4278	38.100	.05556	.03608	.00694	.00231	0 42	1.60	1.64
1 9/16	18	1.5625	1.5264	1.4903	39.688	.05556	.03608	.00694	.00231	0 40	1.74	1.79
1⅝	18	1.6250	1.5889	1.5528	41.275	.05556	.03608	.00694	.00231	0 38	1.89	1.94
1 11/16	18	1.6875	1.6514	1.6153	42.863	.05556	.03608	.00694	.00231	0 37	2.05	2.10
1¾	16	1.7500	1.7094	1.6688	44.450	.06250	.04059	.00781	.00260	0 40	2.19	2.24
2	16	2.0000	1.9594	1.9188	50.800	.06250	.04059	.00781	.00260	0 35	2.89	2.95

TABLE 1.5.—*American National 8-thread series, 8N*

Identification		Basic diameters			Thread data			
Sizes	Threads per inch	Major diameter, *D*	Pitch diameter, *E*	Minor diameter, *K*	Metric equivalent of major diameter	Lead angle at basic pitch diameter, λ	Sectional area at minor diameter at $D-2h$, $=\frac{\pi K^2}{4}$	Tensile-stress area, $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
1	2	3	4	5	6	7	8	9
in.		*in.*	*in.*	*in.*	*mm*	*deg* *min*	*in.*²	*in.*²
ᵃ1	8	1.0000	0.9188	0.8376	25.400	2 29	0.551	0.606
1⅛	8	1.1250	1.0438	.9626	28.575	2 11	.728	.790
1¼	8	1.2500	1.1688	1.0876	31.750	1 57	.929	1.000
1⅜	8	1.3750	1.2938	1.2126	34.925	1 46	1.155	1.233
1½	8	1.5000	1.4188	1.3376	38.100	1 36	1.405	1.492
1⅝	8	1.6250	1.5438	1.4626	41.275	1 29	1.68	1.78
1¾	8	1.7500	1.6688	1.5876	44.450	1 22	1.98	2.08
1⅞	8	1.8750	1.7938	1.7126	47.625	1 16	2.30	2.41
2	8	2.0000	1.9188	1.8376	50.800	1 11	2.65	2.77
2⅛	8	2.1250	2.0438	1.9626	53.975	1 7	3.03	3.15
2¼	8	2.2500	2.1688	2.0876	57.150	1 3	3.42	3.56
2½	8	2.5000	2.4188	2.3376	63.500	0 57	4.29	4.44
2¾	8	2.7500	2.6688	2.5876	69.850	0 51	5.26	5.43
3	8	3.0000	2.9188	2.8376	76.200	0 47	6.32	6.51
3¼	8	3.2500	3.1688	3.0876	82.550	0 43	7.49	7.69
3½	8	3.5000	3.4188	3.3376	88.900	0 40	8.75	8.96
3¾	8	3.7500	3.6688	3.5876	95.250	0 37	10.11	10.34
4	8	4.0000	3.9188	3.8376	101.600	0 35	11.57	11.81
4¼	8	4.2500	4.1688	4.0876	107.950	0 33	13.12	13.38
4½	8	4.5000	4.4188	4.3376	114.300	0 31	14.78	15.06
4¾	8	4.7500	4.6688	4.5876	120.650	0 29	16.53	16.82
5	8	5.0000	4.9188	4.8376	127.000	0 28	18.38	18.69
5¼	8	5.2500	5.1688	5.0876	133.350	0 26	20.33	20.66
5½	8	5.5000	5.4188	5.3375	139.700	0 25	22.38	22.72
5¾	8	5.7500	5.6688	5.5876	146.050	0 24	24.52	24.88
6	8	6.0000	5.9188	5.8376	152.400	0 23	26.76	27.14

ᵃ Standard size of the American National coarse-thread series.

NOTE.—Pitch, $p=0.12500$ in.; depth of thread, $h=0.08119$ in.; basic width of flat, $p/8=0.01562$ in.; minimum width of flat at major diameter of nut, $p/24=0.00521$ in.

by the minimum-material limits on the other, and thus be outside of the tolerance zone as illustrated in figures 1.2 to 1.5 inclusive. Also, the diameter equivalent of the variation in any given element except pitch diameter shall not exceed one-half of the pitch diameter tolerance. (The full tolerance cannot, therefore, be used on pitch diameter unless deviations in other thread elements are zero.) Deviations from specified size and profile include variations in lead, uniformity of helix, flank angle, taper, out-of-roundness, and surface defects. Accordingly, values are given in tables 1.14 and 1.15, for the standard thread series and classes, of one-half of the pitch diameter tolerances and the deviations in lead and flank angle which are equivalent thereto. Flank angle equivalents are based on a depth of thread engagement of $5H/8$.

The diameter equivalents of variations in lead, uniformity of helix, and flank angle are always in the direction toward maximum material, that is they increase the virtual diameter of the external thread and decrease that of the internal thread. Thus, the maximum material pitch diameter limits are a limitation of the virtual diameter (effective size) *and are so specified herein for all thread classes.*

Variations in taper and roundness of the pitch diameter, together with variations of the pitch diameter as a whole, may be in the direction of minimum material, and thus the minimum-material pitch diameter limit may be specified as a limitation of the pitch diameter as a single element. However, in view of the interrelation of the pitch diameter, variation in lead and flank angle, etc., together with practical considerations relating to established production processes, product application, and inspection procedures, it is customary to interpret the minimum pitch diameter of the external thread and the maximum pitch diameter of the internal thread as virtual diameters (effective sizes) in classes 1 and 2, and classes 3 and 4 internal threads, for application to various mass-produced bolts, nuts, screws, and other similar threaded fasteners, and to some custom threaded parts where design requirements are fulfilled. See "Limit gages" and "Acceptability of threads," section VI, pp. 108 and 118.

6. MINOR DIAMETER TOLERANCES.—(*a*) *External threads.*—No tolerance is specified, as the minimum minor diameter is established by the crest of an unworn tool. See footnote, tables 1.8 to 1.13, inclusive.

(*b*) *Internal threads.*—The tolerance on minor diameter for a given size and pitch of thread is the same for all classes. For sizes 1 in. and larger the tolerance is equal to $0.10825p$. For most sizes less than 1 in., tolerances have been made arbitrarily larger than $0.10825p$ to minimize tapping difficulties.

(b) SCREW THREAD CLASSES

1. CLASS 1.—(*a*) *Definition.*—Class 1 is intended to cover the manufacture of threaded parts where quick and easy assembly is necessary, and where an allowance is required.

(*b*) *Limits of size and tolerances.*—Limits of size and tolerances for the respective thread pitches are specified in tables 1.8 and 1.9, and their application is shown in figure 1.2.

2. CLASS 2.—(*a*) *Definition.*—Class 2 is intended to apply to the major portion of threaded work in interchangeable manufacture, where no allowance is required.

(*b*) *Limits of size and tolerances.*—No allowance is provided, but since the tolerances on "go" gages are within the limits of size of the thread, the gages will assure a slight clearance between external and internal threads made to the maximum-material limits. Limits of size and tolerances for the respective thread pitches

TABLE 1.6.—*American National 12-thread series, 12N*

Identification		Basic diameters			Thread data			
Sizes	Threads per inch	Major diameter, *D*	Pitch diameter, *E*	Minor diameter, *K*	Metric equivalent of major diameter	Lead angle at basic pitch diameter, λ	Sectional area at minor diameter at $D-2h$, $=\frac{\pi K^2}{4}$	Tensile-stress area, $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
1	2	3	4	5	6	7	8	9
in.		*in.*	*in.*	*in.*	*mm*	*deg* *min*	*in.*^{2}	*in.*^{2}
½	12	0.5000	0.4459	0.3917	12.700	3 24	0.121	0.138
^{a}9/16	12	.5625	.5084	.4542	14.288	2 59	.162	.182
⅝	12	.6250	.5709	.5167	15.875	2 40	.210	.232
11/16	12	.6875	.6334	.5792	17.463	2 24	.263	.289
¾	12	.7500	.6959	.6417	19.050	2 11	.323	.351
13/16	12	.8125	.7584	.7042	20.638	2 0	.390	.420
⅞	12	.8750	.8209	.7667	22.225	1 51	.462	.495
15/16	12	.9375	.8834	.8292	23.813	1 43	.540	.576
1	12	1.0000	.9459	.8917	25.400	1 36	.625	.663
1 1/16	12	1.0625	1.0084	.9542	26.988	1 30	.715	.756
^{b}1⅛	12	1.1250	1.0709	1.0167	28.575	1 25	.812	.856
1 3/16	12	1.1875	1.1334	1.0792	30.163	1 20	.915	.961
^{b}1¼	12	1.2500	1.1959	1.1417	31.750	1 16	1.024	1.073
1 5/16	12	1.3125	1.2584	1.2042	33.338	1 12	1.139	1.191
^{b}1⅜	12	1.3750	1.3209	1.2667	34.925	1 9	1.260	1.315
1 7/16	12	1.4375	1.3834	1.3292	36.513	1 6	1.388	1.445
^{b}1½	12	1.5000	1.4459	1.3917	38.100	1 3	1.52	1.58
1⅝	12	1.6250	1.5709	1.5167	41.275	0 58	1.81	1.87
1¾	12	1.7500	1.6959	1.6417	44.450	0 54	2.12	2.19
1⅞	12	1.8750	1.8209	1.7667	47.625	0 50	2.45	2.53
2	12	2.0000	1.9459	1.8917	50.800	0 47	2.81	2.89
2⅛	12	2.1250	2.0709	2.0167	53.975	0 44	3.19	3.28
2¼	12	2.2500	2.1959	2.1417	57.150	0 42	3.60	3.69
2⅜	12	2.3750	2.3209	2.2667	60.325	0 39	4.04	4.13
2½	12	2.5000	2.4459	2.3917	63.500	0 37	4.49	4.60
2⅝	12	2.6250	2.5709	2.5167	66.675	0 35	4.97	5.08
2¾	12	2.7500	2.6959	2.6417	69.850	0 34	5.48	5.59
2⅞	12	2.8750	2.8209	2.7667	73.025	0 32	6.01	6.13
3	12	3.0000	2.9459	2.8917	76.200	0 31	6.57	6.69
3⅛	12	3.1250	3.0709	3.0167	79.375	0 30	7.15	7.28
3¼	12	3.2500	3.1959	3.1417	82.550	0 29	7.75	7.89
3⅜	12	3.3750	3.3209	3.2667	85.725	0 27	8.38	8.52
3½	12	3.5000	3.4459	3.3917	88.900	0 26	9.03	9.18
3⅝	12	3.6250	3.5709	3.5167	92.075	0 26	9.71	9.86
3¾	12	3.7500	3.6959	3.6417	95.250	0 25	10.42	10.57
3⅞	12	3.8750	3.8209	3.7667	98.425	0 24	11.14	11.30
4	12	4.0000	3.9459	3.8917	101.600	0 23	11.90	12.06
4¼	12	4.2500	4.1959	4.1417	107.950	0 22	13.47	13.65
4½	12	4.5000	4.4459	4.3917	114.300	0 21	15.1	15.3
4¾	12	4.7500	4.6959	4.6417	120.650	0 19	16.9	17.1
5	12	5.0000	4.9459	4.8917	127.000	0 18	18.8	19.0
5¼	12	5.2500	5.1959	5.1417	133.350	0 18	20.8	21.0
5½	12	5.5000	5.4459	5.3917	139.700	0 17	22.8	23.1
5¾	12	5.7500	5.6959	5.6417	146.050	0 16	25.0	25.2
6	12	6.0000	5.9459	5.8917	152.400	0 15	27.3	27.5

[a] Standard size of the American National coarse-thread series.
[b] Standard size of the American National fine-thread series.

NOTE.—Pitch, $p=0.08333$ in.; depth of thread, $h=0.05413$ in.; basic width of flat, $p/8=0.01042$ in.; minimum width of flat at major diameter of nut, $p/24=0.00347$ in.

are specified in tables 1.8 to 1.13, inclusive, and their application is shown in figure 1.3.

3. CLASS 3.—(*a*) *Definition.*—Class 3 is intended for applications where closeness of fit and accuracy of lead and angle of thread are important. It is obtainable consistently only by the use of high quality production equipment supported by a very efficient system of gaging and inspection. It is the same in every particular as class 2, except that the tolerances are smaller.

(*b*) *Limits of size and tolerances.*—No allowance is provided, but since the tolerances on "go" gages are within the limits of size of the thread, the gages will assure a slight clearance between external and internal threads made to the maximum-material limits. Limits of size and tolerances for the respective thread pitches are specified in tables 1.8 to 1.13, inclusive, and their application is shown in figure 1.4.

4. CLASS 4.—(*a*) *Definition.*—Class 4 is intended for threaded work requiring a fine snug fit, and where a screwdriver or wrench may be necessary for assembly. In the manufacture of screw-thread products belonging in this class it will be necessary to use precision tools,[20] gages made to special tolerances for this class, and other refinements. This class should, therefore, be used only in cases where requirements of the mechanism being produced are exacting, or where special conditions require screws having a precision fit. In order to secure the fit desired it may be necessary in some cases to select the parts when the product is being assembled.

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[20] Including positive control of taps and dies by means of a lead screw.

TABLE 1.7.—*American National 16-thread series, 16N*

Identification		Basic diameters			Thread data				
Sizes	Threads per inch	Major diameter, D	Pitch diameter, E	Minor diameter, K	Metric equivalent of major diameter	Lead angle at basic pitch diameter, λ		Sectional area at minor diameter at $D-2h$, $=\frac{\pi K^2}{4}$	Tensile-stress area, $\pi\left(\frac{E}{2}-\frac{3H}{16}\right)^2$
1	2	3	4	5	6	7		8	9
in.		*in.*	*in.*	*in.*	*mm*	*deg*	*min*	*in.*²	*in.*²
ᵃ3/4	16	0.7500	0.7094	0.6688	19.050	1	36	0.351	0.373
13/16	16	.8125	.7719	.7313	20.638	1	29	.420	.444
7/8	16	.8750	.8344	.7938	22.225	1	22	.495	.521
15/16	16	.9375	.8969	.8563	23.813	1	16	.576	.604
1	16	1.0000	.9594	.9188	25.400	1	11	.663	.693
1 1/16	16	1.0625	1.0219	.9813	26.988	1	7	.756	.788
1 1/8	16	1.1250	1.0844	1.0438	28.575	1	3	.856	.889
1 3/16	16	1.1875	1.1469	1.1063	30.163	1	0	.961	.997
1 1/4	16	1.2500	1.2094	1.1688	31.750	0	57	1.073	1.111
1 5/16	16	1.3125	1.2719	1.2313	33.338	0	54	1.191	1.230
1 3/8	16	1.3750	1.3344	1.2938	34.925	0	51	1.315	1.356
1 7/16	16	1.4375	1.3969	1.3563	36.513	0	49	1.445	1.488
1 1/2	16	1.5000	1.4594	1.4188	38.100	0	47	1.58	1.63
1 9/16	16	1.5625	1.5219	1.4813	39.688	0	45	1.72	1.77
1 5/8	16	1.6250	1.5844	1.5438	41.275	0	43	1.87	1.92
1 11/16	16	1.6875	1.6469	1.6063	42.863	0	42	2.03	2.08
1 3/4	16	1.7500	1.7094	1.6688	44.450	0	40	2.19	2.24
1 13/16	16	1.8125	1.7719	1.7313	46.038	0	39	2.35	2.41
1 7/8	16	1.8750	1.8344	1.7938	47.625	0	37	2.53	2.58
1 15/16	16	1.9375	1.8969	1.8563	49.213	0	36	2.71	2.77
2	16	2.0000	1.9594	1.9188	50.800	0	35	2.89	2.95
2 1/16	16	2.0625	2.0219	1.9813	52.388	0	34	3.08	3.15
2 1/8	16	2.1250	2.0844	2.0438	53.975	0	33	3.28	3.35
2 3/16	16	2.1875	2.1469	2.1063	55.563	0	32	3.48	3.55
2 1/4	16	2.2500	2.2094	2.1688	57.150	0	31	3.69	3.76
2 5/16	16	2.3125	2.2719	2.2313	58.738	0	30	3.91	3.98
2 3/8	16	2.3750	2.3344	2.2938	60.325	0	29	4.13	4.21
2 7/16	16	2.4375	2.3969	2.3563	61.913	0	29	4.36	4.44
2 1/2	16	2.5000	2.4594	2.4188	63.500	0	28	4.60	4.67
2 5/8	16	2.6250	2.5844	2.5438	66.675	0	26	5.08	5.16
2 3/4	16	2.7500	2.7094	2.6688	69.850	0	25	5.59	5.68
2 7/8	16	2.8750	2.8344	2.7938	73.025	0	24	6.13	6.22
3	16	3.0000	2.9594	2.9188	76.200	0	23	6.69	6.78
3 1/8	16	3.1250	3.0844	3.0438	79.375	0	22	7.28	7.37
3 1/4	16	3.2500	3.2094	3.1688	82.550	0	21	7.89	7.98
3 3/8	16	3.3750	3.3344	3.2938	85.725	0	21	8.52	8.63
3 1/2	16	3.5000	3.4594	3.4188	88.900	0	20	9.18	9.29
3 5/8	16	3.6250	3.5844	3.5438	92.075	0	19	9.86	9.98
3 3/4	16	3.7500	3.7094	3.6688	95.250	0	18	10.57	10.69
3 7/8	16	3.8750	3.8344	3.7938	98.425	0	18	11.30	11.43
4	16	4.0000	3.9594	3.9188	101.600	0	17	12.06	12.19

ᵃ Standard size of the American National fine-thread series.

NOTE.—Pitch, $p=0.0625$ in., depth of thread, $h=0.04059$ in.; basic width of flat, $p/8=0.00781$ in.; minimum width of flat at major diameter of nut, $p/24=0.00260$ in.

(*b*) *Limits of size and tolerances.*—A small negative allowance is provided. Limits of size and tolerances for the respective thread pitches are specified in tables 1.8 and 1.9, and their application is shown in figure 1.5.

5. CLASS 5.—This is a wrench fit class intended for studs and tapped holes which are to be assembled permanently. As the earlier specifications have proved to be not entirely satisfactory this class is in process of revision. Reference should be made to previous editions of this handbook for the earlier specifications.

5. METHOD OF DESIGNATING AN AMERICAN NATIONAL THREAD

1. STANDARD AMERICAN NATIONAL THREADS.—The standard method of designating a screw thread is given in section III, p. 26. For all standard threads listed in tables 1.2 to 1.7, inclusive, only the thread designations need be placed on a drawing, it being understood that the limits of size shall be in accordance with tables 1.8 to 1.13, inclusive, or the corresponding table in ASA B1.1.

Examples: 0.250-28NF-3
2.000-8N-2

2. MODIFIED AMERICAN NATIONAL THREADS.—It is occasionally necessary to modify the limits of size of the major diameter of an external thread or the minor diameter of an internal thread from the limits established for standard series and special threads in order to fit a specific purpose but without change in class of thread or pitch diameter limits. Such threads should be specified with the established thread designation followed by a statement of the modified diameter limits and the designation "MOD."

External thread:
3/8-24NF-3 MOD.
Major diameter .3720-.3648 MOD.
Internal thread:
3/8-24NF-2 MOD.
Minor diameter .330-.336 MOD.

For further examples see section III, p. 26.

TABLE 1.8.—*Limits of size and tolerances, classes 1, 2, 3, and 4, American National coarse-thread series, NC*

Limits of size and tolerances		Machine screw number or nominal size															
		1	2	3	4	5	6	8	10	12	1/4	5/16	3/8	7/16	1/2	9/16	5/8
		Threads per inch															
		64	56	48	40	40	32	32	24	24	20	18	16	14	13	12	11
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Class 1, major diameter	Max	0.0723	0.0852	0.0981	0.1110	0.1240	0.1369	0.1629	0.1887	0.2147	0.2485	0.3109	0.3732	0.4354	0.4978	0.5601	0.6224
	Min	.0671	.0796	.0919	.1042	.1172	.1293	.1553	.1795	.2055	.2383	.2995	.3606	.4214	.4830	.5443	.6054
	Tol	.0052	.0056	.0062	.0068	.0068	.0076	.0076	.0092	.0092	.0102	.0114	.0126	.0140	.0148	.0158	.0170
Classes 2, 3, and 4, major diameter	Max	.0730	.0860	.0990	.1120	.1250	.1380	.1640	.1900	.2160	.2500	.3125	.3750	.4375	.5000	.5625	.6250
	Min	.0692	.0820	.0946	.1072	.1202	.1326	.1586	.1834	.2094	.2428	.3043	.3660	.4277	.4896	.5513	.6132
	Tol	.0038	.0040	.0044	.0048	.0048	.0054	.0054	.0066	.0066	.0072	.0082	.0090	.0098	.0104	.0112	.0118
Class 2, major diameter (threaded parts of unfinished, hot-rolled material)	Max	.0730	.0860	.0990	.1120	.1250	.1380	.1640	.1900	.2160	.2500	.3125	.3750	.4375	.5000	.5625	.6250
	Min	.0678	.0804	.0928	.1052	.1182	.1304	.1564	.1808	.2068	.2398	.3011	.3624	.4235	.4852	.5467	.6080
	Tol	.0052	.0056	.0062	.0068	.0068	.0076	.0076	.0092	.0092	.0102	.0114	.0126	.0140	.0148	.0158	.0170
Class 1, minor diameter	Max [1]	.0531	.0633	.0725	.0803	.0933	.0986	.1246	.1376	.1636	.1872	.2427	.2995	.3478	.4034	.4579	.5109
Classes 2, 3, and 4, minor diameter	Max [1]	.0538	.0641	.0734	.0813	.0943	.0997	.1257	.1389	.1649	.1887	.2443	.2983	.3499	.4056	.4603	.5135
Class 1, pitch diameter	Max [4]	.0622	.0736	.0846	.0948	.1078	.1166	.1426	.1616	.1876	.2160	.2748	.3326	.3890	.4478	.5060	.5634
	Min	.0596	.0708	.0815	.0914	.1044	.1128	.1388	.1570	.1830	.2109	.2691	.3263	.3820	.4404	.4981	.5549
	Tol	.0026	.0028	.0031	.0034	.0034	.0038	.0038	.0046	.0046	.0051	.0057	.0063	.0070	.0074	.0079	.0085
Class 2, pitch diameter	Max [4]	.0629	.0744	.0855	.0958	.1088	.1177	.1437	.1629	.1889	.2175	.2764	.3344	.3911	.4500	.5084	.5660
	Min	.0610	.0724	.0833	.0934	.1064	.1150	.1410	.1596	.1856	.2139	.2723	.3299	.3862	.4448	.5028	.5601
	Tol	.0019	.0020	.0022	.0024	.0024	.0027	.0027	.0033	.0033	.0036	.0041	.0045	.0049	.0052	.0056	.0059
Class 3, pitch diameter	Max [3]	.0629	.0744	.0855	.0958	.1088	.1177	.1437	.1629	.1889	.2175	.2764	.3344	.3911	.4500	.5084	.5660
	Min	.0615	.0729	.0839	.0941	.1071	.1158	.1418	.1605	.1865	.2149	.2734	.3312	.3875	.4463	.5044	.5618
	Tol	.0014	.0015	.0016	.0017	.0017	.0019	.0019	.0024	.0024	.0026	.0030	.0032	.0036	.0037	.0040	.0042
Class 4, pitch diameter	Max [3]	------	------	------	------	------	------	------	------	------	.2178	.2767	.3348	.3915	.4504	.5089	.5665
	Min	------	------	------	------	------	------	------	------	------	.2165	.2752	.3332	.3897	.4485	.5069	.5644
	Tol	------	------	------	------	------	------	------	------	------	.0013	.0015	.0016	.0018	.0019	.0020	.0021
INTERNAL THREADS																	
Classes 1, 2, 3, and 4, major diameter	Min [2]	.0730	.0860	.0990	.1120	.1250	.1380	.1640	.1900	.2160	.2500	.3125	.3750	.4375	.5000	.5625	.6250
Classes 1, 2, 3, and 4, minor diameter	Min	.0561	.0667	.0764	.0849	.0979	.1042	.1302	.1449	.1709	.1959	.2524	.3073	.3602	.4167	.4723	.5266
	Max	.0623	.0737	.0841	.0938	.1062	.1145	.1384	.1559	.1801	.2060	.2630	.3184	.3721	.4290	.4850	.5397
	Tol	.0062	.0070	.0077	.0089	.0083	.0103	.0082	.0110	.0092	.0101	.0106	.0111	.0119	.0123	.0127	.0131
Classes 1, 2, 3, and 4, pitch diameter	Min [3]	.0629	.0744	.0855	.0958	.1088	.1177	.1437	.1629	.1889	.2175	.2764	.3344	.3911	.4500	.5084	.5660
Class 1, pitch diameter	Max	.0655	.0772	.0886	.0992	.1122	.1215	.1475	.1675	.1935	.2226	.2821	.3407	.3981	.4574	.5163	.5745
	Tol	.0026	.0028	.0031	.0034	.0034	.0038	.0038	.0046	.0046	.0051	.0057	.0063	.0070	.0074	.0079	.0085
Class 2, pitch diameter	Max	.0648	.0764	.0877	.0982	.1112	.1204	.1464	.1662	.1922	.2211	.2805	.3389	.3960	.4552	.5140	.5719
	Tol	.0019	.0020	.0022	.0024	.0024	.0027	.0027	.0033	.0033	.0036	.0041	.0045	.0049	.0052	.0056	.0059
Class 3, pitch diameter	Max	.0643	.0759	.0871	.0975	.1105	.1196	.1456	.1653	.1913	.2201	.2794	.3376	.3947	.4537	.5124	.5702
	Tol	.0014	.0015	.0016	.0017	.0017	.0019	.0019	.0024	.0024	.0026	.0030	.0032	.0036	.0037	.0040	.0042
Class 4, pitch diameter	Max	------	------	------	------	------	------	------	------	------	.2188	.2779	.3360	.3929	.4519	.5104	.5681
	Tol	------	------	------	------	------	------	------	------	------	.0013	.0015	.0016	.0018	.0019	.0020	.0021

See footnotes on p. 134.

TABLE 1.8.—*Limits of size and tolerances, classes 1, 2, 3, and 4, American National coarse-thread series, NC*—Continued

Limits of size and tolerances		¾	⅞	1	1⅛	1¼	1⅜	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4
	Threads per inch	10	9	8	7	7	6	6	5	4½	4½	4	4	4	4	4	4	4
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Class 1, major diameter	Max	0.7472	0.8719	0.9966	1.1211	1.2461	1.3706	1.4956	1.7448	1.9943	2.2443	2.4936	2.7436	2.9936	3.2436	3.4936	3.7436	3.9936
	Min	.7288	.8519	.9744	1.0963	1.2213	1.3416	1.4666	1.7110	1.9575	2.2075	2.4528	2.7028	2.9528	3.2028	3.4528	3.7028	3.9528
	Tol	.0184	.0200	.0222	.0248	.0248	.0290	.0290	.0338	.0368	.0368	.0408	.0408	.0408	.0408	.0408	.0408	.0408
Classes 2, 3, and 4, major diameter	Max	.7500	.8750	1.0000	1.1250	1.2500	1.3750	1.5000	1.7500	2.0000	2.2500	2.5000	2.7500	3.0000	3.2500	3.5000	3.7500	4.0000
	Min	.7372	.8610	.9848	1.1080	1.2330	1.3548	1.4798	1.7268	1.9746	2.2246	2.4720	2.7220	2.9720	3.2220	3.4720	3.7220	3.9720
	Tol	.0128	.0140	.0152	.0170	.0170	.0202	.0202	.0232	.0254	.0254	.0280	.0280	.0280	.0280	.0280	.0280	.0280
Class 2, major diameter (threaded parts of unfinished, hot-rolled material).	Max	.7500	.8750	1.0000	1.1250	1.2500	1.3750	1.5000	1.7500	2.0000	2.2500	2.5000	2.7500	3.0000	3.2500	3.5000	3.7500	4.0000
	Min	.7316	.8550	.9778	1.1002	1.2252	1.3460	1.4710	1.7162	1.9632	2.2132	2.4592	2.7092	2.9592	3.2092	3.4592	3.7092	3.9592
	Tol	.0184	.0200	.0222	.0248	.0248	.0290	.0290	.0338	.0368	.0368	.0408	.0408	.0408	.0408	.0408	.0408	.0408
Class 1, minor diameter	Max [1]	.6245	.7356	.8432	.9458	1.0708	1.1661	1.2911	1.4994	1.7217	1.9717	2.1869	2.4369	2.6869	2.9369	3.1869	3.4369	3.6869
Classes 2, 3, and 4, minor diameter	Max [1]	.6273	.7387	.8466	.9497	1.0747	1.1705	1.2955	1.5046	1.7274	1.9774	2.1933	2.4433	2.6933	2.9433	3.1933	3.4433	3.6933
Class 1, pitch diameter	Max [3]	.6822	.7997	.9154	1.0283	1.1533	1.2623	1.3873	1.6149	1.8500	2.1000	2.3312	2.5812	2.8312	3.0812	3.3312	3.5612	3.8312
	Min	.6730	.7897	.9043	1.0159	1.1409	1.2478	1.3728	1.5980	1.8316	2.0816	2.3108	2.5608	2.8108	3.0608	3.3108	3.5608	3.8108
	Tol	.0092	.0100	.0111	.0124	.0124	.0145	.0145	.0169	.0184	.0184	.0204	.0204	.0204	.0204	.0204	.0204	.0204
Class 2, pitch diameter	Max [3]	.6850	.8028	.9188	1.0322	1.1572	1.2667	1.3917	1.6201	1.8557	2.1057	2.3376	2.5876	2.8376	3.0976	3.3376	3.5876	3.8376
	Min	.6786	.7958	.9112	1.0237	1.1487	1.2566	1.3816	1.6085	1.8430	2.0930	2.3236	2.5736	2.8236	3.0736	3.3236	3.5736	3.8236
	Tol	.0064	.0070	.0076	.0085	.0085	.0101	.0101	.0116	.0127	.0127	.0140	.0140	.0140	.0140	.0140	.0140	.0140
Class 3, pitch diameter	Max [3]	.6850	.8028	.9188	1.0322	1.1572	1.2667	1.3917	1.6201	1.8557	2.1057	2.3376	2.5876	2.8376	3.0876	3.3376	3.5876	3.8376
	Min	.6805	.7979	.9134	1.0263	1.1513	1.2596	1.3846	1.6119	1.8468	2.0968	2.3279	2.5779	2.8279	3.0779	3.3279	3.5779	3.8279
	Tol	.0045	.0049	.0054	.0059	.0059	.0071	.0071	.0082	.0089	.0089	.0097	.0097	.0097	.0097	.0097	.0097	.0097
Class 4, pitch diameter	Max [3]	.6856	.8034	.9195	1.0330	1.1580	1.2676	1.3926	1.6211	1.8568	2.1068	2.3389	2.5889	2.8389	3.0889	3.3399	3.5589	3.8389
	Min	.6833	.8010	.9168	1.0300	1.1550	1.2640	1.3890	1.6170	1.8524	2.1024	2.3341	2.5841	2.8341	3.0841	3.3341	3.5841	3.8341
	Tol	.0023	.0024	.0027	.0030	.0030	.0036	.0036	.0041	.0044	.0044	.0048	.0048	.0048	.0048	.0048	.0048	.0048
INTERNAL THREADS																		
Classes 1, 2, 3, and 4, major diameter	Min [2]	.7500	.8750	1.0000	1.1250	1.2500	1.3750	1.5000	1.7500	2.0000	2.2500	2.5000	2.7500	3.0000	3.2500	3.5000	3.7500	4.0000
Classes 1, 2, 3, and 4, minor diameter	Min	.6417	.7547	.8647	.9704	1.0954	1.1946	1.3196	1.5335	1.7594	2.0094	2.2294	2.4794	2.7294	2.9794	3.2294	3.4794	3.7294
	Max	.6553	.7689	.8795	.9858	1.1108	1.2126	1.3376	1.5551	1.7835	2.0335	2.2564	2.5064	2.7564	3.0064	3.2564	3.5064	3.7564
	Tol	.0136	.0142	.0148	.0154	.0154	.0180	.0180	.0216	.0241	.0241	.0270	.0270	.0270	.0270	.0270	.0270	.0270
Classes 1, 2, 3, and 4, pitch diameter	Min [3]	.6850	.8028	.9188	1.0322	1.1572	1.2667	1.3917	1.6201	1.8557	2.1057	2.3376	2.5876	2.8376	3.0876	3.3376	3.5876	3.8376
Class 1, pitch diameter	Max	.6942	.8128	.9299	1.0446	1.1696	1.2812	1.4062	1.6370	1.8741	2.1241	2.3580	2.6080	2.8580	3.1080	3.3580	3.6080	3.8580
	Tol	.0092	.0100	.0111	.0124	.0124	.0145	.0145	.0169	.0184	.0184	.0204	.0204	.0204	.0204	.0204	.0204	.0204
Class 2, pitch diameter	Max	.6914	.8098	.9264	1.0407	1.1657	1.2768	1.4018	1.6317	1.8684	2.1184	2.3516	2.6016	2.8516	3.1016	3.3516	3.6016	3.8516
	Tol	.0064	.0070	.0076	.0085	.0085	.0101	.0101	.0116	.0127	.0127	.0140	.0140	.0140	.0140	.0140	.0140	.0140
Class 3, pitch diameter	Max	.6895	.8077	.9242	1.0381	1.1631	1.2738	1.3988	1.6283	1.8646	2.1146	2.3473	2.5973	2.8473	3.0973	3.3473	3.5973	3.8473
	Tol	.0045	.0049	.0054	.0059	.0059	.0071	.0071	.0082	.0089	.0089	.0097	.0097	.0097	.0097	.0097	.0097	.0097
Class 4, pitch diameter	Max	.6873	.8052	.9215	1.0352	1.1602	1.2703	1.3953	1.6242	1.8601	2.1101	2.3424	2.5924	2.8424	3.0924	3.3424	3.5924	3.8424
	Tol	.0023	.0024	.0027	.0030	.0030	.0036	.0036	.0041	.0044	.0044	.0048	.0048	.0048	.0048	.0048	.0048	.0048

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[1] Dimensions given for the maximum minor diameter of the external thread are figured to the intersection of the worn tool arc with a center line through crest and root. The minimum minor diameter of the external thread shall be that corresponding to a flat at the minor diameter of the minimum external thread equal to $\frac{1}{8}\times p$, and may be determined by subtracting the basic thread depth, h (or $0.6495\,p$), from the minimum pitch diameter of the external thread.

[2] Dimensions for the minimum major diameter of the internal thread correspond to the basic flat ($\frac{1}{8}\times p$) and the profile at the major diameter produced by a worn tool must not fall below the basic outline. The maximum major diameter of the internal thread shall be that corresponding to a flat at the major diameter of the maximum internal thread equal to $\frac{1}{24}\times p$, and may be determined by adding $1\frac{2}{9}\times h$ (or $0.7939\,p$) to the maximum pitch diameter of the internal thread.

[3] These dimensions are the maximum material or "go" size and are those which should be placed on the component drawing with the tolerances.

TABLE 1.9.—*Limits of size and tolerances, classes 1, 2, 3, and 4, American National fine-thread series, NF*

Limits of size and tolerances		Machine screw number or nominal size													
		0	1	2	3	4	5	6	8	10	12	¼	5/16	⅜	7/16
		Threads per inch													
		80	72	64	56	48	44	40	36	32	28	28	24	24	20
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Class 1, major diameter	Max	0.0593	0.0723	0.0853	0.0982	0.1111	0.1241	0.1370	0.1629	0.1889	0.2148	0.2488	0.3112	0.3737	0.4360
	Min	.0545	.0673	.0801	.0926	.1049	.1177	.1302	.1557	.1813	.2062	.2402	.3020	.3645	.4258
	Tol	.0048	.0050	.0052	.0056	.0062	.0064	.0068	.0072	.0076	.0086	.0086	.0092	.0092	.0102
Classes 2, 3, and 4, major diameter	Max	.0600	.0730	.0860	.0990	.1120	.1250	.1380	.1640	.1900	.2160	.2500	.3125	.3750	.4375
	Min	.0566	.0694	.0822	.0950	.1076	.1204	.1332	.1590	.1846	.2098	.2438	.3059	.3684	.4303
	Tol	.0034	.0036	.0038	.0040	.0044	.0046	.0048	.0050	.0054	.0062	.0062	.0066	.0066	.0072
Class 1, minor diameter	Max.[1]	.0440	.0553	.0661	.0763	.0855	.0962	.1063	.1288	.1506	.1710	.2050	.2601	.3226	.3747
Classes 2, 3, and 4, minor diameter	Max.[1]	.0447	.0560	.0668	.0771	.0864	.0971	.1073	.1299	.1517	.1722	.2062	.2614	.3239	.3762
Class 1, pitch diameter	Max.[3]	.0512	.0633	.0752	.0866	.0976	.1093	.1208	.1449	.1686	.1916	.2256	.2841	.3466	.4035
	Min	.0488	.0608	.0726	.0838	.0945	.1061	.1174	.1413	.1648	.1873	.2213	.2795	.3420	.3984
	Tol	.0024	.0025	.0026	.0028	.0031	.0032	.0034	.0036	.0038	.0043	.0043	.0046	.0046	.0051
Class 2, pitch diameter	Max.[3]	.0519	.0640	.0759	.0874	.0985	.1102	.1218	.1460	.1697	.1928	.2268	.2854	.3479	4050
	Min	.0502	.0622	.0740	.0854	.0963	.1079	.1194	.1435	.1670	.1897	.2237	.2821	.3446	.4014
	Tol	.0017	.0018	.0019	.0020	.0022	.0023	.0024	.0025	.0027	.0031	.0031	.0033	.0033	.0036
Class 3, pitch diameter	Max.[3]	.0519	.0640	.0759	.0874	.0985	.1102	.1218	.1460	.1697	.1928	.2268	.2854	.3479	.4050
	Min	.0506	.0627	.0745	.0859	.0969	.1086	.1201	.1442	.1678	.1906	.2246	.2830	.3455	.4024
	Tol	.0013	.0013	.0014	.0015	.0016	.0016	.0017	.0018	.0019	.0022	.0022	.0024	.0024	.0026
Class 4, pitch diameter	Max.[3]	------	------	------	------	------	------	------	------	------	------	.2270	.2857	.3482	.4053
	Min	------	------	------	------	------	------	------	------	------	------	.2259	.2845	.3470	.4040
	Tol	------	------	------	------	------	------	------	------	------	------	.0011	.0012	.0012	.0013
INTERNAL THREADS															
Classes 1, 2, 3, and 4, major diameter	Min.[2]	.0600	.0730	.0860	.0990	.1120	.1250	.1380	.1640	.1900	.2160	.2500	.3125	.3750	.4375
Classes 1, 2, 3, and 4, minor diameter	Min	.0465	.0580	.0691	.0797	.0894	.1004	.1109	.1339	.1562	.1773	.2113	.2674	.3299	.3834
	Max	.0514	.0634	.0746	.0856	.0960	.1068	.1179	.1402	.1624	.1835	.2173	.2739	.3364	.3906
	Tol	.0049	.0054	.0055	.0059	.0066	.0064	.0070	.0063	.0062	.0062	.0060	.0065	.0065	.0072
Classes 1, 2, 3, and 4, pitch diameter	Min.[3]	.0519	.0640	.0759	.0874	.0985	.1102	.1218	.1460	.1697	.1928	.2268	.2854	.3479	.4050
Class 1, pitch diameter	Max	.0543	.0665	.0785	.0902	.1016	.1134	.1252	.1496	.1735	.1971	.2311	.2900	.3525	.4101
	Tol	.0024	.0025	.0026	.0028	.0031	.0032	.0034	.0036	.0038	.0043	.0043	.0046	.0046	.0051
Class 2, pitch diameter	Max	.0536	.0658	.0778	.0894	.1007	.1125	.1242	.1485	.1724	.1959	.2299	.2887	.3512	.4086
	Tol	.0017	.0018	.0019	.0020	.0022	.0023	.0024	.0025	.0027	.0031	.0031	.0033	.0033	.0036
Class 3, pitch diameter	Max	.0532	.0653	.0773	.0889	.1001	.1118	.1235	.1478	.1716	.1950	.2290	.2878	.3503	.4076
	Tol	.0013	.0013	.0014	.0015	.0016	.0016	.0017	.0018	.0019	.0022	.0022	.0024	.0024	.0026
Class 4, pitch diameter	Max	------	------	------	------	------	------	------	------	------	------	.2279	.2866	.3491	.4063
	Tol	------	------	------	------	------	------	------	------	------	------	.0011	.0012	.001	.0013

See footnotes on p. 136

TABLE 1.9.—*Limits of size and tolerances, classes 1, 2, 3, and 4, American National fine-thread series, NF*—Continued

Limits of size and tolerances		Size (inches)									
		½	9/16	⅝	¾	⅞	1	1⅛	1¼	1⅜	1½
		Threads per inch									
		20	18	18	16	14	14NS	12	12	12	12
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Class 1, major diameter	Max	0.4985	0.5609	0.6234	0.7482	0.8729	0.9979	1.1226	1.2476	1.3726	1.4976
	Min	.4883	.5495	.6120	.7356	.8589	.9839	1.1068	1.2318	1.3568	1.4818
	Tol	.0102	.0114	.0114	.0126	.0140	.0140	.0158	.0158	.0158	.0158
Classes 2, 3, and 4, major diameter	Max	.5000	.5625	.6250	.7500	.8750	1.0000	1.1250	1.2500	1.3750	1.5000
	Min	.4928	.5543	.6168	.7410	.8652	.9902	1.1138	1.2388	1.3638	1.4888
	Tol	.0072	.0082	.0082	.0090	.0098	.0098	.0112	.0112	.0112	.0112
Class 1, minor diameter	Max [1]	.4372	.4927	.5552	.6715	.7853	.9103	1.0204	1.1454	1.2704	1.3954
Classes 2, 3, and 4, minor diameter	Max [1]	.4387	.4943	.5568	.6733	.7874	.9124	1.0228	1.1478	1.2728	1.3976
Class 1, pitch diameter	Max [3]	.4660	.5248	.5873	.7076	.8265	.9515	1.0685	1.1935	1.3185	1.4435
	Min	.4609	.5191	.5816	.7013	.8195	.9445	1.0606	1.1856	1.3106	1.4356
	Tol	.0051	.0057	.0057	.0063	.0070	.0070	.0079	.0079	.0079	.0079
Class 2, pitch diameter	Max [3]	.4675	.5264	.5889	.7094	.8286	.9536	1.0709	1.1959	1.3209	1.4459
	Min	.4639	.5223	.5848	.7049	.8237	.9487	1.0653	1.1903	1.3153	1.4403
	Tol	.0036	.0041	.0041	.0045	.0049	.0049	.0056	.0056	.0056	.0056
Class 3, pitch diameter	Max [3]	.4675	.5264	.5889	.7094	.8286	.9536	1.0709	1.1959	1.3209	1.4459
	Min	.4649	.5234	.5859	.7062	.8250	.9500	1.0669	1.1919	1.3169	1.4419
	Tol	.0026	.0030	.0030	.0032	.0036	.0036	.0040	.0040	.0040	.0040
Class 4, pitch diameter	Max [3]	.4678	.5267	.5892	.7098	.8290	.9540	1.0714	1.1964	1.3214	1.4464
	Min	.4665	.5252	.5877	.7082	.8272	.9522	1.0694	1.1944	1.3194	1.4444
	Tol	.0013	.0015	.0015	.0016	.0018	.0018	.0020	.0020	.0020	.0020
INTERNAL THREADS											
Classes 1, 2, 3, and 4, major diameter	Min [2]	.5000	.5625	.6250	.7500	.8750	1.0000	1.1250	1.2500	1.3750	1.5000
Classes 1, 2, 3, and 4, minor diameter	Min	.4459	.5024	.5649	.6823	.7977	.9227	1.0348	1.1598	1.2848	1.4098
	Max	.4531	.5100	.5725	.6903	.8062	.9312	1.0438	1.1688	1.2938	1.4188
	Tol	.0072	.0076	.0076	.0080	.0085	.0085	.0090	.0090	.0090	.0090
Classes 1, 2, 3, and 4, pitch diameter	Min [3]	.4675	.5264	.5889	.7094	.8286	.9536	1.0709	1.1959	1.3209	1.4459
Class 1, pitch diameter	Max	.4726	.5321	.5946	.7157	.8356	.9606	1.0788	1.2038	1.3288	1.4538
	Tol	.0051	.0057	.0057	.0063	.0070	.0070	.0079	.0079	.0079	.0079
Class 2, pitch diameter	Max	.4711	.5305	.5930	.7139	.8335	.9585	1.0765	1.2015	1.3265	1.4515
	Tol	.0036	.0041	.0041	.0045	.0049	.0049	.0056	.0056	.0056	.0056
Class 3, pitch diameter	Max	.4701	.5294	.5919	.7126	.8322	.9572	1.0749	1.1999	1.3249	1.4499
	Tol	.0026	.0030	.0030	.0032	.0036	.0036	.0040	.0040	.0040	.0040
Class 4, pitch diameter	Max	.4688	.5279	.5904	.7110	.8304	.9554	1.0729	1.1979	1.3229	1.4479
	Tol	.0013	.0015	.0015	.0016	.0018	.0018	.0020	.0020	.0020	.0020

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[1] Dimensions given for the maximum minor diameter of the external thread are figured to the intersection of the worn tool arc with a center line through crest and root. The minimum minor diameter of the external thread shall be that corresponding to a flat at the minor diameter of the minimum external thread equal to ⅛×p, and may be determined by subtracting the basic thread depth, h (or 0.6495p), from the minimum pitch diameter of the external thread.

[2] Dimensions for the minimum major diameter of the internal thread correspond to the basic flat (⅛×p) and the profile at the major diameter produced by a worn tool must not fall below the basic outline. The maximum major diameter of the internal thread shall be that corresponding to a flat at the major diameter of the maximum internal thread equal to 1/24×p, and may be determined by adding 1⅙×h (or 0.7939p) to the maximum pitch diameter of the internal thread.

[3] These dimensions are the maximum material or "go" size, and are those which should be placed on the component drawing with the tolerances.

TABLE 1.10.—*Limits of size and tolerances, classes 2 and 3, American National extra-fine-thread series, NEF*

Limits of size and tolerances[1]		Size (inches)												
		1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1
		Threads per inch												
		32	32	32	28	28	24	24	24	20	20	20	20	20
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	0.2500	0.3125	0.3750	0.4375	0.5000	0.5625	0.6250	0.6875	0.7500	0.8125	0.8750	0.9375	1.0000
	Min	.2446	.3071	.3696	.4313	.4938	.5559	.6184	.6809	.7428	.8053	.8678	.9303	.9928
	Tol	.0054	.0054	.0054	.0062	.0062	.0066	.0066	.0066	.0072	.0072	.0072	.0072	.0072
Classes 2 and 3, minor diameter	Max[2]	.2117	.2742	.3367	.3937	.4562	.5114	.5739	.6364	.6887	.7512	.8137	.8762	.9387
Class 2, pitch diameter	Max[4]	.2297	.2922	.3547	.4143	.4768	.5354	.5979	.6604	.7175	.7800	.8425	.9050	.9675
	Min	.2265	.2889	.3513	.4107	.4731	.5314	.5938	.6563	.7129	.7754	.8378	.9003	.9627
	Tol	.0032	.0033	.0034	.0036	.0037	.0040	.0041	.0041	.0046	.0046	.0047	.0047	.0048
Class 3, pitch diameter	Max[4]	.2297	.2922	.3547	.4143	.4768	.5354	.5979	.6604	.7175	.7800	.8425	.9050	.9675
	Min	.2275	.2899	.3523	.4118	.4742	.5326	.5950	.6575	.7143	.7768	.8392	.9017	.9641
	Tol	.0022	.0023	.0024	.0025	.0026	.0028	.0029	.0029	.0032	.0032	.0033	.0033	.0034
INTERNAL THREADS														
Classes 2 and 3, major diameter	Min[3]	.2500	3125	.3750	.4375	.5000	.5625	.6250	.6875	.7500	.8125	.8750	.9375	1.0000
Classes 2 and 3, minor diameter	Min	.2162	.2787	.3412	.3988	.4613	.5174	.5799	.6424	.6959	.7584	.8209	.8834	.9459
	Max	.2210	.2835	.3460	.4044	.4669	.5239	.5864	.6489	.7031	.7656	.8281	.8906	.9531
	Tol	.0048	.0048	.0048	.0056	.0056	.0065	.0065	.0065	.0072	.0072	.0072	.0072	.0072
Class 2, pitch diameter	Min[4]	.2297	.2922	.3547	.4143	.4768	.5354	.5979	.6604	.7175	.7800	.8425	.9050	.9675
	Max	.2329	.2955	.3581	.4179	.4805	.5394	.6020	.6645	.7221	.7846	.8472	.9097	.9723
	Tol	.0032	.0033	.0034	.0036	.0037	.0040	.0041	.0041	.0046	.0046	.0047	.0047	.0048
Class 3, pitch diameter	Min[4]	.2297	.2922	.3547	.4143	.4768	.5354	.5979	.6604	.7175	.7800	.8425	.9050	.9675
	Max	.2319	.2945	.3571	.4168	.4794	.5382	.6008	.6633	.7207	.7832	.8458	.9083	.9709
	Tol	.0022	.0023	.0024	.0025	.0026	.0028	.0029	.0029	.0032	.0032	.0033	.0033	.0034

Limits of size and tolerances[1]		Size (inches)												
		1 1/16	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8	1 7/16	1 1/2	1 9/16	1 5/8	1 11/16	1 3/4	2
		Threads per inch												
		18	18	18	18	18	18	18	18	18	18	18	16	16
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	1.0625	1.1250	1.1875	1.2500	1.3125	1.3750	1.4375	1.5000	1.5625	1.6250	1.6875	1.7500	2.0000
	Min	1.0543	1.1168	1.1793	1.2418	1.3043	1.3668	1.4293	1.4918	1.5543	1.6168	1.6793	1.7410	1.9910
	Tol	.0082	.0082	.0082	.0082	.0082	.0082	.0082	.0082	.0082	.0082	.0082	.0090	.0090
Classes 2 and 3, minor diameter	Max[2]	.9943	1.0568	1.1193	1.1818	1.2443	1.3068	1.3693	1.4318	1.4943	1.5568	1.6193	1.6733	1.9233
Class 2, pitch diameter	Max[4]	1.0264	1.0889	1.1514	1.2139	1.2764	1.3389	1.4014	1.4639	1.5264	1.5889	1.6514	1.7094	1.9594
	Min	1.0213	1.0837	1.1462	1.2086	1.2711	1.3335	1.3960	1.4584	1.5209	1.5833	1.6458	1.7035	1.9533
	Tol	.0051	.0052	.0052	.0053	.0053	.0054	.0054	.0055	.0055	.0056	.0056	.0059	.0061
Class 3, pitch diameter	Max[4]	1.0264	1.0889	1.1514	1.2139	1.2764	1.3389	1.4014	1.4639	1.5264	1.5889	1.6514	1.7094	1.9594
	Min	1.0228	1.0853	1.1478	1.2102	1.2727	1.3351	1.3976	1.4601	1.5225	1.5850	1.6475	1.7053	1.9551
	Tol	.0036	.0036	.0036	.0037	.0037	.0038	.0038	.0038	.0039	.0039	.0039	.0041	.0043
INTERNAL THREADS														
Classes 2 and 3, major diameter	Min[3]	1.0625	1.1250	1.1875	1.2500	1.3125	1.3750	1.4375	1.5000	1.5625	1.6250	1.6875	1.7500	2.0000
Classes 2 and 3, minor diameter	Min	1.0024	1.0649	1.1274	1.1899	1.2524	1.3149	1.3774	1.4399	1.5024	1.5649	1.6274	1.6823	1.9323
	Max	1.0100	1.0725	1.1350	1.1975	1.2600	1.3225	1.3850	1.4475	1.5100	1.5725	1.6350	1.6903	1.9403
	Tol	.0076	.0076	.0076	.0076	.0076	.0076	.0076	.0076	.0076	.0076	.0076	.0080	.0080
Class 2, pitch diameter	Min[4]	1.0264	1.0889	1.1514	1.2139	1.2764	1.3389	1.4014	1.4639	1.5264	1.5889	1.6514	1.7094	1.9594
	Max	1.0315	1.0941	1.1566	1.2192	1.2817	1.3443	1.4068	1.4694	1.5319	1.5945	1.6570	1.7153	1.9655
	Tol	.0051	.0052	.0052	.0053	.0053	.0054	.0054	.0055	.0055	.0056	.0056	.0059	.0061
Class 3, pitch diameter	Min[4]	1.0264	1.0889	1.1514	1.2139	1.2764	1.3389	1.4014	1.4639	1.5264	1.5889	1.6514	1.7094	1.9594
	Max	1.0300	1.0925	1.1550	1.2176	1.2801	1.3427	1.4052	1.4677	1.5303	1.5928	1.6553	1.7135	1.9637
	Tol	.0036	.0036	.0036	.0037	.0037	.0038	.0038	.0038	.0039	.0039	.0039	.0041	.0043

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[1] Pitch diameter tolerances include deviations of lead and angle. The class 2 tolerances are based on the formulas in table 2.2 and a length of engagement of 9 threads. The class 3 tolerances are 70 percent of the class 2 tolerances.

[2] Dimensions given for the maximum minor diameter of the external thread are figured to the intersection of the worn tool arc with a center line through crest and root. The minimum minor diameter of the external thread shall be that corresponding to a flat at the minor diameter of the minimum external thread equal to 1/8 × p, and may be determined by subtracting the basic thread depth, *h* (or 0.6495 *p*), from the minimum pitch diameter of the external thread.

[3] Dimensions for the minimum major diameter of the internal thread correspond to the basic flat (1/8 × *p*), and the profile at the major diameter produced by a worn tool must not fall below the basic outline. The maximum major diameter of the internal thread shall be that corresponding to a flat at the major diameter of the maximum internal thread equal to 1/24 × *p*, and may be determined by adding 11/9 × *h* (or 0.7939 *p*) to the maximum pitch diameter of the internal thread.

[4] These dimensions are the maximum material or "go" size, and are those which should be placed on the component drawing with the tolerances.

TABLE 1.11.—*Limits of size and tolerances, classes 2 and 3, American National 8-thread series, 8N*

Limits of size and tolerances[1]		Size (inches)								
		1[2]	1⅛	1¼	1⅜	1½	1⅝	1¾	1⅞	2
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	1.0000	1.1250	1.2500	1.3750	1.5000	1.6250	1.7500	1.8750	2.0000
	Min	.9848	1.1098	1.2348	1.3598	1.4848	1.6098	1.7348	1.8598	1.9848
	Tol	.0152	.0152	.0152	.0152	.0152	.0152	.0152	.0152	.0152
Classes 2 and 3, minor diameter	Max[3]	.8466	.9716	1.0966	1.2216	1.3466	1.4716	1.5966	1.7216	1.8466
Class 2, pitch diameter (for general use)	Max[3]	.9188	1.0438	1.1688	1.2938	1.4188	1.5438	1.6688	1.7938	1.9188
	Min	.9112	1.0359	1.1605	1.2852	1.4098	1.5345	1.6591	1.7838	1.9084
	Tol	.0076	.0079	.0083	.0086	.0090	.0093	.0097	.0100	.0104
Class 3, pitch diameter	Max[5]	.9188	1.0438	1.1688	1.2938	1.4188	1.5438	1.6688	1.7938	1.9188
	Min	.9134	1.0383	1.1630	1.2877	1.4125	1.5373	1.6620	1.7868	1.9115
	Tol	.0054	.0055	.0058	.0061	.0063	.0065	.0068	.0070	.0073
INTERNAL THREADS										
Classes 2 and 3, major diameter	Min[4]	1.0000	1.1250	1.2500	1.3750	1.5000	1.6250	1.7500	1.8750	2.0000
Classes 2 and 3, minor diameter	Min	.8647	.9897	1.1147	1.2397	1.3647	1.4897	1.6147	1.7397	1.8647
	Max	.8795	1.0045	1.1295	1.2545	1.3795	1.5045	1.6295	1.7545	1.8795
	Tol	.0148	.0148	.0148	.0148	.0148	.0148	.0148	.0148	.0148
Classes 2 and 3, pitch diameter	Min[5]	.9188	1.0438	1.1688	1.2938	1.4188	1.5438	1.6688	1.7938	1.9188
Class 2, pitch diameter (for general use)	Max	.9264	1.0517	1.1771	1.3024	1.4278	1.5531	1.6785	1.8038	1.9292
	Tol	.0076	.0079	.0083	.0086	.0090	.0093	.0097	.0100	.0104
Class 3, pitch diameter	Max	.9242	1.0493	1.1746	1.2999	1.4251	1.5503	1.6756	1.8008	1.9261
	Tol	.0054	.0055	.0058	.0061	.0063	.0065	.0068	.0070	.0073

Limits of size and tolerances[1]		Size (inches)								
		2⅛	2¼	2½	2¾	3	3¼	3½	3¾	4
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	2.1250	2.2500	2.5000	2.7500	3.0000	3.2500	3.5000	3.7500	4.0000
	Min	2.1098	2.2348	2.4848	2.7348	2.9848	3.2348	3.4848	3.7348	3.9848
	Tol	.0152	.0152	.0152	.0152	.0152	.0152	.0152	.0152	.0152
Classes 2 and 3, minor diameter	Max[3]	1.9716	2.0966	2.3466	2.5966	2.8466	3.0966	3.3466	3.5966	3.8466
Class 2, pitch diameter (for general use)	Max[3]	2.0438	2.1688	2.4188	2.6688	2.9188	3.1688	3.4188	3.6688	3.9188
	Min	2.0331	2.1578	2.4071	2.6564	2.9058	3.1556	3.4055	3.6554	3.9053
	Tol	.0107	.0110	.0117	.0124	.0130	.0132	.0133	.0134	.0135
Class 3, pitch diameter	Max[5]	2.0438	2.1688	2.4188	2.6688	2.9188	3.1688	3.4188	3.6688	3.9188
	Min	2.0363	2.1611	2.4106	2.6601	2.9096	3.1595	3.4095	3.6594	3.9093
	Tol	.0075	.0077	.0082	.0087	.0092	.0093	.0093	.0094	.0095
INTERNAL THREADS										
Classes 2 and 3, major diameter	Min[4]	2.1250	2.2500	2.5000	2.7500	3.0000	3.2500	3.5000	3.7500	4.0000
Classes 2 and 3, minor diameter	Min	1.9897	2.1147	2.3647	2.6147	2.8647	3.1147	3.3647	3.6147	3.8647
	Max	2.0045	2.1295	2.3795	2.6295	2.8795	3.1295	3.3795	3.6295	3.8795
	Tol	.0148	.0148	.0148	.0148	.0148	.0148	.0148	.0148	.0148
Classes 2 and 3, pitch diameter	Min[5]	2.0438	2.1688	2.4188	2.6688	2.9188	3.1688	3.4188	3.6688	3.9188
Class 2, pitch diameter (for general use)	Max	2.0545	2.1798	2.4305	2.6812	2.9318	3.1820	3.4321	3.6822	3.9323
	Tol	.0107	.0110	.0117	.0124	.0130	.0132	.0133	.0134	.0135
Class 3, pitch diameter	Max	2.0513	2.1765	2.4270	2.6775	2.9280	3.1781	3.4281	3.6782	3.9283
	Tol.	.0075	.0077	.0082	.0087	.0092	.0093	.0093	.0094	.0095

See footnotes at end of table.

TABLE 1.11.—*Limits of size and tolerances, classes 2 and 3, American National 8-thread series, 8N*—Continued

Limits of size and tolerances [1]		Size (inches)							
		4¼	4½	4¾	5	5¼	5½	5¾	6
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	4.2500	4.5000	4.7500	5.0000	5.2500	5.5000	5.7500	6.0000
	Min	4.2348	4.4848	4.7348	4.9848	5.2348	5.4848	5.7348	5.9848
	Tol	.0152	.0152	.0152	.0152	.0152	.0152	.0152	.0152
Classes 2 and 3, minor diameter	Max.[3]	4.0966	4.3466	4.5966	4.8466	5.0966	5.3466	5.5966	5.8466
Class 2, pitch diameter (for general use)	Max.[5]	4.1688	4.4188	4.6688	4.9188	5.1688	5.4188	5.6688	5.9188
	Min	4.1551	4.4050	4.6549	4.9048	5.1547	5.4046	5.6545	5.9044
	Tol	.0137	.0138	.0139	.0140	.0141	.0142	.0143	.0144
Class 3, pitch diameter	Max.[5]	4.1688	4.4188	4.6688	4.9188	5.1688	5.4188	5.6688	5.9188
	Min	4.1592	4.4091	4.6590	4.9089	5.1589	5.4088	5.6587	5.9086
	Tol	.0096	.0097	.0098	.0099	.0099	.0100	.0101	.0102
INTERNAL THREADS									
Classes 2 and 3, major diameter	Min.[4]	4.2500	4.5000	4.7500	5.0000	5.2500	5.5000	5.7500	6.0000
Classes 2 and 3, minor diameter	Min	4.1147	4.3647	4.6147	4.8647	5.1147	5.3647	5.6147	5.8647
	Max	4.1295	4.3795	4.6295	4.8795	5.1295	5.3795	5.6295	5.8795
	Tol	.0148	.0148	.0148	.0148	.0148	.0148	.0148	.0148
Classes 2 and 3, pitch diameter	Min.[5]	4.1688	4.4188	4.6688	4.9188	5.1688	5.4188	5.6688	5.9188
Class 2, pitch diameter (for general use)	Max	4.1825	4.4326	4.6827	4.9328	5.1829	5.4330	5.6831	5.9332
	Tol	.0137	.0138	.0139	.0140	.0141	.0142	.0143	.0144
Class 3, pitch diameter	Max	4.1784	4.4285	4.6786	4.9287	5.1787	5.4288	5.6789	5.9290
	Tol	.0096	.0097	.0098	.0099	.0099	.0100	.0101	.0102

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[1] Pitch diameter tolerances include deviations of lead and angle. The class 2 tolerances are based on the formulas in table 2.2 and a length of engagement equal to the basic major diameter for sizes from 1⅛ to 3 inches, inclusive, and a length of engagement of 3 inches for sizes over the 3-inch. The class 3 tolerances are 70 percent of the class 2 tolerances. The 1-inch size being in the American National coarse-thread series, the tolerances for this size correspond to that series.

[2] Standard size of the American National coarse-thread series

[3] Dimensions given for the maximum minor diameter of the external thread are figured to the intersection of the worn tool arc with a center line through crest and root. The minimum minor diameter of the external thread shall be that corresponding to a flat at the minor diameter of the minimum external thread equal to $\frac{1}{8} \times p$, and may be determined by subtracting 0.0812 inch from the minimum pitch diameter of the external thread.

[4] Dimensions for the minimum major diameter of the internal thread correspond to the basic flat ($\frac{1}{8} \times p$), and the profile at the major diameter produced by a worn tool must not fall below the basic outline. The maximum major diameter of the internal thread shall be that corresponding to a flat at the major diameter of the maximum internal thread equal to $\frac{1}{24} \times p$, and may be determined by adding 0.0992 inch to the maximum pitch diameter of the internal thread.

[5] These dimensions are the maximum material or "go" size, and are those which should be placed on the component drawing with the tolerances.

TABLE 1.12.—*Limits of size and tolerances, classes 2 and 3, American National 12-thread series, 12N*

Limits of size and tolerances [1]		Size (inches)							
		½	9/16 [3]	5/8	11/16	¾	13/16	7/8	15/16
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	0.5000	0.5625	0.6250	0.6875	0.7500	0.8125	0.8750	0.9375
	Min	.4888	.5513	.6138	.6763	.7388	.8013	.8638	.9263
	Tol	.0112	.0112	.0112	.0112	.0112	.0112	.0112	.0112
Classes 2 and 3, minor diameter	Max [4]	.3978	.4603	.5228	.5853	.6478	.7103	.7728	.8353
Class 2, pitch diameter (for general use)	Max [6]	.4459	.5084	.5709	.6334	.6959	.7584	.8209	.8834
	Min	.4403	.5028	.5653	.6278	.6903	.7528	.8153	.8778
	Tol	.0056	.0056	.0056	.0056	.0056	.0056	.0056	.0056
Class 3, pitch diameter	Max [6]	.4459	.5084	.5709	.6334	.6959	.7584	.8209	.8834
	Min	.4419	.5044	.5669	.6294	.6919	.7544	.8169	.8794
	Tol	.0040	.0040	.0040	.0040	.0040	.0040	.0040	.0040
INTERNAL THREADS									
Classes 2 and 3, major diameter	Min [5]	.5000	.5625	.6250	.6875	.7500	.8125	.8750	.9375
Classes 2 and 3, minor diameter	Min	.4098	.4723	.5348	.5973	.6598	.7223	.7848	.8473
	Max	.4225	.4850	.5438	.6063	.6688	.7313	.7938	.8563
	Tol	.0127	.0127	.0090	.0090	.0090	.0090	.0090	.0090
Classes 2 and 3, pitch diameter	Min [6]	.4459	.5084	.5709	.6334	.6959	.7584	.8209	.8834
Class 2, pitch diameter (for general use)	Max	.4515	.5140	.5765	.6390	.7015	.7640	.8265	.8890
	Tol	.0056	.0056	.0056	.0056	.0056	.0056	.0056	.0056
Class 3, pitch diameter	Max	.4499	.5124	.5749	.6374	.6999	.7624	.8249	.8874
	Tol	.0040	.0040	.0040	.0040	.0040	.0040	.0040	.0040

Limits of size and tolerances [1]		Size (inches)						
		1	1 1/16	1⅛ [3]	1 3/16	1¼ [3]	1 5/16	1⅜ [3]
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	1.0000	1.0625	1.1250	1.1875	1.2500	1.3125	1.3750
	Min	.9888	1.0513	1.1138	1.1763	1.2388	1.3013	1.3638
	Tol	.0112	.0112	.0112	.0112	.0112	.0112	.0112
Classes 2 and 3, minor diameter	Max [4]	.8978	.9603	1.0228	1.0853	1.1478	1.2103	1.2728
Class 2, pitch diameter (for general use)	Max [6]	.9459	1.0084	1.0709	1.1334	1.1959	1.2584	1.3209
	Min	.9403	1.0028	1.0653	1.1278	1.1903	1.2528	1.3153
	Tol	.0056	.0056	.0056	.0056	.0056	.0056	.0056
Class 3, pitch diameter	Max [6]	.9459	1.0084	1.0709	1.1334	1.1959	1.2584	1.3209
	Min	.9419	1.0044	1.0669	1.1294	1.1919	1.2544	1.3169
	Tol	.0040	.0040	.0040	.0040	.0040	.0040	.0040
INTERNAL THREADS								
Classes 2 and 3, major diameter	Min [5]	1.0000	1.0625	1.1250	1.1875	1.2500	1.3125	1.3750
Classes 2 and 3, minor diameter	Min	.9098	.9723	1.0348	1.0973	1.1598	1.2223	1.2848
	Max	.9188	.9813	1.0438	1.1063	1.1688	1.2313	1.2938
	Tol	.0090	.0090	.0090	.0090	.0090	.0090	.0090
Classes 2 and 3, pitch diameter	Min [6]	.9459	1.0084	1.0709	1.1334	1.1959	1.2584	1.3209
Class 2, pitch diameter (for general use)	Max	.9515	1.0140	1.0765	1.1390	1.2015	1.2640	1.3265
	Tol	.0056	.0056	.0056	.0056	.0056	.0056	.0056
Class 3, pitch diameter	Max	.9499	1.0124	1.0749	1.1374	1.1999	1.2624	1.3249
	Tol	.0040	.0040	.0040	.0040	.0040	.0040	.0040

See footnotes at end of table.

TABLE 1.12.—*Limits of size and tolerances, classes 2 and 3, American National 12-thread series, 12N*—Continued

Limits of size and tolerances [1]		Size (inches)							
		1 7/16	1½ [3]	1⅝	1¾	1⅞	2	2⅛	2¼
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	1.4375	1.5000	1.6250	1.7500	1.8750	2.0000	2.1250	2.2500
	Min	1.4263	1.4888	1.6138	1.7388	1.8638	1.9888	2.1138	2.2388
	Tol	.0112	.0112	.0112	.0112	.0112	.0112	.0112	.0112
Classes 2 and 3, minor diameter	Max [4]	1.3353	1.3978	1.5228	1.6478	1.7728	1.8978	2.0228	2.1478
Class 2, pitch diameter (for general use)	Max [6]	1.3834	1.4459	1.5709	1.6959	1.8209	1.9459	2.0709	2.1959
	Min	1.3778	1.4403	1.5645	1.6894	1.8143	1.9392	2.0641	2.1890
	Tol	.0056	.0056	.0064	.0065	.0066	.0067	.0068	.0069
Class 3, pitch diameter	Max [6]	1.3834	1.4459	1.5709	1.6959	1.8209	1.9459	2.0709	2.1959
	Min	1.3794	1.4419	1.5664	1.6913	1.8163	1.9412	2.0661	2.1911
	Tol	.0040	.0040	.0045	.0046	.0046	.0047	.0048	.0048
INTERNAL THREADS									
Classes 2 and 3, major diameter	Min [5]	1.4375	1.5000	1.6250	1.7500	1.8750	2.0000	2.1250	2.2500
Classes 2 and 3, minor diameter	Min	1.3473	1.4098	1.5348	1.6598	1.7848	1.9098	2.0348	2.1598
	Max	1.3563	1.4188	1.5438	1.6688	1.7938	1.9188	2.0438	2.1688
	Tol	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090
Classes 2 and 3, pitch diameter	Min [6]	1.3834	1.4459	1.5709	1.6959	1.8209	1.9459	2.0709	2.1959
Class 2, pitch diameter (for general use)	Max	1.3890	1.4515	1.5773	1.7024	1.8275	1.9526	2.0777	2.2028
	Tol	.0056	.0056	.0064	.0065	.0066	.0067	.0068	.0069
Class 3, pitch diameter	Max	1.3874	1.4499	1.5754	1.7005	1.8255	1.9506	2.0757	2.2007
	Tol	.0040	.0040	.0045	.0046	.0046	.0047	.0048	.0048

Limits of size and tolerances [1]		Size (inches)						
		2⅜	2½	2⅝	2¾	2⅞	3	3⅛
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	2.3750	2.5000	2.6250	2.7500	2.8750	3.0000	3.1250
	Min	2.3638	2.4888	2.6138	2.7388	2.8638	2.9888	3.1138
	Tol	.0112	.0112	.0112	.0112	.0112	.0112	.0112
Classes 2 and 3, minor diameter	Max [4]	2.2728	2.3978	2.5228	2.6478	2.7728	2.8978	3.0228
Class 2, pitch diameter (for general use)	Max [6]	2.3209	2.4459	2.5709	2.6959	2.8209	2.9459	3.0709
	Min	2.3139	2.4388	2.5638	2.6887	2.8136	2.9385	3.0635
	Tol	.0070	.0071	.0071	.0072	.0073	.0074	.0074
Class 3, pitch diameter	Max [6]	2.3209	2.4459	2.5709	2.6959	2.8209	2.9459	3.0709
	Min	2.3160	2.4410	2.5659	2.6909	2.8158	2.9408	3.0657
	Tol	.0049	.0049	.0050	.0050	.0051	.0051	.0052
INTERNAL THREADS								
Classes 2 and 3, major diameter	Min [5]	2.3750	2.5000	2.6250	2.7500	2.8750	3.0000	3.1250
Classes 2 and 3, minor diameter	Min	2.2848	2.4098	2.5348	2.6598	2.7848	2.9098	3.0348
	Max	2.2938	2.4188	2.5438	2.6688	2.7938	2.9188	3.0438
	Tol	.0090	.0090	.0090	.0090	.0090	.0090	.0090
Classes 2 and 3, pitch diameter	Min [6]	2.3209	2.4459	2.5709	2.6959	2.8209	2.9459	3.0709
Class 2, pitch diameter (for general use)	Max	2.3279	2.4530	2.5780	2.7031	2.8282	2.9533	3.0783
	Tol	.0070	.0071	.0071	.0072	.0073	.0074	.0074
Class 3, pitch diameter	Max	2.3258	2.4508	2.5759	2.7009	2.8260	2.9510	3.0761
	Tol	.0049	.0049	.0050	.0050	.0051	.0051	.0052

See footnotes at end of table.

TABLE 1.12. *Limits of size and tolerances, classes 2 and 3, American National 12-thread series, 12N*—Continued

Limits of size and tolerances[1]		Size (inches)							
		3¼	3⅜	3½	3⅝	3¾	3⅞	4	4¼
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in*
Classes 2 and 3, major diameter	Max	3.2500	3.3750	3.5000	3.6250	3.7500	3.8750	4.0000	4.2500
	Min	3.2388	3.3638	3.4888	3.6138	3.7388	3.8638	3.9888	4.2388
	Tol	.0112	.0112	.0112	.0112	.0112	.0112	.0112	.0112
Classes 2 and 3, minor diameter	Max[4]	3.1478	3.2728	3.3978	3.5228	3.6478	3.7728	3.8978	4.1478
Class 2, pitch diameter (for general use)	Max[6]	3.1959	3.3209	3.4459	3.5709	3.6959	3.8209	3.9459	4.1959
	Min	3.1884	3.3133	3.4383	3.5632	3.6881	3.8131	3.9380	4.1879
	Tol	.0075	.0076	.0076	.0077	.0078	.0078	.0079	.0080
Class 3, pitch diameter	Max[6]	3.1959	3.3209	3.4459	3.5709	3.6959	3.8209	3.9459	4.1959
	Min	3.1907	3.3156	3.4406	3.5655	3.6905	3.8154	3.9404	4.1903
	Tol	.0052	.0053	.0053	.0054	.0054	.0055	.0055	.0056
INTERNAL THREADS									
Classes 2 and 3, major diameter	Min[5]	3.2500	3.3750	3.5000	3.6250	3.7500	3.8750	4.0000	4.2500
Classes 2 and 3, minor diameter	Min	3.1598	3.2848	3.4098	3.5348	3.6598	3.7848	3.9098	4.1598
	Max	3.1688	3.2938	3.4188	3.5438	3.6688	3.7938	3.9188	4.1688
	Tol	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090
Classes 2 and 3, pitch diameter	Min[6]	3.1959	3.3209	3.4459	3.5709	3.6959	3.8209	3.9459	4.1959
Class 2, pitch diameter (for general use)	Max	3.2034	3.3285	3.4535	3.5786	3.7037	3.8287	3.9538	4.2039
	Tol	.0075	.0076	.0076	.0077	.0078	.0078	.0079	.0080
Class 3, pitch diameter	Max	3.2011	3.3262	3.4512	3.5763	3.7013	3.8264	3.9514	4.2015
	Tol	.0052	.0053	.0053	.0054	.0054	.0055	.0055	.0056

Limits of size and tolerances[1]		Size (inches)						
		4½	4¾	5	5¼	5½	5¾	6
EXTERNAL THREADS		*in.*	*in.*	*in*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	4.5000	4.7500	5.0000	5.2500	5.5000	5.7500	6.0000
	Min	4.4888	4.7388	4.9888	5.2388	5.4888	5.7388	5.9888
	Tol	.0112	.0112	.0112	.0112	.0112	.0112	.0112
Classes 2 and 3, minor diameter	Max[4]	4.3978	4.6478	4.8978	5.1478	5.3978	5.6478	5.8978
Class 2, pitch diameter (for general use)	Max[6]	4.4459	4.6959	4.9459	5.1959	5.4459	5.6959	5.9459
	Min	4.4378	4.6876	4.9375	5.1874	5.4373	5.6872	5.9371
	Tol	.0081	.0083	.0084	.0085	.0086	.0087	.0088
Class 3, pitch diameter	Max[6]	4.4459	4.6959	4.9459	5.1959	5.4459	5.6959	5.9459
	Min	4.4402	4.6901	4.9400	5.1900	5.4399	5.6898	5.9397
	Tol	.0057	.0058	.0059	.0059	.0060	.0061	.0062
INTERNAL THREADS								
Classes 2 and 3, major diameter	Min[5]	4.5000	4.7500	5.0000	5.2500	5.5000	5.7500	6.0000
Classes 2 and 3, minor diameter	Min	4.4098	4.6598	4.9098	5.1598	5.4098	5.6598	5.9098
	Max	4.4188	4.6688	4.9188	5.1688	5.4188	5.6688	5.9188
	Tol	.0090	.0090	.0090	.0090	.0090	.0090	.0090
Classes 2 and 3, pitch diameter	Min[6]	4.4459	4.6959	4.9459	5.1959	5.4459	5.6959	5.9459
Class 2, pitch diameter (for general use)	Max	4.4540	4.7042	4.9543	5.2044	5.4545	5.7046	5.9547
	Tol	.0081	.0083	.0084	.0085	.0086	.0087	.0088
Class 3, pitch diameter	Max	4.4516	4.7017	4.9518	5.2018	5.4519	5.7020	5.9521
	Tol	.0057	.0058	.0059	.0059	.0060	.0061	.0062

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[1] Pitch diameter tolerances include deviations of lead and angle. The class 2 tolerances for sizes above 1½ in. are based on the formulas in table 2.2 and a length of engagement of 9 threads or ¾ in. The class 3 tolerances are 70 percent of the class 2 tolerances. For lengths of engagement of 1 in., 0.0010 in. may be added to these tolerances. As certain sizes up to 1½ in. are included in the American National coarse or fine thread series, the tolerances to and including 1½ in. correspond to those series.

[2] Standard size of the American National coarse thread series.

[3] Standard size of the American National fine thread series.

[4] Dimensions given for the maximum minor diameter of the external thread are figured to the intersection of the worn tool arc with a center line through crest and root. The minimum minor diameter of the external thread shall be that corresponding to a flat at the minor diameter of the minimum external thread equal to ⅛×p, and may be determined by subtracting 0.0541 in. from the minimum pitch diameter of the external thread.

[5] Dimensions for the minimum major diameter of the internal thread correspond to the basic flat (⅛×p) and the profile at the major diameter produced by a worn tool must not fall below the basic outline. The maximum major diameter of the internal thread shall be that corresponding to a flat at the major diameter of the maximum internal thread equal to 1/24×p, and may be determined by adding 0.0962 in. to the maximum pitch diameter of the internal thread.

[6] These dimensions are the maximum material or "go" size, and are those which should be placed on the component drawing with the tolerances.

TABLE 1.13.—*Limits of size and tolerances, classes 2 and 3, American National 16-thread series, 16N*

Limits of size and tolerances [1]		Size (inches)									
		3/4 [2]	13/16	7/8	15/16	1	1 1/16	1 1/8	1 3/16	1 1/4	1 5/16
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	0.7500	0.8125	0.8750	0.9375	1.0000	1.0625	1.1250	1.1875	1.2500	1.3125
	Min	.7410	.8035	.8660	.9285	.9910	1.0535	1.1160	1.1785	1.2410	1.3035
	Tol	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090
Classes 2 and 3, minor diameter	Max [3]	.6733	.7358	.7983	.8608	.9233	.9858	1.0483	1.1108	1.1733	1.2358
Class 2, pitch diameter (for general use)	Max [3]	.7094	.7719	.8344	.8969	.9594	1.0219	1.0844	1.1469	1.2094	1.2719
	Min	.7049	.7668	.8293	.8917	.9542	1.0166	1.0790	1.1415	1.2039	1.2664
	Tol	.0045	.0051	.0051	.0052	.0052	.0053	.0054	.0054	.0055	.0055
Class 3, pitch diameter	Max.[3]	.7094	.7719	.8344	.8969	.9594	1.0219	1.0844	1.1469	1.2094	1.2719
	Min	.7062	.7684	.8308	.8933	.9557	1.0182	1.0806	1.1431	1.2056	1.2680
	Tol	.0032	.0035	.0036	.0036	.0037	.0037	.0038	.0038	.0038	.0039
INTERNAL THREADS											
Classes 2 and 3, major diameter	Min.[4]	.7500	.8125	.8750	.9375	1.0000	1.0625	1.1250	1.1875	1.2500	1.3125
Classes 2 and 3, minor diameter	Min	.6823	.7448	.8073	.8698	.9323	.9948	1.0573	1.1198	1.1823	1.2448
	Max	.6903	.7528	.8153	.8778	.9403	1.0028	1.0653	1.1278	1.1903	1.2528
	Tol	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080
Class 2, pitch diameter (for general use)	Min.[5]	.7094	.7719	.8344	.8969	.9594	1.0219	1.0844	1.1469	1.2094	1.2719
	Max	.7139	.7770	.8395	.9021	.9646	1.0272	1.0898	1.1523	1.2149	1.2774
	Tol	.0045	.0051	.0051	.0052	.0052	.0053	.0054	.0054	.0055	.0055
Class 3, pitch diameter	Min.[5]	.7094	.7719	.8344	.8969	.9594	1.0219	1.0844	1.1469	1.2094	1.2719
	Max	.7126	.7754	.8380	.9005	.9631	1.0256	1.0882	1.1507	1.2132	1.2758
	Tol	.0032	.0035	.0036	.0036	.0037	.0037	.0038	.0038	.0038	.0039

Limits of size and tolerances [1]		Size (inches)									
		1 3/8	1 7/16	1 1/2	1 9/16	1 5/8	1 11/16	1 3/4	1 13/16	1 7/8	1 15/16
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	1.3750	1.4375	1.5000	1.5625	1.6250	1.6875	1.7500	1.8125	1.8750	1.9375
	Min	1.3660	1.4285	1.4910	1.5535	1.6160	1.6785	1.7410	1.8035	1.8660	1.9285
	Tol	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090
Classes 2 and 3, minor diameter	Max.[3]	1.2983	1.3608	1.4233	1.4858	1.5483	1.6108	1.6733	1.7358	1.7983	1.8608
Class 2, pitch diameter (for general use)	Max.[3]	1.3344	1.3969	1.4594	1.5219	1.5844	1.6469	1.7094	1.7719	1.8344	1.8969
	Min	1.3288	1.3913	1.4537	1.5161	1.5786	1.6411	1.7035	1.7660	1.8284	1.8909
	Tol	.0056	.0056	.0057	.0058	.0058	.0058	.0059	.0059	.0060	.0060
Class 3, pitch diameter	Max.[3]	1.3344	1.3969	1.4594	1.5219	1.5844	1.6469	1.7094	1.7719	1.8344	1.8969
	Min	1.3305	1.3929	1.4554	1.5179	1.5803	1.6428	1.7053	1.7677	1.8302	1.8927
	Tol	.0039	.0040	.0040	.0040	.0041	.0041	.0041	.0042	.0042	.0042
INTERNAL THREADS											
Classes 2 and 3, major diameter	Min.[4]	1.3750	1.4375	1.5000	1.5625	1.6250	1.6875	1.7500	1.8125	1.8750	1.9375
Classes 2 and 3, minor diameter	Min	1.3073	1.3698	1.4323	1.4948	1.5573	1.6198	1.6823	1.7448	1.8073	1.8698
	Max	1.3153	1.3778	1.4403	1.5028	1.5653	1.6278	1.6903	1.7528	1.8153	1.8778
	Tol	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080
Class 2, pitch diameter (for general use)	Min.[5]	1.3344	1.3969	1.4594	1.5219	1.5844	1.6469	1.7094	1.7719	1.8344	1.8969
	Max	1.3400	1.4025	1.4651	1.5277	1.5902	1.6527	1.7153	1.7778	1.8404	1.9029
	Tol	.0056	.0056	.0057	.0058	.0058	.0058	.0059	.0059	.0060	.0060
Class 3, pitch diameter	Min.[5]	1.3344	1.3969	1.4594	1.5219	1.5844	1.6469	1.7094	1.7719	1.8344	1.8969
	Max	1.3383	1.4009	1.4634	1.5259	1.5885	1.6510	1.7135	1.7761	1.8386	1.9011
	Tol	.0039	.0040	.0040	.0040	.0041	.0041	.0041	.0042	.0042	.0042

See footnotes at end of table.

TABLE 1.13.—*Limits of size and tolerances, classes 2 and 3, American National 16-thread series, 16N*—Continued

Limits of size and tolerances [1]		Size (inches)									
		2	2 1/16	2⅛	2 3/16	2¼	2 5/16	2⅜	2 7/16	2½	2⅝
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	2.0000	2.0625	2.1250	2.1875	2.2500	2.3125	2.3750	2.4375	2.5000	2.6250
	Min	1.9910	2.0535	2.1160	2.1785	2.2410	2.3035	2.3660	2.4285	2.4910	2.6160
	Tol	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090
Classes 2 and 3, minor diameter	Max [3]	1.9233	1.9858	2.0483	2.1108	2.1733	2.2358	2.2983	2.3608	2.4233	2.5483
Class 2, pitch diameter (for general use)	Max [5]	1.9594	2.0219	2.0844	2.1469	2.2094	2.2719	2.3344	3.3969	2.4594	2.5844
	Min	1.9533	2.0158	2.0782	2.1407	2.2032	2.2656	2.3281	2.3905	2.4530	2.5779
	Tol	.0061	.0061	.0062	.0062	.0062	.0063	.0063	.0064	.0064	.0065
Class 3, pitch diameter	Max [5]	1.9594	2.0219	2.0844	2.1469	2.2094	2.2719	2.3344	2.3969	2.4594	2.5844
	Min	1.9551	2.0176	2.0801	2.1426	2.2050	2.2675	2.3300	2.3924	2.4549	2.5799
	Tol	.0043	.0043	.0043	.0043	.0044	.0044	.0044	.0045	.0045	.0045
INTERNAL THREADS											
Classes 2 and 3, major diameter	Min [4]	2.0000	2.0625	2.1250	2.1875	2.2500	2.3125	2.3750	2.4375	2.5000	2.6250
Classes 2 and 3, minor diameter	Min	1.9323	1.9948	2.0573	2.1198	2.1823	2.2448	2.3073	2.3698	2.4323	2.5573
	Max	1.9403	2.0028	2.0653	2.1278	2.1903	2.2528	2.3153	2.3778	2.4403	2.5653
	Tol	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080
Class 2, pitch diameter (for general use)	Min [5]	1.9594	2.0219	2.0844	2.1469	2.2094	2.2719	2.3344	2.3969	2.4594	2.5844
	Max	1.9655	2.0280	2.0906	2.1531	2.2156	2.2782	2.3407	2.4033	2.4658	2.5909
	Tol	.0061	.0061	.0062	.0062	.0062	.0063	.0063	.0064	.0064	.0065
Class 3, pitch diameter	Min [5]	1.9594	2.0219	2.0844	2.1469	2.2094	2.2719	2.3344	2.3969	2.4594	2.5844
	Max	1.9637	2.0262	2.0887	2.1512	2.2138	2.2763	2.3388	2.4014	2.4639	2.5889
	Tol	.0043	.0043	.0043	.0043	.0044	.0044	.0044	.0045	.0045	.0045

Limits of size and tolerances [1]		Size (inches)										
		2¾	2⅞	3	3⅛	3¼	3⅜	3½	3⅝	3¾	3⅞	4
EXTERNAL THREADS		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
Classes 2 and 3, major diameter	Max	2.7500	2.8750	3.0000	3.1250	3.2500	3.3750	3.5000	3.6250	3.7500	3.8750	4.0000
	Min	2.7410	2.8660	2.9910	3.1160	3.2410	3.3660	3.4910	3.6160	3.7410	3.8660	3.9910
	Tol	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090	.0090
Classes 2 and 3, minor diameter	Max [3]	2.6733	2.7983	2.9233	3.0483	3.1733	3.2983	3.4233	3.5483	3.6733	3.7983	3.9233
Class 2, pitch diameter (for general use)	Max [5]	2.7094	2.8344	2.9594	3.0844	3.2094	3.3344	3.4594	3.5844	3.7094	3.8344	3.9594
	Min	2.7028	2.8278	2.9527	3.0776	3.2025	3.3275	3.4524	3.5773	3.7023	3.8272	3.9522
	Tol	.0066	.0066	.0067	.0068	.0069	.0069	.0070	.0071	.0071	.0072	.0072
Class 3, pitch diameter	Max [5]	2.7094	2.8344	2.9594	3.0844	3.2094	3.3344	3.4594	3.5844	3.7094	3.8344	3.9594
	Min	2.7048	2.8298	2.9547	3.0797	3.2046	3.3296	3.4545	3.5795	3.7044	3.8294	3.9543
	Tol	.0046	.0046	.0047	.0047	.0048	.0048	.0049	.0049	.0050	.0050	.0051
INTERNAL THREADS												
Classes 2 and 3, major diameter	Min [4]	2.7500	2.8750	3.0000	3.1250	3.2500	3.3750	3.5000	3.6250	3.7500	3.8750	4.0000
Classes 2 and 3, minor diameter	Min	2.6823	2.8073	2.9323	3.0573	3.1823	3.3073	3.4323	3.5573	3.6823	3.8073	3.9323
	Max	2.6903	2.8153	2.9403	3.0653	3.1903	3.3153	3.4403	3.5653	3.6903	3.8153	3.9403
	Tol	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080	.0080
Class 2, pitch diameter (for general use)	Min [5]	2.7094	2.8344	2.9594	3.0844	3.2094	3.3344	3.4594	3.5844	3.7094	3.8344	3.9594
	Max	2.7160	2.8410	2.9661	3.0912	3.2163	3.3413	3.4664	3.5915	3.7165	3.8416	3.9666
	Tol	.0066	.0066	.0067	.0068	.0069	.0069	.0070	.0071	.0071	.0072	.0072
Class 3, pitch diameter	Min [5]	2.7094	2.8344	2.9594	3.0844	3.2094	3.3344	3.4594	3.5844	3.7094	3.8344	3.9594
	Max	2.7140	2.8390	2.9641	3.0891	3.2142	3.3392	3.4643	3.5893	3.7144	3.8394	3.9645
	Tol	.0046	.0046	.0047	.0047	.0048	.0048	.0049	.0049	.0050	.0050	.0051

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[1] Pitch-diameter tolerances include deviations of lead and angle. The class 2 tolerances are based on formulas in table 2.2, p. 180, and a length of engagement of 9 threads or 9/16 in. The class 3 tolerances are 70 percent of the class 2 tolerances. The ¾-in. size being in the American National fine-thread series, the tolerance for this size corresponds to that series.

[2] Standard size thread of the American National fine-thread series.

[3] Dimensions given for the maximum minor diameter of the external thread are figured to the intersection of the worn-tool arc with a center line through crest and root. The minimum minor diameter of the external thread shall be that corresponding to a flat at the minor diameter of the minimum external thread equal to ⅛ × p, and may be determined by subtracting 0.0406 in. from the minimum pitch diameter of the external thread.

[4] Dimensions for the minimum major diameter of the internal thread correspond to the basic flat (⅛ × p) and the profile at the major diameter produced by a worn tool must not fall below the basic outline. The maximum major diameter of the internal thread shall be that corresponding to a flat at the major diameter of the maximum internal thread equal to 1/24 × p, and may be determined by adding 0.0406 in. to the maximum pitch diameter of the internal thread.

[5] These dimensions are the maximum material or "go" size, and are those which should be placed on the component drawing with the tolerances.

TABLE 1.14.—*Allowances and tolerances, classes 1 and 2*

Threads per inch	Class 1						Class 2					
	Allowances	Major diameter tolerances, external thread	Pitch-diameter tolerances	Lead deviations consuming one-half of pitch-diameter tolerances [1]	Deviations in half-angle consuming one-half of pitch-diameter tolerances		Major diameter tolerances,[2] external thread	Pitch-diameter tolerances	Lead deviations consuming one-half of pitch-diameter tolerances [1]	Deviations in half-angle consuming one-half of pitch-diameter tolerances	
1	2	3	4	5	6		7	8	9	10	
	in.	*in.*	*in.*	*in.*	*deg*	*min*	*in.*	*in.*	*in.*	*deg*	*min*
80	0.0007	0.0048	0.0024	0.0007	3	40	0.0034	0.0017	0.0005	2	36
72	.0007	.0050	.0025	.0007	3	26	.0036	.0018	.0005	2	22
64	.0007	.0052	.0026	.0008	3	10	.0038	.0019	.0005	2	10
56	.0008	.0056	.0028	.0008	3	0	.0040	.0020	.0006	2	8
48	.0009	.0062	.0031	.0009	2	50	.0044	.0022	.0008	2	1
44	.0009	.0064	.0032	.0009	2	41	.0046	.0023	.0007	1	56
40	.0010	.0068	.0034	.0010	2	36	.0048	.0024	.0007	1	50
36	.0011	.0072	.0036	.0010	2	28	.0050	.0025	.0007	1	43
32	.0011	.0076	.0038	.0011	2	19	.0054	.0027	.0008	1	39
28	.0012	.0086	.0043	.0012	2	18	.0062	.0031	.0009	1	39
24	.0013	.0092	.0049	.0013	2	6	.0066	.0033	.0010	1	31
20	.0015	.0102	.0051	.0015	1	57	.0072	.0036	.0010	1	22
18	.0016	.0114	.0057	.0016	1	58	.0082	.0041	.0012	1	25
16	.0018	.0126	.0063	.0018	1	55	.0090	.0045	.0013	1	22
14	.0021	.0140	.0070	.0020	1	52	.0098	.0049	.0014	1	19
13	.0022	.0148	.0074	.0021	1	50	.0104	.0052	.0015	1	17
12	.0024	.0158	.0079	.0023	1	49	.0112	.0056	.0016	1	17
11	.0026	.0170	.0085	.0025	1	47	.0118	.0059	.0017	1	14
10	.0028	.0184	.0092	.0027	1	45	.0128	.0064	.0018	1	13
9	.0031	.0200	.0100	.0029	1	43	.0140	.0070	.0020	1	12
8	.0034	.0222	.0111	.0032	1	42	.0152	.0076	.0022	1	10
7	.0039	.0248	.0124	.0036	1	39	.0170	.0085	.0025	1	8
6	.0044	.0290	.0145	.0042	1	40	.0202	.0101	.0029	1	9
5	.0052	.0338	.0169	.0049	1	37	.0232	.0116	.0033	1	6
4½	.0057	.0368	.0184	.0053	1	35	.0254	.0127	.0037	1	5
4	.0064	.0408	.0204	.0059	1	33	.0280	.0149	.0040	1	4

[1] Between any 2 threads not farther apart than the length of engagement.
[2] The tolerances in column 3 apply to class 2 unfinished hot-rolled material, NC and 8N series.

TABLE 1.15.—*Allowances and tolerances, classes 3 and 4*

Threads per inch	Class 3					Class 4					
	Major diameter tolerances, external thread	Pitch-diameter tolerances	Lead deviations consuming one-half of pitch-diameter tolerances [1]	Deviations in half-angle consuming one-half of pitch-diameter tolerances		Major diameter tolerances, external thread	Interferences or negative allowances	Pitch-diameter tolerances	Lead deviations consuming one-half of pitch-diameter tolerances [1]	Deviations in half-angle consuming one-half of pitch-diameter tolerances	
1	2	3	4	5		6	7	8	9	10	
	in.	*in.*	*in.*	*deg*	*min*	*in.*	*in.*	*in.*	*in.*	*deg*	*min*
80	0.0034	0.0013	0.0004	1	59	----------	----------	----------	----------	--	--
72	.0036	.0013	.0004	1	47	----------	----------	----------	----------	--	--
64	.0038	.0014	.0004	1	43	----------	----------	----------	----------	--	--
56	.0040	.0015	.0004	1	36	----------	----------	----------	----------	--	--
48	.0044	.0016	.0005	1	28	----------	----------	----------	----------	--	--
44	.0046	.0016	.0005	1	21	----------	----------	----------	----------	--	--
40	.0048	.0017	.0005	1	18	----------	----------	----------	----------	--	--
36	.0050	.0018	.0005	1	14	----------	----------	----------	----------	--	--
32	.0054	.0019	.0005	1	10	----------	----------	----------	----------	--	--
28	.0062	.0022	.0006	1	11	0.0062	0.0002	0.0011	0.0003	0	35
24	.0066	.0024	.0007	1	6	.0066	.0003	.0012	.0003	0	33
20	.0072	.0026	.0008	1	0	.0072	.0003	.0013	.0004	0	30
18	.0082	.0030	.0009	1	2	.0082	.0003	.0015	.0004	0	31
16	.0090	.0032	.0009	0	59	.0090	.0004	.0016	.0005	0	29
14	.0098	.0036	.0010	0	58	.0098	.0004	.0018	.0005	0	29
13	.0104	.0037	.0011	0	55	.0104	.0004	.0019	.0005	0	28
12	.0112	.0040	.0012	0	55	.0112	.0005	.0020	.0005	0	28
11	.0118	.0042	.0012	0	53	.0118	.0005	.0021	.0006	0	26
10	.0128	.0045	.0013	0	52	.0128	.0006	.0023	.0007	0	25
9	.0140	.0049	.0014	0	51	.0140	.0006	.0024	.0007	0	25
8	.0152	.0054	.0016	0	50	.0152	.0007	.0027	.0008	0	25
7	.0170	.0059	.0017	0	47	.0170	.0008	.0030	.0009	0	24
6	.0202	.0071	.0020	0	49	.0202	.0009	.0036	.0010	0	25
5	.0232	.0082	.0024	0	47	.0232	.0010	.0041	.0012	0	23
4½	.0254	.0089	.0026	0	46	.0254	.0011	.0044	.0013	0	23
4	.0280	.0097	.0028	0	44	.0280	.0013	.0048	.0014	0	22

[1] Between any 2 threads not farther apart than the length of engagement.

6. LIMITS OF SIZE OF GAGES

The limits of size of plain and thread gages applicable to the standard series of American National screw threads are presented in table 1.16. In this table *X* tolerances are applied to thread gages for classes 1, 2, and 3, *W* tolerances to thread gages for class 4, and *Z* tolerances to plain gages. The limits of size of *W* truncated thread setting plug gages, and of both *W* and *X* basic-crest thread setting plug gages, are presented in table 1.17 or as indicated in the footnotes to table 1.17. These limits are developed in accordance with the requirements for gages and gaging stated in section VI, p. 107.

TABLE 1.16.—*Gages for standard thread series. American National screw threads*

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			Thread gages					Z plain gages for major diameter			Thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go							
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semifinished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter		Go	Not go			
					Plus tol. gage	Minus tol. gage								Minus tol. gage	Plus tol. gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
0-80	NF	1	0.0512	0.0458	0.0488	0.0488	0.0469	0.0593	0.0545	....	0.0600	0.0519	0.0596	0.0543	0.0543	0.0465	0.0514	1	NF	0-80
			.0510	.0455	.0490	.0486	.0472	.0592	.0546	....	.0603	.0521	.0593	.0541	.0545	.0466	.0513			
		2	.0519	.0465	.0502	.0502	.0475	.0600	.0556	....	.0600	.0519	.0590	.0536	.0536	.0465	.0514	2		
			.0517	.0462	.0504	.0500	.0478	.0599	.0557	....	.0603	.0521	.0587	.0534	.0538	.0466	.0513			
		3	.0519	.0465	.0506	.0506	.0479	.0600	.0556	....	.0600	.0519	.0586	.0532	.0532	.0465	.0514	3		
			.0517	.0462	.0508	.0504	.0482	.0599	.0557	....	.0603	.0521	.0583	.0530	.0534	.0466	.0513			
1-64	NC	1	.0622	.0554	.0596	.0596	.0562	.0723	.0671	....	.0730	.0629	.0723	.0655	.0655	.0561	.0623	1	NC	1-64
			.0620	.0551	.0598	.0594	.0566	.0722	.0672	....	.0734	.0631	.0719	.0653	.0657	.0562	.0622			
		2	.0629	.0561	.0610	.0610	.0576	.0730	.0692	0.0678	.0730	.0629	.0716	.0648	.0648	.0561	.0623	2		
			.0627	.0557	.0612	.0608	.0580	.0729	.0693	.0679	.0734	.0631	.0712	.0646	.0650	.0562	.0622			
		3	.0629	.0561	.0615	.0615	.0581	.0730	.0692	....	.0730	.0629	.0711	.0643	.0643	.0561	.0623	3		
			.0627	.0557	.0617	.0613	.0585	.0729	.0693	....	.0734	.0631	.0707	.0641	.0645	.0562	.0622			
1-72	NF	1	.0633	.0573	.0608	.0608	.0585	.0723	.0673	....	.0730	.0640	.0725	.0665	.0665	.0580	.0634	1	NF	1-72
			.0631	.0570	.0610	.0606	.0588	.0722	.0674	....	.0733	.0642	.0722	.0663	.0667	.0581	.0633			
		2	.0640	.0580	.0622	.0622	.0592	.0730	.0694	....	.0730	.0640	.0718	.0658	.0658	.0580	.0634	2		
			.0638	.0577	.0624	.0620	.0595	.0729	.0695	....	.0733	.0642	.0715	.0656	.0660	.0581	.0633			
		3	.0640	.0580	.0627	.0627	.0597	.0730	.0694	....	.0730	.0640	.0713	.0653	.0653	.0580	.0634	3		
			.0638	.0577	.0629	.0625	.0600	.0729	.0695	....	.0733	.0642	.0710	.0651	.0655	.0581	.0633			
2-56	NC	1	.0736	.0659	.0708	.0708	.0669	.0852	.0796	....	.0860	.0744	.0849	.0772	.0772	.0667	.0737	1	NC	2-56
			.0734	.0655	.0710	.0706	.0673	.0851	.0797	....	.0864	.0746	.0845	.0770	.0774	.0668	.0736			
		2	.0744	.0667	.0724	.0724	.0685	.0860	.0820	.0804	.0860	.0744	.0841	.0764	.0764	.0667	.0737	2		
			.0742	.0663	.0726	.0722	.0689	.0859	.0821	.0805	.0864	.0746	.0837	.0762	.0766	.0668	.0736			
		3	.0744	.0667	.0729	.0729	.0690	.0860	.0820	....	.0860	.0744	.0836	.0759	.0759	.0667	.0737	3		
			.0742	.0663	.0731	.0727	.0694	.0859	.0821	....	.0864	.0746	.0832	.0757	.0761	.0668	.0736			
2-64	NF	1	.0752	.0684	.0726	.0726	.0696	.0853	.0801	....	.0860	.0759	.0853	.0785	.0785	.0691	.0746	1	NF	2-64
			.0750	.0680	.0728	.0724	.0700	.0852	.0802	....	.0864	.0761	.0849	.0783	.0787	.0692	.0745			
		2	.0759	.0691	.0740	.0740	.0706	.0860	.0822	....	.0860	.0759	.0846	.0778	.0778	.0691	.0746	2		
			.0757	.0687	.0742	.0738	.0710	.0859	.0823	....	.0864	.0761	.0842	.0776	.0780	.0692	.0745			
		3	.0759	.0691	.0745	.0745	.0711	.0860	.0822	....	.0860	.0759	.0841	.0773	.0773	.0691	.0746	3		
			.0757	.0687	.0747	.0743	.0715	.0859	.0823	....	.0864	.0761	.0837	.0771	.0775	.0692	.0745			
3-48	NC	1	.0846	.0756	.0815	.0815	.0770	.0981	.0919	....	.0990	.0855	.0976	.0886	.0886	.0764	.0841	1	NC	3-48
			.0844	.0752	.0817	.0813	.0774	.0980	.0920	....	.0994	.0857	.0972	.0884	.0888	.0765	.0840			
		2	.0855	.0765	.0833	.0833	.0788	.0990	.0946	.0928	.0990	.0855	.0967	.0877	.0877	.0764	.0841	2		
			.0853	.0761	.0835	.0831	.0792	.0989	.0947	.0929	.0994	.0857	.0963	.0875	.0879	.0765	.0840			
		3	.0855	.0765	.0839	.0839	.0794	.0990	.0946	....	.0990	.0855	.0961	.0871	.0871	.0764	.0841	3		
			.0853	.0761	.0841	.0837	.0798	.0989	.0947	....	.0994	.0857	.0957	.0869	.0873	.0765	.0840			
3-56	NF	1	.0866	.0789	.0838	.0838	.0803	.0982	.0926	....	.0990	.0874	.0979	.0902	.0902	.0797	.0856	1	NF	3-56
			.0864	.0785	.0840	.0836	.0807	.0981	.0927	....	.0994	.0876	.0975	.0900	.0904	.0798	.0855			
		2	.0874	.0797	.0854	.0854	.0815	.0990	.0950	....	.0990	.0874	.0971	.0894	.0894	.0797	.0856	2		
			.0872	.0793	.0856	.0852	.0819	.0989	.0951	....	.0994	.0876	.0967	.0892	.0896	.0798	.0855			
		3	.0874	.0797	.0859	.0859	.0820	.0990	.0950	....	.0990	.0874	.0966	.0889	.0889	.0797	.0856	3		
			.0872	.0793	.0861	.0857	.0824	.0989	.0951	....	.0994	.0876	.0962	.0887	.0891	.0798	.0855			
4-40	NC	1	.0948	.0840	.0914	.0914	.0860	.1110	.1042	....	.1120	.0958	.1100	.0992	.0992	.0849	.0938	1	NC	4-40
			.0946	.0836	.0916	.0912	.0864	.1109	.1043	....	.1124	.0960	.1096	.0990	.0994	.0850	.0937			
		2	.0958	.0850	.0934	.0934	.0880	.1120	.1072	.1052	.1120	.0958	.1090	.0982	.0982	.0849	.0938	2		
			.0956	.0846	.0936	.0932	.0884	.1119	.1073	.1053	.1124	.0960	.1086	.0980	.0984	.0850	.0937			
		3	.0958	.0850	.0941	.0941	.0887	.1120	.1072	....	.1120	.0958	.1083	.0975	.0975	.0849	.0938	3		
			.0956	.0846	.0943	.0939	.0891	.1119	.1073	....	.1124	.0960	.1079	.0973	.0977	.0850	.0937			

4-48	NF	1	.0976	.0886	.0945	.0945	.0901	.1111	.1049	....	.1120	.0985	.1106	.1016	.1016	.0894	.0960	1	NF	4-48
			.0974	.0882	.0947	.0943	.0905	.1110	.1050	....	.1124	.0987	.1102	.1014	.1018	.0895	.0959			
		2	.0983	.0895	.0963	.0963	.0918	.1123	.1075	....	.1120	.0985	.1097	.1007	.1007	.0894	.0960	2		
			.0983	.0891	.0965	.0961	.0922	.1119	.1077	....	.1124	.0987	.1093	.1005	.1009	.0895	.0959			
		3	.0985	.0895	.0969	.0969	.0924	.1121	.1076	....	.1120	.0985	.1091	.1001	.1001	.0894	.0960	3		
			.0983	.0891	.0971	.0967	.0928	.1119	.1077	....	.1124	.0987	.1087	.0999	.1003	.0895	.0959			
5-40	NC	1	.1078	.0970	.1044	.1044	.0990	.1240	.1172	....	.1250	.1088	.1230	.1122	.1122	.0979	.1062	1	NC	5-40
			.1076	.0966	.1046	.1042	.0994	.1239	.1173	....	.1254	.1090	.1226	.1120	.1124	.0980	.1061			
		2	.1088	.0980	.1064	.1064	.1010	.1250	.1202	.1182	.1250	.1088	.1220	.1112	.1112	.0979	.1062	2		
			.1086	.0976	.1066	.1062	1014	.1249	.1203	.1183	.1254	.1090	.1216	.1110	.1114	.0980	.1061			
		3	.1088	.0986	.1071	.1071	.1017	.1250	.1202	....	.1250	.1088	.1215	.1105	.1105	.0979	.1062	3		
			.1086	.0976	.1073	.1069	.1021	.1249	.1203	....	.1254	.1090	.1209	.1103	.1107	.0980	.1061			
5-44	NF	1	.1093	.0995	.1061	.1061	.1012	.1241	.1177	....	.1250	.1102	.1232	.1134	.1134	.1004	1068	1	NF	5-44
			.1091	.0991	.1063	.1059	.1016	.1240	.1178	....	.1254	.1104	.1228	.1132	.1136	.1005	.1067			
		2	.1102	.1004	.1079	.1079	.1030	.1250	.1204	....	.1250	.1102	.1223	.1125	.1125	.1004	.1068	2		
			1100	.1000	.1081	.1077	.1034	.1249	.1205	....	.1254	.1104	.1219	.1123	.1127	.1005	.1067			
		3	1102	.1004	.1086	.1085	.1037	.1250	.1204	....	.1250	.1102	.1216	.1118	.1118	.1004	.1068	3		
			.1100	.1000	.1088	.1084	.1041	.1249	.1205	....	.1254	.1104	.1212	.1116	.1120	.1005	.1067			
6-32	NC	1	.1166	.1031	.1128	.1128	.1060	.1369	.1293	....	.1380	1177	.1350	.1215	.1215	.1042	.1145	1	NC	6-32
			.1163	.1026	.1131	.1125	.1065	.1368	.1294	....	.1385	.1180	.1345	.1212	.1218	.1043	.1144			
		2	.1177	.1042	.1150	.1150	.1082	.1380	.1326	.1304	.1380	.1177	.1339	.1204	.1204	.1042	.1145	2		
			.1174	.1037	.1153	.1147	.1087	.1379	.1327	.1305	.1385	.1180	.1334	.1201	.1207	.1043	.1144			
		3	.1177	.1042	.1158	.1158	.1090	.1380	.1326	....	.1380	.1177	.1331	.1196	.1196	.1042	.1145	3		
			.1174	.1037	.1161	.1155	.1095	.1379	.1327	....	.1385	.1180	.1326	.1193	.1199	.1043	.1144			
6-40	NF	1	.1208	.1100	.1174	.1174	.1120	.1370	.1302	....	.1380	.1218	.1360	.1252	.1252	.1109	.1179	1	NF	6-40
			.1206	.1096	.1176	.1172	.1124	.1369	.1303	....	.1384	.1220	.1356	.1250	.1254	.1110	.1178			
		2	.1218	.1110	.1194	.1194	.1140	.1380	.1332	....	.1380	.1218	.1350	.1242	.1242	.1109	.1179	2		
			.1216	.1106	.1196	.1192	.1144	.1379	.1333	....	.1384	.1220	.1346	.1240	.1244	.1110	.1178			
		3	.1218	.1110	.1202	.1201	.1147	.1380	.1332	....	.1380	.1218	.1343	.1235	.1235	.1109	.1179	3		
			.1216	.1106	.1203	.1199	.1151	.1379	.1333	....	.1384	.1220	.1339	.1233	.1237	.1110	.1178			
8-32	NC	1	.1426	.1291	.1388	.1388	.1329	.1629	.1553	....	.1640	.1437	.1610	.1475	.1475	.1302	.1384	1	NC	8-32
			.1423	.1286	.1391	.1385	.1325	.1628	.1554	....	.1645	.1440	.1605	.1472	.1478	.1303	.1383			
		2	.1437	.1302	.1410	.1410	.1342	.1640	.1586	.1564	.1640	.1437	.1599	.1464	.1464	.1302	.1384	2		
			.1434	.1297	.1413	.1407	.1347	.1639	.1587	.1565	.1645	.1440	.1594	.1461	.1467	.1303	.1383			
		3	.1437	.1302	.1418	.1418	.1350	.1640	.1586	....	.1640	.1437	.1591	.1456	.1456	.1302	.1384	3		
			.1434	.1297	.1421	.1415	.1355	.1639	.1587	....	.1645	.1440	.1586	.1453	.1459	.1303	.1383			
8-36	NF	1	.1449	.1329	.1413	.1413	.1353	.1629	.1557	....	.1640	.1460	.1616	.1496	.1496	.1339	.1402	1	NF	8-36
			.1447	.1325	.1415	.1411	.1357	.1628	.1558	....	.1644	.1462	.1612	.1494	.1498	.1340	.1401			
		2	.1460	.1340	.1435	.1435	.1375	.1640	.1590	....	.1640	.1460	.1605	.1485	.1485	.1339	.1402	2		
			.1458	.1336	.1437	.1433	.1379	.1639	.1591	....	.1644	.1462	.1601	.1483	.1487	.1340	.1401			
		3	.1460	.1340	.1442	.1442	.1382	.1640	.1590	....	.1640	.1460	.1598	.1478	.1478	.1339	.1402	3		
			.1458	.1336	.1444	.1440	.1386	.1639	.1591	....	.1644	.1462	.1594	.1476	.1480	.1340	.1401			
10-24	NC	1	.1616	.1436	.1570	.1570	.1480	.1887	.1795	....	.1900	.1629	.1855	.1675	.1675	.1449	.1559	1	NC	10-24
			.1613	.1431	.1573	.1567	.1485	.1886	.1796	....	.1905	.1632	.1850	.1672	.1678	.1450	.1558			
		2	.1629	1449	.1596	.1596	.1506	.1900	.1834	.1808	.1900	.1629	.1842	.1662	.1662	.1449	.1559	2		
			.1626	1444	.1599	.1593	.1511	.1899	.1835	.1809	.1905	.1632	.1837	.1659	.1665	.1450	.1558			
		3	.1629	.1449	.1605	.1605	.1515	.1900	.1834	....	.1900	.1629	.1833	.1653	.1653	.1449	.1559	3		
			.1626	.1444	1608	.1602	.1520	.1899	.1835	....	.1905	.1632	.1828	.1650	.1656	.1450	.1558			
10-32	NF	1	.1686	.1551	.1648	.1648	.1580	.1889	.1813	....	.1900	.1697	.1870	.1735	.1735	.1562	.1624	1	NF	10-32
			.1683	.1546	.1651	.1645	.1585	.1888	.1814	....	.1905	.1700	.1865	.1732	.1738	.1563	.1623			
		2	.1697	.1562	.1670	.1670	.1602	.1900	.1846	....	.1900	.1697	.1859	.1724	.1724	.1562	.1624	2		
			.1694	.1557	.1673	.1667	.1607	.1899	.1847	....	.1905	1700	.1854	.1721	.1727	.1563	.1623			
		3	.1697	.1562	.1678	.1678	.1610	.1900	.1846	....	.1900	.1697	.1851	.1716	.1716	.1562	.1624	3		
			.1694	.1557	.1681	.1675	.1615	.1899	.1847	....	.1905	.1700	.1846	.1713	.1719	.1563	.1623			
12-24	NC	1	.1876	.1696	.1830	.1830	.1740	.2147	.2055	....	.2160	.1889	.2115	.1935	.1935	.1709	.1801	1	NC	12-24
			.1873	.1691	.1833	.1827	.1745	.2146	.2056	....	.2165	.1892	.2110	.1932	.1938	.1710	.1800			
		2	.1889	.1709	.1856	.1856	.1766	.2160	.2094	.2068	.2160	.1889	.2102	.1922	.1922	.1709	.1801	2		
			.1886	.1704	.1859	.1853	.1771	.2159	.2095	.2069	.2165	.1892	.2097	.1919	.1925	.1710	.1800			
		3	.1889	.1709	.1865	.1865	.1775	.2160	.2094	....	.2160	.1889	.2093	.1913	.1913	.1709	.1801	3		
			.1886	.1704	1868	1862	.1780	.2159	.2095	....	.2165	.1892	.2088	.1910	.1916	.1710	.1800			
12-28	NF	1	.1916	.1761	.1873	.1873	.1796	.2148	.2062	....	.2160	.1925	.2126	.1971	.1971	.1773	.1835	1	NF	12-28
			.1913	.1756	.1876	.1870	.1801	.2147	.2063	....	.2165	.1931	.2121	.1968	.1974	.1774	.1834			
		2	.1928	.1773	.1897	.1897	.1820	.2160	.2098	....	.2160	.1928	.2114	.1959	.1959	.1773	.1835	2		
			.1925	.1768	.1900	.1894	.1825	.2159	.2099	....	.2165	.1931	.2109	.1956	.1962	.1771	.1834			
		3	.1925	.1773	.1906	.1906	.1829	.2160	.2098	....	.2160	.1928	.2105	.1950	.1950	.1773	.1835	3		
			.1925	.1768	.1909	.1903	.1834	.2159	.2099	....	.2165	.1931	.2100	.1947	.1953	.1774	.1834			

TABLE 1.16.—*Gages for standard thread series, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			Thread gages					Z plain gages for major diameter			Thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tol. gage	Minus tol. gage								Minus tol. gage	Plus tol. gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
12-32	NEF	2	0.1957	0.1822	0.1926	0.1926	0.1858	0.2160	0.2106	----------	0.2160	0.1957	0.2123	0.1988	0.1988	0.1822	0.1875	2	NEF	12-32
			.1954	.1817	.1929	.1923	.1863	.2159	.2107	----------	.2165	.1960	.2118	.1985	.1991	.1823	.1874			
		3	.1957	.1822	.1935	.1935	.1867	.2160	.2106	----------	.2160	.1957	.2114	.1979	.1979	.1822	.1875	3		
			.1954	.1817	.1938	.1932	.1372	.2159	.2107	----------	.2165	.1960	.2109	.1976	.1982	.1823	.1874			
¼-20	NC	1	.2160	.1944	.2109	.2109	.2001	.2485	.2383	----------	.2500	.2175	.2443	.2226	.2226	.1959	.2060	1	NC	¼-20
			.2157	.1939	.2112	.2106	.2006	.2484	.2384	----------	.2505	.2178	.2438	.2223	.2229	.1960	.2059			
		2	.2175	.1959	.2139	.2139	.2031	.2500	.2424	0.2398	.2500	.2175	.2428	.2211	.2211	.1959	.2060	2		
			.2172	.1954	.2142	.2136	.2036	.2499	.2421	.2399	.2505	.2178	.2423	.2208	.2214	.1960	.2059			
		3	.2175	.1959	.2149	.2149	.2041	.2500	.2423	----------	.2500	.2175	.2418	.2201	.2201	.1959	.2060	3		
			.2172	.1954	.2152	.2146	.2046	.2499	.2429	----------	.2505	.2178	.2413	.2198	.2204	.1960	.2059			
		4	.2178	.1962	.2165	.2165	.2057	.2500	.2428	----------	.2500	.2175	.2405	.2188	.2188	.1959	.2060	4		
			.2177	.1957	.2166	.2164	.2062	.2499	.2429	----------	.2505	.2176	.2400	.2187	.2189	.1960	.2059			
¼-28	NF	1	.2256	.2101	.2213	.2213	.2136	.2488	.2402	----------	.2500	.2268	.2466	.2311	.2311	.2113	.2173	1	NF	¼-28
			.2253	.2096	.2216	.2210	.2141	.2487	.2403	----------	.2505	.2271	.2461	.2308	.2314	.2114	.2172			
		2	.2268	.2113	.2237	.2237	.2160	.2500	.2438	----------	.2500	.2268	.2454	.2299	.2299	.2113	.2173	2		
			.2265	.2108	.2240	.2234	.2165	.2499	.2439	----------	.2505	.2271	.2449	.2296	.2302	.2114	.2172			
		3	.2268	.2113	.2246	.2246	.2169	.2500	.2438	----------	.2500	.2268	.2445	.2290	.2296	.2113	.2173	3		
			.2265	.2108	.2249	.2243	.2174	.2499	.2439	----------	.2505	.2271	.2440	.2287	.2293	.2114	.2172			
		4	.2270	.2115	.2259	.2259	.2182	.2500	.2438	----------	.2500	.2268	.2434	.2279	.2279	.2113	.2173	4		
			.2269	.2110	.2260	.2258	.2187	.2499	.2439	----------	.2505	.2269	.2429	.2278	.2280	.2214	.2172			
¼-32	NEF	2	.2297	.2162	.2265	.2265	.2197	.2500	.2446	----------	.2500	.2297	.2464	.2329	.2329	.2162	.2210	2	NEF	¼-32
			.2294	.2157	.2268	.2262	.2202	.2499	.2447	----------	.2505	.2300	.2459	.2326	.2332	.2163	.2209			
		3	.2297	.2162	.2275	.2275	.2207	.2500	.2446	----------	.2500	.2297	.2454	.2319	.2319	.2162	.2210	3		
			.2294	.2157	.2278	.2272	.2212	.2499	.2447	----------	.2505	.2200	.2449	.2316	.2322	.2163	.2209			
5/16-18	NC	1	.2748	.2507	.2691	.2691	.2571	.3109	.2995	----------	.3125	.2764	.3062	.2821	.2821	.2524	.2630	1	NC	5/16-18
			.2745	.2502	.2694	.2688	.2576	.3108	.2996	----------	.3130	.2767	.3057	.2818	.2824	.2525	.2629			
		2	.2764	.2523	.2723	.2723	.2603	.3125	.3043	.3011	.3125	.2764	.3046	.2805	.2805	.2524	.2630	2		
			.2761	.2518	.2726	.2720	.2608	.3124	.3044	.3012	.3130	.2767	.3041	.2802	.2808	.2525	.2629			
		3	.2764	.2523	.2734	.2734	.2614	.3125	.3043	----------	.3125	.2764	.3035	.2794	.2794	.2524	.2630	3		
			.2761	.2518	.2737	.2731	.2619	.3124	.3044	----------	.3130	.2767	.3030	.2791	.2797	.2525	.2629			
		4	.2767	.2526	.2752	.2752	.2632	.3125	.3043	----------	.3125	.2764	.3020	.2779	.2779	.2524	.2630	4		
			.2766	.2521	.2753	.2751	.2637	.3124	.3044	----------	.3130	.2765	.3015	.2778	.2780	.2525	.2629			
5/16-24	NF	1	.2841	.2661	.2795	.2795	.2705	.3112	.3020	----------	.3125	.2854	.3080	.2900	.2900	.2674	.2739	1	NF	5/16-24
			.2838	.2656	.2798	.2792	.2710	.3111	.3021	----------	.3130	.2857	.3075	.2897	.2903	.2675	.2738			
		2	.2854	.2674	.2821	.2821	.2731	.3125	.3059	----------	.3125	.2854	.3067	.2887	.2887	.2674	.2739	2		
			.2851	.2669	.2824	.2818	.2736	.3124	.3060	----------	.3130	2857	.3062	.2884	.2390	.2675	.2738			
		3	.2854	.2674	.2830	.2830	.2740	.3125	.3059	----------	.3125	.2854	.3058	2878	.2878	.2674	.2739	3		
			.2851	2669	2833	.2827	.2745	.3124	.3060	----------	.3130	.2857	.3053	.2875	.2881	.2675	2728			
		4	.2857	.2677	.2845	.2845	.2755	.3125	.3059	----------	.3125	.2854	.3046	.2866	.2866	.2674	.2739	4		
			.2856	.2672	.2846	.2844	.2760	.3124	.3060	----------	.3130	.2855	.3041	.2865	.2867	.2675	.2738			
5/16-32	NEF	2	.2922	.2787	.2889	.2889	.2821	.3125	.3071	----------	.3125	.2922	.3090	.2955	.2955	.2787	.2835	2	NEF	5/16-32
			.2919	.2782	.2892	.2886	.2826	.3124	.3072	----------	.3130	.2925	.3085	.2952	.2958	.2788	.2834			
		3	.2922	.2787	.2899	.2899	.2831	.3125	.3071	----------	.3125	.2922	.3080	.2945	.2945	.2787	.2835	3		
			.2919	.2782	.2902	.2896	.2236	.3124	.3072	----------	.3130	.2925	.3075	.2942	2948	.2788	.2834			

⅜-16	NC	1	.3326	.3055	.3263	.3263	.3128	.3732	.3606	....	.3750	.3344	.3678	.3407	.3407	.3073	.3184	1	NC	⅜-16
			.3323	.3049	.3266	.3260	.3134	.3731	.3607	....	.3756	.3347	.3672	.3404	.3410	.3074	.3183			
		2	.3344	.3073	.3299	.3299	.3164	.3750	.3660	.3624	.3750	.3344	.3660	.3389	.3389	.3073	.3184	2		
			.3341	.3067	.3302	.3296	.3170	.3749	.3661	.3625	.3756	.3347	.3654	3386	.3392	.3074	.3183			
		3	.3344	.3073	.3312	.3312	.3177	.3750	.3660	....	.3750	.3344	.3647	.3376	.3376	.3073	.3184	3		
			.3341	.3067	.3315	.3309	.3183	.3749	.3661	....	.3756	.3347	.3641	.3373	.3379	.3074	.3183			
		4	.3348	.3077	.3332	.3332	.3197	.3750	.3660	....	.3750	.3344	.3631	.3360	.3360	.3073	.3184	4		
			.3347	.3071	.3333	.3331	.3203	.3749	.3661	....	.3756	.3345	.3625	.3359	.3361	.3074	.3183			
⅜-24	NF	1	.3466	.3286	.3420	.3420	.3330	.3737	.3645	....	.3750	.3479	.3705	.3525	.3525	.3299	.3364	1	NF	⅜-24
			.3463	.3281	.3423	.3417	.3335	.3736	.3646	....	.3755	.3482	.3700	.3522	.3528	.3300	.3363			
		2	.3479	.3299	.3446	.3446	.3356	.3750	.3684	....	.3750	.3479	.3692	.3512	.3512	.3299	.3364	2		
			.3476	.3294	.3449	.3443	.3361	.3749	.3685	....	.3755	.3482	.3687	.3509	.3515	.3300	.3363			
		3	.3479	.3299	.3455	.3455	.3365	.3750	.3684	....	.3750	.3479	.3683	.3503	.3503	.3299	.3364	3		
			.3476	.3294	.3458	.3452	.3370	.3749	.3685	....	.3755	.3482	.3678	.3500	.3506	.3300	.3363			
		4	.3482	.3302	.3470	.3470	.3380	.3750	3684	....	.3750	.3479	.3671	.3491	.3491	.3299	.3364	4		
			.3481	.3297	.3471	.3469	.3385	.3749	.3685	....	.3755	.3480	.3666	.3490	.3492	.3300	.3363			
⅜-32	NEF	2	.3547	.3412	.3513	.3513	.3445	3750	.3696	....	.3750	.3547	.3716	.3581	.3581	.3412	.3460	2	NEF	⅜-32
			.3544	.3407	.3516	.3510	.3450	.3749	.3697	....	.3755	.3550	.3711	.3578	.3584	.3413	.3459			
		3	.3547	.3412	.3523	.3523	.3455	.3750	.3696	....	.3750	.3547	.3706	.3571	.3571	.3412	.3460	3		
			.3544	.3407	.3526	.3520	.3460	.3749	.3697	....	.3755	.3550	.3701	.3568	.3574	.3413	.3459			
7/16-14	NC	1	.3890	.3581	.3820	.3820	.3665	.4354	.4214	....	.4375	.3911	.4290	.3981	.3981	.3602	.3721	1	NC	7/16-14
			.3887	.3575	.3823	.3817	.3671	.4353	.4215	....	.4381	.3914	.4284	.3978	.3984	.3603	.3720			
		2	.3911	.3602	.3862	.3862	.3707	.4375	.4277	.4235	.4375	.3911	.4269	.3960	.3960	.3602	.3721	2		
			.3908	.3596	.3865	.3859	.3713	.4374	.4278	.4236	.4381	.3914	.4263	.3957	.3963	.3603	.3720			
		3	.3911	.3602	.3875	.3875	.3720	.4375	.4277	....	.4375	.3911	.4256	.3947	.3947	.3602	.3721	3		
			.3908	.3596	.3878	.3872	.3726	.4374	.4278	....	.4381	.3914	.4250	.3944	.3950	.3603	.3720			
		4	.39150	.3606	.38970	.38970	.3742	.4375	.4277	....	.4375	.39110	.4232	.39290	.39290	.3602	.3721	4		
			.39135	.3600	.38985	.38955	.3748	.4374	.4278	....	.4381	.39125	.4232	.39275	.39305	.3603	.3720			
7/16-20	NF	1	.4035	.3818	.3984	.3984	.3876	.4360	.4258	....	.4375	.4050	.4318	.4101	.4101	.3834	.3906	1	NF	7/16-20
			.4032	.3813	.3987	.3981	.3881	.4359	.4259	....	.4380	.4053	.4313	.4098	.4104	.3835	.3905			
		2	.4050	.3834	.4014	.4014	.3906	.4375	.4303	....	.4375	.4050	.4303	.4086	.4086	.3834	.3906	2		
			.4047	.3829	.4017	.4011	.3911	.4374	.4304	....	.4380	.4053	.4298	.4083	.4089	.3835	.3905			
		3	.4050	.3834	.4024	.4024	3916	.4375	.4303	....	.4375	.4050	.4293	.4076	.4076	.3834	.3906	3		
			.4047	.3829	.4027	.4021	.3921	.4374	.4304	....	.4380	.4053	.4288	.4073	.4079	.3835	.3905			
		4	.4053	.3837	.4040	.4040	.3932	.4375	.4303	....	.4375	.4050	.4280	.4063	.4063	.3834	.3906	4		
			.4052	.3832	.4041	.4039	.3937	.4374	.4304	....	.4380	.4051	.4275	.4062	.4064	.3835	.3905			
7/16-28	NEF	2	.4143	.3988	.4107	.4107	.4030	.4375	.4313	....	.4375	.4143	.4334	.4179	.4179	.3988	.4044	2	NEF	7/16-28
			.4140	.3983	.4110	.4104	.4035	.4374	.4314	....	.4380	.4146	.4329	.4176	.4182	.3989	.4043			
		3	.4143	.3988	.4118	.4118	.4041	.4375	.4313	....	.4375	.4143	.4323	.4168	.4168	.3988	.4044	3		
			.4140	.3983	.4121	.4115	.4046	.4374	.4314	....	.4380	.4146	.4318	.4165	.4171	.3989	.4043			
½-12	N	2	.4459	.4098	.4403	.4403	.4223	.5000	.4888	....	.5000	.4459	.4876	.4515	.4515	.4098	.4225	2	N	½-12
			.4456	.4092	.4406	.4400	.4229	.4999	.4889	....	.5006	.4462	.4870	.4512	.4518	.4099	.4224			
		3	.4459	.4098	.4419	.4419	.4239	.5000	.4888	....	.5000	.4459	.4860	.4499	.4499	.4098	.4225	3		
			.4456	.4092	.4422	.4416	.4245	.4999	.4889	....	.5006	.4462	.4854	.4496	.4502	.4099	.4224			
½-13	NC	1	.4478	.4145	.4404	.4404	.4238	.4978	.4830	....	.5000	.4500	.4907	.4574	.4574	.4167	.4290	1	NC	½-13
			.4475	.4139	.4407	.4401	.4244	.4977	.4831	....	.5006	.4503	.4901	.4571	.4577	.4168	.4289			
		2	.4500	.4167	.4448	.4448	.4282	.5000	.4896	.4852	.5000	.4500	.4885	.4552	.4552	.4167	.4290	2		
			.4497	.4161	.4451	.4445	.4288	.4999	.4897	.4853	.5006	.4503	.4879	.4549	.4555	.4168	.4289			
		3	.4500	.4167	.4463	.4463	.4297	.5000	.4896	....	.5000	.4500	.4870	.4537	.4537	.4167	.4290	3		
			.4497	.4161	.4460	.4460	.4303	.4999	.4897	....	.5006	.4503	.4864	.4534	.4540	.4168	.4289			
		4	.45040	.4171	.44850	.44850	.4319	.5000	.4896	....	.5000	.45000	.4852	.45190	.45190	.4167	.4290	4		
			.45025	.4165	.44865	.44835	.4325	.4999	.4897	....	.5006	.45015	.4846	.45175	.45205	.4168	.4289			
½-20	NF	1	.4660	.4444	.4609	.4609	.4501	.4985	.4883	....	.5000	.4675	.4943	.4726	.4726	.4459	.4531	1	NF	½-20
			.4657	.4439	.4612	.4606	.4506	.4984	.4884	....	.5005	.4678	.4938	.4723	.4729	.4460	.4530			
		2	.4675	.4459	.4639	.4639	.4531	.5000	.4928	....	.5000	.4675	.4928	.4711	.4711	.4459	.4531	2		
			.4672	.4454	.4642	.4636	.4536	.4999	.4929	....	.5005	.4678	.4923	.4708	.4714	.4460	.4530			
		3	.4675	.4459	.4649	.4649	.4541	.5000	.4928	....	.5000	.4675	.4918	.4701	4701	.4459	.4531	3		
			.4672	.4454	.4652	.4646	.4546	.4999	.4929	....	.5005	.4678	.4913	.4698	.4704	.4460	.4530			
		4	.4678	.4462	.4665	.4665	.4557	.5000	.4928	....	.5000	.4675	.4905	.4688	.4688	.4459	.4531	4		
			.4677	.4457	.4666	.4664	.4562	.4999	.4929	....	.5005	.4676	.4900	.4687	.4689	.4460	.4530			
½-28	NEF	2	.4768	.4613	.4731	.4731	.4654	.5000	.4938	....	.5000	.4768	.4960	.4805	.4805	.4613	.4669	2	NEF	½-28
			.4765	.4608	.4734	.4728	.4659	.4999	.4939	....	.5005	.4771	.4955	.4802	.4808	.4614	.4668			
		3	.4768	.4613	.4742	.4742	.4665	.5000	.4938	....	.5000	.4768	.4949	.4794	.4794	.4613	.4669	3		
			.4765	.4608	.4745	.4739	.4670	.4999	.4939	....	.5005	.4771	.4944	.4791	.4797	.4614	.4668			

TABLE 1.16.—*Gages for standard thread series, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			Thread gages					Z plain gages for major diameter			Thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tol. gage	Minus tol. gage								Minus tol. gage	Plus tol. gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
9/16-12	NC	1	0.5060	0.4699	0.4981	0.4981	0.4801	0.5601	0.5443	----------	0.5625	0.5084	0.5524	0.5163	0.5163	0.4723	0.4850	1	NC	9/16-12
			.5057	.4693	.4984	.4978	.4807	.5600	.5444	----------	.5631	.5087	.5518	.5160	.5166	.4724	.4849			
		2	.5084	.4723	.5028	.5028	.4848	.5625	.5513	0.5467	.5625	.5084	.5501	.5140	.5140	.4723	.4850	2		
			.5081	.4717	.5031	.5025	.4854	.5624	.5514	.5468	.5631	.5087	.5495	.5137	.5143	.4724	.4849			
		3	.5084	.4723	.5044	.5044	.4864	.5625	.5513	----------	.5625	.5084	.5485	.5124	.5124	.4723	.4850	3		
			.5081	.4717	.5047	.5041	.4870	.5624	.5514	----------	.5631	.5087	.5479	.5121	.5127	.4724	.4849			
		4	.5089	.4728	.5069	.5069	.4889	.5625	.5513	----------	.5625	.5084	.5465	.5104	.5104	.4723	.4850	4		
			.5087	.4722	.5071	.5067	.4895	.5624	.5514	----------	.5631	.5086	.5459	.5102	.5106	.4724	.4849			
9/16-18	NF	1	.5248	.5007	.5191	.5191	.5071	.5609	.5495	----------	.5625	.5264	.5562	.5321	.5321	.5024	.5100	1	NF	9/16-18
			.5245	.5002	.5194	.5188	.5076	.5608	.5496	----------	.5630	.5267	.5557	.5318	.5324	.5025	.5099			
		2	.5264	.5023	.5223	.5223	.5103	.5625	.5543	----------	.5625	.5264	.5546	.5305	.5305	.5024	.5100	2		
			.5261	.5018	.5226	.5220	.5108	.5624	.5544	----------	.5630	.5267	.5541	.5302	.5308	.5025	.5099			
		3	.5264	.5023	.5234	.5234	.5114	.5625	.5543	----------	.5625	.5264	.5535	.5294	.5294	.5024	.5100	3		
			.5261	.5018	.5237	.5231	.5119	.5624	.5544	----------	.5630	.5267	.5530	.5291	.5297	.5025	.5099			
		4	.52670	.5026	.52520	.52520	.5132	.5625	.5543	----------	.5625	.52640	.5520	.52790	.52790	.5024	.5100	4		
			.52655	.5021	.52535	.52505	.5137	.5624	.5544	----------	.5630	.52655	.5515	.52775	.52805	.5025	.5099			
9/16-24	NEF	2	.5354	.5174	.5314	.5314	.5224	.5625	.5559	----------	.5625	.5354	.5574	.5394	.5394	.5174	.5239	2	NEF	9/16-24
			.5351	.5169	.5317	.5311	.5229	.5624	.5560	----------	.5630	.5357	.5569	.5391	.5397	.5175	.5233			
		3	.5354	.5174	.5326	.5326	.5236	.5625	.5559	----------	.5625	.5354	.5562	.5382	.5382	.5174	.5239	3		
			.5351	.5169	.5329	.5323	.5241	.5624	.5560	----------	.5630	.5357	.5557	.5379	.5385	.5175	.5233			
5/8-11	NC	1	.5634	.5240	.5549	.5549	.5352	.6224	.6054	----------	.6250	.5660	.6139	.5745	.5745	.5266	.5397	1	NC	5/8-11
			.5631	.5234	.5552	.5546	.5358	.6223	.6055	----------	.6256	.5663	.6133	.5742	.5748	.5267	.5396			
		2	.5660	.5266	.5601	.5601	.5404	.6250	.6132	.6080	.6250	.5660	.6113	.5719	.5719	.5266	.5397	2		
			.5657	.5260	.5604	.5598	.5410	.6249	.6133	.6081	.6256	.5663	.6107	.5716	.5722	.5267	.5396			
		3	.5660	.5266	.5618	.5618	.5421	.6250	.6132	----------	.6250	.5660	.6096	.5702	.5702	.5266	.5397	3		
			.5657	.5260	.5621	.5615	.5427	.6249	.6133	----------	.6256	.5663	.6090	.5699	.5705	.5267	.5396			
		4	.5665	.5271	.5644	.5644	.5447	.6250	.6132	----------	.6250	.5660	.6075	.5681	.5681	.5266	.5397	4		
			.5663	.5265	.5646	.5642	.5453	.6249	.6133	----------	.6256	.5662	.6069	.5679	.5683	.5267	.5396			
5/8-12	N	2	.5709	.5348	.5653	.5653	.5473	.6250	.6138	----------	.6250	.5709	.6126	.5765	.5765	.5348	.5438	2	N	5/8-12
			.5706	.5342	.5656	.5650	.5479	.6249	.6139	----------	.6256	.5712	.6120	.5762	.5768	.5349	.5437			
		3	.5709	.5348	.5669	.5669	.5489	.6250	.6138	----------	.6250	.5709	.6110	.5749	.5749	.5348	.5438	3		
			.5706	.5342	.5672	.5666	.5495	.6249	.6139	----------	.6256	.5712	.6104	.5746	.5752	.5349	.5437			
5/8-18	NF	1	.5873	.5632	.5816	.5816	.5696	.6234	.6120	----------	.6250	.5889	.6187	.5946	.5946	.5649	.5725	1	NF	5/8-18
			.5870	.5627	.5819	.5813	.5701	.6233	.6121	----------	.6255	.5892	.6182	.5943	.5949	.5650	.5724			
		2	.5889	.5648	.5848	.5848	.5728	.6250	.6168	----------	.6250	.5889	.6171	.5930	.5930	.5649	.5725	2		
			.5886	.5643	.5851	.5845	.5733	.6249	.6169	----------	.6255	.5892	.6166	.5927	.5933	.5650	.5724			
		3	.5889	.5648	.5859	.5859	.5739	.6250	.6168	----------	.6250	.5889	.6160	.5919	.5919	.5649	.5725	3		
			.5886	.5643	.5862	.5856	.5744	.6249	.6169	----------	.6255	.5892	.6155	.5916	.5922	.5650	.5724			
		4	.58920	.5651	.58770	.58770	.5757	.6250	.6168	----------	.6250	.58890	.6145	.59040	.59040	.5649	.5725	4		
			.58905	.5646	.58785	.58755	.5762	.6249	.6169	----------	.6255	.58905	.6140	.59025	.59055	.5650	.5724			
5/8-24	NEF	2	.5979	.5799	.5938	.5938	.5848	.6250	.6184	----------	.6250	.5979	.6200	.6020	.6020	.5799	.5864	2	NEF	5/8-24
			.5976	.5794	.5941	.5935	.5853	.6249	.6185	----------	.6255	.5982	.6195	.6017	.6023	.5800	.5863			
		3	.5979	.5799	.5950	.5950	.5860	.6250	.6184	----------	.6250	.5979	.6188	.6008	.6008	.5799	.5864	3		
			.5976	.5794	.5953	.5947	.5865	.6249	.6185	----------	.6255	.5982	.6183	.6005	.6011	.5800	.5863			
11/16-12	N	2	.6334	.5973	.6278	.6278	.6098	.6875	.6763	----------	.6875	.6334	.6751	.6390	.6390	.5973	.6063	2	N	11/16-12
			.6331	.5967	.6281	.6275	.6104	.6874	.6764	----------	.6881	.6337	.6745	.6387	.6393	.5974	.6062			
		3	.6334	.5973	.6294	.6294	.6114	.6875	.6763	----------	.6875	.6334	.6735	.6374	.6374	.5973	.6063	3		
			.6331	.5967	.6297	.6291	.6120	.6874	.6764	----------	.6881	.6337	.6729	.6371	.6377	.5974	.6062			

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11/16-24	NEF	2	.6604	.6424	.6563	.6563	.6473	.6875	.6809	----------	.6875	.6604	.6825	.6645	.6645	.6424	.6489	2	NEF	11/16-24
			.6601	.6419	.6566	.6560	.6478	.6874	.6810	----------	.6880	.6607	.6820	.6642	.6648	.6425	.6488			
		3	.6604	.6424	.6575	.6575	.6485	.6875	.6809	----------	.6875	.6604	.6813	.6633	.6633	.5424	.6489	3		
			.6601	.6419	.6578	.6572	.6490	.6874	.6810	----------	.6880	.6607	.6808	.6630	.6636	.6425	.6488			
3/4-10	NC	1	.6822	.6389	.6730	.6730	.6514	.7472	.7288	----------	.7500	.6850	.7375	.6942	.6942	.6417	.6553	1	NC	3/4-10
			.6819	.6383	.6733	.6727	.6520	.7471	.7289	----------	.7506	.6853	.7369	.6939	.6945	.6418	.6552			
		2	.6850	.6417	.6786	.6786	.6570	.7500	.7372	.7316	.7500	.6850	.7347	.6914	.6914	.6417	.6553	2		
			.6847	.6411	.6789	.6783	.6576	.7499	.7373	.7317	.7506	.6853	.7341	.6911	.6917	.6418	.6552			
		3	.6850	.6417	.6805	.6805	.6589	.7500	.7372	----------	.7500	.6850	.7328	.6895	.6895	.6417	.6553	3		
			.6847	.6411	.6808	.6802	.6595	.7499	.7373	----------	.7506	.6853	.7322	.6892	.6898	.6418	.6552			
		4	.6856	.6423	.6833	.6833	.6617	.7500	.7372	----------	.7500	.6850	.7306	.6873	.6873	.6417	.6553	4		
			.6854	.6417	.6835	.6831	.6623	.7499	.7373	----------	.7506	.6852	.7300	.6871	.6875	.6418	.6552			
3/4-12	N	2	.6959	.6598	.6903	.6903	.6723	.7500	.7388	----------	.7500	.6959	.7376	.7015	.7015	.6598	.6688	2	N	3/4-12
			.6956	.6592	.6906	.6900	.6729	.7499	.7389	----------	.7506	.6962	.7370	.7012	.7018	.6599	.6687			
		3	.6959	.6598	.6919	.6919	.6739	.7500	.7388	----------	.7500	.6959	.7360	.6999	.6999	.6598	.6688	3		
			.6956	.6592	.6922	.6916	.6745	.7499	.7389	----------	.7506	.6962	.7354	.6996	.7002	.6599	.6687			
3/4-16	NF	1	.7076	.6805	.7013	.7013	.6878	.7482	.7356	----------	.7500	.7094	.7428	.7157	.7157	.6823	.6903	1	NF	3/4-16
			.7073	.6799	.7016	.7010	.6884	.7481	.7357	----------	.7506	.7097	.7422	.7154	.7160	.6824	.6902			
		2	.7094	.6823	.7049	.7049	.6914	.7500	.7410	----------	.7500	.7094	.7410	.7139	.7139	.6823	.6903	2		
			.7091	.6817	.7052	.7046	.6920	.7499	.7411	----------	.7506	.7097	.7404	.7136	.7142	.6824	.6902			
		3	.7094	.6823	.7062	.7062	.6927	.7500	.7410	----------	.7500	.7094	.7397	.7126	.7126	.6823	.6903	3		
			.7091	.6817	.7065	.7059	.6933	.7499	.7411	----------	.7506	.7097	.7391	.7123	.7129	.6824	.6902			
		4	.7098	.6827	.7082	.7082	.6947	.7500	.7410	----------	.7500	.7094	.7381	.7110	.7110	.6823	.6903	4		
			.7096	.6821	.7084	.7080	.6953	.7499	.7411	----------	.7506	.7096	.7375	.7108	.7112	.6824	.6902			
3/4-20	NEF	2	.7175	.6959	.7129	.7129	.7021	.7500	.7428	----------	.7500	.7175	.7438	.7221	.7221	.6959	.7031	2	NEF	3/4-20
			.7172	.6954	.7132	.7126	.7026	.7499	.7429	----------	.7505	.7178	.7433	.7218	.7224	.6960	.7030			
		3	.7175	.6959	.7143	.7143	.7035	.7500	.7428	----------	.7500	.7175	.7424	.7207	.7207	.6959	.7031	3		
			.7172	.6954	.7146	.7140	.7040	.7499	.7429	----------	.7505	.7178	.7419	.7204	.7210	.6960	.7030			
13/16-12	N	2	.7584	.7223	.7528	.7528	.7348	.8125	.8013	----------	.8125	.7584	.8001	.7640	.7640	.7223	.7313	2	N	13/16-12
			.7581	.7217	.7531	.7525	.7354	.8124	.8014	----------	.8131	.7587	.7995	.7637	.7643	.7224	.7312			
		2	.7584	.7223	.7544	.7544	.7364	.8125	.8013	----------	.8125	.7584	.7985	.7624	.7624	.7223	.7313	3		
			.7581	.7217	.7547	.7541	.7370	.8124	.8014	----------	.8131	.7587	.7979	.7621	.7627	.7224	.7312			
13/16-16	N	2	.7719	.7448	.7668	.7668	.7533	.8125	.8035	----------	.8125	.7719	.8041	.7770	.7770	.7448	.7528	2	N	13/16-16
			.7716	.7442	.7671	.7665	.7539	.8124	.8036	----------	.8131	.7722	.8035	.7767	.7773	.7449	.7527			
		3	.7719	.7448	.7684	.7684	.7549	.8125	.8035	----------	.8125	.7719	.8025	.7754	.7754	.7448	.7528	3		
			.7716	.7442	.7687	.7681	.7555	.8124	.8036	----------	.8131	.7722	.8019	.7751	.7757	.7449	.7527			
13/16-20	NEF	2	.7800	.7584	.7754	.7754	.7646	.8125	.8053	----------	.8125	.7800	.8063	.7846	.7846	.7584	.7656	2	NEF	13/16-20
			.7797	.7579	.7757	.7751	.7651	.8124	.8054	----------	.8130	.7803	.8058	.7843	.7849	.7585	.7655			
		3	.7800	.7584	.7768	.7768	.7660	.8125	.8053	----------	.8125	.7800	.8049	.7832	.7832	.7584	.7656	3		
			.7797	.7579	.7771	.7765	.7665	.8124	.8054	----------	.8130	.7803	.8044	.7829	.7835	.7585	.7655			
7/8-9	NC	1	.7997	.7516	.7897	.7897	.7656	.87190	.85190	----------	.8750	.8028	.8609	.8128	.8128	.75470	.76890	1	NC	7/8-9
			.7994	.7509	.7900	.7894	.7663	.87178	.85202	----------	.8757	.8031	.8602	.8125	.8131	.75482	.76878			
		2	.8028	.7547	.7958	.7958	.7717	.87500	.86100	.85500	.8750	.8028	.8579	.8098	.8098	.75470	.76890	2		
			.8025	.7540	.7961	.7955	.7724	.87488	.86112	.85512	.8757	.8031	.8572	.8095	.8101	.75482	.76878			
		3	.8028	.7547	.7979	.7979	.7738	.87500	.86100	----------	.8750	.8028	.8558	.8077	.8077	.75470	.76890	3		
			.8025	.7540	.7982	.7976	.7745	.87488	.86112	----------	.8757	.8031	.8551	.8074	.8080	.75482	.76878			
		4	.8034	.7553	.8010	.8010	.7769	.87500	.86100	----------	.8750	.8028	.8533	.8052	.8052	.75470	.76890	4		
			.8032	.7546	.8012	.8008	.7776	.87488	.86112	----------	.8757	.8030	.8526	.8050	.8054	.75482	.76878			
7/8-12	N	2	.8209	.7848	.8153	.8153	.7973	.87500	.86380	----------	.8750	.8209	.8626	.8265	.8265	.78480	.79380	2	N	7/8-12
			.8206	.7842	.8156	.8150	.7979	.87488	.86392	----------	.8756	.8212	.8620	.8262	.8268	.78492	.79368			
		3	.8209	.7848	.8169	.8169	.7989	.87500	.86380	----------	.8750	.8209	.8610	.8249	.8249	.78480	.79380	3		
			.8206	.7842	.8172	.8166	.7995	.87488	.86392	----------	.8756	.8212	.8604	.8246	.8252	.78492	.79368			
7/8-14	NF	1	.8265	.7956	.8195	.8195	.8040	.87290	.85890	----------	.8750	.8286	.8665	.8356	.8356	.79770	.80620	1	NF	7/8-14
			.8252	.7950	.8198	.8192	.8046	.87278	.85902	----------	.8756	.8289	.8659	.8353	.8359	.79782	.80608			
		2	.8286	.7977	.8237	.8237	.8082	.87500	.86520	----------	.8750	.8286	.8644	.8335	.8335	.79770	.80620	2		
			.8283	.7971	.8240	.8234	.8088	.87488	.86532	----------	.8756	.8289	.8638	.8332	.8338	.79782	.80608			
		3	.8286	.7977	.8250	.8250	.8095	.87500	.86520	----------	.8750	.8286	.8631	.8322	.8322	.79770	.80620	3		
			.8283	.7971	.8253	.8247	.8101	.87488	.86532	----------	.8756	.8289	.8625	.8319	.8325	.79782	.80608			
		4	.8290	.7981	.8272	.8272	.8117	.87500	.86520	----------	.8750	.8286	.8613	.8304	.8304	.79770	.80620	4		
			.8288	.7975	.8274	.8270	.8123	.87488	.86532	----------	.8756	.8288	.8607	.8302	.8306	.79782	.80603			
7/8-16	N	2	.8344	.8073	.8293	.8293	.8158	.87500	.86600	----------	.8750	.8344	.8666	.8295	.8295	.80730	.81530	2	N	7/8-16
			.8341	.8067	.8296	.8290	.8164	.87488	.86612	----------	.8756	.8347	.8560	.8392	.8398	.80742	.81518			
		3	.8344	.8073	.8308	.8308	.8173	.87500	.86600	----------	.8750	.8344	.8651	.8380	.8380	.80730	.81530	3		
			.8341	.8067	.8311	.8305	.8179	.87488	.86612	----------	.8756	.8347	.8645	.8377	.8383	.80742	.81518			
7/8-20	NEF	2	.8425	.8209	.8378	.8378	.8270	.87500	.86780	----------	.8750	.8425	.8689	.8472	.8472	.82090	.82810	2	NEF	7/8-20
			.8422	.8204	.8381	.8375	.8275	.87488	.86792	----------	.8755	8428	.8684	.8469	.8475	.82102	.82798			
		3	.8425	.8209	.8392	.8392	.8284	.87500	.86780	----------	.8750	.8425	.8675	.8458	.8458	.82090	.82810	3		
			.8422	.8204	.8395	.8389	.8289	.87488	.86792	----------	.8755	.8428	.8670	.8455	.8461	.82102	.82798			

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TABLE 1.16.—*Gages for standard thread series, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			Thread gages					Z plain gages for major diameter			Thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tol. gage	Minus tol. gage								Minus tol. gage	Plus tol. gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
15/16-12	N	2	0.8834	0.8473	0.8778	0.8778	0.8598	0.93750	0.92630	----------	0.9375	0.8834	0.9251	0.8890	0.8890	0.84730	0.85630	2	N	15/16-12
			.8831	.8467	.8781	.8775	.8604	.93738	.92642	----------	.9381	.8837	.9245	.8887	.8893	.84742	.85618			
		3	.8834	.8473	.8794	.8794	.8614	.93750	.92630	----------	.9375	.8834	.9235	.8874	.8874	.84730	.85630	3		
			.8831	.8467	.8797	.8791	.8620	.93738	.92642	----------	.9381	.8837	.9229	.8871	.8877	.84742	.85618			
15/16-16	N	2	.8969	.8698	.8917	.8917	.8782	.93750	.92850	----------	.9375	.8969	.9292	.9021	.9021	.86980	.87780	2	N	15/16-16
			.8966	.8692	.8920	.8914	.8788	.93738	.92862	----------	.9381	.8972	.9286	.9018	.9024	.86992	.87768			
		3	.8969	.8698	.8933	.8933	.8798	.93750	.92850	----------	.9375	.8969	.9276	.9005	.9005	.86980	.87780	3		
			.8966	.8692	.8936	.8930	.8804	.93738	.92862	----------	.9381	.8972	.9270	.9002	.9008	.86992	.87768			
15/16-20	NEF	2	.9050	.8834	.9003	.9003	.8895	.93750	.93030	----------	.9375	.9050	.9314	.9097	.9097	.88340	.89060	2	NEF	15/16-20
			.9047	.8829	.9006	.9000	.8900	.93738	.93042	----------	.9380	.9053	.9309	.9094	.9100	.88352	.89048			
		3	.9050	.8834	.9017	.9017	.8909	.93750	.93030	----------	.9375	.9050	.9300	.9083	.9083	.88340	.89060	3		
			.9047	.8829	.9020	.9014	.8914	.93738	.93042	----------	.9380	.9053	.9295	.9080	.9086	.88352	.89048			
1-8	NC	1	.9154	.8613	.9043	.9043	.8772	.99660	.97440	----------	1.0000	.9188	.9840	.9299	.9299	.86470	.87950	1	NC	1-8
			.9150	.8606	.9047	.9039	.8779	.99648	.97452	----------	1.0007	.9192	.9833	.9295	.9303	.86482	.87938			
		2	.9188	.8647	.9112	.9112	.8841	1.00000	.98480	0.97780	1.0000	.9188	.9805	.9264	.9264	.86470	.87950	2		
			.9184	.8640	.9116	.9108	.8848	.99988	.98492	.97792	1.0007	.9192	.9798	.9260	.9268	.86482	.87938			
		3	.9188	.8647	.9134	.9134	.8863	1.00000	.98480	----------	1.0000	.9188	.9783	.9242	.9242	.84670	.87950	3		
			.9184	.8640	.9138	.9130	.8870	.99988	.98492	----------	1.0007	.9192	.9776	.9238	.9246	.86482	.87938			
		4	.9195	.8654	.9168	.9168	.8897	1.00000	.98480	----------	1.0000	.9188	.9756	.9215	.9215	.86470	.87950	4		
			.9193	.8647	.9170	.9166	.8904	.99988	.98492	----------	1.0007	.9190	.9749	.9213	.9217	.86482	.87938			
1-12	N	2	.9459	.9098	.9403	.9403	.9223	1.00000	.98880	----------	1.0000	.9459	.9876	.9515	.9515	.90980	.91880	2	N	1-12
			.9456	.9092	.9406	.9400	.9229	.99988	.98892	----------	1.0006	.9462	.9870	.9512	.9518	.90992	.91868			
		3	.9459	.9098	.9419	.9419	.9239	1.00000	.98880	----------	1.0000	.9459	.9860	.9499	.9499	.90980	.91880	3		
			.9456	.9092	.9422	.9416	.9245	.99988	.98892	----------	1.0006	.9462	.9854	.9496	.9502	.90992	.91868			
1-14	NS	1	.9515	.9206	.9445	.9445	.9290	.99790	.98390	----------	1.0000	.9536	.9915	.9606	.9606	.92270	.93120	1	NS	1-14
			.9512	.9200	.9448	.9442	.9296	.99778	.98402	----------	1.0006	.9539	.9909	.9603	.9609	.92282	.93108			
		2	.9536	.9227	.9487	.9487	.9332	1.00000	.99020	----------	1.0000	.9536	.9894	.9585	.9585	.92270	.93120	2		
			.9533	.9221	.9490	.9484	.9338	.99988	.99032	----------	1.0006	.9539	.9888	.9582	.9588	.92282	.93108			
		3	.9536	.9227	.9500	.9500	.9345	1.00000	.99020	----------	1.0000	.9536	.9881	.9572	.9572	.92270	.93120	3		
			.9533	.9221	.9503	.9497	.9351	.99988	.99032	----------	1.0006	.9539	.9875	.9569	.9575	.92282	.93108			
		4	.9540	.9231	.9522	.9522	.9367	1.00000	.99020	----------	1.0000	.9536	.9863	.9554	.9554	.92270	.93120	4		
			.9538	.9225	.9524	.9520	.9373	.99988	.99032	----------	1.0006	.9538	.9857	.9552	.9556	.92282	.93108			
1-16	N	2	.9594	.9323	.9542	.9542	.9407	1.00000	.99100	----------	1.0000	.9594	.9917	.9646	.9646	.93230	.94030	2	N	1-16
			.9591	.9317	.9545	.9539	.9413	.99988	.99112	----------	1.0006	.9597	.9911	.9643	.9649	.93242	.94018			
		3	.9594	.9323	.9557	.9557	.9422	1.00000	.99100	----------	1.0000	.9594	.9902	.9631	.9631	.93230	.94030	3		
			.9591	.9317	.9560	.9554	.9428	.99988	.99112	----------	1.0006	.9597	.9896	.9628	.9634	.93242	.94018			
1-20	NEF	2	.9675	.9459	.9627	.9627	.9519	1.00000	.99280	----------	1.0000	.9675	.9940	.9723	.9723	.94590	.95310	2	NEF	1-20
			.9672	.9454	.9630	.9624	.9524	.99988	.99292	----------	1.0005	.9678	.9935	.9720	.9726	.94602	.95298			
		3	.9675	.9459	.9641	.9641	.9533	1.00000	.99280	----------	1.0000	.9675	.9926	.9709	.9709	.94590	.95310	3		
			.9672	.9454	.9644	.9638	.9538	.99988	.99292	----------	1.0005	.9678	.9921	.9706	.9712	.94602	.95298			
1 1/16-12	N	2	1.0084	.9723	1.0028	1.0028	.9848	1.06250	1.05130	----------	1.0625	1.0084	1.0501	1.0140	1.0140	.97230	.98130	2	N	1 1/16-12
			1.0081	.9717	1.0031	1.0025	.9854	1.06238	1.05142	----------	1.0631	1.0087	1.0495	1.0137	1.0143	.97242	.98118			
		3	1.0084	.9723	1.0044	1.0044	.9864	1.06250	1.05130	----------	1.0625	1.0084	1.0485	1.0124	1.0124	.97230	.98130	3		
			1.0081	.9717	1.0047	1.0041	.9870	1.06238	1.05142	----------	1.0631	1.0087	1 0479	1.0121	1.0127	.97242	.98118			
1 1/16-16	N	2	1.0219	.9948	1.0166	1.0166	1.0031	1.06250	1.05350	----------	1.0625	1.0219	1.0543	1.0272	1.0272	.99480	1.00280	2	N	1 1/16-16
			1.0216	.9942	1.0169	1.0163	1.0037	1.06238	1.05362	----------	1.0631	1.0222	1.0537	1.0269	1.0275	.99492	1.00268			
		3	1.0219	.9948	1.0182	1.0182	1.0047	1.06250	1.05350	----------	1.0625	1.0219	1.0527	1.0256	1.0256	.99480	1.00280	3		
			1.0216	.9942	1.0185	1.0179	1.0053	1.06238	1.05362	----------	1.0631	1.0222	1.0521	1.0253	1.0259	.99492	1.00268			

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1¹⁄₁₆-18	NEF	2	1.0264	1.0023	1.0213	1.0213	1.0093	1.06250	1.05430	....	1.0625	1.0264	1.0556	1.0315	1.0315	1.00240	1.01000	2	NEF	1¹⁄₁₆-18
			1.0261	1.0018	1.0216	1.0210	1.0098	1.06238	1.05442	....	1.0630	1.0267	1.0551	1.0312	1.0318	1.00252	1.00988			
		3	1.0264	1.0023	1.0228	1.0228	1.0108	1.06250	1.05430	....	1.0625	1.0264	1.0541	1.0300	1.0300	1.00240	1.01000	3		
			1.0261	1.0018	1.0231	1.0225	1.0113	1.06238	1.05442	....	1.0630	1.0267	1.0536	1.0297	1.0303	1.00252	1.00988			
1⅛-7	NC	1	1.0283	.9664	1.0159	1.0159	.9850	1.12110	1.09630	....	1.1250	1.0322	1.1065	1.0446	1.0446	.97040	.98580	1	NC	1⅛-7
			1.0279	.9657	1.0163	1.0155	.9857	1.12098	1.09642	....	1.1257	1.0326	1.1058	1.0442	1.0450	.97052	.98568			
		2	1.0322	.9703	1.0237	1.0237	.9928	1.12500	1.10800	1.10020	1.1250	1.0322	1.1026	1.0407	1.0407	.97040	.98580	2		
			1.0318	.9696	1.0241	1.0233	.9935	1.12488	1.10812	1.10032	1.1257	1.0326	1.1019	1.0403	1.0411	.97052	.98568			
		3	1.0322	.9703	1.0263	1.0263	.9954	1.12500	1.10800	....	1.1250	1.0322	1.1000	1.0381	1.0381	.97040	.98580	3		
			1.0318	.9696	1.0267	1.0259	.9961	1.12488	1.10812	....	1.1257	1.0326	1.0993	1.0377	1.0385	.97052	.98568			
		4	1.0330	.9711	1.0300	1.0300	.9991	1.12500	1.10800	....	1.1250	1.0322	1.0971	1.0352	1.0352	.97040	.98580	4		
			1.0328	.9704	1.0302	1.0298	.9998	1.12488	1.10812	....	1.1257	1.0324	1.0964	1.0350	1.0354	.97052	.98568			
1⅛-8	N	2	1.0438	.9897	1.0359	1.0359	1.0088	1.12500	1.10980	1.10280	1.1250	1.0438	1.1058	1.0517	1.0517	.98970	1.00450	2	N	1⅛-8
			1.0431	.9890	1.0363	1.0355	1.0095	1.12488	1.10992	1.10292	1.1257	1.0442	1.1051	1.0513	1.0521	.98982	1.00438			
		3	1.0438	.9897	1.0383	1.0383	1.0112	1.12500	1.10980	....	1.1250	1.0438	1.1034	1.0493	1.0493	.98970	1.00450	3		
			1.0434	.9890	1.0387	1.0379	1.0119	1.12488	1.10992	....	1.1257	1.0442	1.1027	1.0489	1.0497	.98982	1.00438			
1⅛-12	NF	1	1.0685	1.0324	1.0606	1.0606	1.0426	1.12260	1.10680	....	1.1250	1.0709	1.1149	1.0788	1.0788	1.03480	1.04380	1	NF	1⅛-12
			1.0682	1.0318	1.0609	1.0603	1.0432	1.12248	1.10692	....	1.1256	1.0712	1.1143	1.0785	1.0791	1.03492	1.04368			
		2	1.0709	1.0348	1.0653	1.0653	1.0473	1.12500	1.11380	....	1.1250	1.0709	1.1126	1.0765	1.0765	1.03480	1.04380	2		
			1.0706	1.0342	1.0656	1.0650	1.0479	1.12488	1.11392	....	1.1256	1.0712	1.1120	1.0762	1.0768	1.03492	1.04368			
		3	1.0709	1.0348	1.0669	1.0669	1.0489	1.12500	1.11380	....	1.1250	1.0709	1.1110	1.0749	1.0749	1.03480	1.04380	3		
			1.0706	1.0342	1.0672	1.0666	1.0495	1.12488	1.11392	....	1.1256	1.0712	1.1104	1.0746	1.0752	1.03492	1.04308			
		4	1.0711	1.0353	1.0694	1.0694	1.0514	1.12500	1.11380	....	1.1250	1.0709	1.1090	1.0729	1.0720	1.03480	1.04380	4		
			1.0712	1.0347	1.0696	1.0692	1.0520	1.12488	1.11392	....	1.1256	1.0711	1.1084	1.0727	1.0731	1.03492	1.04368			
1⅛-16	N	2	1.0844	1.0573	1.0790	1.0790	1.0655	1.12500	1.11600	....	1.1250	1.0844	1.1169	1.0898	1.0898	1.05730	1.06530	2	N	1⅛-16
			1.0841	1.0567	1.0793	1.0787	1.0661	1.12488	1.11612	....	1.1256	1.0847	1.1163	1.0895	1.0901	1.05742	1.06518			
		3	1.0844	1.0573	1.0806	1.0806	1.0671	1.12500	1.11600	....	1.1250	1.0844	1.1153	1.0882	1.0882	1.05730	1.06530	3		
			1.0841	1.0567	1.0809	1.0803	1.0677	1.12488	1.11612	....	1.1256	1.0847	1.1147	1.0879	1.0885	1.05742	1.06518			
1⅛-18	NEF	2	1.0889	1.0648	1.0837	1.0837	1.0717	1.12500	1.11680	....	1.1250	1.0889	1.1182	1.0941	1.0941	1.06490	1.07250	2	NEF	1⅛-18
			1.0886	1.0643	1.0840	1.0834	1.0722	1.12488	1.11692	....	1.1255	1.0892	1.1177	1.0938	1.0944	1.06502	1.07238			
		3	1.0889	1.0648	1.0853	1.0853	1.0733	1.12500	1.11680	....	1.1250	1.0889	1.1166	1.0925	1.0925	1.06490	1.07250	3		
			1.0886	1.0643	1.0856	1.0850	1.0738	1.12488	1.11692	....	1.1255	1.0892	1.1161	1.0922	1.0928	1.06502	1.07238			
1³⁄₁₆-12	N	2	1.1334	1.0973	1.1278	1.1278	1.1098	1.18750	1.17630	....	1.1875	1.1334	1.1751	1.1390	1.1390	1.09730	1.10630	2	N	1³⁄₁₆-12
			1.1331	1.0967	1.1281	1.1275	1.1104	1.18738	1.17642	....	1.1881	1.1337	1.1745	1.1387	1.1393	1.09742	1.10618			
		3	1.1334	1.0973	1.1294	1.1294	1.1114	1.18750	1.17630	....	1.1875	1.1334	1.1735	1.1374	1.1374	1.09730	1.10630	3		
			1.1331	1.0967	1.1297	1.1291	1.1120	1.18738	1.17642	....	1.1881	1.1337	1.1729	1.1371	1.1377	1.09742	1.10618			
1³⁄₁₆-16	N	2	1.1469	1.1198	1.1415	1.1415	1.1280	1.18750	1.17850	....	1.1875	1.1469	1.1794	1.1523	1.1523	1.11980	1.12780	2	NEF	1³⁄₁₆-16
			1.1466	1.1192	1.1418	1.1412	1.1286	1.18738	1.17862	....	1.1881	1.1472	1.1788	1.1520	1.1526	1.11992	1.12768			
		3	1.1469	1.1198	1.1431	1.1431	1.1296	1.18750	1.17850	....	1.1875	1.1469	1.1778	1.1507	1.1507	1.11980	1.12780	3		
			1.1466	1.1192	1.1434	1.1428	1.1302	1.18738	1.17862	....	1.1881	1.1472	1.1772	1.1504	1.1510	1.11992	1.12768			
1³⁄₁₆-18	NEF	2	1.1514	1.1273	1.1462	1.1462	1.1342	1.18750	1.17930	....	1.1875	1.1514	1.1807	1.1566	1.1566	1.12740	1.13500	2	NEF	1³⁄₁₆-18
			1.1511	1.1268	1.1465	1.1459	1.1347	1.18738	1.17942	....	1.1880	1.1517	1.1802	1.1563	1.1569	1.12752	1.13488			
		3	1.1514	1.1273	1.1478	1.1478	1.1358	1.18750	1.17930	....	1.1875	1.1514	1.1791	1.1550	1.1550	1.12740	1.13500	3		
			1.1511	1.1268	1.1481	1.1475	1.1363	1.18738	1.17942	....	1.1880	1.1517	1.1786	1.1547	1.1553	1.12752	1.13488			
1¼-7	NC	1	1.1533	1.0914	1.1409	1.1409	1.1100	1.24610	1.22130	....	1.2500	1.1572	1.2315	1.1696	1.1696	1.09540	1.11080	1	NC	1¼-7
			1.1529	1.0907	1.1413	1.1405	1.1107	1.24598	1.22142	....	1.2507	1.1576	1.2308	1.1692	1.1700	1.09552	1.11068			
		2	1.1572	1.0953	1.1487	1.1487	1.1178	1.25000	1.23300	1.22520	1.2500	1.1572	1.2276	1.1657	1.1657	1.09540	1.11080	2		
			1.1568	1.0946	1.1491	1.1483	1.1185	1.24988	1.23312	1.22532	1.2507	1.1576	1.2269	1.1653	1.1661	1.09552	1.11068			
		3	1.1572	1.0953	1.1513	1.1513	1.1204	1.25000	1.23300	....	1.2500	1.1572	1.2250	1.1631	1.1631	1.09540	1.11080	3		
			1.1568	1.0946	1.1517	1.1509	1.1211	1.24988	1.23312	....	1.2507	1.1576	1.2243	1.1627	1.1635	1.09552	1.11068			
		4	1.1580	1.0961	1.1550	1.1550	1.1241	1.25000	1.23300	....	1.2500	1.1572	1.2221	1.1602	1.1602	1.09540	1.11080	4		
			1.1578	1.0954	1.1552	1.1548	1.1248	1.24988	1.23312	....	1.2507	1.1574	1.2214	1.1600	1.1604	1.09552	1.11068			
1¼-8	N	2	1.1688	1.1147	1.1605	1.1605	1.1334	1.25000	1.23480	1.22780	1.2500	1.1688	1.2312	1.1771	1.1771	1.11470	1.12950	2	N	1¼-8
			1.1684	1.1140	1.1609	1.1601	1.1341	1.24988	1.23492	1.22792	1.2507	1.1692	1.2305	1.1767	1.1775	1.11482	1.12938			
		3	1.1688	1.1147	1.1630	1.1630	1.1359	1.25000	1.23480	....	1.2500	1.1688	1.2287	1.1746	1.1746	1.11470	1.12950	3		
			1.1684	1.1140	1.1634	1.1626	1.1366	1.24988	1.23492	....	1.2507	1.1692	1.2280	1.1742	1.1750	1.11482	1.12938			
1¼-12	NF	1	1.1935	1.1574	1.1856	1.1856	1.1676	1.24760	1.23180	....	1.2500	1.1959	1.2399	1.2038	1.2038	1.15980	1.16880	1	NF	1¼-12
			1.1932	1.1568	1.1859	1.1853	1.1682	1.24748	1.23192	....	1.2506	1.1962	1.2393	1.2035	1.2041	1.15992	1.16868			
		2	1.1959	1.1598	1.1903	1.1903	1.1723	1.25000	1.23880	....	1.2500	1.1959	1.2376	1.2015	1.2015	1.15980	1.16880	2		
			1.1956	1.1592	1.1906	1.1900	1.1729	1.24988	1.23892	....	1.2506	1.1962	1.2370	1.2012	1.2018	1.15992	1.16868			
		3	1.1959	1.1598	1.1919	1.1919	1.1739	1.25000	1.23880	....	1.2500	1.1959	1.2360	1.1999	1.1999	1.15980	1.16880	3		
			1.1956	1.1592	1.1922	1.1916	1.1745	1.24988	1.23892	....	1.2506	1.1962	1.2354	1.1996	1.2002	1.15992	1.16868			
		4	1.1964	1.1603	1.1944	1.1944	1.1764	1.25000	1.23880	....	1.2500	1.1959	1.2340	1.1979	1.1979	1.15980	1.16880	4		
			1.1962	1.1597	1.1946	1.1942	1.1770	1.24988	1.23892	....	1.2506	1.1961	1.2334	1.1977	1.1981	1.15992	1.16868			
1¼-16	N	2	1.2094	1.1823	1.2039	1.2039	1.1904	1.25000	1.24100	....	1.2500	1.2094	1.2420	1.2149	1.2149	1.18230	1.19030	2	N	1¼-16
			1.2091	1.1817	1.2042	1.2036	1.1910	1.24988	1.24112	....	1.2506	1.2097	1.2414	1.2146	1.2152	1.18242	1.19018			
		3	1.2094	1.1823	1.2056	1.2056	1.1921	1.25000	1.24100	....	1.2500	1.2094	1.2403	1.2132	1.2132	1.18230	1.19030	3		
			1.2091	1.1817	1.2059	1.2053	1.1927	1.24988	1.24112	....	1.2506	1.2097	1.2397	1.2129	1.2135	1.18242	1.19018			

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TABLE 1.16.—*Gages for standard thread series, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			Thread gages					Z plain gages for major diameter			Thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tol. gage	Minus tol. gage								Minus tol. gage	Plus tol. gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
1¼-18	NEF	2	1.2139	1.1898	1.2086	1.2086	1.1966	1.25000	1.24180	---------	1.2500	1.2139	1.2433	1.2192	1.2192	1.18990	1.19750	2	NEF	1¼-18
			1.2136	1.1893	1.2089	1.2083	1.1971	1.24988	1.24192	---------	1.2505	1.2142	1.2428	1.2189	1.2195	1.19002	1.19738			
		3	1.2139	1.1898	1.2102	1.2102	1.1982	1.25000	1.24180	---------	1.2500	1.2139	1.2417	1.2176	1.2176	1.18990	1.19750	3		
			1.2136	1.1893	1.2105	1.2099	1.1987	1.24988	1.24192	---------	1.2505	1.2142	1.2412	1.2173	1.2179	1.19002	1.19738			
1⁵⁄₁₆-12	N	2	1.2584	1.2223	1.2528	1.2528	1.2348	1.31250	1.30130	---------	1.3125	1.2584	1.3001	1.2640	1.2640	1.22230	1.23130	2	N	1⁵⁄₁₆-12
			1.2581	1.2217	1.2531	1.2525	1.2354	1.31238	1.30142	---------	1.3131	1.2587	1.2995	1.2637	1.2643	1.22242	1.23118			
		3	1.2584	1.2223	1.2544	1.2544	1.2364	1.31250	1.30130	---------	1.3125	1.2584	1.2985	1.2624	1.2624	1.22230	1.23130	3		
			1.2581	1.2217	1.2547	1.2541	1.2370	1.31238	1.30142	---------	1.3131	1.2587	1.2979	1.2621	1.2627	1.22242	1.23118			
1⁵⁄₁₆-16	N	2	1.2719	1.2448	1.2664	1.2664	1.2529	1.31250	1.30350	---------	1.3125	1.2719	1.3045	1.2774	1.2774	1.24480	1.25280	2	N	1⁵⁄₁₆-16
			1.2716	1.2442	1.2667	1.2661	1.2535	1.31238	1.30362	---------	1.3131	1.2722	1.3039	1.2771	1.2777	1.24492	1.25268			
		3	1.2719	1.2448	1.2680	1.2680	1.2545	1.31250	1.30350	---------	1.3125	1.2719	1.3029	1.2758	1.2758	1.24480	1.25280	3		
			1.2716	1.2442	1.2683	1.2677	1.2551	1.31238	1.30362	---------	1.3131	1.2722	1.3023	1.2755	1.2761	1.24492	1.25268			
1⁵⁄₁₆-18	NEF	2	1.2764	1.2523	1.2711	1.2711	1.2591	1.31250	1.30430	---------	1.3125	1.2764	1.3058	1.2817	1.2817	1.25240	1.26000	2	NEF	1⁵⁄₁₆-18
			1.2761	1.2518	1.2714	1.2708	1.2596	1.31238	1.30442	---------	1.3130	1.2767	1.3053	1.2814	1.2820	1.25252	1.25988			
		3	1.2764	1.2523	1.2727	1.2727	1.2607	1.31250	1.30430	---------	1.3125	1.2764	1.3042	1.2801	1.2801	1.25240	1.26000	3		
			1.2761	1.2518	1.2730	1.2724	1.2612	1.31238	1.30442	---------	1.3130	1.2767	1.3037	1.2798	1.2804	1.25252	1.25988			
1⅜-6	NC	1	1.2623	1.1901	1.2478	1.2478	1.2117	1.37060	1.34160	---------	1.3750	1.2667	1.3534	1.2812	1.2812	1.19460	1.21260	1	NC	1⅜-6
			1.2619	1.1893	1.2482	1.2474	1.2125	1.37048	1.34172	---------	1.3758	1.2671	1.3526	1.2808	1.2816	1.19472	1.21248			
		2	1.2667	1.1945	1.2566	1.2566	1.2205	1.37500	1.35480	1.34600	1.3750	1.2667	1.3490	1.2768	1.2768	1.19460	1.21260	2		
			1.2663	1.1937	1.2570	1.2562	1.2213	1.37488	1.35492	1.34612	1.3758	1.2671	1.3482	1.2764	1.2772	1.19472	1.21248			
		3	1.2667	1.1945	1.2596	1.2596	1.2235	1.37500	1.35480	---------	1.3750	1.2667	1.3460	1.2738	1.2738	1.19460	1.21260	3		
			1.2663	1.1937	1.2600	1.2592	1.2243	1.37488	1.35492	---------	1.3758	1.2671	1.3452	1.2734	1.2742	1.19472	1.21248			
		4	1.2676	1.1954	1.2640	1.2640	1.2279	1.37500	1.35480	---------	1.3750	1.2667	1.3425	1.2703	1.2703	1.19460	1.21260	4		
			1.2674	1.1946	1.2642	1.2638	1.2287	1.37488	1.35492	---------	1.3758	1.2669	1.3417	1.2701	1.2705	1.19472	1.21248			
1⅜-8	N	2	1.2938	1.2397	1.2852	1.2852	1.2581	1.37500	1.35980	1.35280	1.3750	1.2938	1.3565	1.3024	1.3024	1.23970	1.25450	2	N	1⅜-8
			1.2934	1.2390	1.2856	1.2848	1.2588	1.37488	1.35992	1.35292	1.3757	1.2942	1.3558	1.3020	1.3028	1.23982	1.25438			
		3	1.2938	1.2397	1.2877	1.2877	1.2606	1.37500	1.35980	---------	1.3750	1.2938	1.3540	1.2999	1.2999	1.23970	1.25450	3		
			1.2934	1.2390	1.2881	1.2873	1.2613	1.37488	1.35992	---------	1.3757	1.2942	1.3533	1.2995	1.3003	1.23982	1.25438			
1⅜-12	NF	1	1.3185	1.2824	1.3106	1.3106	1.2926	1.37260	1.35680	---------	1.3750	1.3209	1.3649	1.3288	1.3288	1.28490	1.29380	1	NF	1⅜-12
			1.3182	1.2818	1.3109	1.3103	1.2932	1.37248	1.35692	---------	1.3756	1.3212	1.3643	1.3285	1.3291	1.28492	1.29368			
		2	1.3209	1.2848	1.3153	1.3153	1.2973	1.37500	1.36380	---------	1.3750	1.3209	1.3626	1.3265	1.3265	1.28490	1.29380	2		
			1.3206	1.2842	1.3156	1.3150	1.2979	1.37488	1.36392	---------	1.3756	1.3212	1.3620	1.3262	1.3268	1.28492	1.29368			
		3	1.3209	1.2848	1.3169	1.3169	1.2989	1.37500	1.36380	---------	1.3750	1.3209	1.3610	1.3249	1.3249	1.28490	1.29380	3		
			1.3206	1.2842	1.3172	1.3166	1.2995	1.37488	1.36392	---------	1.3756	1.3212	1.3604	1.3246	1.3252	1.28492	1.29368			
		4	1.3214	1.2853	1.3194	1.3194	1.3014	1.37500	1.36380	---------	1.3750	1.3209	1.3590	1.3229	1.3229	1.28490	1.29380	4		
			1.3212	1.2847	1.3196	1.3192	1.3020	1.37488	1.36392	---------	1.3756	1.3211	1.3584	1.3227	1.3231	1.28492	1.29368			
1⅜-16	N	2	1.3344	1.3073	1.3288	1.3288	1.3153	1.37500	1.36600	---------	1.3750	1.3344	1.3671	1.3400	1.3400	1.30730	1.31530	2	N	1⅜-16
			1.3341	1.3067	1.3291	1.3285	1.3159	1.37488	1.36612	---------	1.3756	1.3347	1.3665	1.3397	1.3403	1.30742	1.31518			
		3	1.3344	1.3073	1.3305	1.3305	1.3170	1.37500	1.36600	---------	1.3750	1.3344	1.3654	1.3383	1.3383	1.30730	1.31530	3		
			1.3341	1.3067	1.3308	1.3302	1.3176	1.37488	1.36612	---------	1.3756	1.3347	1.3648	1.3380	1.3386	1.30742	1.31518			
1⅜-18	NEF	2	1.3389	1.3148	1.3335	1.3335	1.3215	1.37500	1.36680	---------	1.3750	1.3389	1.3684	1.3443	1.3443	1.31490	1.32250	2	NEF	1⅜-18
			1.3386	1.3143	1.3338	1.3332	1.3220	1.37488	1.36692	---------	1.3755	1.3392	1.3679	1.3440	1.3446	1.31502	1.32238			
		3	1.3389	1.3148	1.3351	1.3351	1.3231	1.37500	1.36680	---------	1.3750	1.3389	1.3668	1.3427	1.3427	1.31490	1.32250	3		
			1.3386	1.3143	1.3354	1.3348	1.3236	1.37488	1.36692	---------	1.3755	1.3392	1.3663	1.3424	1.3430	1.31502	1.32238			

Best Available Copy

1⁷⁄₁₆-12	N	2	1.3834	1.3473	1.3778	1.3778	1.3598	1.43750	1.42630	----------	1.4375	1.3834	1.4251	1.3890	1.3890	1.34730	1.35630	2	N	1⁷⁄₁₆-12
			1.3831	1.3467	1.3781	1.3775	1.3604	1.43738	1.42642	----------	1.4381	1.3837	1.4245	1.3887	1.3893	1.34742	1.35618			
		3	1.3834	1.3473	1.3794	1.3794	1.3614	1.43750	1.42630	----------	1.4375	1.3834	1.4235	1.3874	1.3874	1.34730	1.35630	3		
			1.3831	1.3467	1.3797	1.3791	1.3620	1.43738	1.42642	----------	1.4381	1.3837	1.4229	1.3871	1.3877	1.34742	1.35618			
1⁷⁄₁₆-16	N	2	1.3969	1.3698	1.3913	1.3913	1.3778	1.43750	1.42850	----------	1.4375	1.3969	1.4296	1.4025	1.4025	1.36980	1.37780	2	N	1⁷⁄₁₆-16
			1.3966	1.3692	1.3916	1.3910	1.3784	1.43738	1.42862	----------	1.4381	1.3972	1.4290	1.4022	1.4028	1.36992	1.37768			
		3	1.3969	1.3698	1.3929	1.3929	1.3794	1.43750	1.42850	----------	1.4375	1.3969	1.4280	1.4009	1.4009	1.36980	1.37780	3		
			1.3966	1.3692	1.3932	1.3926	1.3800	1.43738	1.42862	----------	1.4381	1.3972	1.4274	1.4006	1.4012	1.36992	1.37768			
1⁷⁄₁₆-18	NEF	2	1.4014	1.3773	1.3960	1.3960	1.3840	1.43750	1.42930	----------	1.4375	1.4014	1.4309	1.4068	1.4068	1.37740	1.38500	2	NEF	1⁷⁄₁₆-18
			1.4011	1.3768	1.3963	1.3957	1.3845	1.43738	1.42942	----------	1.4380	1.4017	1.4304	1.4065	1.4071	1.37752	1.38488			
		3	1.4014	1.3773	1.3976	1.3976	1.3856	1.43750	1.42930	----------	1.4375	1.4014	1.4293	1.4052	1.4052	1.37740	1.38500	3		
			1.4011	1.3768	1.3979	1.3973	1.3861	1.43738	1.42942	----------	1.4380	1.4017	1.4288	1.4040	1.4055	1.37752	1.38488			
1½-6	NC	1	1.3873	1.3151	1.3728	1.3728	1.3367	1.49560	1.46660	----------	1.5000	1.3917	1.4784	1.4062	1.4062	1.31960	1.33760	1	NC	1½-6
			1.3869	1.3143	1.3732	1.3724	1.3375	1.49548	1.46672	----------	1.5008	1.3921	1.4776	1.4058	1.4066	1.31972	1.33748			
		2	1.3917	1.3195	1.3816	1.3816	1.3455	1.50000	1.47980	1.47100	1.5000	1.3917	1.4740	1.4018	1.4018	1.31960	1.33760	2		
			1.3913	1.3187	1.3820	1.3812	1.3463	1.49988	1.47992	1.47112	1.5008	1.3921	1.4732	1.4014	1.4022	1.31972	1.33748			
		3	1.3917	1.3195	1.3846	1.3846	1.3485	1.50000	1.47980	----------	1.5000	1.3917	1.4710	1.3988	1.3988	1.31960	1.33760	3		
			1.3913	1.3187	1.3850	1.3842	1.3493	1.49988	1.47992	----------	1.5008	1.3921	1.4702	1.3984	1.3992	1.31972	1.33748			
		4	1.3926	1.3204	1.3890	1.3890	1.3529	1.50000	1.47980	----------	1.5000	1.3917	1.4675	1.3953	1.3953	1.31960	1.33760	4		
			1.3924	1.3196	1.3892	1.3888	1.3537	1.49988	1.47992	----------	1.5008	1.3919	1.4667	1.3951	1.3955	1.31972	1.33748			
1½-8	N	2	1.4188	1.3647	1.4098	1.4098	1.3827	1.50000	1.48480	1.47780	1.5000	1.4188	1.4819	1.4278	1.4278	1.36470	1.37950	2	N	1½-8
			1.4184	1.3640	1.4102	1.4094	1.3834	1.49988	1.48492	1.47792	1.5007	1.4192	1.4812	1.4274	1.4282	1.36482	1.37938			
		3	1.4188	1.3647	1.4125	1.4125	1.3854	1.50000	1.48480	----------	1.5000	1.4188	1.4792	1.4251	1.4251	1.36470	1.37950	3		
			1.4184	1.3640	1.4129	1.4121	1.3861	1.49988	1.48492	----------	1.5007	1.4192	1.4785	1.4247	1.4255	1.36482	1.37938			
1½-12	NF	1	1.4435	1.4074	1.4356	1.4356	1.4176	1.49760	1.48180	----------	1.5000	1.4459	1.4899	1.4538	1.4538	1.40980	1.41880	1	NF	1½-12
			1.4432	1.4068	1.4359	1.4353	1.4182	1.49748	1.48192	----------	1.5006	1.4462	1.4893	1.4535	1.4541	1.40992	1.41868			
		2	1.4459	1.4098	1.4403	1.4403	1.4223	1.50000	1.48880	----------	1.5000	1.4459	1.4876	1.4515	1.4515	1.40980	1.41880	2		
			1.4456	1.4092	1.4406	1.4400	1.4229	1.49988	1.48892	----------	1.5006	1.4462	1.4870	1.4512	1.4518	1.40992	1.41868			
		3	1.4459	1.4098	1.4419	1.4419	1.4239	1.50000	1.48880	----------	1.5000	1.4459	1.4860	1.4499	1.4499	1.40980	1.41880	3		
			1.4456	1.4092	1.4422	1.4416	1.4245	1.49988	1.48892	----------	1.5006	1.4462	1.4854	1.4496	1.4502	1.40992	1.41868			
		4	1.4464	1.4103	1.4444	1.4444	1.4264	1.50000	1.48880	----------	1.5000	1.4459	1.4840	1.4479	1.4479	1.40980	1.41880	4		
			1.4462	1.4097	1.4446	1.4442	1.4270	1.49988	1.48892	----------	1.5006	1.4461	1.4834	1.4477	1.4481	1.40992	1.41868			
1½-16	N	2	1.4594	1.4323	1.4537	1.4537	1.4402	1.50000	1.49100	----------	1.5000	1.4594	1.4922	1.4651	1.4651	1.43230	1.44030	2	N	1½-16
			1.4591	1.4317	1.4540	1.4534	1.4408	1.49988	1.49112	----------	1.5006	1.4597	1.4916	1.4648	1.4654	1.43242	1.44018			
		3	1.4594	1.4323	1.4554	1.4554	1.4419	1.50000	1.49100	----------	1.5000	1.4594	1.4905	1.4634	1.4634	1.43230	1.44030	3		
			1.4591	1.4317	1.4557	1.4551	1.4425	1.49988	1.49112	----------	1.5006	1.4597	1.4899	1.4631	1.4637	1.43242	1.44018			
1½-18	NEF	2	1.4639	1.4398	1.4584	1.4584	1.4464	1.50000	1.49180	----------	1.5000	1.4639	1.4935	1.4694	1.4694	1.43990	1.44750	2	NEF	1½-18
			1.4636	1.4393	1.4587	1.4581	1.4469	1.49988	1.49192	----------	1.5005	1.4642	1.4930	1.4691	1.4697	1.44002	1.44738			
		3	1.4639	1.4398	1.4601	1.4601	1.4481	1.50000	1.49180	----------	1.5000	1.4639	1.4918	1.4677	1.4677	1.43990	1.44750	3		
			1.4636	1.4393	1.4604	1.4598	1.4486	1.49988	1.49192	----------	1.5005	1.4642	1.4913	1.4674	1.4680	1.44002	1.44738			
1⁹⁄₁₆-16	N	2	1.5219	1.4948	1.5161	1.5161	1.5026	1.56250	1.55350	----------	1.5625	1.5219	1.5548	1.5277	1.5277	1.49480	1.50280	2	N	1⁹⁄₁₆-16
			1.5215	1.4942	1.5165	1.5157	1.5032	1.56234	1.55366	----------	1.5631	1.5223	1.5542	1.5273	1.5281	1.49496	1.50264			
		3	1.5219	1.4948	1.5179	1.5179	1.5044	1.56250	1.55350	----------	1.5625	1.5219	1.5530	1.5259	1.5259	1.49480	1.50280	3		
			1.5215	1.4942	1.5183	1.5175	1.5050	1.56234	1.55366	----------	1.5631	1.5223	1.5524	1.5255	1.5263	1.49496	1.50264			
1⁹⁄₁₆-18	NEF	2	1.5264	1.5023	1.5209	1.5209	1.5089	1.56250	1.55430	----------	1.5625	1.5264	1.5560	1.5319	1.5319	1.50240	1.51000	2	NEF	1⁹⁄₁₆-18
			1.5260	1.5018	1.5213	1.5205	1.5094	1.56234	1.55446	----------	1.5630	1.5268	1.5555	1.5315	1.5323	1.50256	1.50984			
		3	1.5264	1.5023	1.5225	1.5225	1.5105	1.56250	1.55430	----------	1.5625	1.5264	1.5544	1.5303	1.5303	1.50240	1.51000	3		
			1.5260	1.5018	1.5229	1.5221	1.5110	1.56234	1.55446	----------	1.5630	1.5268	1.5539	1.5299	1.5307	1.50256	1.50984			
1⅝-8	N	2	1.5438	1.4897	1.5345	1.5345	1.5074	1.62500	1.60980	1.60280	1.6250	1.5438	1.6072	1.5531	1.5531	1.48970	1.50450	2	N	1⅝-8
			1.5433	1.4890	1.5350	1.5340	1.5081	1.62484	1.60996	1.60296	1.6257	1.5443	1.6065	1.5526	1.5536	1.48986	1.50434			
		3	1.5438	1.4897	1.5373	1.5373	1.5102	1.62500	1.60980	----------	1.6250	1.5438	1.6044	1.5503	1.5503	1.48970	1.50450	3		
			1.5433	1.4890	1.5378	1.5368	1.5109	1.62484	1.60996	----------	1.6257	1.5443	1.6037	1.5498	1.5508	1.48986	1.50434			
1⅝-12	N	2	1.5709	1.5348	1.5645	1.5645	1.5465	1.62500	1.61380	----------	1.6250	1.5709	1.6134	1.5773	1.5773	1.53480	1.54380	2	N	1⅝-12
			1.5705	1.5342	1.5649	1.5641	1.5471	1.62484	1.61396	----------	1.6256	1.5713	1.6128	1.5769	1.5777	1.53496	1.54364			
		3	1.5709	1.5348	1.5664	1.5664	1.5484	1.62500	1.61380	----------	1.6250	1.5709	1.6115	1.5754	1.5754	1.53480	1.54380	3		
			1.5705	1.5342	1.5668	1.5660	1.5490	1.62484	1.61396	----------	1.6256	1.5713	1.6109	1.5750	1.5758	1.53496	1.54364			
1⅝-16	N	2	1.5844	1.5573	1.5786	1.5786	1.5651	1.62500	1.61600	----------	1.6250	1.5844	1.6173	1.5902	1.5902	1.55730	1.56530	2	N	1⅝-16
			1.5840	1.5567	1.5790	1.5782	1.5657	1.62484	1.61616	----------	1.6256	1.5848	1.6167	1.5898	1.5906	1.55746	1.56514			
		3	1.5844	1.5573	1.5803	1.5803	1.5668	1.62500	1.61600	----------	1.6250	1.5844	1.6156	1.5885	1.5885	1.55730	1.56530	3		
			1.5840	1.5567	1.5807	1.5799	1.5674	1.62484	1.61616	----------	1.6256	1.5848	1.6150	1.5881	1.5889	1.55746	1.56514			
1⅝-18	NEF	2	1.5889	1.5648	1.5833	1.5833	1.5713	1.62500	1.61680	----------	1.6250	1.5889	1.6186	1.5945	1.5945	1.56490	1.57250	2	NEF	1⅝-18
			1.5885	1.5643	1.5837	1.5829	1.5718	1.62484	1.61696	----------	1.6255	1.5893	1.6181	1.5941	1.5949	1.56506	1.57234			
		3	1.5889	1.5648	1.5850	1.5850	1.5730	1.62500	1.61680	----------	1.6250	1.5889	1.6169	1.5928	1.5928	1.56490	1.57250	3		
			1.5885	1.5643	1.5854	1.5846	1.5735	1.62484	1.61696	----------	1.6255	1.5893	1.6164	1.5924	1.5932	1.56506	1.57234			

TABLE 1.16.—*Gages for standard thread series, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			Thread gages					Z plain gages for major diameter			Thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tol. gage	Minus tol. gage								Minus tol. gage	Plus tol. gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
1 11/16-16	N	2	1.6469	1.6198	1.6411	1.6411	1.6276	1.68750	1.67850	----------	1.6875	1.6469	1.6798	1.6527	1.6527	1.61980	1.62780	2	N	1 11/16-16
			1.6465	1.6192	1.6415	1.6407	1.6282	1.68734	1.67866	----------	1.6881	1.6473	1.6792	1.6523	1.6531	1.61996	1.62764			
		3	1.6469	1.6198	1.6428	1.6428	1.6293	1.68750	1.67850	----------	1.6875	1.6469	1.6781	1.6510	1.6510	1.61980	1.62780	3		
			1.6465	1.6192	1.6432	1.6424	1.6299	1.68734	1.67866	----------	1.6881	1.6473	1.6775	1.6506	1.6514	1.61996	1.62764			
1 11/16-18	NEF	2	1.6514	1.6273	1.6458	1.6458	1.6338	1.68750	1.67930	----------	1.6875	1.6514	1.6811	1.6570	1.6570	1.62740	1.63500	2	NEF	1 11/16-18
			1.6510	1.6268	1.6462	1.6454	1.6343	1.68734	1.67946	----------	1.6880	1.6518	1.6806	1.6566	1.6574	1.62756	1.63484			
		3	1.6514	1.6273	1.6475	1.6475	1.6355	1.68750	1.67930	----------	1.6875	1.6514	1.6794	1.6553	1.6553	1.62740	1.63500	3		
			1.6510	1.6268	1.6479	1.6471	1.6360	1.68734	1.67946	----------	1.6880	1.6518	1.6789	1.6549	1.6557	1.62756	1.63484			
1¾-5	NC	1	1.6149	1.5283	1.5980	1.5980	1.5547	1.74480	1.71100	----------	1.7500	1.6201	1.7236	1.6370	1.6370	1.53350	1.55510	1	NC	1¾-5
			1.6144	1.5275	1.5985	1.5975	1.5555	1.74464	1.71116	----------	1.7508	1.6206	1.7228	1.6365	1.6375	1.53366	1.55494			
		2	1.6201	1.5335	1.6085	1.6085	1.5652	1.75000	1.72680	1.71620	1.7500	1.6201	1.7183	1.6317	1.6317	1.53350	1.55510	2		
			1.6196	1.5327	1.6090	1.6080	1.5660	1.74984	1.72696	1.71636	1.7508	1.6206	1.7175	1.6312	1.6322	1.53366	1.55494			
		3	1.6201	1.5335	1.6119	1.6119	1.5686	1.75000	1.72680	----------	1.7500	1.6201	1.7149	1.6283	1.6283	1.53350	1.55510	3		
			1.6196	1.5327	1.6124	1.6114	1.5694	1.74984	1.72696	----------	1.7508	1.6206	1.7141	1.6278	1.6288	1.53366	1.55494			
		4	1.62110	1.5345	1.61700	1.61700	1.5737	1.75000	1.72680	----------	1.7500	1.62010	1.7108	1.62420	1.62420	1.53350	1.55510	4		
			1.62085	1.5337	1.61725	1.61675	1.5745	1.74984	1.72696	----------	1.7508	1.62035	1.7100	1.62395	1.62445	1.53366	1.55494			
1¾-8	N	2	1.6688	1.6147	1.6591	1.6591	1.6320	1.75000	1.73480	1.72780	1.7500	1.6688	1.7326	1.6785	1.6785	1.61470	1.62950	2	N	1¾-8
			1.6683	1.6140	1.6596	1.6586	1.6327	1.74984	1.73496	1.72796	1.7507	1.6693	1.7319	1.6780	1.6790	1.61486	1.62934			
		3	1.6688	1.6147	1.6620	1.6620	1.6349	1.75000	1.73480	----------	1.7500	1.6688	1.7297	1.6756	1.6756	1.61470	1.62950	3		
			1.6683	1.6140	1.6625	1.6615	1.6356	1.74984	1.73496	----------	1.7507	1.6693	1.7290	1.6751	1.6761	1.61486	1.62934			
1¾-12	N	2	1.6959	1.6598	1.6894	1.6894	1.6714	1.75000	1.73880	----------	1.7500	1.6959	1.7385	1.7024	1.7024	1.65980	1.66880	2	N	1¾-12
			1.6955	1.6592	1.6898	1.6890	1.6720	1.74984	1.73896	----------	1.7506	1.6963	1.7379	1.7020	1.7028	1.65996	1.66864			
		3	1.6959	1.6598	1.6913	1.6913	1.6733	1.75000	1.73880	----------	1.7500	1.6959	1.7366	1.7005	1.7005	1.65980	1.66880	3		
			1.6955	1.6592	1.6917	1.6909	1.6739	1.74984	1.73896	----------	1.7506	1.6963	1.7360	1.7001	1.7009	1.65996	1.66864			
1¾-16	NEF	2	1.7094	1.6823	1.7035	1.7035	1.6900	1.75000	1.74100	----------	1.7500	1.7094	1.7424	1.7153	1.7153	1.68230	1.69030	2	NEF	1¾-16
			1.7090	1.6817	1.7039	1.7031	1.6906	1.74984	1.74116	----------	1.7506	1.7098	1.7418	1.7149	1.7157	1.68246	1.69014			
		3	1.7094	1.6823	1.7053	1.7053	1.6918	1.75000	1.74100	----------	1.7500	1.7094	1.7406	1.7135	1.7135	1.68230	1.69030	3		
			1.7090	1.6817	1.7057	1.7049	1.6924	1.74984	1.74116	----------	1.7506	1.7098	1.7400	1.7131	1.7139	1.68246	1.69014			
1 13/16-16	N	2	1.7719	1.7448	1.7660	1.7660	1.7525	1.81250	1.80350	----------	1.8125	1.7719	1.8049	1.7778	1.7778	1.74480	1.75280	2	N	1 13/16-16
			1.7715	1.7442	1.7664	1.7656	1.7531	1.81234	1.80366	----------	1.8131	1.7723	1.8043	1.7774	1.7782	1.74496	1.75264			
		3	1.7719	1.7448	1.7677	1.7677	1.7542	1.81250	1.80350	----------	1.8125	1.7719	1.8032	1.7761	1.7761	1.74480	1.75280	3		
			1.7715	1.7442	1.7681	1.7673	1.7548	1.81234	1.80366	----------	1.8331	1.7723	1.8026	1.7757	1.7765	1.74496	1.75264			
1⅞-8	N	2	1.7938	1.7397	1.7838	1.7838	1.7567	1.87500	1.85980	1.85280	1.8750	1.7938	1.8579	1.8038	1.8038	1.73970	1.75450	2	N	1⅞-8
			1.7933	1.7390	1.7843	1.7833	1.7574	1.87484	1.85996	1.85296	1.8757	1.7943	1.8572	1.8033	1.8043	1.73986	1.75434			
		3	1.7938	1.7397	1.7868	1.7868	1.7597	1.87500	1.85980	----------	1.8750	1.7938	1.8549	1.8008	1.8008	1.73970	1.75450	3		
			1.7933	1.7390	1.7873	1.7863	1.7604	1.87484	1.85996	----------	1.8757	1.7943	1.8542	1.8003	1.8013	1.73986	1.75434			
1⅞-12	N	2	1.8209	1.7848	1.8143	1.8143	1.7963	1.87500	1.86380	----------	1.8750	1.8209	1.8636	1.8275	1.8275	1.78480	1.79380	2	N	1⅞-12
			1.8205	1.7842	1.8147	1.8139	1.7969	1.87484	1.86396	----------	1.8756	1.8213	1.8630	1.8271	1.8279	1.78496	1.79364			
		3	1.8209	1.7848	1.8163	1.8163	1.7983	1.87500	1.86380	----------	1.8750	1.8209	1.8616	1.8255	1.8255	1.78480	1.79380	3		
			1.8205	1.7842	1.8167	1.8159	1.7989	1.87484	1.86396	----------	1.8756	1.8213	1.8610	1.8251	1.8259	1.78496	1.79364			
1⅞-16	N	2	1.8344	1.8073	1.8284	1.8284	1.8149	1.87500	1.86600	----------	1.8750	1.8344	1.8675	1.8404	1.8404	1.80730	1.81530	2	N	1⅞-16
			1.8340	1.8067	1.8288	1.8280	1.8155	1.87484	1.86616	----------	1.8756	1.8348	1.8669	1.8400	1.8408	1.80746	1.81514			
		3	1.8344	1.8073	1.8302	1.8302	1.8167	1.87500	1.86600	----------	1.8750	1.8344	1.8657	1.8386	1.8386	1.80730	1.81530	3		
			1.8340	1.8067	1.8306	1.8298	1.8173	1.87484	1.86616	----------	1.8756	1.8348	1.8651	1.8382	1.8390	1.80746	1.81514			

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	N	2	1.8969	1.8698	1.8909	1.8909	1.8774	1.93750	1.92850	----------	1.9375	1.8969	1.9300	1.9029	1.9029	1.86980	1.87780	2	N	1¹⁵⁄₁₆-16
			1.8965	1.8692	1.8913	1.8905	1.8780	1.93734	1.92866	----------	1.9381	1.8973	1.9294	1.9025	1.9033	1.86996	1.87764			
		3	1.8969	1.8698	1.8927	1.8927	1.8792	1.93750	1.92850	----------	1.9375	1.8969	1.9282	1.9011	1.9011	1.86980	1.87780	3		
			1.8965	1.8692	1.8931	1.8923	1.8798	1.93734	1.92866	----------	1.9381	1.8973	1.9276	1.9007	1.9015	1.86996	1.87764			
	NC	1	1.8500	1.7538	1.8316	1.8316	1.7835	1.99430	1.95750	----------	2.0000	1.8557	1.9703	1.8741	1.8741	1.75940	1.78350	1	NC	2-4½
			1.8495	1.7530	1.8321	1.8311	1.7843	1.99414	1.95766	----------	2.0008	1.8562	1.9695	1.8736	1.8746	1.75956	1.78334			
		2	1.8557	1.7595	1.8430	1.8430	1.7949	2.00000	1.97460	1.96320	2.0000	1.8557	1.9646	1.8684	1.8684	1.75940	1.78350	2		
			1.8552	1.7587	1.8435	1.8425	1.7957	1.99984	1.97476	1.96336	2.0008	1.8562	1.9638	1.8679	1.8689	1.75956	1.78334			
		3	1.8557	1.7595	1.8468	1.8468	1.7987	2.00000	1.97460	----------	2.0000	1.8557	1.9608	1.8646	1.8646	1.75940	1.78350	3		
			1.8552	1.7587	1.8473	1.8463	1.7995	1.99984	1.97476	----------	2.0008	1.8562	1.9600	1.8641	1.8651	1.75956	1.78334			
		4	1.85680	1.7606	1.85240	1.85240	1.8043	2.00000	1.97460	----------	2.0000	1.85570	1.9563	1.86010	1.86010	1.75940	1.78350	4		
			1.85655	1.7598	1.85265	1.85215	1.8051	1.99984	1.97476	----------	2.0008	1.85595	1.9555	1.85985	1.86035	1.75956	1.78334			
2-8	N	2	1.9188	1.8647	1.9084	1.9084	1.8813	2.00000	1.98480	1.97780	2.0000	1.9188	1.9833	1.9292	1.9292	1.86470	1.87950	2	N	2-8
			1.9183	1.8640	1.9089	1.9079	1.8820	1.99984	1.98496	1.97796	2.0007	1.9193	1.9826	1.9287	1.9297	1.86486	1.87934			
		3	1.9188	1.8647	1.9115	1.9115	1.8844	2.00000	1.98480	----------	2.0000	1.9188	1.9802	1.9261	1.9261	1.86470	1.87950	3		
			1.9183	1.8640	1.9120	1.9110	1.8851	1.99984	1.98496	----------	2.0007	1.9193	1.9795	1.9256	1.9266	1.86486	1.87934			
2-12	N	2	1.9459	1.9098	1.9392	1.9392	1.9212	2.00000	1.98880	----------	2.0000	1.9459	1.9887	1.9526	1.9526	1.90980	1.91880	2	N	2-12
			1.9455	1.9092	1.9396	1.9388	1.9218	1.99984	1.98896	----------	2.0006	1.9463	1.9881	1.9522	1.9530	1.90996	1.91864			
		3	1.9459	1.9098	1.9412	1.9412	1.9232	2.00000	1.98880	----------	2.0000	1.9459	1.9867	1.9506	1.9506	1.90980	1.91880	3		
			1.9455	1.9092	1.9416	1.9408	1.9238	1.99984	1.98896	----------	2.0006	1.9463	1.9861	1.9502	1.9510	1.90996	1.91864			
2-16	NEF	2	1.9594	1.9323	1.9533	1.9533	1.9398	2.00000	1.99100	----------	2.0000	1.9594	1.9926	1.9655	1.9655	1.93230	1.94030	2	NEF	2-16
			1.9590	1.9317	1.9537	1.9529	1.9404	1.99984	1.99116	----------	2.0006	1.9598	1.9920	1.9651	1.9659	1.93246	1.94014			
		3	1.9594	1.9323	1.9551	1.9551	1.9416	2.00000	1.99100	----------	2.0000	1.9594	1.9908	1.9637	1.9637	1.93230	1.94030	3		
			1.9590	1.9317	1.9555	1.9547	1.9422	1.99984	1.99116	----------	2.0006	1.9598	1.9902	1.9633	1.9641	1.93246	1.94014			
2¹⁄₁₆-16	N	2	2.0219	1.9948	2.0158	2.0158	2.0023	2.06250	2.05350	----------	2.0625	2.0219	2.0551	2.0280	2.0280	1.99480	2.00280	2	N	2¹⁄₁₆-16
			2.0215	1.9942	2.0162	2.0154	2.0029	2.06234	2.05366	----------	2.0631	2.0223	2.0545	2.0276	2.0284	1.99496	2.00264			
		3	2.0219	1.9948	2.0176	2.0176	2.0041	2.06250	2.05350	----------	2.0625	2.0219	2.0533	2.0262	2.0262	1.99480	2.00280	3		
			2.0215	1.9942	2.0180	2.0172	2.0047	2.06234	2.05366	----------	2.0631	2.0223	2.0527	2.0258	2.0266	1.99496	2.00264			
2⅛-8	N	2	2.0438	1.9897	2.0331	2.0331	2.0060	2.12500	2.10980	2.10280	2.1250	2.0438	2.1086	2.0545	2.0545	1.98970	2.00450	2	N	2⅛-8
			2.0433	1.9890	2.0336	2.0326	2.0067	2.12484	2.10996	2.10296	2.1257	2.0443	2.1079	2.0540	2.0550	1.98986	2.00434			
		3	2.0438	1.9897	2.0363	2.0363	2.0092	2.12500	2.10980	----------	2.1250	2.0438	2.1054	2.0513	2.0513	1.98970	2.00450	3		
			2.0133	1.9890	2.0368	2.0358	2.0099	2.12484	2.10996	----------	2.1257	2.0443	2.1047	2.0508	2.0518	1.98986	2.00434			
2⅛-12	N	2	2.0709	2.0348	2.0641	2.0641	2.0461	2.12500	2.11380	----------	2.1250	2.0709	2.1138	2.0777	2.0777	2.03480	2.04380	2	N	2⅛-12
			2.0705	2.0342	2.0645	2.0637	2.0467	2.12484	2.11396	----------	2.1256	2.0713	2.1132	2.0773	2.0781	2.03496	2.04364			
		3	2.0709	2.0348	2.0661	2.0661	2.0481	2.12500	2.11380	----------	2.1250	2.0709	2.1118	2.0757	2.0757	2.03480	2.04380	3		
			2.0705	2.0342	2.0665	2.0657	2.0487	2.12484	2.11396	----------	2.1256	2.0713	2.1112	2.0753	2.0761	2.03496	2.04364			
2⅛-16	N	2	2.0844	2.0573	2.0782	2.0782	2.0647	2.12500	2.11600	----------	2.1250	2.0844	2.1177	2.0906	2.0906	2.05730	2.06530	2	N	2⅛-16
			2.0840	2.0567	2.0786	2.0778	2.0653	2.12484	2.11616	----------	2.1256	2.0848	2.1171	2.0902	2.0910	2.05746	2.06514			
		3	2.0844	2.0573	2.0801	2.0801	2.0666	2.12500	2.11600	----------	2.1250	2.0844	2.1158	2.0887	2.0887	2.05730	2.06530	3		
			2.0840	2.0567	2.0805	2.0797	2.0672	2.12484	2.11616	----------	2.1256	2.0848	2.1152	2.0883	2.0891	2.05746	2.06514			
2³⁄₁₆-16	N	2	2.1469	2.1198	2.1407	2.1407	2.1272	2.18750	2.17850	----------	2.1875	2.1469	2.1802	2.1531	2.1531	2.11980	2.12780	2	N	2³⁄₁₆-16
			2.1465	2.1192	2.1411	2.1403	2.1278	2.18734	2.17866	----------	2.1881	2.1473	2.1796	2.1527	2.1535	2.11996	2.12764			
		3	2.1469	2.1198	2.1426	2.1426	2.1291	2.18750	2.17850	----------	2.1875	2.1469	2.1783	2.1512	2.1512	2.11980	2.12780	3		
			2.1465	2.1192	2.1430	2.1422	2.1297	2.18734	2.17866	----------	2.1881	2.1473	2.1777	2.1508	2.1516	2.11996	2.12764			
2¼-4½	NC	1	2.1000	2.0038	2.0816	2.0816	2.0335	2.24430	2.20750	----------	2.2500	2.1057	2.2203	2.1241	2.1241	2.00940	2.03350	1	NC	2¼-4½
			2.0995	2.0030	2.0821	2.0811	2.0343	2.24414	2.20766	----------	2.2508	2.1062	2.2195	2.1236	2.1246	2.00956	2.03334			
		2	2.1057	2.0095	2.0930	2.0930	2.0449	2.25000	2.22460	2.21320	2.2500	2.1057	2.2146	2.1184	2.1184	2.00940	2.03350	2		
			2.1052	2.0087	2.0935	2.0925	2.0457	2.24984	2.22476	2.21336	2.2508	2.1062	2.2138	2.1179	2.1189	2.00956	2.03334			
		3	2.1057	2.0095	2.0968	2.0968	2.0487	2.25000	2.22460	----------	2.2500	2.1057	2.2108	2.1146	2.1146	2.00940	2.03350	3		
			2.1052	2.0087	2.0973	2.0963	2.0495	2.24984	2.22476	----------	2.2508	2.1062	2.2100	2.1141	2.1151	2.00956	2.03334			
		4	2.10680	2.0106	2.10240	2.10240	2.0543	2.25000	2.22460	----------	2.2500	2.10570	2.2063	2.11010	2.11010	2.00940	2.03350	4		
			2.10655	2.0098	2.10265	2.10215	2.0551	2.24984	2.22476	----------	2.2508	2.10595	2.2055	2.10985	2.11035	2.00956	2.03334			
2¼-8	N	2	2.1688	2.1147	2.1578	2.1578	2.1307	2.25000	2.23480	2.22780	2.2500	2.1688	2.2339	2.1798	2.1798	2.11470	2.12950	2	N	2¼-8
			2.1683	2.1140	2.1583	2.1573	2.1314	2.24984	2.23496	2.22796	2.2507	2.1693	2.2332	2.1793	2.1803	2.11486	2.12934			
		3	2.1688	2.1147	2.1611	2.1611	2.1340	2.25000	2.23480	----------	2.2500	2.1688	2.2306	2.1765	2.1765	2.11470	2.12950	3		
			2.1683	2.1140	2.1616	2.1606	2.1347	2.24984	2.23496	----------	2.2507	2.1693	2.2299	2.1760	2.1770	2.11486	2.12934			
2¼-12	N	2	2.1959	2.1598	2.1890	2.1890	2.1710	2.25000	2.23880	----------	2.2500	2.1959	2.2389	2.2028	2.2028	2.15980	2.16880	2	N	2¼-12
			2.1955	2.1592	2.1894	2.1886	2.1716	2.24984	2.23896	----------	2.2506	2.1963	2.2383	2.2024	2.2032	2.15996	2.16864			
		3	2.1959	2.1598	2.1911	2.1911	2.1731	2.25000	2.23880	----------	2.2500	2.1959	2.2368	2.2007	2.2007	2.15980	2.16880	3		
			2.1955	2.1592	2.1915	2.1907	2.1737	2.24984	2.23896	----------	2.2506	2.1963	2.2362	2.2003	2.2011	2.15996	2.16864			
2¼-16	N	2	2.2094	2.1823	2.2032	2.2032	2.1897	2.25000	2.24100	----------	2.2500	2.2094	2.2427	2.2156	2.2156	2.18230	2.19030	2	N	2¼-16
			2.2090	2.1817	2.2036	2.2028	2.1903	2.24984	2.24116	----------	2.2506	2.2098	2.2421	2.2152	2.2160	2.18246	2.19014			
		3	2.2094	2.1823	2.2050	2.2050	2.1915	2.25000	2.24100	----------	2.2500	2.2094	2.2409	2.2138	2.2138	2.18230	2.19030	3		
			2.2090	2.1817	2.2054	2.2046	2.1921	2.24984	2.24116	----------	2.2506	2.2098	2.2403	2.2134	2.2142	2.18246	2.19014			

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TABLE 1.16.—*Gages for standard thread series, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			Thread gages					Z plain gages for major diameter			Thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tol. gage	Minus tol. gage								Minus tol. gage	Plus tol. gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
2 5/16-16	N	2	2.2719	2.2448	2.2656	2.2656	2.2521	2.31250	2.30350	---------	2.3125	2.2719	2.3053	2.2782	2.2782	2.24480	2.25280	2	N	2 5/16-16
			2.2715	2.2442	2.2660	2.2652	2.2527	2.31234	2.30366	---------	2.3131	2.2723	2.3047	2.2778	2.2786	2.24496	2.25264			
		3	2.2719	2.2448	2.2675	2.2675	2.2540	2.31250	2.30350	---------	2.3125	2.2719	2.3034	2.2763	2.2763	2.24480	2.25280	3		
			2.2715	2.2442	2.2679	2.2671	2.2546	2.31234	2,30366	---------	2.3131	2.2723	2.3028	2.2759	2.2767	2.24496	2.25264			
2 3/8-12	N	2	2.3209	2.2848	2.3139	2.3139	2.2959	2.37500	2.36380	---------	2.3750	2.3209	2.3640	2.3279	2.3279	2.28480	2.29380	2	N	2 3/8-12
			2.3205	2.2842	2.3143	2.3135	2.2965	2.37481	2.36396	---------	2.3756	2.3213	2.3634	2.3275	2.3283	2.28496	2.29364			
		3	2.3209	2.2848	2.3160	2.3160	2.2980	2.37500	2.36380	---------	2.3750	2.3209	2.3619	2.3258	2.3258	2.28480	2.29380	3		
			2.3205	2.2842	2.3164	2.3156	2.2986	2.37484	2.36396	---------	2.3756	2.3213	2.3613	2.3254	2.3262	2.28496	2.29364			
2 3/8-16	N	2	2.3344	2.3073	2.3281	2.3281	2.3146	2.37500	2.36600	---------	2.3750	2.3344	2.3678	2.3407	2.3407	2.30730	2.31530	2	N	2 3/8-16
			2.3340	2.3067	2.3285	2.3277	2.3152	2.37484	2.36616	---------	2.3756	2.3348	2.3672	2.3403	2.3411	2.30746	2.31514			
		3	2.3344	2.3073	2.3300	2.3300	2.3165	2.37500	2.36600	---------	2.3750	2.3344	2.3659	2.3388	2.3388	2.30730	2.31530	3		
			2.3340	2.3067	2.3304	2.3296	2.3171	2.37484	2.36616	---------	2.3756	2.3348	2.3653	2.3384	2.3392	2.30746	2.31514			
2 7/16-16	N	2	2.3969	2.3698	2.3905	2.3905	2.3770	2.43750	2.42850	---------	2.4375	2.3969	2.4304	2.4033	2.4033	2.36980	2.37780	2	N	2 7/16-16
			2.3965	2.3692	2.3909	2.3901	2.3776	2.43734	2.42866	---------	2.4381	2.3973	2.4298	2.4029	2.4037	2.36996	2.37764			
		3	2.3969	2.3698	2.3924	2.3924	2.3789	2.43750	2.42850	---------	2.4375	2.3969	2.4285	2.4014	2.4014	2.36980	2.37780	3		
			2.3965	2.3692	2.3928	2.3920	2.3795	2.43734	2.42866	---------	2.4381	2.3973	2.4279	2.4010	2.4018	2.36996	2.37764			
2½-4	NC	1	2.3312	2.2230	2.3108	2.3108	2.2567	2.49360	2.45280	---------	2.5000	2.3376	2.4663	2.3580	2.3580	2.22940	2.25640	1	NC	2½-4
			2.3307	2.2221	2.3113	2.3103	2.2576	2.49344	2.45296	---------	2.5009	2.3381	2.4654	2.3575	2.3585	2.22956	2.25624			
		2	2.3376	2.2294	2.3236	2.3236	2.2695	2.50000	2.47200	2.45920	2.5000	2.3376	2.4599	2.3516	2.3516	2.22940	2.25640	2		
			2.3371	2.2285	2.3241	2.3231	2.2704	2.49984	2.47216	2.45936	2.5009	2.3381	2.4590	2.3511	2.3521	2.22956	2.25624			
		3	2.3376	2.2294	2.3279	2.3279	2.2738	2.50000	2.47200	---------	2.5000	2.3376	2.4556	2.3473	2.3473	2.22940	2.25640	3		
			2.3371	2.2285	2.3284	2.3274	2.2747	2.49984	2.47216	---------	2.5009	2.3381	2.4547	2.3468	2.3478	2.22956	2.25624			
		4	2.33890	2.2307	2.33410	2.33410	2.2800	2.50000	2.47200	---------	2.5000	2.33760	2.4507	2.34240	2.34240	2.22940	2.25640	4		
			2.33865	2.2298	2.33435	2.33385	2.2809	2.49984	2.47216	---------	2.5009	2.33785	2.4498	2.34215	2.34265	2.22956	2.25624			
2½-8	N	2	2.4188	2.3647	2.4071	2.4071	2.3800	2.50000	2.48480	2.47780	2.5000	2.4188	2.4846	2.4305	2.4305	2.36470	2.37950	2	N	2½-8
			2.4183	2.3640	2.4076	2.4066	2.3807	2.49984	2.48496	2.47796	2.5007	2.4193	2.4839	2.4300	2.4310	2.36486	2.37934			
		3	2.4188	2.3647	2.4106	2.4106	2.3835	2.50000	2.48480	---------	2.5000	2.4188	2.4811	2.4270	2.4270	2.36470	2.37950	3		
			2.4183	2.3640	2.4111	2.4101	2.3842	2.49984	2.48496	---------	2.5007	2.4193	2.4804	2.4265	2.4275	2.36486	2.37934			
2½-12	N	2	2.4459	2.4098	2.4388	2.4388	2.4208	2.50000	2.48880	---------	2.5000	2.4459	2.4891	2.4530	2.4530	2.40980	2.41880	2	N	2½-12
			2.4455	2.4092	2.4392	2.4384	2.4214	2.49984	2.48896	---------	2.5006	2.4463	2.4885	2.4526	2.4534	2.40996	2.41861			
		3	2,4459	2.4098	2.4410	2.4410	2.4230	2.50000	2.48880	---------	2.5000	2.4459	2.4869	2.4508	2.4508	2.40980	2.41880	3		
			2.4455	2.4092	2.4414	2.4406	2.4236	2.49984	2.48896	---------	2.5006	2.4463	2.4863	2.4504	2.4512	2.40996	2.41864			
2½-16	N	2	2.4594	2.4323	2.4530	2.4530	2.4395	2.50000	2.49100	---------	2.5000	2.4594	2.4929	2.4658	2.4658	2.43230	2.44030	2	N	2½-16
			2.4590	2.4317	2.4534	2.4526	2.4401	2.49984	2.49116	---------	2.5006	2.4598	2.4923	2.4654	2.4662	2.43246	2.44014			
		3	2.4594	2.4323	2.4549	[illegible]	2.4414	2.50000	2.49100	---------	2.5000	2.4594	2.4910	2.4639	2.4639	2.43230	2.44030	3		
			2.4590	2.4317	2.4553	[illegible]	2.4420	2.49984	2.49116	---------	2.5006	2.4598	2.4904	2.4635	2.4643	2.43246	2.44014			
2 5/8-12	N	2	2.5709	2.5348	2.5638	2.5638	2.5458	2.6250	2.6138	---------	2.6250	2.5709	2.6141	2.5780	2.5780	2.5348	2.5438	2	N	2 5/8-12
			2.5705	2.5342	2.5642	2.5634	2.5464	2.6248	2.6140	---------	2.6256	2.5713	2.6135	2.5776	2.5784	2.5350	2.5436			
		3	2.5709	2.5348	2.5659	2.5659	2.5479	2.6250	2.6138	---------	2.6250	2.5709	2.6120	2.5759	2.5759	2.5348	2.5438	3		
			2.5705	2.5342	2.5663	2.5655	2.5485	2.6248	2.6140	---------	2.6256	2.5713	2.6114	2.5755	2.5763	2.5350	2.5436			
2 5/8-16	N	2	2.5844	2.5573	2.5779	2.5779	2.5644	2.6250	2.6160	---------	2.6250	2.5844	2.6180	2.5909	2.5909	2.5573	2.5653	2	N	2 5/8-16
			2.5840	2.5567	2.5783	2.5775	2.5650	2.6248	2.6162	---------	2.6256	2.5848	2.6174	2.5905	2.5913	2.5575	2.5651			
		3	2.5844	2.5573	2.5799	2.5799	2.5664	2.6250	2.6160	---------	2.6250	2.5844	2.6160	2.5889	2.5889	2.5573	2.5653	3		
			2.5840	2.5567	2.5803	2.5795	2.5670	2.6248	2.6162	---------	2.6256	2.5848	2.6154	2.5885	2.5893	2.5575	2.5651			

Best Available Cop

2¾-4	NC	1	2.5812	2.4730	2.5608	2.5608	2.5067	2.7436	2.7028	----------	2.7500	2.5876	2.7163	2.6080	2.6080	2.4794	2.5064	1	NC	2¾-4
			2.5807	2.4721	2.5613	2.5603	2.5076	2.7434	2.7030	----------	2.7509	2.5881	2.7154	2.6075	2.6085	2.4796	2.5062			
		2	2.5876	2.4794	2.5736	2.5736	2.5195	2.7500	2.7220	2.7092	2.7500	2.5876	2.7099	2.6016	2.6016	2.4794	2.5064	2		
			2.5871	2.4785	2.5741	2.5731	2.5204	2.7498	2.7222	2.7094	2.7509	2.5881	2.7090	2.6011	2.6021	2.4796	2.5062			
		3	2.5876	2.4794	2.5779	2.5779	2.5238	2.7500	2.7220	----------	2.7500	2.5876	2.7056	2.5973	2.5973	2.4794	2.5064	3		
			2.5871	2.4785	2.5784	2.5774	2.5247	2.7498	2.7222	----------	2.7509	2.5881	2.7047	2.5968	2.5978	2.4796	2.5062			
		4	2.58890	2.4807	2.58410	2.58410	2.5300	2.7500	2.7220	----------	2.7500	2.58760	2.7007	2.59240	2.59240	2.4794	2.5064	4		
			2.58865	2.4798	2.58435	2.58385	2.5309	2.7498	2.7222	----------	2.7509	2.58785	2.6998	2.59215	2.59265	2.4796	2.5062			
2¾-8	N	2	2.6688	2.6147	2.6564	2.6564	2.6293	2.7500	2.7348	2.7278	2.7500	2.6688	2.7353	2.6812	2.6812	2.6147	2.6295	2	N	2¾-8
			2.6683	2.6140	2.6569	2.6559	2.6300	2.7498	2.7350	2.7280	2.7507	2.6693	2.7346	2.6807	2.6817	2.6149	2.6293			
		3	2.6688	2.6147	2.6601	2.6601	2.6330	2.7500	2.7348	----------	2.7500	2.6688	2.7316	2.6775	2.6775	2.6147	2.6295	3		
			2.6683	2.6140	2.6606	2.6596	2.6337	2.7498	2.7350	----------	2.7507	2.6693	2.7309	2.6770	2.6780	2.6149	2.6293			
2¾-12	N	2	2.6959	2.6598	2.6887	2.6887	2.6707	2.7500	2.7388	----------	2.7500	2.6959	2.7392	2.7031	2.7031	2.6598	2.6688	2	N	2¾-12
			2.6955	2.6592	2.6891	2.6883	2.6713	2.7498	2.7390	----------	2.7506	2.6963	2.7386	2.7027	2.7035	2.6600	2.6686			
		3	2.6959	2.6598	2.6909	2.6909	2.6729	2.7500	2.7388	----------	2.7500	2.6959	2.7370	2.7009	2.7009	2.6598	2.6688	3		
			2.6955	2.6592	2.6913	2.6905	2.6735	2.7498	2.7390	----------	2.7506	2.6963	2.7364	2.7005	2.7013	2.6600	2.6686			
2¾-16	N	2	2.7094	2.6823	2.7028	2.7028	2.6893	2.7500	2.7410	----------	2.7500	2.7094	2.7431	2.7160	2.7160	2.6823	2.6903	2	N	2¾-16
			2.7090	2.6817	2.7032	2.7024	2.6899	2.7498	2.7412	----------	2.7506	2.7098	2.7425	2.7156	2.7164	2.6825	2.6901			
		3	2.7094	2.6823	2.7048	2.7048	2.6913	2.7500	2.7410	----------	2.7500	2.7094	2.7411	2.7140	2.7140	2.6823	2.6903	3		
			2.7090	2.6817	2.7052	2.7044	2.6919	2.7498	2.7412	----------	2.7506	2.7098	2.7405	2.7136	2.7144	2.6825	2.6901			
2⅞-12	N	2	2.8209	2.7848	2.8136	2.8136	2.7956	2.8750	2.8638	----------	2.8750	2.8209	2.8643	2.8282	2.8282	2.7848	2.7938	2	N	2⅞-12
			2.8205	2.7842	2.8140	2.8132	2.7962	2.8748	2.8640	----------	2.8756	2.8213	2.8637	2.8278	2.8286	2.7850	2.7936			
		3	2.8209	2.7848	2.8158	2.8158	2.7978	2.8750	2.8638	----------	2.8750	2.8209	2.8621	2.8260	2.8260	2.7848	2.7938	3		
			2.8205	2.7842	2.8162	2.8154	2.7984	2.8748	2.8640	----------	2.8756	2.8213	2.8615	2.8256	2.8264	2.7850	2.7936			
2⅞-16	N	2	2.8344	2.8073	2.8278	2.8278	2.8143	2.8750	2.8660	----------	2.8750	2.8344	2.8681	2.8410	2.8410	2.8073	2.8153	2	N	2⅞-16
			2.8340	2.8067	2.8282	2.8274	2.8149	2.8748	2.8662	----------	2.8756	2.8348	2.8675	2.8406	2.8414	2.8075	2.8151			
		3	2.8344	2.8073	2.8298	2.8298	2.8163	2.8750	2.8660	----------	2.8750	2.8344	2.8661	2.8390	2.8390	2.8073	2.8153	3		
			2.8340	2.8067	2.8302	2.8294	2.8169	2.8748	2.8662	----------	2.8756	2.8348	2.8655	2.8386	2.8394	2.8075	2.8151			
3-4	NC	1	2.8312	2.7230	2.8108	2.8108	2.7567	2.9936	2.9528	----------	3.0000	2.8376	2.9663	2.8580	2.8580	2.7294	2.7564	1	NC	3-4
			2.8307	2.7221	2.8113	2.8103	2.7576	2.9934	2.9530	----------	3,0009	2.8381	2.9654	2.8575	2.8585	2.7296	2.7562			
		2	2.8376	2.7294	2.8236	2.8236	2.7695	3.0000	2.9720	2.9592	3.0000	2.8376	2.9599	2.8516	2.8516	2.7294	2.7564	2		
			2.8371	2.7285	2.8241	2.8231	2.7704	2.9998	2.9722	2.9594	3.0009	2.8381	2.9590	2.8511	2.8521	2.7296	2.7562			
		3	2.8376	2.7294	2.8279	2.8279	2.7738	3.0000	2.9720	----------	3.0000	2.8376	2.9556	2.8473	2.8473	2.7294	2.7564	3		
			2.8371	2.7285	2.8284	2.8274	2.7747	2.9998	2.9722	----------	3.0009	2.8381	2.9547	2.8468	2.8478	2.7296	2.7562			
		4	2.83890	2.7307	2.83410	2.83410	2.7800	3.0000	2.9720	----------	3.0000	2.83760	2.9507	2.84240	2.84240	2.7294	2.7564	4		
			2.83865	2.7298	2.83435	2.83385	2.7809	2.9998	2.9722	----------	3.0009	2.83785	2.9498	2.84215	2.84265	2.7296	2.7562			
3-8	N	2	2.9188	2.8647	2.9058	2.9058	2.8787	3.0000	2.9848	2.9778	3.0000	2.9188	2.9859	2.9318	2.9318	2.8647	2.8795	2	N	3-8
			2.9183	2.8640	2.9063	2.9053	2.8794	2.9998	2.9850	2.9780	3.0007	2.9193	2.9852	2.9313	2.9323	2.8649	2.8793			
		3	2.9188	2.8647	2.9096	2.9096	2.8825	3.0000	2.9848	----------	3.0000	2.9188	2.9821	2.9280	2.9280	2.8647	2.8795	3		
			2.9183	2.8640	2.9101	2.9091	2.8832	2.9998	2.9850	----------	3.0007	2.9193	2.9814	2.9275	2.9285	2.8649	2.8793			
3-12	N	2	2.9459	2.9098	2.9385	2.9385	2.9205	3.0000	2.9888	----------	3.0000	2.9459	2.9894	2.9533	2.9523	2.9098	2.9188	2	N	3-12
			2.9455	2.9092	2.9389	2.9381	2.9211	2.9998	2.9890	----------	3.0006	2.9463	2.9888	2.9529	2.9537	2.9100	2.9186			
		3	2.9459	2.9098	2.9408	2.9408	2.9228	3.0000	2.9888	----------	3.0000	2.9459	2.9871	2.9510	2.9510	2.9098	2.9188	3		
			2.9455	2.9092	2.9412	2.9404	2.9234	2.9998	2.9890	----------	3.0006	2.9463	2.9865	2.9506	2.9514	2.9100	2.9186			
3-16	N	2	2.9594	2.9323	2.9527	2.9527	2.9392	3.0000	2.9910	----------	3.0000	2.9594	2.9932	2.9661	2.9661	2.9323	2.9403	2	N	3-16
			2.9590	2.9317	2.9531	2.9523	2.9398	2.9998	2.9912	----------	3.0006	2.9598	2.9926	2.9657	2.9665	2.9325	2.9401			
		3	2.9594	2.9323	2.9547	2.9547	2.9412	3.0000	2.9910	----------	3.0000	2.9594	2.9912	2.9641	2.9641	2.9323	2.9403	3		
			2.9590	2.9317	2.9551	2.9543	2.9418	2.9998	2.9912	----------	3.0006	2.9598	2.9906	2.9637	2.9645	2.9325	2.9401			
3⅛-12	N	2	3.0709	3.0348	3.0635	3.0635	3.0455	3.1250	3.1138	----------	3.1250	3.0709	3.1144	3.0783	3.0783	3.0348	3.0438	2	N	3⅛-12
			3.0705	3.0342	3.0639	3.0631	3.0461	3.1248	3.1140	----------	3.1256	3.0713	3.1138	3.0779	3.0787	3.0350	3.0436			
		3	3.0709	3.0348	3.0657	3.0657	3.0477	3.1250	3.1138	----------	3.1250	3.0709	3.1122	3.0761	3.0761	3.0348	3.0438	3		
			3.0705	3.0342	3.0661	3.0653	3.0483	3.1248	3.1140	----------	3.1256	3.0713	3.1116	3.0757	3.0765	3.0350	3.0436			
3⅛-16	N	2	3.0844	3.0573	3.0776	3.0776	3.0641	3.1250	3.1160	----------	3.1250	3.0844	3.1183	3.0912	3.0912	3.0573	3.0653	2	N	3⅛-16
			3.0840	3.0567	3.0780	3.0772	3.0547	3.1248	3.1162	----------	3.1256	3.0848	3.1177	3.0908	3.0916	3.0575	3.0651			
		3	3.0844	3.0573	3.0797	3.0797	3.0662	3.1250	3.1160	----------	3.1250	3.0844	3.1162	3.0891	3.0891	3.0573	3.0653	3		
			3.0840	3.0567	3.0801	3.0793	3.0668	3.1248	3.1162	----------	3.1256	3.0848	3.1156	3.0887	3.0895	3.0575	3.0651			
3¼-4	NC	1	3.0812	2.9730	3.0608	3.0608	3.0067	3.2436	3.2028	----------	3.2500	3.0876	3.2163	3.1080	3.1080	2.9794	3.0064	1	NC	3¼-4
			3.0807	2.9721	3.0613	3.0603	3.0076	3.2434	3.2030	----------	3.2509	3.0881	3.2154	3.1075	3.1085	2.9796	3.0062			
		2	3.0876	2.9794	3.0736	3.0736	3.0195	3.2500	3.2220	3.2092	3.2500	3.0876	3.2099	3.1016	3.1016	2.9794	3.0064	2		
			3.0871	2.9785	3.0741	3.0731	3.0204	3.2498	3.2222	3.2094	3.2509	3.0881	3.2090	3.1011	3.1021	2.9796	3.0062			
		3	3.0876	2.9794	3.0779	3.0779	3.0238	3.2500	3.2220	----------	3.2500	3.0876	3.2056	3.0973	3.0973	2.9794	3.0064	3		
			3.0871	2.9785	3.0784	3.0774	3.0247	3.2498	3.2222	----------	3.2509	3.0881	3.2047	3.0968	3.0978	2.9796	3.0062			
		4	3.08890	2.9807	3.08410	3.08410	3.0300	3.2500	3.2220	----------	3.2500	3.08760	3.2007	3.09240	3.09240	2.9794	3.0064	4		
			3.08865	2.9798	3.08435	3.08385	3.0309	3.2498	3.2222	----------	3.2509	3.08785	3.1998	3.09215	3.09265	2.9796	3.0062			

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TABLE 1.16.—*Gages for standard thread series, American National screw threads*—Continued

			Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			Thread gages					Z plain gages for major diameter			Thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tol. gage	Minus tol. gage								Minus tol. gage	Plus tol. gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
3¼-8	N	2	3.1688	3.1147	3.1556	3.1556	3.1285	3.2500	3.2348	3.2278	3.2500	3.1688	3.2361	3.1820	3.1820	3.1147	3.1295	2	N	3¼-8
			3.1683	3.1140	3.1561	3.1551	3.1292	3.2498	3.2350	3.2280	3.2507	3.1693	3.2354	3.1815	3.1825	3.1149	3.1293			
		3	3.1688	3.1147	3.1595	3.1595	3.1324	3.2500	3.2348	----------	3.2500	3.1688	3.2322	3.1781	3.1781	3.1147	3.1295	3		
			3.1683	3.1140	3.1600	3.1590	3.1331	3.2498	3.2350	----------	3.2507	3.1693	3.2315	3.1776	3.1786	3.1149	3.1293			
3¼-12	N	2	3.1959	3.1598	3.1884	3.1884	3.1704	3.2500	3.2388	----------	3.2500	3.1959	3.2395	3.2034	3.2034	3.1598	3.1688	2	N	3¼-12
			3.1955	3.1592	3.1888	3.1880	3.1710	3.2498	3.2390	----------	3.2506	3.1963	3.2389	3.2030	3.2038	3.1600	3.1686			
		3	3.1959	3.1598	3.1907	3.1907	3.1727	3.2500	3.2388	----------	3.2500	3.1959	3.2372	3.2011	3.2011	3.1598	3.1688	3		
			3.1955	3.1592	3.1911	3.1903	3.1733	3.2498	3.2390	----------	3.2506	3.1963	3.2366	3.2007	3.2015	3.1600	3.1686			
3¼-16	N	2	3.2094	3.1823	3.2025	3.2025	3.1890	3.2500	3.2410	----------	3.2500	3.2094	3.2434	3.2163	3.2163	3.1823	3.1903	2	N	3¼-16
			3.2090	3.1817	3.2029	3.2021	3.1896	3.2498	3.2412	----------	3.2506	3.2098	3.2428	3.2159	3.2167	3.1825	3.1901			
		3	3.2094	3.1823	3.2046	3.2046	3.1911	3.2500	3.2410	----------	3.2500	3.2094	3.2413	3.2142	3.2142	3.1823	3.1903	3		
			3.2090	3.1817	3.2050	3.2042	3.1917	3.2498	3.2412	----------	3.2506	3.2098	3.2407	3.2138	3.2146	3.1825	3.1901			
3⅜-12	N	2	3.3209	3.2848	3.3133	3.3133	3.2953	3.3750	3.3638	----------	3.3750	3.3209	3.3646	3.3285	3.3285	3.2848	3.2938	2	N	3⅜-12
			3.3205	3.2842	3.3137	3.3129	3.2959	3.3748	3.3640	----------	3.3756	3.3213	3.3640	3.3281	3.3289	3.2850	3.2936			
		3	3.3209	3.2848	3.3156	3.3156	3.2976	3.3750	3.3638	----------	3.3750	3.3209	3.3623	3.3262	3.3262	3.2848	3.2938	3		
			3.3205	3.2842	3.3160	3.3152	3.2982	3.3748	3.3640	----------	3.3756	3.3213	3.3617	3.3258	3.3266	3.2850	3.2936			
3⅜-16	N	2	3.3344	3.3073	3.3275	3.3275	3.3140	3.3750	3.3660	----------	3.3750	3.3344	3.3684	3.3413	3.3413	3.3073	3.3153	2	N	3⅜-16
			3.3340	3.3067	3.3279	3.3271	3.3146	3.3748	3.3662	----------	3.3756	3.3348	3.3678	3.3409	3.3417	3.3075	3.3151			
		3	3.3344	3.3073	3.3296	3.3296	3.3161	3.3750	3.3660	----------	3.3750	3.3344	3.3663	3.3392	3.3392	3.3073	3.3153	3		
			3.3340	3.3067	3.3300	3.3292	3.3167	3.3748	3.3662	----------	3.3756	3.3348	3.3657	3.3388	3.3396	3.3075	3.3151			
3½-4	NC	1	3.3312	3.2230	3.3108	3.3108	3.2567	3.4936	3.4528	----------	3.5000	3.3376	3.4663	3.3580	3.3580	3.2294	3.2564	1	NC	3½-4
			3.3307	3.2221	3.3113	3.3103	3.2576	3.4934	3.4530	----------	3.5009	3.3381	3.4654	3.3575	3.3585	3.2296	3.2562			
		2	3.3376	3.2294	3.3236	3.3236	3.2695	3.5000	3.4720	3.4592	3.5000	3.3376	3.4599	3.3516	3.3516	3.2294	3.2564	2		
			3.3371	3.2285	3.3241	3.3231	3.2704	3.4998	3.4722	3.4594	3.5009	3.3381	3.4590	3.3511	3.3521	3.2296	3.2562			
		3	3.3376	3.2294	3.3279	3.3279	3.2738	3.5000	3.4720	----------	3.5000	3.3376	3.4556	3.3473	3.3473	3.2294	3.2564	3		
			3.3371	3.2285	3.3234	3.3274	3.2747	3.4998	3.4722	----------	3.5009	3.3381	3.4547	3.3468	3.3478	3.2296	3.2562			
		4	3.33890	3.2307	3.33410	3.33410	3.2800	3.5000	3.4720	----------	3.5000	3.33760	3.4507	3.34240	3.34240	3.2294	3.2564	4		
			3.33865	3.2298	3.33135	3.33385	3.2809	3.4998	3.4722	----------	3.5009	3.33785	3.4498	3.34215	3.34265	3.2296	3.2562			
3½-8	N	2	3.4188	3.3647	3.4055	3.4055	3.3784	3.5000	3.4848	3.4778	3.5000	3.4188	3.4862	3.4321	3.4321	3.3647	3.3795	2	N	3½-8
			3.4183	3.3640	3.4060	3.4050	3.3791	3.4998	3.4850	3.4780	3.5007	3.4193	3.4855	3.4316	3.4326	3.3649	3.3793			
		3	3.4188	3.3647	3.4095	3.4095	3.3824	3.5000	3.4848	----------	3.5000	3.4188	3.4822	3.4281	3.4281	3.3647	3.3795	3		
			3.4183	3.3640	3.4100	3.4090	3.3831	3.4998	3.4850	----------	3.5007	3.4193	3.4815	3.4276	3.4286	3.3649	3.3793			
3½-12	N	2	3.4459	3.4098	3.4383	3.4383	3.4203	3.5000	3.4888	----------	3.5000	3.4459	3.4896	3.4535	3.4535	3.4098	3.4188	2	N	3½-12
			3.4455	3.4092	3.4387	3.4379	3.4209	3.4998	3.4890	----------	3.5006	3.4463	3.4890	3.4531	3.4539	3.4100	3.4186			
		3	3.4459	3.4098	3.4406	3.4406	3.4226	3.5000	3.4888	----------	3.5000	3.4459	3.4873	3.4512	3.4512	3.4098	3.4188	3		
			3.4455	3.4092	3.4410	3.4402	3.4232	3.4998	3.4890	----------	3.5006	3.4463	3.4867	3.4508	3.4516	3.4100	3.4186			
3½-16	N	2	3.4594	3.4323	3.4524	3.4524	3.4389	3.5000	3.4910	----------	3.5000	3.4594	3.4935	3.4664	3.4664	3.4323	3.4403	2	N	3½-16
			3.4590	3.4317	3.4528	3.4520	3.4395	3.4998	3.4912	----------	3.5006	3.4598	3.4929	3.4660	3.4668	3.4325	3.4401			
		3	3.4594	3.4323	3.4545	3.4545	3.4410	3.5000	3.4910	----------	3.5000	3.4594	3.4914	3.4643	3.4643	3.4323	3.4403	3		
			3.4590	3.4317	3.4549	3.4541	3.4416	3.4998	3.4912	----------	3.5006	3.4598	3.4908	3.4639	3.4647	3.4325	3.4401			
3⅝-12	N	2	3.5709	3.5348	3.5632	3.5632	3.5452	3.6250	3.6138	----------	3.6250	3.5709	3.6147	3.5786	3.5786	3.5348	3.5438	2	N	3⅝-12
			3.5705	3.5342	3.5636	3.5628	3.5458	3.6248	3.6140	----------	3.6256	3.5713	3.6141	3.5782	3.5790	3.5350	3.5436			
		3	3.5709	3.5348	3.5655	3.5655	3.5475	3.6250	3.6138	----------	3.6250	3.5709	3.6124	3.5763	3.5763	3.5348	3.5438	3		
			3.5705	3.5342	3.5659	3.5651	3.5481	3.6248	3.6140	----------	3.6256	3.5713	3.6118	3.5759	3.5767	3.5350	3.5436			

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			[illegible]	3.5573	3.5773	3.5773	3.5638	3.6250	3.6160	....	3.6250	3.5844	3.6186	3.5915	3.5915	3.5573	3.5663	2	N	3⅝-16
			[illegible]	3.5567	3.5777	3.5769	3.5644	3.6248	3.6162	....	3.6256	3.5848	3.6180	3.5911	3.5919	3.5575	3.5661			
			[illegible]	3.5573	3.5795	3.5795	3.5660	3.6250	3.6160	....	3.6250	3.5844	3.6164	3.5893	3.5893	3.5573	3.5663	3		
			[illegible]	3.5567	3.5799	3.5791	3.5666	3.6248	3.6162	....	3.6256	3.5848	3.6158	3.5889	3.5897	3.5575	3.5651			
			[illegible]	3.4730	3.5608	3.5608	3.5067	3.7436	3.7028	....	3.7500	3.5876	3.7163	3.6080	3.6080	3.4794	3.5064	1	NC	3¾-4
			[illegible]	3.4721	3.5613	3.5603	3.5076	3.7434	3.7030	....	3.7509	3.5881	3.7154	3.6075	3.6085	3.4796	3.5062			
			[illegible]	3.4794	3.5736	3.5736	3.5195	3.7500	3.7220	3.7092	3.7500	3.5876	3.7099	3.6016	3.6016	3.4794	3.5064	2		
			[illegible]	3.4785	3.5741	3.5731	3.5204	3.7498	3.7222	3.7094	3.7509	3.5881	3.7090	3.6011	3.6021	3.4796	3.5062			
			[illegible]	3.4794	3.5779	3.5779	3.5238	3.7500	3.7220	....	3.7500	3.5876	3.7056	3.5973	3.5973	3.4794	3.5064	3		
			[illegible]	3.4785	3.5784	3.5774	3.5247	3.7498	3.7222	....	3.7509	3.5881	3.7047	3.5968	3.5978	3.4796	3.5062			
			[illegible]	3.4807	3.58410	3.58410	3.5300	3.7500	3.7220	....	3.7500	3.58760	3.7007	3.59240	3.59240	3.4794	3.5064	4		
			[illegible]	3.4798	3.58435	3.58385	3.5309	3.7498	3.7222	....	3.7509	3.58785	3.6998	3.59215	3.59265	3.4796	3.5062			
	N		3.6688	3.6147	3.6554	3.6554	3.6283	3.7500	3.7348	3.7278	3.7500	3.6688	3.7363	3.6822	3.6822	3.6147	3.6295	2	N	3¾-8
			3.6683	3.6140	3.6559	3.6549	3.6290	3.7498	3.7350	3.7280	3.7507	3.6693	3.7356	3.6817	3.6827	3.6149	3.6293			
			3.6688	3.6147	3.6594	3.6594	3.6323	3.7500	3.7348	....	3.7500	3.6688	3.7323	3.6782	3.6782	3.6147	3.6295	3		
			3.6683	3.6140	3.6599	3.6589	3.6330	3.7498	3.7350	....	3.7507	3.6693	3.7316	3.6777	3.6787	3.6149	3.6293			
	N	2	3.6959	3.6598	3.6881	3.6881	3.6701	3.7500	3.7388	....	3.7500	3.6959	3.7398	3.7037	3.7037	3.6598	3.6688	2	N	3¾-12
			3.6955	3.6592	3.6885	3.6877	3.6707	3.7498	3.7390	....	3.7506	3.6963	3.7392	3.7033	3.7041	3.6600	3.6686			
		3	3.6959	3.6598	3.6905	3.6905	3.6725	3.7500	3.7388	....	3.7500	3.6959	3.7374	3.7013	3.7013	3.6598	3.6688	3		
			3.6955	3.6592	3.6909	3.6901	3.6731	3.7498	3.7390	....	3.7506	3.6963	3.7368	3.7009	3.7017	3.6600	3.6686			
	N	2	3.7094	3.6823	3.7023	3.7023	3.6888	3.7500	3.7410	....	3.7500	3.7094	3.7436	3.7165	3.7165	3.6823	3.6903	2	N	3¾-16
			3.7090	3.6817	3.7027	3.7019	3.6894	3.7498	3.7412	....	3.7506	3.7098	3.7430	3.7161	3.7169	3.6825	3.6901			
		3	3.7094	3.6823	3.7044	3.7044	3.6909	3.7500	3.7410	....	3.7500	3.7094	3.7415	3.7144	3.7144	3.6823	3.6903	3		
			3.7090	3.6817	3.7048	3.7040	3.6915	3.7498	3.7412	....	3.7506	3.7098	3.7409	3.7140	3.7148	3.6825	3.6901			
3⅞-12	N	2	3.8209	3.7848	3.8131	3.8131	3.7951	3.8750	3.8638	....	3.8750	3.8209	3.8648	3.8287	3.8287	3.7848	3.7938	2	N	3⅞-12
			3.8205	3.7842	3.8135	3.8127	3.7957	3.8748	3.8640	....	3.8756	3.8213	3.8642	3.8283	3.8291	3.7850	3.7936			
		3	3.8209	3.7848	3.8154	3.8154	3.7974	3.8750	3.8638	....	3.8750	3.8209	3.8625	3.8264	3.8264	3.7848	3.7938	3		
			3.8205	3.7842	3.8158	3.8150	3.7980	3.8748	3.8640	....	3.8756	3.8213	3.8619	3.8260	3.8268	3.7850	3.7936			
3⅞-16	N	2	3.8344	3.8073	3.8272	3.8272	3.8137	3.8750	3.8660	....	3.8750	3.8344	3.8687	3.8416	3.8416	3.8073	3.8153	2	N	3⅞-16
			3.8340	3.8067	3.8276	3.8268	3.8143	3.8748	3.8662	....	3.8756	3.8348	3.8681	3.8412	3.8420	3.8075	3.8151			
		3	3.8344	3.8073	3.8294	3.8294	3.8159	3.8750	3.8660	....	3.8750	3.8344	3.8665	3.8394	3.8394	3.8073	3.8153	3		
			3.8340	3.8067	3.8298	3.8290	3.8165	3.8748	3.8662	....	3.8756	3.8348	3.8659	3.8390	3.8398	3.8075	3.8151			
4-4	NC	1	3.8312	3.7230	3.8108	3.8108	3.7567	3.9936	3.9528	....	4.0000	3.8376	3.9663	3.8580	3.8580	3.7294	3.7564	1	NC	4-4
			3.8307	3.7221	3.8113	3.8103	3.7576	3.9934	3.9530	....	4.0009	3.8381	3.9654	3.8575	3.8585	3.7296	3.7562			
		2	3.8376	3.7294	3.8236	3.8236	3.7695	4.0000	3.9720	3.9592	4.0000	3.8376	3.9599	3.8516	3.8516	3.7294	3.7564	2		
			3.8371	3.7285	3.8241	3.8231	3.7704	3.9998	3.9722	3.9594	4.0009	3.8381	3.9590	3.8511	3.8521	3.7296	3.7562			
		3	3.8376	3.7294	3.8279	3.8279	3.7738	4.0000	3.9720	....	4.0000	3.8376	3.9556	3.8473	3.8473	3.7294	3.7564	3		
			3.8371	3.7285	3.8284	3.8274	3.7747	3.9998	3.9722	....	4.0009	3.8381	3.9547	3.8468	3.8478	3.7296	3.7562			
		4	3.83890	3.7307	3.83410	3.83410	3.7800	4.0000	3.9720	....	4.0000	3.83760	3.9507	3.84240	3.84240	3.7294	3.7564	4		
			3.83865	3.7298	3.83435	3.83385	3.7809	3.9998	3.9722	....	4.0009	3.83785	3.9498	3.84215	3.84265	3.7296	3.7562			
4-8	N	2	3.9188	3.8647	3.9053	3.9053	3.8782	4.0000	3.9848	3.9778	4.0000	3.9188	3.9864	3.9323	3.9323	3.8647	3.8795	2	N	4-8
			3.9183	3.8640	3.9058	3.9048	3.8789	3.9998	3.9850	3.9780	4.0007	3.9193	3.9857	3.9318	3.9328	3.8649	3.8793			
		3	3.9188	3.8647	3.9093	3.9093	3.8822	4.0000	3.9848	....	4.0000	3.9188	3.9824	3.9283	3.9283	3.8647	3.8795	3		
			3.9183	3.8640	3.9098	3.9088	3.8829	3.9998	3.9850	....	4.0007	3.9193	3.9817	3.9278	3.9288	3.8649	3.8793			
4-12	N	2	3.9459	3.9098	3.9380	3.9380	3.9200	4.0000	3.9888	....	4.0000	3.9459	3.9899	3.9538	3.9538	3.9098	3.9188	2	N	4-12
			3.9455	3.9092	3.9384	3.9376	3.9206	3.9998	3.9890	....	4.0006	3.9463	3.9893	3.9534	3.9542	3.9100	3.9186			
		3	3.9459	3.9098	3.9404	3.9404	3.9224	4.0000	3.9888	....	4.0000	3.9459	3.9875	3.9514	3.9514	3.9098	3.9188	3		
			3.9455	3.9092	3.9408	3.9400	3.9230	3.9998	3.9890	....	4.0006	3.9463	3.9869	3.9510	3.9518	3.9100	3.9186			
4-16	N	2	3.9594	3.9323	3.9522	3.9522	3.9387	4.0000	3.9910	....	4.0000	3.9594	3.9937	3.9666	3.9666	3.9323	3.9403	2	N	4-16
			3.9590	3.9317	3.9526	3.9518	3.9393	3.9998	3.9912	....	4.0006	3.9598	3.9931	3.9662	3.9670	3.9325	3.9401			
		3	3.9594	3.9323	3.9543	3.9543	3.9408	4.0000	3.9910	....	4.0000	3.9594	3.9916	3.9645	3.9645	3.9323	3.9403	3		
			3.9590	3.9317	3.9547	3.9539	3.9414	3.9998	3.9912	....	4.0006	3.9598	3.9910	3.9641	3.9649	3.9325	3.9401			
4¼-8	N	2	4.1688	4.1147	4.1551	4.1551	4.1280	4.2500	4.2348	4.2278	4.2500	4.1688	4.2366	4.1825	4.1825	4.1147	4.1295	2	N	4¼-8
			4.1682	4.1136	4.1557	4.1515	4.1291	4.2498	4.2350	4.2280	4.2511	4.1694	4.2355	4.1819	4.1831	4.1149	4.1293			
		3	4.1688	4.1147	4.1592	4.1592	4.1321	4.2500	4.2348	....	4.2500	4.1688	4.2325	4.1784	4.1784	4.1147	4.1295	3		
			4.1682	4.1136	4.1598	4.1586	4.1332	4.2498	4.2350	....	4.2511	4.1694	4.2314	4.1778	4.1790	4.1149	4.1293			
4¼-12	N	2	4.1959	4.1598	4.1879	4.1879	4.1699	4.2500	4.2388	....	4.2500	4.1959	4.2400	4.2039	4.2039	4.1598	4.1688	2	N	4¼-12
			4.1953	4.1589	4.1885	4.1873	4.1708	4.2498	4.2390	....	4.2509	4.1965	4.2391	4.2033	4.2045	4.1600	4.1686			
		3	4.1959	4.1598	4.1903	4.1103	4.1723	4.2500	4.2388	....	4.2500	4.1959	4.2376	4.2015	4.2015	4.1598	4.1688	3		
			4.1953	4.1589	4.1909	4.1897	4.1732	4.2498	4.2390	....	4.2509	4.1965	4.2367	4.2009	4.2021	4.1600	4.1686			
4¼-16	N	2	4.2094	4.1823	4.2020	4.2020	4.1885	4.2500	4.2410	....	4.2500	4.2094	4.2439	4.2168	4.2168	4.1823	4.1903	2	N	4¼-16
			4.2088	4.1814	4.2026	4.2014	4.1894	4.2498	4.2412	....	4.2509	4.2100	4.2430	4.2162	4.2174	4.1825	4.1901			
		3	4.2094	4.1823	4.2042	4.2042	4.1907	4.2500	4.2410	....	4.2500	4.2094	4.2417	4.2146	4.2146	4.1823	4.1903	3		
			4.2088	4.1814	4.2048	4.2036	4.1916	4.2498	4.2412	....	4.2509	4.2100	4.2408	4.2140	4.2152	4.1825	4.1901			

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TABLE 1.16.—*Gages for standard thread series, American National screw threads*—Continued

			Gages for external threads								Gages for internal threads							Class	Series designation	Nominal size and threads per inch
			Thread gages					Z plain gages for major diameter			Thread gages					Z plain gages for minor diameter				
			Go		Not go			Go	Not go		Go		Not go			Go	Not go			
			Pitch diameter	Minor diameter	Pitch diameter		Minor diameter		Semi-finished	Unfinished hot-rolled material	Major diameter	Pitch diameter	Major diameter	Pitch diameter						
					Plus tol. gage	Minus tol. gage								Minus tol. gage	Plus tol. gage					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*			
4½-8	N	2	4.4188	4.3647	4.4050	4.4050	4.3779	4.5000	4.4848	4.4778	4.5000	4.4188	4.4867	4.4326	4.4326	4.3647	4.3795	2	N	4½-8
			4.4182	4.3636	4.4056	4.4044	4.3790	4.4998	4.4850	4.4780	4.5011	4.4194	4.4856	4.4320	4.4332	4.3649	4.3793			
		3	4.4188	4.3647	4.4091	4.4091	4.3820	4.5000	4.4848	----------	4.5000	4.4188	4.4826	4.4285	4.4285	4.3647	4.3795	3		
			4.4182	4.3636	4.4097	4.4085	4.3831	4.4998	4.4850	----------	4.5011	4.4194	4.4815	4.4279	4.4291	4.3649	4.3793			
4½-12	N	2	4.4459	4.4098	4.4378	4.4378	4.4198	4.5000	4.4888	----------	4.5000	4.4459	4.4901	4.4540	4.4540	4.4098	4.4188	2	N	4½-12
			4.4453	4.4089	4.4384	4.4372	4.4207	4.4998	4.4890	----------	4.5009	4.4465	4.4892	4.4534	4.4546	4.4100	4.4186			
		3	4.4459	4.4098	4.4402	4.4402	4.4222	4.5000	4.4888	----------	4.5000	4.4459	4.4877	4.4516	4.4516	4.4098	4.4188	3		
			4.4453	4.4089	4.4408	4.4396	4.4231	4.4998	4.4890	----------	4.5009	4.4465	4.4868	4.4510	4.4522	4.4100	4.4186			
4½-16	N	2	4.4594	4.4323	4.4519	4.4519	4.4384	4.5000	4.4910	----------	4.5000	4.4594	4.4940	4.4669	4.4669	4.4323	4.4403	2	N	4½-16
			4.4588	4.4314	4.4525	4.4513	4.4393	4.4998	4.4912	----------	4.5009	4.4600	4.4931	4.4663	4.4675	4.4325	4.4401			
		3	4.4594	4.4323	4.4541	4.4541	4.4406	4.5000	4.4910	----------	4.5000	4.4594	4.4918	4.4647	4.4647	4.4323	4.4403	3		
			4.4588	4.4314	4.4547	4.4535	4.4415	4.4998	4.4912	----------	4.5009	4.4600	4.4909	4.4641	4.4653	4.4325	4.4401			
4¾-8	N	2	4.6688	4.6147	4.6549	4.6549	4.6278	4.75000	4.73480	4.72780	4.7500	4.6688	4.7368	4.6827	4.6827	4.61470	4.62950	2	N	4¾-8
			4.6682	4.6136	4.6555	4.6543	4.6289	4.74975	4.73505	4.72805	4.7511	4.6694	4.7357	4.6821	4.6833	4.61495	4.62925			
		3	4.6688	4.6147	4.6590	4.6590	4.6319	4.75000	4.73480	----------	4.7500	4.6688	4.7327	4.6786	4.6786	4.61470	4.62950	3		
			4.6682	4.6136	4.6596	4.6584	4.6330	4.74975	4.73505	----------	4.7511	4.6694	4.7316	4.6780	4.6792	4.61495	4.62925			
4¾-12	N	2	4.6959	4.6598	4.6876	4.6876	4.6696	4.75000	4.73880	----------	4.7500	4.6959	4.7403	4.7042	4.7042	4.65980	4.66880	2	N	4¾-12
			4.6953	4.6589	4.6882	4.6870	4.6705	4.74975	4.73905	----------	4.7509	4.6965	4.7394	4.7036	4.7048	4.66005	4.66855			
		3	4.6959	4.6598	4.6901	4.6901	4.6721	4.75000	4.73880	----------	4.7500	4.6959	4.7378	4.7017	4.7017	4.65980	4.66880	3		
			4.6953	4.6559	4.6907	4.6895	4.6730	4.74975	4.73905	----------	4.7509	4.6965	4.7369	4.7011	4.7023	4.66005	4.66855			
4¾-16	N	2	4.7094	4.6823	4.7018	4.7018	4.6883	4.75000	4.74100	----------	4.7500	4.7094	4.7441	4.7170	4.7170	4.68230	4.69030	2	N	4¾-16
			4.7088	4.6814	4.7024	4.7012	4.6892	4.74975	4.74125	----------	4.7509	4.7100	4.7432	4.7164	4.7176	4.68255	4.69005			
		3	4.7094	4.6823	4.7041	4.7041	4.6906	4.75000	4.74100	----------	4.7500	4.7094	4.7418	4.7147	4.7147	4.68230	4.69030	3		
			4.7088	4.6814	4.7047	4.7035	4.6915	4.74975	4.74125	----------	4.7509	4.7100	4.7409	4.7141	4.7153	4.68255	4.69005			
5-8	N	2	4.9188	4.8647	4.9048	4.9048	4.8777	5.00000	4.98480	4.97780	5.0000	4.9188	4.9869	4.9328	4.9328	4.86470	4.87950	2	N	5-8
			4.9182	4.8636	4.9054	4.9042	4.8788	4.99975	4.98505	4.97805	5.0011	4.9194	4.9858	4.9322	4.9334	4.86495	4.87925			
		3	4.9188	4.8647	4.9089	4.9089	4.8818	5.00000	4.98480	----------	5.0000	4.9188	4.9828	4.9287	4.9287	4.86470	4.87950	3		
			4.9182	4.8636	4.9095	4.9083	4.8829	4.99975	4.98505	----------	5.0011	4.9194	4.9817	4.9281	4.9293	4.86495	4.87925			
5-12	N	2	4.9459	4.9098	4.9375	4.9375	4.9195	5.00000	4.98880	----------	5.0000	4.9459	4.9904	4.9543	4.9543	4.90980	4.91880	2	N	5-12
			4.9453	4.9089	4.9381	4.9369	4.9204	4.99975	4.98905	----------	5.0009	4.9465	4.9895	4.9537	4.9549	4.91005	4.91855			
		3	4.9459	4.9098	4.9400	4.9400	4.9220	5.00000	4.98880	----------	5.0000	4.9459	4.9879	4.9518	4.9518	4.90980	4.91880	3		
			4.9453	4.9089	4.9406	4.9394	4.9229	4.99975	4.98905	----------	5.0009	4.9465	4.9870	4.9512	4.9524	4.91005	4.91855			
5-16	N	2	4.9594	4.9323	4.9517	4.9517	4.9382	5.00000	4.99100	----------	5.0000	4.9594	4.9942	4.9671	4.9671	4.93230	4.94030	2	N	5-16
			4.9588	4.9314	4.9523	4.9511	4.9391	4.99975	4.99125	----------	5.0009	4.9600	4.9933	4.9665	4.9677	4.93255	4.94005			
		3	4.9594	4.9323	4.9540	4.9540	4.9405	5.00000	4.99100	----------	5.0000	4.9594	4.9919	4.9648	4.9648	4.93230	4.94030	3		
			4.9588	4.9314	4.9546	4.9534	4.9414	4.99975	4.99125	----------	5.0009	4.9600	4.9910	4.9642	4.9654	4.93255	4.94005			
5¼-8	N	2	5.1688	5.1147	5.1547	5.1547	5.1276	5.25000	5.23480	5.22780	5.2500	5.1688	5.2370	5.1829	5.1829	5.11470	5.12950	2	N	5¼-8
			5.1682	5.1136	5.1553	5.1541	5.1287	5.24975	5.23505	5.22805	5.2511	5.1694	5.2359	5.1823	5.1835	5.11495	5.12925			
		3	5.1688	5.1147	5.1589	5.1589	5.1318	5.25000	5.23480	----------	5.2500	5.1688	5.2328	5.1787	5.1787	5.11470	5.12950	3		
			5.1682	5.1136	5.1595	5.1583	5.1329	5.24975	5.23505	----------	5.2511	5.1694	5.2317	5.1781	5.1793	5.11495	5.12925			
5¼-12	N	2	5.1959	5.1598	5.1874	5.1874	5.1694	5.25000	5.23880	----------	5.2500	5.1959	5.2405	5.2044	5.2044	5.15980	5.16880	2	N	5¼-12
			5.1953	5.1589	5.1880	5.1868	5.1703	5.24975	5.23905	----------	5.2509	5.1965	5.2396	5.2038	5.2050	5.16005	5.16855			
		3	5.1959	5.1598	5.1900	5.1900	5.1720	5.25000	5.23880	----------	5.2500	5.1959	5.2379	5.2018	5.2018	5.15990	5.16880	3		
			5.1953	5.1589	5.1906	5.1894	5.1729	5.24975	5.23905	----------	5.2509	5.1965	5.2370	5.2012	5.2024	5.16005	5.16855			

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	N	2	5.2094	5.1823	5.2016	5.2016	5.1881	5.25000	5.24100	----------	5.2500	5.2094	5.2443	5.2172	5.2172	5.18230	5.19030	2	N	5¼-16
			5.2088	5.1814	5.2022	5.2010	5.1890	5.24975	5.24125	----------	5.2509	5.2100	5.2434	5.2166	5.2178	5.18255	5.19005			
		3	5.2094	5.1823	5.2039	5.2039	5.1904	5.25000	5.24100	----------	5.2500	5.2094	5.2420	5.2149	5.2149	5.18230	5.19030	3		
			5.2088	5.1814	5.2045	5.2033	5.1913	5.24975	5.24125	----------	5.2509	5.2100	5.2411	5.2143	5.2155	5.18255	5.19005			
	N	2	5.4188	5.3647	5.4046	5.4046	5.3775	5.50000	5.48480	5.47780	5.5000	5.4188	5.4871	5.4330	5.4330	5.36470	5.37950	2	N	5½-8
			5.4182	5.3636	5.4052	5.4040	5.3786	5.49975	5.48505	5.47805	5.5011	5.4194	5.4860	5.4324	5.4336	5.36495	5.37925			
		3	5.4188	5.3647	5.4088	5.4088	5.3817	5.50000	5.48480	----------	5.5000	5.4188	5.4829	5.4288	5.4288	5.36470	5.37950	3		
			5.4182	5.3636	5.4094	5.4082	5.3828	5.49975	5.48505	----------	5.5011	5.4194	5.4818	5.4282	5.4294	5.36495	5.37925			
	N	2	5.4459	5.4098	5.4373	5.4373	5.4193	5.50000	5.48880	----------	5.5000	5.4459	5.4906	5.4545	5.4545	5.40980	5.41880	2	N	5½-12
			5.4453	5.4089	5.4379	5.4367	5.4202	5.49975	5.48905	----------	5.5009	5.4465	5.4897	5.4539	5.4551	5.41005	5.41855			
		3	5.4459	5.4098	5.4399	5.4399	5.4219	5.50000	5.48880	----------	5.5000	5.4459	5.4880	5.4519	5.4519	5.40980	5.41880	3		
			5.4453	5.4089	5.4405	5.4393	5.4228	5.49975	5.48905	----------	5.5009	5.4465	5.4871	5.4513	5.4525	5.41005	5.41855			
	N	2	5.4594	5.4323	5.4515	5.4515	5.4380	5.50000	5.49100	----------	5.5000	5.4594	5.4944	5.4673	5.4673	5.43230	5.44030	2	N	5½-16
			5.4588	5.4314	5.4521	5.4509	5.4389	5.49975	5.49125	----------	5.5009	5.4600	5.4935	5.4667	5.4679	5.43255	5.44005			
		3	5.4594	5.4323	5.4538	5.4538	5.4403	5.50000	5.49100	----------	5.5000	5.4594	5.4921	5.4650	5.4650	5.43230	5.44030	3		
			5.4588	5.4314	5.4544	5.4532	5.4412	5.49975	5.49125	----------	5.5009	5.4600	5.4912	5.4644	5.4656	5.43255	5.44005			
5¾-8	N	2	5.6688	5.6147	5.6545	5.6545	5.6274	5.75000	5.73480	5.72780	5.7500	5.6688	5.7372	5.6831	5.6831	5.61470	5.62950	2	N	5¾-8
			5.6682	5.6136	5.6551	5.6539	5.6285	5.74975	5.73505	5.72805	5.7511	5.6694	5.7361	5.6825	5.6837	5.61495	5.62925			
		3	5.6688	5.6147	5.6587	5.6587	5.6316	5.75000	5.73480	----------	5.7500	5.6688	5.7330	5.6789	5.6789	5.61470	5.62950	3		
			5.6682	5.6136	5.6593	5.6581	5.6327	5.74975	5.73505	----------	5.7511	5.6694	5.7319	5.6783	5.6795	5.61495	5.62925			
5¾-12	N	2	5.6959	5.6598	5.6872	5.6872	5.6692	5.75000	5.73880	----------	5.7500	5.6959	5.7407	5.7046	5.7046	5.65980	5.66880	2	N	5¾-12
			5.6953	5.6589	5.6878	5.6866	5.6701	5.74975	5.73905	----------	5.7509	5.6965	5.7398	5.7040	5.7052	5.66005	5.66855			
		3	5.6959	5.6598	5.6898	5.6898	5.6718	5.75000	5.73880	----------	5.7500	5.6959	5.7391	5.7020	5.7020	5.65980	5.66880	3		
			5.6953	5.6589	5.6904	5.6892	5.6727	5.74975	5.73905	----------	5.7509	5.6965	5.7372	5.7014	5.7026	5.66005	5.66855			
5¾-16	N	2	5.7094	5.6823	5.7014	5.7014	5.6879	5.75000	5.74100	----------	5.7500	5.7094	5.7445	5.7174	5.7174	5.68230	5.69030	2	N	5¾-16
			5.7088	5.6814	5.7020	5.7008	5.6888	5.74975	5.74125	----------	5.7509	5.7100	5.7436	5.7168	5.7180	5.68255	5.69005			
		3	5.7094	5.6823	5.7038	5.7038	5.6903	5.75000	5.74100	----------	5.7500	5.7094	5.7421	5.7150	5.7150	5.68230	5.69030	3		
			5.7088	5.6814	5.7044	5.7032	5.6912	5.74975	5.74125	----------	5.7509	5.7100	5.7412	5.7144	5.7156	5.68255	5.69005			
6-8	N	2	5.9188	5.8647	5.9044	5.9044	5.8773	6.00000	5.98480	5.97780	6.0000	5.9188	5.9873	5.9332	5.9332	5.86470	5.87950	2	N	6-8
			5.9182	5.8636	5.9050	5.9038	5.8784	5.99975	5.98505	5.97805	6.0011	5.9194	5.9862	5.9326	5.9338	5.86495	5.87925			
		3	5.9188	5.8647	5.9086	5.9086	5.8815	6.00000	5.98480	----------	6.0000	5.9188	5.9831	5.9290	5.9290	5.86470	5.87950	3		
			5.9182	5.8636	5.9092	5.9080	5.8826	5.99975	5.98505	----------	6.0011	5.9194	5.9820	5.9284	5.9296	5.86495	5.87925			
6-12	N	2	5.9459	5.9098	5.9371	5.9371	5.9191	6.00000	5.98880	----------	6.0000	5.9459	5.9908	5.9547	5.9547	5.90980	5.91880	2	N	6-12
			5.9453	5.9089	5.9377	5.9365	5.9200	5.99975	5.98905	----------	6.0009	5.9465	5.9899	5.9541	5.9553	5.91005	5.91855			
		3	5.9459	5.9098	5.9397	5.9397	5.9217	6.00000	5.98880	----------	6.0000	5.9459	5.9882	5.9521	5.9521	5.90980	5.91880	3		
			5.9453	5.9089	5.9403	5.9391	5.9226	5.99975	5.98905	----------	6.0009	5.9465	5.9873	5.9515	5.9527	5.91005	5.91855			
6-16	N	2	5.9594	5.9323	5.9513	5.9513	5.9378	6.00000	‡5.99100	----------	6.0000	5.9594	5.9946	5.9675	5.9675	5.93230	5.94030	2	N	6-16
			5.9588	5.9314	5.9519	5.9507	5.9387	5.99975	5.99125	----------	6.0009	5.9600	5.9937	5.9669	5.9681	5.93255	5.94005			
		3	5.9594	5.9323	5.9537	5.9537	5.9402	6.00000	5.99100	----------	6.0000	5.9594	5.9922	5.9651	5.9651	5.93230	5.94030	3		
			5.9588	5.9314	5.9543	5.9531	5.9411	5.99975	5.99125	----------	6.0009	5.9600	5.9913	5.9645	5.9657	5.93255	5.94005			

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TABLE 1.17.—*Setting plug gages, American National screw threads*

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs			
			Plug for "Go"			Plug for "Not go"				Major diameter			
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]		Not go [2]	
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W tolerance	X tolerance	W tolerance	X tolerance
1	2	3	4	5	6	7	8	9	10	11A	11B	12A	12B
			in.	*in.*	*in.*	*in.*	*in*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
0-80	NF	1	0.0559	0.0593	0.0512	0.0542	0.0576	0.0488	0.0488	0.0593	0.0593	0.0576	0.0576
			.0556	.0596	.0511	.0539	.0579	.0489	.0487	.0596	.0596	.0579	.0579
		2	.0566	.0600	.0519	.0556	.0590	.0502	.0502	.0600	.0600	.0590	.0590
			.0563	.0603	.0518	.0553	.0593	.0503	.0501	.0603	.0603	.0593	.0593
		3	.0566	.0600	.0519	.0560	.0594	.0506	.0506	.0600	.0600	.0594	.0594
			.0563	.0603	.0518	.0557	.0597	.0507	.0505	.0603	.0603	.0597	.0597
1-64	NC	1	.0683	.0723	.0622	.0664	.0710	.0596	.0596	.0723	.0723	.0710	.0710
			.0680	.0726	.0621	.0661	.0713	.0597	.0595	.0726	.0727	.0713	.0714
		2	.0690	.0730	.0629	.0678	.0724	.0610	.0610	.0730	.0730	.0724	.0724
			.0687	.0733	.0628	.0675	.0727	.0611	.0609	.0733	.0734	.0727	.0728
		3	.0690	.0730	.0629	.0683	.0729	.0615	.0615	.0730	.0730	.0729	.0729
			.0687	.0733	.0628	.0680	.0732	.0616	.0614	.0733	.0734	.0732	.0733
1-72	NF	1	.0686	.0723	.0633	.0668	.0708	.0608	.0608	.0723	.0723	.0708	.0708
			.0683	.0726	.0632	.0665	.0711	.0609	.0607	.0726	.0726	.0711	.0711
		2	.0693	.0730	.0640	.0682	.0722	.0622	.0622	.0730	.0730	.0722	.0722
			.0690	.0733	.0639	.0679	.0725	.0623	.0621	.0733	.0733	.0725	.0725
		3	.0693	.0730	.0640	.0687	.0727	.0627	.0627	.0730	.0730	.0727	.0727
			.0690	.0733	.0639	.0684	.0730	.0628	.0626	.0733	.0733	.0730	.0730
2-56	NC	1	.0808	.0852	.0736	.0785	.0841	.0708	.0708	.0852	.0852	.0841	.0841
			.0805	.0855	.0735	.0782	.0844	.0709	.0707	.0855	.0856	.0844	.0845
		2	.0816	.0860	.0744	.0801	.0857	.0724	.0724	.0860	.0860	.0857	.0857
			.0813	.0863	.0743	.0798	.0860	.0725	.0723	.0863	.0864	.0860	.0861
		3	.0816	.0860	.0744	.0806	.0860	.0729	.0729	.0860	.0860	.0860	.0860
			.0813	.0863	.0743	.0803	0863	.0730	.0728	.0863	.0864	.0863	.0864
2-64	NF	1	.0813	.0853	.0752	.0794	.0840	.0726	.0726	.0853	.0853	.0840	.0840
			.0810	.0856	.0751	.0791	.0843	.0727	.0725	.0856	.0857	.0843	.0844
		2	.0820	.0860	.0759	.0808	.0854	.0740	.0740	.0860	.0860	.0854	.0854
			.0817	.0863	.0758	.0805	.0857	.0741	.0739	.0863	.0864	.0857	.0858
		3	.0820	.0860	.0759	.0813	.0859	.0745	.0745	.0860	.0860	.0859	.0859
			.0817	.0863	.0758	.0810	.0862	.0746	.0744	.0863	.0864	.0862	.0863
3-48	NC	1	.0932	.0981	.0846	.0905	.0971	.0815	.0815	.0981	.0981	.0971	.0971
			.0929	.0984	.0845	.0902	.0974	.0816	.0814	.0984	.0985	.0974	.0975
		2	.0941	.0990	.0855	.0923	.0989	.0833	.0833	.0990	.0990	.0989	.0989
			.0938	.0993	.0854	.0920	.0992	.0834	.0832	.0993	.0994	.0992	.0993
		3	.0941	.0990	.0855	.0929	.0990	.0839	.0839	.0990	.0990	.0990	.0990
			.0938	.0993	.0854	.0926	.0993	.0840	.0838	.0993	.0994	.0993	.0994
3-56	NF	1	.0938	.0982	.0866	.0915	.0971	.0838	.0838	.0982	.0982	.0971	.0971
			.0935	.0985	.0865	.0912	.0974	.0839	.0837	.0985	.0986	.0974	.0975
		2	.0946	.0990	.0874	.0931	.0987	.0854	.0854	.0990	.0990	.0987	.0987
			.0943	.0993	.0873	.0928	.0990	.0855	.0853	.0993	.0994	.0990	.0991
		3	.0946	.0990	.0874	.0936	.0990	.0859	.0859	.0990	.0990	.0990	.0990
			.0943	.0993	.0873	.0933	.0993	.0860	.0858	.0993	.0994	.0993	.0994
4-40	NC	1	.1054	.1110	.0948	.1022	.1102	.0914	.0914	.1110	.1110	.1102	.1102
			.1051	.1113	.0947	.1019	.1105	.0915	.0913	.1113	.1114	.1105	.1106
		2	.1064	.1120	.0958	.1042	.1120	.0934	.0934	.1120	.1120	.1120	.1120
			.1061	.1123	.0957	.1039	.1123	.0935	.0933	.1123	.1124	.1123	.1124
		3	.1064	.1120	.0958	.1049	.1120	.0941	.0941	.1120	.1120	.1120	.1120
			.1061	.1123	.0957	.1046	.1123	.0942	.0940	.1123	.1124	.1123	.1124
4-48	NF	1	.1062	.1111	.0976	.1035	.1101	.0945	.0945	.1111	.1111	.1101	.1101
			.1059	.1114	.0975	.1032	.1104	.0946	.0944	.1114	.1115	.1104	.1105
		2	.1071	.1120	.0985	.1053	.1119	.0963	.0963	.1120	.1120	.1119	.1119
			.1068	.1123	.0984	.1050	.1122	.0964	.0962	.1123	.1124	.1122	.1123
		3	.1071	.1120	.0985	.1059	.1120	.0969	.0969	.1120	.1120	.1120	.1120
			.1068	.1123	.0984	.1056	.1123	.0970	.0968	.1123	.1124	.1123	.1124
5-40	NC	1	.1184	.1240	.1078	.1152	.1232	.1044	.1044	.1240	.1240	.1232	.1232
			.1181	.1243	.1077	.1149	.1235	.1045	.1043	.1243	.1244	.1235	.1236
		2	.1194	.1250	.1088	.1172	.1250	.1064	.1064	.1250	.1250	.1250	.1250
			.1191	.1253	.1087	.1169	.1253	.1065	.1063	.1253	.1254	.1253	.1254
		3	.1194	.1250	.1088	.1179	.1250	.1071	.1071	.1250	.1250	.1250	.1250
			.1191	.1253	.1087	.1176	.1253	.1072	.1070	.1253	.1254	.1253	.1254
5-44	NF	1	.1189	.1241	.1093	.1159	.1232	.1061	.1061	.1241	.1241	.1232	.1232
			.1186	.1244	.1092	.1156	.1235	.1062	.1060	.1244	.1245	.1235	.1236
		2	.1198	.1250	.1102	.1177	.1250	.1079	.1079	.1250	.1250	.1250	.1250
			.1195	.1253	.1101	.1174	.1253	.1080	.1078	.1253	.1254	.1253	.1254
		3	.1198	.1250	.1102	.1184	.1250	.1086	.1086	.1250	.1250	.1250	.1250
			.1195	.1253	.1101	.1181	.1253	.1087	.1085	.1253	.1254	.1253	.1254
6-32	NC	1	.1304	.1369	.1166	.1263	.1362	.1128	.1128	.1369	.1369	.1362	.1362
			.1301	.1372	.1165	.1260	.1365	.1129	.1127	.1372	.1374	.1365	.1367
		2	.1315	.1380	.1177	.1285	.1380	.1150	.1150	.1380	.1380	.1380	.1380
			.1312	.1383	.1176	.1282	.1383	.1151	.1149	.1383	.1385	.1383	.1385
		3	.1315	.1380	.1177	.1293	.1380	.1158	.1158	.1380	.1380	.1380	.1380
			.1312	.1383	.1176	.1290	.1383	.1159	.1157	.1383	.1385	.1383	.1385

See footnotes at end of table.

TABLE 1.17. —*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs			
			Plug for "Go"			Plug for "Not go"				Major diameter			
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]		Not go [2]	
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W tolerance	X tolerance	W tolerance	X tolerance
1	2	3	4	5	6	7	8	9	10	11A	11B	12A	12B
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
6-40	NF	1	0.1314	0.1370	0.1208	0.1292	0.1362	0.1174	0.1174	0.1370	0.1370	0.1362	0.1362
			.1311	.1373	.1207	.1279	.1365	.1175	.1173	.1373	.1374	.1365	.1366
		2	.1324	.1380	.1218	.1302	.1380	.1194	.1194	.1380	.1380	.1380	.1380
			.1321	.1383	.1217	.1299	.1383	.1195	.1193	.1383	.1384	.1383	.1381
		3	.1324	.1380	.1218	.1309	.1380	.1201	.1201	.1380	.1380	.1380	.1380
			.1321	.1383	.1217	.1306	.1383	.1202	.1200	.1383	.1384	.1383	.1381
8-32	NC	1	.1564	.1629	.1426	.1523	.1622	.1388	.1388	.1629	.1629	.1622	.1622
			.1561	.1632	.1425	.1526	.1625	.1389	.1387	.1632	.1634	.1625	.1627
		2	.1575	.1640	.1437	.1545	.1640	.1410	.1410	.1640	.1640	.1640	.1640
			.1572	.1643	.1436	.1542	.1643	.1411	.1409	.1643	.1645	.1643	.1645
		3	.1575	.1640	.1437	.1553	.1640	.1418	.1418	.1640	.1640	.1640	.1640
			.1572	.1643	.1436	.1550	.1643	.1419	.1417	.1643	.1645	.1643	.1645
8-36	NF	1	.1569	.1629	.1449	.1533	.1621	.1413	.1413	.1629	.1629	.1621	.1621
			.1566	.1632	.1448	.1530	.1624	.1414	.1412	.1632	.1633	.1624	.1625
		2	.1580	.1640	.1460	.1555	.1640	.1435	.1435	.1640	.1640	.1640	.1640
			.1577	.1643	.1459	.1552	.1643	.1436	.1434	.1643	.1644	.1643	.1644
		3	.1580	.1640	.1460	.1562	.1640	.1442	.1442	.1640	.1640	.1640	.1640
			.1577	.1643	.1459	.1559	.1643	.1443	.1441	.1643	.1644	.1643	.1644
10-24	NC	1	.1808	.1887	.1616	.1750	.1882	.1570	.1570	.1887	.1887	.1882	.1882
			.1803	.1892	.1615	.1745	.1887	.1571	.1569	.1892	.1892	.1887	.1887
		2	.1821	.1900	.1629	.1776	.1900	.1596	.1596	.1900	.1900	.1900	.1900
			.1816	.1905	.1628	.1771	.1905	.1597	.1595	.1905	.1905	.1905	.1905
		3	.1821	.1900	.1629	.1785	.1900	.1605	.1605	.1900	.1900	.1900	.1900
			.1816	.1905	.1628	.1780	.1905	.1606	.1604	.1905	.1905	.1905	.1905
10-32	NF	1	.1824	.1889	.1686	.1783	.1882	.1648	.1648	.1889	.1889	.1882	.1882
			.1831	.1892	.1685	.1780	.1885	.1649	.1647	.1892	.1894	.1885	.1887
		2	.1835	.1900	.1697	.1805	.1900	.1670	.1670	.1900	.1900	.1900	.1900
			.1832	.1903	.1696	.1802	.1903	.1671	.1669	.1903	.1905	.1903	.1905
		3	.1835	.1900	.1697	.1813	.1900	.1678	.1678	.1900	.1900	.1900	.1900
			.1832	.1903	.1696	.1810	.1903	.1679	.1677	.1903	.1905	.1903	.1905
12-24	NC	1	.2068	.2147	.1876	.2010	.2142	.1830	.1830	.2147	.2147	.2142	.2142
			.2063	.2152	.1875	.2005	.2147	.1831	.1829	.2152	.2152	.2147	.2147
		2	.2081	.2160	.1889	.2036	.2160	.1856	.1856	.2160	.2160	.2160	.2160
			.2076	.2165	.1888	.2031	.2165	.1857	.1855	.2165	.2165	.2165	.2165
		3	.2081	.2160	.1889	.2045	.2160	.1865	.1865	.2160	.2160	.2160	.2160
			.2076	.2165	.1888	.2040	.2165	.1866	.1864	.2165	.2165	.2165	.2165
12-28	NF	1	.2077	.2148	.1916	.2028	.2141	.1873	.1873	.2148	.2148	.2141	.2141
			.2072	.2153	.1915	.2023	.2146	.1874	.1872	.2153	.2153	.2146	.2146
		2	.2089	.2160	.1928	.2052	.2160	.1897	.1897	.2160	.2160	.2160	.2160
			.2084	.2165	.1927	.2047	.2165	.1898	.1896	.2165	.2165	.2165	.2165
		3	.2089	.2160	.1928	.2061	.2160	.1906	.1906	.2160	.2160	.2160	.2160
			.2084	.2165	.1927	.2056	.2165	.1907	.1905	.2165	.2165	.2165	.2165
12-32	NEF	2	.2095	.2160	.1957	.2061	.2160	.1926	.1926	.2160	.2160	.2160	.2160
			.2092	.2163	.1956	.2058	.2163	.1927	.1925	.2163	.2165	.2163	.2165
		3	.2095	.2160	.1957	.2070	.2160	.1935	.1935	.2160	.2160	.2160	.2160
			.2092	.2163	.1956	.2067	.2163	.1936	.1934	.2163	.2165	.2163	.2165
¼-20	NC	1	.2395	.2485	.2160	.2326	.2484	.2109	.2109	.2485	.2485	.2484	.2484
			.2390	.2490	.2159	.2321	.2489	.2110	.2108	.2490	.2490	.2489	.2489
		2	.2410	.2500	.2175	.2356	.2500	.2139	.2139	.2500	.2500	.2500	.2500
			.2405	.2505	.2174	.2351	.2505	.2140	.2138	.2505	.2505	.2505	.2505
		3	.2410	.2500	.2175	.2366	.2500	.2149	.2149	.2500	.2500	.2500	.2500
			.2405	.2505	.2174	.2361	.2505	.2150	.2148	.2505	.2505	.2505	.2505
		4	.2413	.2503	.2178	.2382	.2503	.2165	.2165	.2500	.2500	.2500	.2500
			.2408	.2508	.2177	.2377	.2508	.2166	.2164	.2505	.2505	.2505	.2505
¼-28	NF	1	.2417	.2488	.2256	.2368	.2481	.2213	.2213	.2488	.2488	.2481	.2481
			.2412	.2493	.2255	.2363	.2486	.2214	.2212	.2493	.2493	.2486	.2486
		2	.2429	.2500	.2268	.2392	.2500	.2237	.2237	.2500	.2500	.2500	.2500
			.2424	.2505	.2267	.2387	.2505	.2238	.2236	.2505	.2505	.2505	.2505
		3	.2429	.2500	.2268	.2401	.2500	.2246	.2246	.2500	.2500	.2500	.2500
			.2424	.2505	.2267	.2396	.2505	.2247	.2245	.2505	.2505	.2505	.2505
		4	.2431	.2502	.2270	.2414	.2502	.2259	.2259	.2500	.2500	.2500	.2500
			.2426	.2507	.2269	.2409	.2507	.2260	.2258	.2505	.2505	.2505	.2505
¼-32	NEF	2	.2435	.2500	.2297	.2400	.2499	.2265	.2265	.2500	.2500	.2499	.2499
			.2432	.2503	.2296	.2397	.2502	.2266	.2264	.2503	.2505	.2502	.2504
		3	.2435	.2500	.2297	.2410	.2500	.2275	.2275	.2500	.2500	.2500	.2500
			.2432	.2503	.2296	.2407	.2503	.2276	.2274	.2503	.2505	.2503	.2505
5/16-18	NC	1	.3012	.3109	.2748	.2932	.3108	.2691	.2691	.3109	.3109	.3108	.3108
			.3007	.3114	.2747	.2927	.3113	.2692	.2690	.3114	.3114	.3113	.3113
		2	.3028	.3125	.2764	.2964	.3125	.2723	.2723	.3125	.3125	.3125	.3125
			.3023	.3130	.2763	.2959	.3130	.2724	.2722	.3130	.3130	.3130	.3130
		3	.3028	.3125	.2764	.2975	.3125	.2734	.2734	.3125	.3125	.3125	.3125
			.3023	.3130	.2763	.2970	.3130	.2735	.2733	.3130	.3130	.3130	.3130
		4	.3031	.3128	.2767	.2993	.3128	.2752	.2752	.3125	.3125	.3125	.3125
			.3026	.3133	.2766	.2988	.3133	.2753	.2751	.3130	.3130	.3130	.3130

See footnotes at end of table

TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs			
			Plug for "Go"			Plug for "Not go"				Major diameter			
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go[1]		Not go[2]	
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	*W* tolerance	*X* tolerance	*W* tolerance	*X* tolerance
1	2	3	4	5	6	7	8	9	10	11A	11B	12A	12B
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
5/16-24	NF	1	0.3033	0.3112	0.2841	0.2975	0.3108	0.2795	0.2795	0.3112	0.3112	0.3108	0.3108
			.3028	.3117	.2840	.2970	.3113	.2796	.2794	.3117	.3117	.3113	.3113
		2	.3046	.3125	.2854	.3001	.3125	.2821	.2821	.3125	.3125	.3125	.3125
			.3041	.3130	.2853	.2996	.3130	.2822	.2820	.3130	.3130	.3130	.3130
		3	.3046	.3125	.2854	.3010	.3125	.2830	.2830	.3125	.3125	.3125	.3125
			.3041	.3130	.2853	.3005	.3130	.2831	.2829	.3130	.3130	.3130	.3130
		4	.3049	.3128	.2857	.3025	.3128	.2845	.2845	.3125	.3125	.3125	.3125
			.3044	.3133	.2856	.3020	.3133	.2846	.2844	.3130	.3130	.3130	.3130
5/16-32	NEF	2	.3060	.3125	.2922	.3024	.3123	.2889	.2889	.3125	.3125	.3123	.3125
			.3057	.3128	.2921	.3021	.3126	.2890	.2888	.3128	.3130	.3126	.3130
		3	.3060	.3125	.2922	.3034	.3125	.2899	.2899	.3125	.3125	.3125	.3125
			.3057	.3128	.2921	.3021	.3128	.2900	.2898	.3128	.3130	.3128	.3130
3/8-16	NC	1	.3627	.3732	.3326	.3534	.3732	.3263	.3263	.3732	.3732	.3732	.3732
			.3621	.3738	.3325	.3528	.3738	.3264	.3262	.3738	.3738	.3738	.3738
		2	.3645	.3750	.3344	.3570	.3750	.3299	.3299	.3750	.3750	.3750	.3750
			.3639	.3756	.3343	.3564	.3756	.3300	.3298	.3756	.3756	.3756	.3756
		3	.3645	.3750	.3344	.3583	.3750	.3312	.3312	.3750	.3750	.3750	.3750
			.3639	.3756	.3343	.3577	.3756	.3313	.3311	.3756	.3756	.3756	.3756
		4	.3649	.3754	.3348	.3603	.3754	.3332	.3332	.3750	.3750	.3750	.3750
			.3643	.3760	.3347	.3597	.3760	.3333	.3331	.3756	.3756	.3756	.3756
3/8-24	NF	1	.3658	.3737	.3466	.3600	.3732	.3420	.3420	.3737	.3737	.3732	.3732
			.3653	.3742	.3465	.3595	.3737	.3421	.3419	.3742	.3742	.3737	.3737
		2	.3671	.3750	.3479	.3626	.3750	.3446	.3446	.3750	.3750	.3750	.3750
			.3666	.3755	.3478	.3621	.3755	.3447	.3445	.3755	.3755	.3755	.3755
		3	.3671	.3750	.3479	.3635	.3750	.3455	.3455	.3750	.3750	.3750	.3750
			.3666	.3755	.3478	.3630	.3755	.3456	.3454	.3755	.3755	.3755	.3755
		4	.3674	.3753	.3482	.3650	.3753	.3470	.3470	.3750	.3750	.3750	.3750
			.3669	.3758	.3481	.3645	.3758	.3471	.3469	.3755	.3755	.3755	.3755
3/8-32	NEF	2	.3685	.3750	.3547	.3648	.3747	.3513	.3513	.3750	.3750	.3747	.3747
			.3682	.3753	.3546	.3645	.3750	.3514	.3512	.3753	.3755	.3750	.3752
		3	.3685	.3750	.3547	.3658	.3750	.3523	.3523	.3750	.3750	.3750	.3750
			.3682	.3753	.3546	.3655	.3753	.3524	.3522	.3753	.3755	.3753	.3755

See footnotes at end of table.

TABLE 1.17. *Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
7/16-14	NC	1	0.4239	0.4354	0.38900	0.4129	0.4354	0.38200	0.38200	0.4354	0.4354
			.4233	.4360	.38885	.4123	.4360	.38215	.38185	.4360	.4360
		2	.4260	.4375	.39110	.4171	.4375	.38620	.38620	.4375	.4375
			.4254	.4381	.39095	.4165	.4381	.38635	.38605	.4381	.4381
		3	.4260	.4375	.39110	.4184	.4375	.38770	.38770	.4375	.4375
			.4254	.4381	.39095	.4178	.4381	.38785	.38755	.4381	.4381
		4	.4264	.4379	.39150	.4206	.4379	.38970	.38970	.4375	.4375
			.4258	.4385	.39135	.4200	.4385	.38985	.38955	.4381	.4381
7/16-20	NF	1	.4270	.4360	.4035	.4200	.4359	.3984	.3984	.4360	.4359
			.4265	.4365	.4034	.4195	.4364	.3985	.3983	.4365	.4364
		2	.4285	.4375	.4050	.4231	.4375	.4014	.4014	.4375	.4375
			.4280	.4380	.4049	.4226	.4380	.4015	.4013	.4380	.4380
		3	.4285	.4375	.4050	.4241	.4375	.4024	.4024	.4375	.4375
			.4280	.4380	.4049	.4236	.4380	.4025	.4023	.4380	.4380
		4	.4288	.4378	.4053	.4256	.4378	.4040	.4040	.4375	.4375
			.4283	.4383	.4052	.4251	.4383	.4041	.4039	.4380	.4380
7/16-28	NEF	2	.4304	.4375	.4143	.4282	.4375	.4107	.4107	.4375	.4375
			.4299	.4380	.4142	.4277	.4380	.4108	.4106	.4380	.4380
		3	.4304	.4375	.4143	.4273	.4375	.4118	.4118	.4375	.4375
			.4299	.4380	.4142	.4268	.4380	.4119	.4117	.4380	.4380
1/2-12	N	2	.4871	.5000	.44590	.4784	.5000	.44030	.44030	.5000	.5000
			.4865	.5006	.44575	.4778	.5006	.44045	.44015	.5006	.5006
		3	.4871	.5000	.44590	.4780	.5000	.44190	.44190	.5000	.5000
			.4865	.5006	.44575	.4774	.5006	.44205	.44175	.5006	.5006
1/2-13	NC	1	.4856	.4978	.44780	.4737	.4978	.44040	.44040	.4978	.4978
			.4850	.4984	.44765	.4731	.4984	.44055	.44025	.4984	.4984
		2	.4878	.5000	.45000	.4781	.5000	.44480	.44480	.5000	.5000
			.4872	.5006	.44985	.4775	.5006	.44495	.44465	.5006	.5006
		3	.4878	.5000	.45000	.4796	.5000	.44630	.44630	.5000	.5000
			.4872	.5006	.44985	.4790	.5006	.44645	.44615	.5006	.5006
		4	.4882	.5004	.45040	.4818	.5004	.44850	.44850	.5000	.5000
			.4876	.5010	.45025	.4812	.5010	.44865	.44835	.5006	.5006
1/2-20	NF	1	.4895	.4985	.4660	.4826	.4984	.4609	.4609	.4985	.4984
			.4890	.4990	.4659	.4821	.4989	.4610	.4608	.4990	.4989
		2	.4910	.5000	.4675	.4856	.5000	.4639	.4639	.5000	.5000
			.4905	.5005	.4674	.4851	.5005	.4640	.4638	.5005	.5005
		3	.4910	.5000	.4675	.4866	.5000	.4649	.4649	.5000	.5000
			.4905	.5005	.4674	.4861	.5005	.4650	.4648	.5005	.5005
		4	.4913	.5003	.4678	.4882	.5003	.4665	.4665	.5000	.5000
			.4908	.5008	.4677	.4877	.5008	.4666	.4664	.5005	.5005
1/2-28	NEF	2	.4929	.5000	.4768	.4886	.4999	.4731	.4731	.5000	.4999
			.4924	.5005	.4767	.4881	.5004	.4732	.4730	.5005	.5004
		3	.4929	.5000	.4768	.4897	.5000	.4742	.4742	.5000	.5000
			.4924	.5005	.4767	.4892	.5005	.4743	.4741	.5005	.5005
9/16-12	NC	1	.5472	.5601	.5060	.5342	.5601	.4981	.4981	.5601	.5601
			.5466	.5607	.5058	.5336	.5607	.4983	.4979	.5607	.5607
		2	.5496	.5625	.5084	.5389	.5625	.5028	.5028	.5625	.5625
			.5490	.5631	.5082	.5383	.5631	.5030	.5026	.5631	.5631
		3	.5496	.5625	.5084	.5405	.5625	.5044	.5044	.5625	.5625
			.5490	.5631	.5082	.5399	.5631	.5046	.5042	.5631	.5631
		4	.5501	.5630	.5089	.5430	.5630	.5069	.5069	.5625	.5625
			.5495	.5636	.5087	.5424	.5636	.5071	5067	.5631	.5631
9/16-18	NF	1	.5512	.5609	.52480	.5432	.5608	.51910	.51910	.5609	.5608
			.5507	.5614	.52465	.5427	.5613	.51925	.51895	.5614	.5613
		2	.5528	.5625	.52640	.5464	.5625	.52230	.52230	.5625	.5625
			.5523	.5630	.52625	.5459	.5630	.52245	.52215	.5630	.5630
		3	.5528	.5625	.52640	.5475	.5625	.52340	.52340	.5625	.5625
			.5523	.5630	.52625	.5470	.5630	.52355	.52325	.5630	.5630
		4	.5531	.5628	.52670	.5493	.5628	.52520	.52520	.5625	.5625
			.5526	.5633	.52655	.5488	.5633	.52535	.52505	.5630	.5630
9/16-24	NEF	2	.5546	.5625	.53540	.5494	.5625	.53140	.53140	.5625	.5625
			.5541	.5630	.53525	.5489	.5630	.53155	.53125	.5630	.5630
		3	.5546	.5625	.53540	.5506	.5625	.53260	.53260	.5625	.5625
			.5541	.5630	.53525	.5501	.5630	.53275	.53245	.5630	.5630
5/8-11	NC	1	.6087	.6224	.5634	.5943	.6224	.5549	.5549	.6224	.6224
			.6081	.6230	.5632	.5937	.6230	.5551	.5547	.6230	.6230
		2	.6113	.6250	.5660	.5995	.6250	.5601	.5601	.6250	.6250
			.6107	.6256	.5658	.5989	.6256	.5603	.5599	.6256	.6256
		3	.6113	.6250	.5660	.6012	.6250	.5618	.5618	.6250	.6250
			.6107	.6256	.5658	.6006	.6256	.5620	.5616	.6256	.6256
		4	.6118	.6255	.5665	.6038	.6255	.5644	.5644	.6250	.6250
			.6112	.6261	.5663	.6032	.6261	.5646	.5642	.6256	.6256

See footnotes at end of table.

TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
5/8-12	N	2	0.6121	0.6250	0.5709	0.6014	0.6250	0.5653	0.5653	0.6250	0.6250
			.6115	.6256	.5707	.6008	.6256	.5655	.5651	.6256	.6256
		3	.6121	.6250	.5709	.6030	.6250	.5669	.5669	.6250	.6250
			.6115	.6256	.5707	.6024	.6256	.5671	.5667	.6256	.6255
5/8-18	NF	1	.6137	.6234	.58730	.6057	.6233	.58160	.58150	.6234	.6233
			.6132	.6239	.58715	.6052	.6238	.58175	.58145	.6239	.6238
		2	.6153	.6250	.58890	.6089	.6250	.58480	.58480	.6250	.6250
			.6148	.6255	.58875	.6084	.6255	.58495	.58465	.6255	.6255
		3	.6153	.6250	.58890	.6100	.6250	.58590	.58590	.6250	.6250
			.6148	.6255	.58875	.6095	.6255	.58605	.58575	.6255	.6255
		4	.6156	.6253	.58920	.6118	.6253	.58770	.58770	.6250	.6250
			.6151	.6258	.58905	.6113	.6258	.58785	.58755	.6255	.6255
5/8-24	NEF	2	.6171	.6250	.59790	.6118	.6250	.59380	.59380	.6250	.6250
			.6166	.6255	.59775	.6113	.6255	.59395	.59365	.6255	.6255
		3	.6171	.6250	.59790	.6130	.6250	.59500	.59500	.6250	.6250
			.6166	.6255	.59775	.6125	.6255	.59515	.59485	.6255	.6255
11/16-12	N	2	.6746	.6875	.6334	.6639	.6875	.6278	.6278	.6875	.6875
			.6740	.6881	.6332	.6633	.6881	.6280	.6276	.6881	.6881
		3	.6746	.6875	.6334	.6655	.6875	.6294	.6294	.6875	.6875
			.6740	.6881	.6332	.6649	.6881	.6296	.6292	.6881	.6881
11/16-24	NEF	2	.6796	.6875	.66040	.6743	.6875	.65630	.65630	.6875	.6875
			.6791	.6880	.66025	.6738	.6880	.65645	.65615	.6880	.6880
		3	.6796	.6875	.66040	.6755	.6875	.65750	.65750	.6875	.6875
			.6791	.6880	.66025	.6750	.6880	.65765	.65735	.6880	.6880
3/4-10	NC	1	.7326	.7472	.6822	.7163	.7472	.6730	.6730	.7472	.7472
			.7320	.7478	.6820	.7157	.7478	.6732	.6728	.7478	.7478
		2	.7354	.7500	.6850	.7219	.7500	.6786	.6786	.7500	.7500
			.7348	.7506	.6848	.7213	.7506	.6788	.6784	.7506	.7506
		3	.7354	.7500	.6850	.7238	.7500	.6805	.6805	.7500	.7500
			.7348	.7506	.6848	.7232	.7506	.6807	.6803	.7506	.7506
		4	.7360	.7506	.6856	.7266	.7506	.6833	.6833	.7500	.7500
			.7354	.7512	.6854	.7260	.7512	.6835	.6851	.7506	.7506
3/4-12	N	2	.7371	.7500	.6959	7264	.7500	.6903	.6903	.7500	.7500
			.7365	.7506	.6957	.7258	.7506	.6905	.6901	.7506	.7506
		3	.7371	.7500	.6959	.7280	.7500	.6919	.6919	.7500	.7500
			.7365	.7506	.6957	.7274	.7506	.6921	.6917	.7506	.7506
3/4-16	NF	1	.7377	.7482	.7076	.7284	.7482	.7013	.7013	.7482	.7482
			.7371	.7488	.7074	.7278	.7488	.7015	.7011	.7488	.7488
		2	.7395	.7500	.7094	.7320	.7500	.7049	.7049	.7500	.7500
			.7389	.7506	.7092	.7314	.7506	.7051	.7047	.7506	.7506
		3	.7395	.7500	.7094	.7333	.7500	.7062	.7062	.7500	.7500
			.7389	.7506	.7092	.7327	.7506	.7064	.7060	.7506	.7506
		4	.7399	.7504	.7098	.7353	.7504	.7082	.7082	.7500	.7500
			.7393	.7510	.7096	.7347	.7510	.7084	.7080	.7506	.7506
3/4-20	NEF	2	.7410	.7500	.71750	.7345	.7500	.71290	.71290	.7500	.7500
			.7405	.7505	.71735	.7341	.7505	.71305	.71275	.7505	.7505
		3	.7410	.7500	.71750	.7360	.7500	.71430	.71430	.7500	.7500
			.7405	.7505	.71735	.7355	.7505	.71445	.71415	.7505	.7505
13/16-12	N	2	.7996	.8125	.7584	.7889	.8125	.7528	.7528	.8125	.8125
			.7990	.8131	.7582	.7883	.8131	.7530	.7526	.8131	.8131
		3	.7996	.8125	.7584	.7905	.8125	.7544	.7544	.8125	.8125
			.7990	.8131	.7582	.7899	.8131	.7546	.7542	.8131	.8131
13/16-16	N	2	.8020	.8125	.7719	.7939	.8125	.7668	.7668	.8125	.8125
			.8014	.8131	.7717	.7933	.8131	.7670	.7666	.8131	.8131
		3	.8020	.8125	.7719	.7955	.8125	.7684	.7684	.8125	.8125
			.8014	.8131	.7717	.7949	.8131	.7686	.7682	.8131	.8131
13/16-20	NEF	2	.8035	.8125	.78000	.7971	.8125	.77540	.77540	.8125	.8125
			.8030	.8130	.77985	.7966	.8130	.77555	.77525	.8130	.8130
		3	.8035	.8125	.78000	.7985	.8125	.77680	.77680	.8125	.8125
			.8030	.8130	.77985	.7980	.8130	.77695	.77665	.8130	.8130
7/8-9	NC	1	.8561	.8719	.7997	.8378	.8719	.7897	.7897	.8719	.8719
			.8554	.8726	.7995	.8371	.8726	.7899	.7895	.8726	.8726
		2	.8592	.8750	.8028	.8439	.8750	.7958	.7958	.8750	.8750
			.8585	.8757	.8026	.8432	.8757	.7960	.7956	.8757	.8757
		3	.8592	.8750	.8028	.8460	.8750	.7979	.7979	.8750	.8750
			.8585	.8757	.8026	.8453	.8757	.7981	.7977	.8757	.8757
		4	.8598	.8756	.8034	.8491	.8756	.8010	.8010	.8750	.8750
			.8591	.8763	.8032	.8484	.8763	.8012	.8008	.8757	.8757

See footnotes at end of table.

TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
7/8-12	N	2	0.8621	0.8750	0.8209	0.8514	0.8750	0.8153	0.8153	0.8750	0.8750
			.8615	.8756	.8207	.8508	.8756	.8155	.8151	.8756	.8756
		3	.8621	.8750	.8209	.8530	.8750	.8169	.8169	.8750	.8750
			.8615	.8756	.8207	.8524	.8756	.8171	.8167	.8756	.8756
7/8-14	NF	1	.8614	.8729	.8265	.8504	.8729	.8195	.8195	.8729	.8729
			.8608	.8735	.8263	.8498	.8735	.8197	.8193	.8735	.8735
		2	.8635	.8750	.8286	.8516	.8750	.8237	.8237	.8750	.8750
			.8629	.8756	.8284	.8510	.8756	.8239	.8235	.8756	.8756
		3	.8635	.8750	.8286	.8559	.8750	.8250	.8250	.8750	.8750
			.8629	.8756	.8284	.8553	.8756	.8252	.8248	.8756	.8756
		4	.8639	.8754	.8290	.8581	.8754	.8272	.8272	.8750	.8750
			.8633	.8760	.8288	.8575	.8760	.8274	.8270	.8756	.8756
7/8-16	N	2	.8645	.8750	.8344	.8564	.8750	.8293	.8293	.8750	.8750
			.8639	.8756	.8342	.8558	.8756	.8295	.8291	.8756	.8756
		3	.8645	.8750	.8344	.8579	.8750	.8308	.8308	.8750	.8750
			.8639	.8756	.8342	.8573	.8756	.8310	.8306	.8756	.8756
7/8-20	NEF	2	.8660	.8750	.84250	.8595	.8750	.83780	.83780	.8750	.8750
			.8655	.8755	.84235	.8590	.8755	.83795	.83765	.8755	.8755
		3	.8660	.8750	.84250	.8608	.8750	.83920	.83920	.8750	.8750
			.8655	.8755	.84235	.8603	.8755	.83935	.83905	.8755	.8755
15/16-12	N	2	.9246	.9375	.8834	.9139	.9375	.8778	.8778	.9375	.9375
			.9240	.9381	.8832	.9133	.9381	.8780	.8776	.9381	.9381
		3	.9246	.9375	.8834	.9155	.9375	.8794	.8794	.9375	.9375
			.9240	.9381	.8832	.9149	.9381	.8796	.8792	.9381	.9381
15/16-16	N	2	.9270	.9375	.8969	.9188	.9375	.8917	.8917	.9375	.9375
			.9264	.9381	.8967	.9182	.9381	.8919	.8915	.9381	.9381
		3	.9270	.9375	.8969	.9204	.9375	.8933	.8933	.9375	.9375
			.9264	.9381	.8967	.9198	.9381	.8935	.8931	.9381	.9381
15/16-20	NEF	2	.9285	.9375	.90500	.9220	.9375	.90030	.90030	.9375	.9375
			.9280	.9380	.90485	.9215	.9380	.90045	.90015	.9380	.9380
		3	.9285	.9375	.90700	.9234	.9375	.90170	.90170	.9375	.9375
			.9280	.9380	.90685	.9229	.9380	.90185	.90155	.9380	.9380
1-8	NC	1	.9795	.9966	.9154	.9584	.9966	.9043	.9043	.9966	.9966
			.9788	.9973	.9152	.9577	.9973	.9045	.9041	.9973	.9973
		2	.9829	1.0000	.9188	.9653	1.0000	.9112	.9112	1.0000	1.0000
			.9822	1.0007	.9186	.9646	1.0007	.9114	.9110	1.0007	1.0007
		3	.9829	1.0000	.9188	.9675	1.0000	.9134	.9134	1.0000	1.0000
			.9822	1.0007	.9186	.9668	1.0007	.9136	.9132	1.0007	1.0007
		4	.9836	1.0007	.9195	.9709	1.0007	.9168	.9168	1.0000	1.0000
			.9829	1.0014	.9193	.9702	1.0014	.9170	.9166	1.0007	1.0007
1-12	N	2	.9871	1.0000	.9459	.9764	1.0000	.9403	.9403	1.0000	1.0000
			.9865	1.0006	.9457	.9758	1.0006	.9405	.9401	1.0006	1.0006
		3	.9871	1.0000	.9459	.9780	1.0000	.9419	.9419	1.0000	1.0000
			.9865	1.0006	.9457	.9774	1.0006	.9421	.9417	1.0006	1.0006
1-14	NS	1	.9864	.9979	.9545	.9754	.9979	.9445	.9445	.9979	.9979
			.9858	.9985	.9543	.9748	.9985	.9447	.9443	.9985	.9985
		2	.9885	1.0000	.9536	.9796	1.0000	.9487	.9487	1.0000	1.0000
			.9879	1.0006	.9534	.9790	1.0006	.9489	.9485	1.0006	1.0006
		3	.9885	1.0000	.9536	.9809	1.0000	.9500	.9500	1.0000	1.0000
			.9879	1.0006	.9534	.9803	1.0006	.9502	.9498	1.0006	1.0006
		4	.9889	1.0004	.9540	.9831	1.0004	.9522	.9522	1.0000	1.0000
			.9883	1.0010	.9538	.9825	1.0010	.9524	.9520	1.0006	1.0006
1-16	N	2	.9895	1.0000	.9594	.9813	1.0000	.9542	.9542	1.0000	1.0000
			.9889	1.0006	.9592	.9807	1.0006	.9544	.9540	1.0006	1.0006
		3	.9895	1.0000	.9594	.9828	1.0000	.9557	.9557	1.0000	1.0000
			.9889	1.0006	.9592	.9822	1.0006	.9559	.9555	1.0006	1.0006
1-20	NEF	2	.9910	1.0000	.96750	.9844	1.0000	.96270	.96270	1.0000	1.0000
			.9905	1.0005	.96735	.9839	1.0005	.96285	.96255	1.0005	1.0005
		3	.9910	1.0000	.96750	.9858	1.0000	.96410	.96410	1.0000	1.0000
			.9905	1.0005	.96735	.9853	1.0005	.96425	.96395	1.0005	1.0005
1 1/16-12	N	2	1.0496	1.0625	1.0084	1.0389	1.0625	1.0028	1.0028	1.0625	1.0625
			1.0490	1.0631	1.0082	1.0383	1.0631	1.0030	1.0026	1.0631	1.0631
		3	1.0496	1.0625	1.0084	1.0405	1.0625	1.0044	1.0044	1.0625	1.0625
			1.0490	1.0631	1.0082	1.0399	1.0631	1.0046	1.0042	1.0631	1.0631
1 1/16-16	N	2	1.0520	1.0625	1.0219	1.0437	1.0625	1.0166	1.0166	1.0625	1.0625
			1.0514	1.0631	1.0217	1.0431	1.0631	1.0168	1.0164	1.0631	1.0631
		3	1.0520	1.0625	1.0219	1.0453	1.0625	1.0182	1.0182	1.0625	1.0625
			1.0514	1.0631	1.0217	1.0447	1.0631	1.0184	1.0180	1.0631	1.0631

See footnotes at end of table.

TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go[1]	Not go[1]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
1 1/16-18	NEF	2	1.0528	1.0625	1.02640	1.0454	1.0625	1.02130	1.02130	1.0625	1.0625
			1.0523	1.0630	1.02625	1.0449	1.0630	1.02145	1.02115	1.0630	1.0630
		3	1.0528	1.0625	1.02640	1.0469	1.0625	1.02280	1.02280	1.0625	1.0625
			1.0523	1.0630	1.02625	1.0464	1.0630	1.02295	1.02265	1.0630	1.0630
1 1/8-7	NC	1	1.1023	1.1211	1.0283	1.0778	1.1211	1.0159	1.0159	1.1211	1.1211
			1.1016	1.1218	1.0281	1.0771	1.1218	1.0161	1.0157	1.1218	1.1218
		2	1.1062	1.1250	1.0322	1.0856	1.1250	1.0237	1.0237	1.1250	1.1250
			1.1055	1.1257	1.0320	1.0849	1.1257	1.0239	1.0235	1.1257	1.1257
		3	1.1062	1.1250	1.0322	1.0882	1.1250	1.0263	1.0263	1.1250	1.1250
			1.1055	1.1257	1.0320	1.0875	1.1257	1.0265	1.0261	1.1257	1.1257
		4	1.1070	1.1258	1.0330	1.0919	1.1258	1.0300	1.0300	1.1250	1.1250
			1.1063	1.1265	1.0328	1.0912	1.1265	1.0302	1.0298	1.1257	1.1257
1 1/8-8	N	2	1.1079	1.1250	1.0438	1.0900	1.1250	1.0359	1.0359	1.1250	1.1250
			1.1072	1.1257	1.0436	1.0893	1.1257	1.0361	1.0357	1.1257	1.1257
		3	1.1079	1.1250	1.0438	1.0924	1.1250	1.0383	1.0383	1.1250	1.1250
			1.1072	1.1257	1.0436	1.0917	1.1257	1.0385	1.0381	1.1257	1.1257
1 1/8-12	NF	1	1.1097	1.1226	1.0685	1.0967	1.1226	1.0606	1.0606	1.1226	1.1226
			1.1091	1.1232	1.0683	1.0961	1.1232	1.0608	1.0604	1.1232	1.1232
		2	1.1121	1.1250	1.0709	1.1014	1.1250	1.0653	1.0653	1.1250	1.1250
			1.1115	1.1256	1.0707	1.1008	1.1256	1.0655	1.0651	1.1256	1.1256
		3	1.1121	1.1250	1.0709	1.1030	1.1250	1.0669	1.0669	1.1250	1.1250
			1.1115	1.1256	1.0707	1.1024	1.1256	1.0671	1.0667	1.1256	1.1256
		4	1.1126	1.1255	1.0714	1.1055	1.1255	1.0694	1.0694	1.1250	1.1250
			1.1120	1.1261	1.0712	1.1049	1.1261	1.0696	1.0692	1.1256	1.1256
1 1/8-16	N	2	1.1145	1.1250	1.0844	1.1061	1.1250	1.0790	1.0790	1.1250	1.1250
			1.1139	1.1256	1.0842	1.1055	1.1256	1.0792	1.0788	1.1256	1.1256
		3	1.1145	1.1250	1.0844	1.1077	1.1250	1.0806	1.0806	1.1250	1.1250
			1.1139	1.1256	1.0842	1.1071	1.1256	1.0808	1.0804	1.1256	1.1256
1 1/8-18	NEF	2	1.1153	1.1250	1.08890	1.1078	1.1250	1.08370	1.08370	1.1250	1.1250
			1.1148	1.1255	1.08875	1.1073	1.1255	1.08385	1.08355	1.1255	1.1255
		3	1.1153	1.1250	1.08890	1.1094	1.1250	1.08530	1.08530	1.1250	1.1250
			1.1148	1.1255	1.08875	1.1089	1.1255	1.08545	1.08515	1.1255	1.1255
1 3/16-12	N	2	1.1746	1.1875	1.1334	1.1639	1.1875	1.1278	1.1278	1.1875	1.1875
			1.1740	1.1881	1.1332	1.1633	1.1881	1.1280	1.1276	1.1881	1.1881
		3	1.1746	1.1875	1.1334	1.1655	1.1875	1.1294	1.1294	1.1875	1.1875
			1.1740	1.1881	1.1332	1.1649	1.1881	1.1296	1.1292	1.1881	1.1881
1 3/16-16	N	2	1.1770	1.1875	1.1469	1.1686	1.1875	1.1415	1.1415	1.1875	1.1875
			1.1764	1.1881	1.1467	1.1680	1.1881	1.1417	1.1413	1.1881	1.1881
		3	1.1770	1.1875	1.1469	1.1702	1.1875	1.1431	1.1431	1.1875	1.1875
			1.1764	1.1881	1.1467	1.1696	1.1881	1.1433	1.1429	1.1881	1.1881
1 3/16-18	NEF	2	1.1778	1.1875	1.15140	1.1703	1.1875	1.14620	1.14620	1.1875	1.1875
			1.1773	1.1880	1.15125	1.1698	1.1880	1.14635	1.14605	1.1880	1.1880
		3	1.1778	1.1875	1.15140	1.1719	1.1875	1.14780	1.14780	1.1875	1.1875
			1.1773	1.1880	1.15125	1.1714	1.1880	1.14795	1.14765	1.1880	1.1880
1 1/4-7	NC	1	1.2273	1.2461	1.1533	1.2028	1.2461	1.1409	1.1409	1.2461	1.2461
			1.2266	1.2468	1.1531	1.2021	1.2468	1.1411	1.1407	1.2468	1.2468
		2	1.2312	1.2500	1.1572	1.2106	1.2500	1.1487	1.1487	1.2500	1.2500
			1.2305	1.2507	1.1570	1.2099	1.2507	1.1489	1.1485	1.2507	1.2507
		3	1.2312	1.2500	1.1572	1.2132	1.2500	1.1513	1.1513	1.2500	1.2500
			1.2305	1.2507	1.1570	1.2125	1.2507	1.1515	1.1511	1.2507	1.2507
		4	1.2320	1.2508	1.1580	1.2169	1.2508	1.1550	1.1550	1.2500	1.2500
			1.2313	1.2515	1.1578	1.2162	1.2515	1.1552	1.1548	1.2507	1.2507
1 1/4-8	N	2	1.2329	1.2500	1.1688	1.2146	1.2500	1.1605	1.1605	1.2500	1.2500
			1.2322	1.2507	1.1686	1.2139	1.2507	1.1607	1.1603	1.2507	1.2507
		3	1.2329	1.2500	1.1688	1.2171	1.2500	1.1630	1.1630	1.2500	1.2500
			1.2322	1.2507	1.1686	1.2164	1.2507	1.1632	1.1628	1.2507	1.2507
1 1/4-12	NF	1	1.2347	1.2476	1.1935	1.2217	1.2476	1.1856	1.1856	1.2476	1.2476
			1.2341	1.2482	1.1933	1.2211	1.2482	1.1858	1.1854	1.2482	1.2482
		2	1.2371	1.2500	1.1959	1.2264	1.2500	1.1903	1.1903	1.2500	1.2500
			1.2365	1.2506	1.1957	1.2258	1.2506	1.1905	1.1901	1.2506	1.2506
		3	1.2371	1.2500	1.1959	1.2280	1.2500	1.1919	1.1919	1.2500	1.2500
			1.2365	1.2506	1.1957	1.2274	1.2506	1.1921	1.1917	1.2506	1.2506
		4	1.2376	1.2505	1.1964	1.2305	1.2505	1.1944	1.1944	1.2500	1.2500
			1.2370	1.2511	1.1962	1.2299	1.2511	1.1946	1.1942	1.2506	1.2506
[illegible]	N	2	1.2395	1.2500	1.2094	1.2310	1.2500	1.2039	1.2039	1.2500	1.2500
			1.2389	1.2506	1.2092	1.2304	1.2506	1.2041	1.2037	1.2506	1.2506
		3	1.2395	1.2500	1.2094	1.2327	1.2500	1.2056	1.2056	1.2500	1.2500
			1.2389	1.2506	1.2092	1.2321	1.2506	1.2058	1.2054	1.2506	1.2506

[illegible] at end of table.

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TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
1¼-18	NEF	2	1.2403	1.2500	1.21390	1.2327	1.2500	1.20860	1.20860	1.2500	1.2500
			1.2398	1.2505	1.21375	1.2322	1.2505	1.20875	1.20845	1.2505	1.2505
		3	1.2403	1.2500	1.21390	1.2343	1.2500	1.21020	1.21020	1.2500	1.2500
			1.2398	1.2505	1.21375	1.2338	1.2505	1.21035	1.21005	1.2505	1.2505
1⁵⁄₁₆-12	N	2	1.2996	1.3125	1.2584	1.2889	1.3125	1.2528	1.2528	1.3125	1.3125
			1.2990	1.3131	1.2582	1.2883	1.3131	1.2530	1.2526	1.3131	1.3131
		3	1.2996	1.3125	1.2584	1.2905	1.3125	1.2544	1.2544	1.3125	1.3125
			1.2990	1.3131	1.2582	1.2899	1.3131	1.2546	1.2542	1.3131	1.3131
1⁵⁄₁₆-16	N	2	1.3020	1.3125	1.2719	1.2935	1.3125	1.2664	1.2664	1.3125	1.3125
			1.3014	1.3131	1.2717	1.2929	1.3131	1.2666	1.2662	1.3131	1.3131
		3	1.3020	1.3125	1.2719	1.2951	1.3125	1.2680	1.2680	1.3125	1.3125
			1.3014	1.3131	1.2717	1.2945	1.3131	1.2682	1.2678	1.3131	1.3131
1⁵⁄₁₆-18	NEF	2	1.3028	1.3125	1.27640	1.2952	1.3125	1.27110	1.27110	1.3125	1.3125
			1.3023	1.3130	1.27625	1.2947	1.3130	1.27125	1.27095	1.3130	1.3130
		3	1.3028	1.3125	1.27640	1.2968	1.3125	1.27270	1.27270	1.3125	1.3125
			1.3023	1.3130	1.27625	1.2963	1.3130	1.27285	1.27255	1.3130	1.3130
1⅜-6	NC	1	1.3496	1.3706	1.2623	1.3200	1.3706	1.2478	1.2478	1.3706	1.3706
			1.3488	1.3714	1.2621	1.3192	1.3714	1.2480	1.2476	1.3714	1.3714
		2	1.3540	1.3750	1.2667	1.3288	1.3750	1.2566	1.2566	1.3750	1.3750
			1.3532	1.3758	1.2665	1.3280	1.3758	1.2568	1.2564	1.3758	1.3758
		3	1.3540	1.3750	1.2667	1.3318	1.3750	1.2596	1.2596	1.3750	1.3750
			1.3532	1.3758	1.2665	1.3310	1.3758	1.2598	1.2594	1.3758	1.3758
		4	1.3549	1.3759	1.2676	1.3362	1.3759	1.2640	1.2640	1.3750	1.3750
			1.3541	1.3767	1.2674	1.3354	1.3767	1.2642	1.2638	1.3758	1.3758
1⅜-8	N	2	1.3579	1.3750	1.2938	1.3393	1.3750	1.2852	1.2852	1.3750	1.3750
			1.3572	1.3757	1.2936	1.3386	1.3757	1.2854	1.2850	1.3757	1.3757
		3	1.3579	1.3750	1.2938	1.3418	1.3750	1.2877	1.2877	1.3750	1.3750
			1.3572	1.3757	1.2936	1.3411	1.3757	1.2879	1.2875	1.3757	1.3757
1⅜-12	NF	1	1.3597	1.3726	1.3185	1.3467	1.3726	1.3106	1.3106	1.3726	1.3726
			1.3591	1.3732	1.3183	1.3461	1.3732	1.3108	1.3104	1.3732	1.3732
		2	1.3621	1.3750	1.3209	1.3514	1.3750	1.3153	1.3153	1.3750	1.3750
			1.3615	1.3756	1.3207	1.3508	1.3756	1.3155	1.3151	1.3756	1.3756
		3	1.3621	1.3750	1.3209	1.3530	1.3750	1.3169	1.3169	1.3750	1.3750
			1.3615	1.3756	1.3207	1.3524	1.3756	1.3171	1.3167	1.3756	1.3756
		4	1.3626	1.3755	1.3214	1.3555	1.3755	1.3194	1.3194	1.3750	1.3750
			1.3620	1.3761	1.3212	1.3549	1.3761	1.3196	1.3192	1.3756	1.3756
1⅜-16	N	2	1.3645	1.3750	1.3344	1.3559	1.3750	1.3288	1.3288	1.3750	1.3750
			1.3639	1.3756	1.3342	1.3553	1.3756	1.3290	1.3286	1.3756	1.3756
		3	1.3645	1.3750	1.3344	1.3576	1.3750	1.3305	1.3305	1.3750	1.3750
			1.3639	1.3756	1.3342	1.3570	1.3756	1.3307	1.3303	1.3756	1.3756
1⅜-18	NEF	2	1.3653	1.3750	1.33890	1.3576	1.3750	1.33350	1.33350	1.3750	1.3750
			1.3648	1.3755	1.33875	1.3571	1.3755	1.33365	1.33335	1.3755	1.3755
		3	1.3653	1.3750	1.33890	1.3592	1.3750	1.33510	1.33510	1.3750	1.3750
			1.3648	1.3755	1.33875	1.3587	1.3755	1.33525	1.33495	1.3755	1.3755
1⁷⁄₁₆-12	N	2	1.4246	1.4375	1.3834	1.4139	1.4375	1.3778	1.3778	1.4375	1.4375
			1.4240	1.4381	1.3832	1.4133	1.4381	1.3780	1.3776	1.4381	1.4381
		3	1.4246	1.4375	1.3834	1.4155	1.4375	1.3794	1.3794	1.4375	1.4375
			1.4240	1.4381	1.3832	1.4149	1.4381	1.3796	1.3792	1.4381	1.4381
1⁷⁄₁₆-16	N	2	1.4270	1.4375	1.3969	1.4184	1.4375	1.3913	1.3913	1.4375	1.4375
			1.4264	1.4381	1.3967	1.4178	1.4381	1.3915	1.3911	1.4381	1.4381
		3	1.4270	1.4375	1.3969	1.4200	1.4375	1.3929	1.3929	1.4375	1.4375
			1.4264	1.4381	1.3967	1.4194	1.4381	1.3931	1.3927	1.4381	1.4381
1⁷⁄₁₆-18	NEF	2	1.4278	1.4375	1.40140	1.4201	1.4375	1.39600	1.39600	1.4375	1.4375
			1.4273	1.4380	1.40125	1.4196	1.4380	1.39615	1.39585	1.4380	1.4380
		3	1.4278	1.4375	1.40140	1.4217	1.4375	1.39760	1.39760	1.4375	1.4375
			1.4273	1.4380	1.40125	1.4212	1.4380	1.39775	1.39745	1.4380	1.4380
1½-6	NC	1	1.4746	1.4956	1.3873	1.4450	1.4956	1.3728	1.3728	1.4956	1.4956
			1.4738	1.4964	1.3871	1.4442	1.4964	1.3730	1.3726	1.4964	1.4964
		2	1.4790	1.5000	1.3917	1.4538	1.5000	1.3816	1.3816	1.5000	1.5000
			1.4782	1.5008	1.3915	1.4530	1.5008	1.3818	1.3814	1.5008	1.5008
		3	1.4790	1.5000	1.3917	1.4568	1.5000	1.3846	1.3846	1.5000	1.5000
			1.4782	1.5008	1.3915	1.4560	1.5008	1.3848	1.3844	1.5008	1.5008
		4	1.4799	1.5009	1.3926	1.4612	1.5009	1.3890	1.3890	1.5000	1.5000
			1.4791	1.5017	1.3924	1.4604	1.5017	1.3892	1.3888	1.5008	1.5008
[illegible]	[illegible]	2	1.4829	1.5000	1.4188	1.4639	1.5000	1.4098	1.4098	1.5000	1.5000
			1.4822	1.5007	1.4186	1.4632	1.5007	1.4100	1.4096	1.5007	1.5007
		3	1.4829	1.5000	1.4188	1.4656	1.5000	1.4125	1.4125	1.5000	1.5000
			1.4822	1.5007	1.4186	1.4650	1.5007	1.4127	1.4123	1.5007	1.5007

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TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
1½-12	NF	1	1.4847	1.4976	1.4435	1.4717	1.4976	1.4356	1.4356	1.4976	1.4976
			1.4841	1.4982	1.4433	1.4711	1.4982	1.4358	1.4354	1.4982	1.4982
		2	1.4871	1.5000	1.4459	1.4764	1.5000	1.4403	1.4403	1.5000	1.5000
			1.4865	1.5006	1.4457	1.4758	1.5006	1.4405	1.4401	1.5006	1.5006
		3	1.4871	1.5000	1.4459	1.4780	1.5000	1.4419	1.4419	1.5000	1.5000
			1.4865	1.5006	1.4457	1.4774	1.5006	1.4421	1.4417	1.5006	1.5006
		4	1.4876	1.5005	1.4464	1.4805	1.5005	1.4444	1.4444	1.5000	1.5000
			1.4870	1.5011	1.4462	1.4799	1.5011	1.4446	1.4442	1.5006	1.5006
1½-16	N	2	1.4895	1.5000	1.4594	1.4808	1.5000	1.4537	1.4537	1.5000	1.5000
			1.4889	1.5006	1.4592	1.4802	1.5006	1.4539	1.4535	1.5006	1.5006
		3	1.4895	1.5000	1.4594	1.4825	1.5000	1.4554	1.4554	1.5000	1.5000
			1.4889	1.5006	1.4592	1.4819	1.5006	1.4556	1.4552	1.5006	1.5006
1½-18	NEF	2	1.4903	1.5000	1.46390	1.4825	1.5000	1.45840	1.45840	1.5000	1.5000
			1.4898	1.5005	1.46375	1.4820	1.5005	1.45855	1.45825	1.5005	1.5005
		3	1.4903	1.5000	1.46390	1.4842	1.5000	1.46010	1.46010	1.5000	1.5000
			1.4898	1.5005	1.46375	1.4837	1.5005	1.46025	1.45995	1.5005	1.5005
1 9/16-16	N	2	1.5520	1.5625	1.52190	1.5432	1.5625	1.51610	1.51610	1.5625	1.5625
			1.5514	1.5631	1.52165	1.5426	1.5631	1.51635	1.51585	1.5631	1.5631
		3	1.5520	1.5625	1.52190	1.5450	1.5625	1.51790	1.51790	1.5625	1.5625
			1.5514	1.5631	1.52165	1.5444	1.5631	1.51815	1.51865	1.5631	1.5631
1 9/16-18	NEF	2	1.5528	1.5625	1.5264	1.5450	1.5625	1.5209	1.5209	1.5625	1.5625
			1.5523	1.5630	1.5262	1.5445	1.5630	1.5211	1.5207	1.5630	1.5630
		3	1.5528	1.5625	1.5264	1.5466	1.5625	1.5225	1.5225	1.5625	1.5625
			1.5523	1.5630	1.5262	1.5461	1.5630	1.5227	1.5223	1.5630	1.5630
1⅝-8	N	2	1.6079	1.6250	1.54380	1.5886	1.6250	1.53450	1.53450	1.6250	1.6250
			1.6072	1.6257	1.54355	1.5879	1.6257	1.53475	1.53425	1.6257	1.6257
		3	1.6079	1.6250	1.54380	1.5914	1.6250	1.53730	1.53730	1.6250	1.6250
			1.6072	1.6257	1.54355	1.5907	1.6257	1.53755	1.53705	1.6257	1.6257
1⅝-12	N	2	1.6121	1.6250	1.57090	1.6006	1.6250	1.56450	1.56450	1.6250	1.6250
			1.6115	1.6256	1.57065	1.6000	1.6256	1.56475	1.56425	1.6256	1.6256
		3	1.6121	1.6250	1.57090	1.6025	1.6250	1.56640	1.56640	1.6250	1.6250
			1.6115	1.6256	1.57065	1.6019	1.6256	1.56665	1.56615	1.6256	1.6256
1⅝-16	N	2	1.6145	1.6250	1.58440	1.6057	1.6250	1.57860	1.57860	1.6250	1.6250
			1.6139	1.6256	1.58415	1.6051	1.6256	1.57885	1.57835	1.6256	1.6256
		3	1.6145	1.6250	1.58440	1.6074	1.6250	1.58030	1.58030	1.6250	1.6250
			1.6139	1.6256	1.58415	1.6068	1.6256	1.58055	1.58005	1.6256	1.6256
1⅝-18	NEF	2	1.6153	1.6250	1.5889	1.6074	1.6250	1.5833	1.5833	1.6250	1.6250
			1.6148	1.6255	1.5887	1.6069	1.6255	1.5835	1.5831	1.6255	1.6255
		3	1.6153	1.6250	1.5889	1.6091	1.6250	1.5850	1.5850	1.6250	1.6250
			1.6148	1.6255	1.5887	1.6086	1.6255	1.5852	1.5848	1.6255	1.6255
1 11/16-16	N	2	1.6770	1.6875	1.64690	1.6682	1.6875	1.64110	1.64110	1.6875	1.6875
			1.6764	1.6881	1.64665	1.6676	1.6881	1.64135	1.64085	1.6881	1.6881
		3	1.6770	1.6875	1.64690	1.6699	1.6875	1.64280	1.64280	1.6875	1.6875
			1.6764	1.6881	1.64665	1.6693	1.6881	1.64305	1.64255	1.6881	1.6881
1 11/16-18	NEF	2	1.6778	1.6875	1.6514	1.6609	1.6875	1.6458	1.6458	1.6875	1.6875
			1.6773	1.6880	1.6512	1.6604	1.6880	1.6460	1.6456	1.6880	1.6880
		3	1.6778	1.6875	1.6514	1.6716	1.6875	1.6475	1.6475	1.6875	1.6875
			1.6773	1.6880	1.6512	1.6711	1.6880	1.6477	1.6473	1.6880	1.6880
1¾-5	NC	1	1.7209	1.7448	1.61490	1.6846	1.7448	1.59800	1.59800	1.7448	1.7448
			1.7201	1.7456	1.61465	1.6838	1.7456	1.59825	1.59775	1.7456	1.7456
		2	1.7261	1.7500	1.62010	1.6951	1.7500	1.60850	1.60850	1.7500	1.7500
			1.7253	1.7508	1.61985	1.6943	1.7508	1.60875	1.60825	1.7508	1.7508
		3	1.7261	1.7500	1.62010	1.6985	1.7500	1.61190	1.61190	1.7500	1.7500
			1.7253	1.7508	1.61985	1.6977	1.7508	1.61215	1.61165	1.7508	1.7508
		4	1.7271	1.7510	1.62110	1.7036	1.7510	1.61700	1.61700	1.7500	1.7500
			1.7263	1.7518	1.62085	1.7028	1.7518	1.61725	1.61675	1.7508	1.7508
1¾-8	N	2	1.7329	1.7500	1.66880	1.7132	1.7500	1.65910	1.65910	1.7500	1.7500
			1.7322	1.7507	1.66855	1.7125	1.7507	1.65935	1.65885	1.7507	1.7507
		3	1.7329	1.7500	1.66880	1.7161	1.7500	1.66200	1.66200	1.7500	1.7500
			1.7322	1.7507	1.66855	1.7154	1.7507	1.66225	1.66175	1.7507	1.7507
[illegible]	[illegible]	2	1.7371	1.7500	1.69590	1.7255	1.7500	1.68940	1.68940	1.7500	1.7500
			1.7365	1.7506	1.69565	1.7249	1.7506	1.68965	1.68915	1.7506	1.7506
		3	1.7371	1.7500	1.69590	1.7274	1.7500	1.69130	1.69130	1.7500	1.7500
			1.7365	1.7506	1.69565	1.7268	1.7506	1.69155	1.69105	1.7506	1.7506
[illegible]	[illegible]	2	1.7395	1.7500	1.70940	1.7306	1.7500	1.70350	1.70350	1.7500	1.7500
			1.7389	1.7506	1.70915	1.7300	1.7506	1.70375	1.70325	1.7506	1.7506
		3	1.7395	1.7500	1.70940	1.7324	1.7500	1.70530	1.70530	1.7500	1.7500
			1.7389	1.7506	1.70915	1.7318	1.7506	1.70555	1.70505	1.7506	1.7506

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TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go ¹	Not go ²
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
1¹³⁄₁₆-16	N	2	1.8020	1.8125	1.77190	1.7931	1.8125	1.76600	1.76600	1.8125	1.8125
			1.8014	1.8131	1.77165	1.7925	1.8131	1.76625	1.76575	1.8131	1.8131
		3	1.8020	1.8125	1.77190	1.7948	1.8125	1.76770	1.76770	1.8125	1.8125
			1.8014	1.8131	1.77165	1.7942	1.8131	1.76795	1.76745	1.8131	1.8131
1⅞-8	N	2	1.8579	1.8750	1.79380	1.8379	1.8750	1.78380	1.78380	1.8750	1.8750
			1.8572	1.8757	1.79355	1.8372	1.8757	1.78405	1.78355	1.8757	1.8757
		3	1.8579	1.8750	1.79380	1.8409	1.8750	1.78680	1.78680	1.8750	1.8750
			1.8572	1.8757	1.79355	1.8402	1.8757	1.78705	1.78655	1.8757	1.8757
1⅞-12	N	2	1.8621	1.8750	1.82090	1.8504	1.8750	1.81430	1.81430	1.8750	1.8750
			1.8615	1.8756	1.82065	1.8498	1.8756	1.81455	1.81405	1.8756	1.8756
		3	1.8621	1.8750	1.82090	1.8524	1.8750	1.81630	1.81630	1.8750	1.8750
			1.8615	1.8756	1.82065	1.8518	1.8756	1.81655	1.81605	1.8756	1.8756
1⅞-16	N	2	1.8645	1.8750	1.83440	1.8555	1.8750	1.82840	1.82840	1.8750	1.8750
			1.8639	1.8756	1.83415	1.8549	1.8756	1.82865	1.82815	1.8756	1.8756
		3	1.8645	1.8750	1.83440	1.8573	1.8750	1.83020	1.83020	1.8750	1.8750
			1.8639	1.8756	1.83415	1.8567	1.8756	1.83045	1.82995	1.8756	1.8756
1¹⁵⁄₁₆-16	N	2	1.9270	1.9375	1.89690	1.9180	1.9375	1.89090	1.89090	1.9375	1.9375
			1.9264	1.9381	1.89665	1.9174	1.9381	1.89115	1.89065	1.9381	1.9381
		3	1.9270	1.9375	1.89690	1.9198	1.9375	1.89270	1.89270	1.9375	1.9375
			1.9264	1.9381	1.89665	1.9192	1.9381	1.89295	1.89245	1.9381	1.9381
2-4½	NC	1	1.9685	1.9943	1.85000	1.9278	1.9943	1.83160	1.83160	1.9943	1.9943
			1.9677	1.9951	1.84975	1.9270	1.9951	1.83185	1.83135	1.9951	1.9951
		2	1.9742	2.0000	1.85570	1.9392	2.0000	1.84300	1.84300	2.0000	2.0000
			1.9734	2.0008	1.85545	1.9384	2.0008	1.84325	1.84275	2.0008	2.0008
		3	1.9742	2.0000	1.85570	1.9430	2.0000	1.84680	1.84680	2.0000	2.0000
			1.9734	2.0008	1.85545	1.9422	2.0008	1.84705	1.84655	2.0008	2.0008
		4	1.9753	2.0011	1.85680	1.9486	2.0011	1.85240	1.85240	2.0000	2.0000
			1.9745	2.0019	1.85655	1.9478	2.0019	1.85265	1.85215	2.0008	2.0008
2-8	N	2	1.9829	2.0000	1.91880	1.9625	2.0000	1.90840	1.90840	2.0000	2.0000
			1.9822	2.0007	1.91855	1.9618	2.0007	1.90865	1.90815	2.0007	2.0007
		3	1.9829	2.0000	1.91880	1.9656	2.0000	1.91150	1.91150	2.0000	2.0000
			1.9822	2.0007	1.91855	1.9649	2.0007	1.91175	1.91125	2.0007	2.0007
2-12	N	2	1.9871	2.0000	1.94590	1.9753	2.0000	1.93920	1.93920	2.0000	2.0000
			1.9865	2.0006	1.94565	1.9747	2.0006	1.93945	1.93895	2.0006	2.0006
		3	1.9871	2.0000	1.94590	1.9773	2.0000	1.94120	1.94120	2.0000	2.0000
			1.9865	2.0006	1.94565	1.9767	2.0006	1.94145	1.95095	2.0006	2.0006
2-16	NEF	2	1.9895	2.0000	1.95940	1.9804	2.0000	1.95330	1.95330	2.0000	2.0000
			1.9889	2.0006	1.95915	1.9798	2.0006	1.95355	1.95305	2.0006	2.0006
		3	1.9895	2.0000	1.95940	1.9822	2.0000	1.95510	1.95510	2.0000	2.0000
			1.9889	2.0006	1.95915	1.9816	2.0006	1.95535	1.95485	2.0006	2.0006
2¹⁄₁₆-16	N	2	2.0520	2.0625	2.02190	2.0429	2.0625	2.01580	2.01580	2.0625	2.0625
			2.0514	2.0631	2.02165	2.0423	2.0631	2.01605	2.01555	2.0631	2.0631
		3	2.0520	2.0625	2.02190	2.0417	2.0625	2.01760	2.01760	2.0625	2.0625
			2.0514	2.0631	2.02165	2.0441	2.0631	2.01785	2.01735	2.0631	2.0631
2⅛-8	N	2	2.1079	2.1250	2.04380	2.0872	2.1250	2.03310	2.03310	2.1250	2.1250
			2.1072	2.1257	2.04355	2.0865	2.1257	2.03335	2.03285	2.1257	2.1257
		3	2.1079	2.1250	2.04380	2.0904	2.1250	2.03630	2.03630	2.1250	2.1250
			2.1072	2.1257	2.04355	2.0897	2.1257	2.03655	2.03605	2.1257	2.1257
2⅛-12	N	2	2.1121	2.1250	2.07090	2.1002	2.1250	2.06410	2.06410	2.1250	2.1250
			2.1115	2.1256	2.07065	2.0996	2.1256	2.06435	2.06385	2.1256	2.1256
		3	2.1121	2.1250	2.07090	2.1022	2.1250	2.06610	2.06610	2.1250	2.1250
			2.1115	2.1256	2.07065	2.1016	2.1256	2.06635	2.06585	2.1256	2.1256
2⅛-16	N	2	2.1145	2.1250	2.08440	2.1053	2.1250	2.07820	2.07820	2.1250	2.1250
			2.1139	2.1256	2.08415	2.1047	2.1256	2.07845	2.07795	2.1256	2.1256
		3	2.1145	2.1250	2.08440	2.1072	2.1250	2.08010	2.08010	2.1250	2.1250
			2.1139	2.1256	2.08415	2.1066	2.1256	2.08035	2.07985	2.1256	2.1256
2³⁄₁₆-16	N	2	2.1770	2.1875	2.14690	2.1678	2.1875	2.14070	2.14070	2.1875	2.1875
			2.1764	2.1881	2.14665	2.1672	2.1881	2.14095	2.14045	2.1881	2.1881
		3	2.1770	2.1875	2.14690	2.1697	2.1875	2.14260	2.14260	2.1875	2.1875
			2.1764	2.1881	2.14665	2.1691	2.1881	2.14285	2.14235	2.1881	2.1881
2¼-4½	NC	1	2.2185	2.2443	2.10000	2.1778	2.2443	2.08160	2.08160	2.2443	2.2443
			2.2177	2.2451	1.99975	2.1770	2.2451	2.08185	2.08135	2.2451	2.2451
		2	2.2242	2.2500	2.10570	2.1892	2.2500	2.09300	2.09300	2.2500	2.2500
			2.2234	2.2508	2.10545	2.1884	2.2508	2.09325	2.09275	2.2508	2.2508
		3	2.2242	2.2500	2.10570	2.1930	2.2500	2.09680	2.09680	2.2500	2.2500
			2.2234	2.2508	2.10545	2.1922	2.2508	2.09705	2.09655	2.2508	2.2508
		4	2.2253	2.2511	2.10680	2.1986	2.2511	2.10240	2.10240	2.2500	2.2500
			2.2245	2.2519	2.10655	2.1978	2.2519	2.10265	2.10215	2.2508	2.2508

End of table.

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TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
2¼-8	N	2	2.2329	2.2500	2.16880	2.2119	2.2500	2.15780	2.15780	2.2500	2.2500
			2.2322	2.2507	2.16855	2.2112	2.2507	2.15805	2.15755	2.2507	2.2507
		3	2.2329	2.2500	2.16880	2.2152	2.2500	2.16110	2.16110	2.2500	2.2500
			2.2322	2.2507	2.16855	2.2145	2.2507	2.16135	2.16085	2.2507	2.2507
2¼-12	N	2	2.2371	2.2500	2.19590	2.2251	2.2500	2.18900	2.18900	2.2500	2.2500
			2.2365	2.2506	2.19565	2.2245	2.2506	2.18925	2.18875	2.2506	2.2506
		3	2.2371	2.2500	2.19590	2.2272	2.2500	2.19110	2.19110	2.2500	2.2500
			2.2365	2.2506	2.19565	2.2266	2.2506	2.19135	2.19085	2.2506	2.2506
2¼-16	N	2	2.2395	2.2500	2.20940	2.2303	2.2500	2.20320	2.20320	2.2500	2.2500
			2.2389	2.2506	2.20915	2.2297	2.2506	2.20345	2.20295	2.2506	2.2506
		3	2.2395	2.2500	2.20940	2.2321	2.2500	2.20500	2.20500	2.2500	2.2500
			2.2389	2.2506	2.20915	2.2315	2.2506	2.20525	2.20475	2.2506	2.2506
2⁵⁄₁₆-16	N	2	2.3020	2.3125	2.27190	2.2927	2.3125	2.26560	2.26560	2.3125	2.3125
			2.3014	2.3131	2.27165	2.2921	2.3131	2.26585	2.26535	2.3131	2.3131
		3	2.3020	2.3125	3.27190	2.2946	2.3125	2.26750	2.26750	2.3125	2.3125
			2.3014	2.3131	2.27165	2.2940	2.3131	2.26775	2.26725	2.3131	2.3131
2⅜-12	N	2	2.3621	2.3750	2.32090	2.3500	2.3750	2.31390	2.31390	2.3750	2.3750
			2.3615	2.3756	2.32065	2.3494	2.3756	2.31415	2.31365	2.3756	2.3756
		3	2.3621	2.3750	2.32090	2.3521	2.3750	2.31600	2.31600	2.3750	2.3750
			2.3615	2.3756	2.32065	2.3515	2.3756	2.31625	2.31575	2.3756	2.3756
2⅜-16	N	2	2.3645	2.3750	2.33440	2.3552	2.3750	2.32810	2.32810	2.3750	2.3750
			2.3639	2.3756	2.33415	2.3546	2.3756	2.32835	2.32785	2.3756	2.3756
		3	2.3645	2.3750	2.33440	2.3571	2.3750	2.33000	2.33000	2.3750	2.3750
			2.3639	2.3756	2.33415	2.3565	2.3756	2.33025	2.32975	2.3756	2.3756
2⁷⁄₁₆-16	N	2	2.4270	2.4375	2.39690	2.4176	2.4374	2.39050	2.39050	2.4375	2.4374
			2.4264	2.4381	2.39665	2.4170	2.4380	2.39075	2.39025	2.4381	2.4380
		3	2.4270	2.4375	2.39690	2.4195	2.4375	2.39240	2.39240	2.4375	2.4375
			2.4264	2.4381	2.39665	2.4189	2.4381	2.39265	2.39215	2.4381	2.4381
2½-4	NC	1	2.4655	2.4936	2.33120	2.4190	2.4936	2.31080	2.31080	2.4936	2.4936
			2.4646	2.4945	2.33095	2.4181	2.4945	2.31105	2.31055	2.4945	2.4945
		2	2.4719	2.5000	2.33760	2.4319	2.5000	2.32360	2.32360	2.5000	2.5000
			2.4710	2.5009	2.33735	2.4310	2.5009	2.32385	2.32335	2.5009	2.5009
		3	2.4719	2.5000	2.33760	2.4362	2.5000	2.32790	2.32790	2.5000	2.5000
			2.4710	2.5009	2.33735	2.4353	2.5009	2.32815	2.32765	2.5009	2.5009
		4	2.4732	2.5013	2.33890	2.4424	2.5013	2.33410	2.33410	2.5000	2.5000
			2.4723	2.5022	2.33865	2.4415	2.5022	2.33435	2.33385	2.5009	2.5009
2½-8	N	2	2.4829	2.5000	2.41880	2.4612	2.5000	2.40710	2.40710	2.5000	2.5000
			2.4822	2.5007	2.41855	2.4605	2.5007	2.40735	2.40685	2.5007	2.5007
		3	2.4829	2.5000	2.41880	2.4647	2.5000	2.41060	2.41060	2.5000	2.5000
			2.4822	2.5007	2.41855	2.4640	2.5007	2.41085	2.41035	2.5007	2.5007
2½-12	N	2	2.4871	2.5000	2.44590	2.4749	2.5000	2.43880	2.43880	2.5000	2.5000
			2.4865	2.5006	2.44565	2.4743	2.5006	2.43905	2.43855	2.5006	2.5006
		3	2.4871	2.5000	2.44590	2.4771	2.5000	2.44100	2.44100	2.5000	2.5000
			2.4865	2.5006	2.44565	2.4765	2.5006	2.44125	2.44075	2.5006	2.5006
2½-16	N	2	2.4895	2.5000	2.45940	2.4801	2.4999	2.45300	2.45300	2.5000	2.4999
			2.4889	2.5006	2.45915	2.4795	2.5005	2.45325	2.45275	2.5006	2.5005
		3	2.4895	2.5000	2.45940	2.4820	2.5000	2.45490	2.45490	2.5000	2.5000
			2.4889	2.5006	2.45915	2.4814	2.5006	2.45515	2.45465	2.5006	2.5006
2⅝-12	N	2	2.6121	2.6250	2.57090	2.5999	2.6250	2.56380	2.56380	2.6250	2.6250
			2.6115	2.6256	2.57065	2.5993	2.6256	2.56405	2.56355	2.6256	2.6256
		3	2.6121	2.6250	2.57090	2.6020	2.6250	2.56590	2.56590	2.6250	2.6250
			2.6115	2.6256	2.57065	2.6014	2.6256	2.56615	2.56565	2.6256	2.6256
2⅝-16	N	2	2.6145	2.6250	2.58440	2.6050	2.6248	2.57790	2.57790	2.6250	2.6248
			2.6139	2.6256	2.58415	2.6044	2.6254	2.57815	2.57765	2.6256	2.6254
		3	2.6145	2.6250	2.58440	2.6070	2.6250	2.57990	2.57990	2.6250	2.6250
			2.6139	2.6256	2.58415	2.6064	2.6256	2.58015	2.57965	2.6256	2.6256
2¾-4	NC	1	2.7155	2.7436	2.58120	2.6690	2.7436	2.56080	2.56080	2.7436	2.7436
			2.7146	2.7445	2.58095	2.6681	2.7445	2.56105	2.56055	2.7445	2.7445
		2	2.7219	2.7500	2.58760	2.6819	2.7500	2.57360	2.57360	2.7500	2.7500
			2.7210	2.7509	2.58735	2.6810	2.7509	2.57385	2.57335	2.7509	2.7509
		3	2.7219	2.7500	2.58760	2.6862	2.7500	2.57790	2.57790	2.7500	2.7500
			2.7210	2.7509	2.58735	2.6853	2.7509	2.57815	2.57765	2.7509	2.7509
		4	2.7232	2.7513	2.58890	2.6924	2.7513	2.58410	2.58410	2.7500	2.7500
			2.7223	2.7522	2.58865	2.6915	2.7522	2.58435	2.58385	2.7509	2.7509
2¾-8	N	2	2.7329	2.7500	2.66880	2.7105	2.7500	2.65640	2.65640	2.7500	2.7500
			2.7322	2.7507	2.66855	2.7098	2.7507	2.65665	2.65615	2.7507	2.7507
		3	2.7329	2.7500	2.66880	2.7142	2.7500	2.66010	2.66010	2.7500	2.7500
			2.7322	2.7507	2.66855	2.7135	2.7507	2.66035	2.65985	2.7507	2.7507

See footnotes at end of table.

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TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go[1]	Not go[2]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
2¾-12	N	2	2.7371	2.7500	2.69590	2.7248	2.7500	2.68870	2.68870	2.7500	2.7500
			2.7365	2.7506	2.69565	2.7242	2.7506	2.68895	2.68845	2.7506	2.7506
		3	2.7371	2.7500	2.69590	2.7270	2.7500	2.69090	2.69090	2.7500	2.7500
			2.7365	2.7506	2.69565	2.7264	2.7506	2.69115	2.69065	2.7506	2.7506
2¾-16	N	2	2.7395	2.7500	2.70940	2.7299	2.7497	2.70280	2.70280	2.7500	2.7497
			2.7389	2.7506	2.70915	2.7293	2.7503	2.70305	2.70255	2.7506	2.7503
		3	2.7395	2.7500	2.70940	2.7319	2.7500	2.70480	2.70480	2.7500	2.7500
			2.7389	2.7506	2.70915	2.7313	2.7506	2.70505	2.70455	2.7506	2.7506
2⅞-12	N	2	2.8621	2.8750	2.82090	2.8497	2.8750	2.81360	2.81360	2.8750	2.8750
			2.8615	2.8756	2.82065	2.8491	2.8756	2.81385	2.81335	2.8756	2.8756
		3	2.8621	2.8750	2.82090	2.8519	2.8750	2.81580	2.81580	2.8750	2.8750
			2.8615	2.8756	2.82065	2.8513	2.8756	2.81605	2.81555	2.8756	2.8756
2⅞-16	N	2	2.8645	2.8750	2.83440	2.8549	2.8747	2.82780	2.82780	2.8750	2.8747
			2.8639	2.8756	2.83415	2.8543	2.8753	2.82805	2.82755	2.8756	2.8753
		3	2.8645	2.8750	2.83440	2.8569	2.8750	2.82980	2.82980	2.8750	2.8750
			2.8639	2.8756	2.83415	2.8563	2.8756	2.83005	2.82955	2.8756	2.8756
3-4	NC	1	2.9655	2.9936	2.83120	2.9190	2.9936	2.81080	2.81080	2.9936	2.9936
			2.9646	2.9945	2.83095	2.9181	2.9945	2.81105	2.81055	2.9945	2.9945
		2	2.9719	3.0000	2.83760	2.9319	3.0000	2.82360	2.82360	3.0000	3.0000
			2.9710	3.0009	2.83735	2.9310	3.0009	2.82385	2.82535	3.0009	3.0009
		3	2.9719	3.0000	2.83760	2.9362	3.0000	2.82790	2.82790	3.0000	3.0000
			2.9710	3.0009	2.83735	2.9353	3.0009	2.82815	2.82765	3.0009	3.0009
		4	2.9732	3.0013	2.83890	2.9424	3.0013	2.83410	2.83410	3.0000	3.0000
			2.9723	3.0022	2.83865	2.9415	3.0022	2.83435	2.83385	3.0009	3.0009
3-8	N	2	2.9829	3.0000	2.91880	2.9599	2.9996	2.90580	2.90580	3.0000	2.9996
			2.9822	3.0007	2.91855	2.9592	3.0003	2.90605	2.90555	3.0007	3.0003
		3	2.9829	3.0000	2.91880	2.9637	3.0000	2.90960	2.90960	3.0000	3.0000
			2.9822	3.0007	2.91855	2.9630	3.0007	2.90985	2.90935	3.0007	3.0007
3-12	N	2	2.9871	3.0000	2.94590	2.9746	3.0000	2.93850	2.93850	3.0000	3.0000
			2.9865	3.0006	2.94565	2.9730	3.0006	2.93875	2.93825	3.0006	3.0006
		3	2.9871	3.0000	2.94590	2.9769	3.0000	2.94080	2.94080	3.0000	3.0000
			2.9865	3.0006	2.94565	2.9763	3.0006	2.94105	2.94055	3.0006	3.0006
3-16	N	2	2.9895	3.0000	2.95940	2.9798	2.9996	2.95270	2.95270	3.0000	2.9996
			2.9889	3.0006	2.95915	2.9792	3.0002	2.95295	2.95245	3.0006	3.0002
		3	2.9895	3.0000	2.95940	2.9818	3.0000	2.95470	2.95470	3.0000	3.0000
			2.9889	3.0006	2.95915	2.9812	3.0006	2.95495	2.95445	3.0006	3.0006
3⅛-12	N	2	3.1121	3.1250	3.07090	3.0996	3.1250	3.06350	3.06350	3.1250	3.1250
			3.1115	3.1256	3.07065	3.0990	3.1256	3.06375	3.06325	3.1256	3.1256
		3	3.1121	3.1250	3.07090	3.1018	3.1250	3.06570	3.06570	3.1250	3.1250
			3.1115	3.1256	3.07065	3.1012	3.1256	3.06595	3.06545	3.1256	3.1256
3⅛-16	N	2	3.1145	3.1250	3.08440	3.1047	3.1245	3.07760	3.07760	3.1250	3.1245
			3.1139	3.1256	3.08415	3.1041	3.1251	3.07785	3.07735	3.1256	3.1251
		3	3.1145	3.1250	3.08440	3.1068	3.1250	3.07970	3.07970	3.1250	3.1250
			3.1139	3.1256	3.08415	3.1062	3.1256	3.07995	3.07945	3.1256	3.1256
3¼-4	NC	1	3.2155	3.2436	3.08120	3.1690	3.2436	3.06080	3.06080	3.2436	3.2436
			3.2146	3.2445	3.08095	3.1681	3.2445	3.06105	3.06055	3.2445	3.2445
		2	3.2219	3.2500	3.08760	3.1819	3.2500	3.07360	3.07360	3.2500	3.2500
			3.2210	3.2509	3.08735	3.1810	3.2509	3.07385	3.07335	3.2509	3.2509
		3	3.2219	3.2500	3.08760	3.1862	3.2500	3.07790	3.07790	3.2500	3.2500
			3.2210	3.2509	3.08735	3.1853	3.2509	3.07815	3.07765	3.2509	3.2509
		4	3.2232	3.2513	3.08890	3.1924	3.2513	3.08410	3.08410	3.2500	3.2500
			3.2223	3.2522	3.08865	3.1915	3.2522	3.08435	3.08385	3.2509	2.2509
3¼-8	N	2	3.2329	3.2500	3.16880	3.2097	3.2494	3.15560	3.15560	3.2500	3.2494
			3.2322	3.2507	3.16855	3.2090	3.2501	3.15585	3.15535	3.2507	3.2501
		3	3.2329	3.2500	3.16880	3.2136	3.2500	3.15950	3.15950	3.2500	3.2500
			3.2322	3.2507	3.16855	3.2129	3.2507	3.15975	3.15925	3.2507	3.2507
3¼-12	N	2	3.2371	3.2500	3.19590	3.2245	3.2500	3.18840	3.18840	3.2500	3.2500
			3.2365	3.2506	3.19565	3.2239	3.2506	3.18865	3.18815	3.2506	3.2506
		3	3.2371	3.2500	3.19590	3.2268	3.2500	3.19070	3.19070	3.2500	3.2500
			3.2365	3.2506	3.19565	3.2262	3.2506	3.19095	3.19045	3.2506	3.2506
3¼-16	N	2	3.2395	3.2500	3.20940	3.2296	3.2494	3.20250	3.20250	3.2500	3.2494
			3.2389	2.2506	3.20915	3.2290	3.2500	3.20275	3.20225	3.2506	3.2500
		3	3.2395	3.2500	3.20940	3.2317	3.2500	3.20460	3.20460	3.2500	3.2500
			3.2389	3.2506	3.20915	3.2311	3.2506	3.20485	3.20435	3.2506	3.2506
3⅜-12	N	2	3.3621	3.3750	3.32090	3.3494	3.3750	3.31330	3.31330	3.3750	3.3750
			3.3615	3.3756	3.32065	3.3488	3.3756	3.31355	3.31305	3.3756	3.3756
		3	3.3621	3.3750	3.32090	3.3517	3.3750	3.31560	3.31560	3.3750	3.3750
			3.3615	3.3756	3.32065	3.3511	3.3756	3.31585	3.31535	3.3756	3.3756

See footnotes at end of table.

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TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
3⅜-16	N	2	3.3645	3.3750	3.33440	3.3546	3.3744	3.32750	3.32750	3.3750	3.3744
			3.3639	3.3756	3.33415	3.3540	3.3750	3.32775	3.32725	3.3756	3.3750
		3	3.3645	3.3750	3.33440	3.3567	3.3750	3.32960	3.32960	3.3750	3.3750
			3.3639	3.3756	3.33415	3.3561	3.3756	3.32985	3.32935	3.3756	3.3756
3½-4	NC	1	3.4655	3.4936	3.33120	3.4190	3.4936	3.31080	3.31080	3.4936	3.4936
			3.4646	3.4945	3.33095	3.4181	3.4945	3.31105	3.31055	3.4945	3.4945
		2	3.4719	3.5000	3.33760	3.4319	3.5000	3.32360	3.32360	3.5000	3.5000
			3.4710	3.5009	3.33735	3.4310	3.5009	3.32385	3.32335	3.5009	3.5009
		3	3.4719	3.5000	3.33760	3.4362	3.5000	3.32790	3.32790	3.5000	3.5000
			3.4710	3.5009	3.33735	3.4353	3.5009	3.32815	3.32765	3.5009	3.5009
		4	3.4732	3.5013	3.33890	3.4424	3.5013	3.33410	3.33410	3.5000	3.5000
			3.4723	3.5022	3.33865	3.4415	3.5022	3.33435	3.33385	3.5009	3.5009
3½-8	N	2	3.4829	3.5000	3.41880	3.4596	3.4992	3.40550	3.40550	3.5000	3.4992
			3.4822	3.5007	3.41855	3.4589	3.4999	3.40575	3.40525	3.5007	3.4999
		3	3.4829	3.5000	3.41880	3.4636	3.5000	3.40950	3.40950	3.5000	3.5000
			3.4822	3.5007	3.41855	3.4629	3.5007	3.40975	3.40925	3.5007	3.5007
3½-12	N	2	3.4871	3.5000	3.44590	3.4744	3.5000	3.43830	3.43830	3.5000	3.5000
			3.4865	3.5006	3.44565	3.4738	3.5006	3.43855	3.43805	3.5006	3.5006
		3	3.4871	3.5000	3.44590	3.4767	3.5000	3.44060	3.44060	3.5000	3.5000
			3.4865	3.5006	3.44565	3.4761	3.5006	3.44085	3.44035	3.5006	3.5006
3½-16	N	2	3.4895	3.5000	3.45940	3.4795	3.4993	3.45240	3.45240	3.5000	3.4993
			3.4889	3.5006	3.45915	3.4789	3.4999	3.45265	3.45215	3.5006	3.4999
		3	3.4895	3.5000	3.45940	3.4816	3.5000	3.45450	3.45450	3.5000	3.5000
			3.4889	3.5006	3.45915	3.4810	3.5006	3.45475	3.45425	3.5006	3.5006
3⅝-12	N	2	3.6121	3.6250	3.57090	3.5993	3.6250	3.56320	3.56320	3.6250	3.6250
			3.6115	3.6256	3.57065	3.5987	3.6256	3.56345	3.56295	3.6256	3.6256
		3	3.6121	3.6250	3.57090	3.6016	3.6250	3.56550	3.56550	3.6250	3.6250
			3.6115	3.6256	3.57065	3.6010	3.6256	3.56575	3.56525	3.6256	3.6256
3⅝-16	N	2	3.6145	3.6250	3.58440	3.6044	3.6242	3.57730	3.57730	3.6250	3.6242
			3.6139	3.6256	3.58415	3.6038	3.6248	3.57755	3.57705	3.6256	3.6248
		3	3.6145	3.6250	3.58440	3.6066	3.6250	3.57950	3.57950	3.6250	3.6250
			3.6139	3.6256	3.58415	3.6060	3.6256	3.57975	3.57925	3.6256	3.6256
3¾-4	NC	1	3.7155	3.7436	3.58120	3.6690	3.7436	3.56080	3.56080	3.7436	3.7436
			3.7146	3.7445	3.58095	3.6681	3.7445	3.56105	3.56055	3.7445	3.7445
		2	3.7219	3.7500	3.58760	3.6819	3.7500	3.57360	3.57360	3.7500	3.7500
			3.7210	3.7509	3.58735	3.6810	3.7509	3.57385	3.57335	3.7509	3.7509
		3	3.7219	3.7500	3.58760	3.6862	3.7500	3.57790	3.57790	3.7500	3.7500
			3.7210	3.7509	3.58735	3.6853	3.7509	3.57815	3.57765	3.7509	3.7509
		4	3.7232	3.7513	3.58890	3.6924	3.7513	3.58410	3.58410	3.7500	3.7500
			3.7223	3.7522	3.58865	3.6915	3.7522	3.58435	3.58385	3.7509	3.7509
3¾-8	N	2	3.7329	3.7500	3.66880	3.7095	3.7492	3.65540	3.65540	3.7500	3.7492
			3.7322	3.7507	3.66855	3.7088	3.7499	3.65565	3.65515	3.7507	3.7499
		3	3.7329	3.7500	3.66880	3.7135	3.7500	3.65940	3.65940	3.7500	3.7500
			3.7322	3.7507	3.66855	3.7128	3.7507	3.65965	3.65915	3.7507	3.7507
3¾-12	N	2	3.7371	3.7500	3.69590	3.7242	3.7500	3.68810	3.68810	3.7500	3.7500
			3.7365	3.7506	3.69565	3.7236	3.7506	3.68835	3.68785	3.7506	3.7506
		3	3.7371	3.7500	3.69590	3.7266	3.7500	3.69050	3.69050	3.7500	3.7500
			3.7365	3.7506	3.69565	3.7260	3.7506	3.69075	3.69025	3.7506	3.7506
3¾-16	N	2	3.7395	3.7500	3.70940	3.7294	3.7492	3.70230	3.70230	3.7500	3.7492
			3.7389	3.7506	3.70915	3.7288	3.7498	3.70255	3.70205	3.7506	3.7498
		3	3.7395	3.7500	3.70940	3.7315	3.7500	3.70440	3.70440	3.7500	3.7500
			3.7389	3.7506	3.70915	3.7309	3.7506	3.70465	3.70415	3.7506	3.7506
3⅞-12	N	2	3.8621	3.8750	3.82090	3.8492	3.8750	3.81310	3.81310	3.8750	3.8750
			3.8615	3.8756	3.82065	3.8486	3.8756	3.81335	3.81285	3.8756	3.8756
		3	3.8621	3.8750	3.82090	3.8515	3.8750	3.81540	3.81540	3.8750	3.8750
			3.8615	3.8756	3.82065	3.8509	3.8756	3.81565	3.81515	3.8756	3.8756
3⅞-16	N	2	3.8645	3.8750	3.83440	3.8543	3.8741	3.82720	3.82720	3.8750	3.8741
			3.8639	3.8756	3.83415	3.8537	3.8747	3.82745	3.82695	3.8756	3.8747
		3	3.8645	3.8750	3.83440	3.8565	3.8750	3.82940	3.82940	3.8750	3.8750
			3.8639	3.8756	3.83415	3.8559	3.8756	3.82965	3.82915	3.8756	3.8756
4-4	NC	1	3.9655	3.9936	3.83120	3.9190	3.9936	3.81080	3.81080	3.9936	3.9936
			3.9646	3.9945	3.83095	3.9181	3.9945	3.81105	3.81055	3.9945	3.9945
		2	3.9719	4.0000	3.83760	3.9319	4.0000	3.82360	3.82360	4.0000	4.0000
			3.9710	4.0009	3.83735	3.9310	4.0009	3.82385	3.82335	4.0009	4.0009
		3	3.9719	4.0000	3.83760	3.9362	4.0000	3.82790	3.82790	4.0000	4.0000
			3.9710	4.0009	3.83735	3.9353	4.0009	3.82815	3.82765	4.0009	4.0009
		4	3.9732	4.0013	3.83890	3.9424	4.0013	3.83410	3.83410	4.0000	4.0000
			3.9723	4.0022	3.83865	3.9415	4.0022	3.83435	3.83385	4.0009	4.0009

See footnotes at end of table.

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TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go[1]	Not go[2]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
4-8	N	2	3.9829	4.0000	3.91880	3.9594	3.9990	3.90530	3.90530	4.0000	3.9990
			3.9822	4.0007	3.91855	3.9587	3.9997	3.90555	3.90505	4.0007	3.9997
		3	3.9829	4.0000	3.91880	3.9634	4.0000	3.90930	3.90930	4.0000	4.0000
			3.9822	4.0007	3.91855	3.9627	4.0007	3.90955	3.90905	4.0007	4.0007
4-12	N	2	3.9871	4.0000	3.94590	3.9741	4.0000	3.93800	3.93800	4.0000	4.0000
			3.9865	4.0006	3.94565	3.9735	4.0006	3.93825	3.93775	4.0006	4.0006
		3	3.9871	4.0000	3.94590	3.9765	4.0000	3.94040	3.94040	4.0000	4.0000
			3.9865	4.0006	3.94565	3.9759	4.0006	3.94065	3.94015	4.0006	4.0006
4-16	N	2	3.9895	4.0000	3.95940	3.9793	3.9991	3.95220	3.95220	4.0000	3.9991
			3.9889	4.0006	3.95915	3.9787	3.9997	3.95245	3.95195	4.0006	3.9997
		3	3.9895	4.0000	3.95940	3.9814	4.0000	3.95430	3.95430	4.0000	4.0000
			3.9889	4.0006	3.95915	3.9808	4.0006	3.95455	3.95405	4.0006	4.0006
4¼-8	N	2	4.2329	4.2500	4.1688	4.2092	4.2488	4.1551	4.1551	4.2500	4.2488
			4.2318	4.2511	4.1685	4.2081	4.2499	4.1554	4.1548	4.2511	4.2499
		3	4.2329	4.2500	4.1688	4.2133	4.2500	4.1592	4.1592	4.2500	4.2500
			4.2318	4.2511	4.1685	4.2122	4.2511	4.1595	4.1589	4.2511	4.2511
4¼-12	N	2	4.2371	4.2500	4.1959	4.2240	4.2500	4.1879	4.1879	4.2500	4.2500
			4.2362	4.2509	4.1956	4.2231	4.2509	4.1882	4.1876	4.2509	4.2509
		3	4.2371	4.2500	4.1959	4.2264	4.2500	4.1903	4.1903	4.2500	4.2500
			4.2362	4.2509	4.1956	4.2255	4.2509	4.1906	4.1900	4.2509	4.2509
4¼-16	N	2	4.2395	4.2500	4.2094	4.2291	4.2489	4.2020	4.2020	4.2500	4.2489
			4.2386	4.2509	4.2091	4.2282	4.2498	4.2023	4.2017	4.2509	4.2498
		3	4.2395	4.2500	4.2094	4.2313	4.2500	4.2042	4.2042	4.2500	4.2500
			4.2386	4.2509	4.2091	4.2304	4.2509	4.2045	4.2039	4.2509	4.2509
4½-8	N	2	4.4829	4.5000	4.4188	4.4591	4.4988	4.4050	4.4050	4.5000	4.4988
			4.4818	4.5011	4.4185	4.4580	4.4999	4.4053	4.4047	4.5011	4.4999
		3	4.4829	4.5000	4.4188	4.4632	4.5000	4.4091	4.4091	4.5000	4.5000
			4.4818	4.5011	4.4185	4.4621	4.5011	4.4094	4.4088	4.5011	4.5011
4½-12	N	2	4.4871	4.5000	4.4459	4.4739	4.5000	4.4378	4.4378	4.5000	4.5000
			4.4862	4.5009	4.4456	4.4730	4.5009	4.4381	4.4375	4.5009	4.5009
		3	4.4871	4.5000	4.4459	4.4763	4.5000	4.4402	4.4402	4.5000	4.5000
			4.4862	4.5009	4.4456	4.4754	4.5009	4.4405	4.4399	4.5009	4.5009
4½-16	N	2	4.4895	4.5000	4.4594	4.4790	4.4988	4.4519	4.4519	4.5000	4.4988
			4.4886	4.5009	4.4591	4.4781	4.4997	4.4522	4.4516	4.5009	4.4997
		3	4.4895	4.5000	4.4594	4.4812	4.5000	4.4541	4.4541	4.5000	4.5000
			4.4886	4.5009	4.4591	4.4803	4.5009	4.4544	4.4538	4.5009	4.5009
4¾-8	N	2	4.7329	4.7500	4.6688	4.7090	4.7486	4.6549	4.6549	4.7500	4.7486
			4.7318	4.7511	4.6685	4.7079	4.7497	4.6552	4.6546	4.7511	4.7497
		3	4.7329	4.7500	4.6688	4.7131	4.7500	4.6590	4.6590	4.7500	4.7500
			4.7318	4.7511	4.6685	4.7120	4.7511	4.6593	4.6587	4.7511	4.7511
4¾-12	N	2	4.7371	4.7500	4.6959	4.7237	4.7500	4.6876	4.6876	4.7500	4.7500
			4.7362	4.7509	4.6956	4.7228	4.7509	4.6879	4.6873	4.7509	4.7509
		3	4.7371	4.7500	4.6959	4.7262	4.7500	4.6901	4.6901	4.7500	4.7500
			4.7362	4.7509	4.6956	4.7253	4.7509	4.6904	4.6898	4.7509	4.7509
4¾-16	N	2	4.7395	4.7500	4.7094	4.7289	4.7487	4.7018	4.7018	4.7500	4.7487
			4.7386	4.7509	4.7091	4.7280	4.7496	4.7021	4.7015	4.7509	4.7496
		3	4.7395	4.7500	4.7094	4.7312	4.7500	4.7041	4.7041	4.7500	4.7500
			4.7386	4.7509	4.7091	4.7303	4.7509	4.7044	4.7038	4.7509	4.7509
5-8	N	2	4.9829	5.0000	4.9188	4.9589	4.9986	4.9048	4.9048	5.0000	4.9986
			4.9818	5.0011	4.9185	4.9578	4.9997	4.9051	4.9045	5.0011	4.9997
		3	4.9829	5.0000	4.9188	4.9630	5.0000	4.9089	4.9089	5.0000	5.0000
			4.9818	5.0011	4.9185	4.9619	5.0011	4.9092	4.9086	5.0011	5.0011
5-12	N	2	4.9871	5.0000	4.9459	4.9736	5.0000	4.9375	4.9375	5.0000	5.0000
			4.9862	5.0009	4.9456	4.9727	5.0009	4.9378	4.9372	5.0009	5.0009
		3	4.9871	5.0000	4.9459	4.9761	5.0000	4.9400	4.9400	5.0000	5.0000
			4.9862	5.0009	4.9456	4.9752	5.0009	4.9403	4.9397	5.0009	5.0009
5-16	N	2	4.9895	5.0000	4.9594	4.9788	4.9986	4.9517	4.9517	5.0000	4.9986
			4.9886	5.0009	4.9591	4.9779	4.9995	4.9520	4.9514	5.0009	4.9995
		3	4.9895	5.0000	4.9594	4.9811	5.0000	4.9540	4.9540	5.0000	5.0000
			4.9886	5.0009	4.9591	4.9802	5.0009	4.9543	4.9537	5.0009	5.0009
5¼-8	N	2	5.2329	5.2500	5.1688	5.2088	5.2484	5.1547	5.1547	5.2500	5.2484
			5.2318	5.2511	5.1685	5.2077	5.2495	5.1550	5.1544	5.2511	5.2495
		3	5.2329	5.2500	5.1688	5.2130	5.2500	5.1589	5.1589	5.2500	5.2500
			5.2318	5.2511	5.1685	5.2119	5.2511	5.1592	5.1586	5.2511	5.2511

See footnotes at end of table.

TABLE 1.17.—*Setting plug gages, American National screw threads*—Continued

Nominal size and threads per inch	Series designation	Class	W truncated setting plugs							Basic-crest setting plugs	
			Plug for "Go"			Plug for "Not go"				Major diameter	
			Major diameter		Pitch diameter	Major diameter		Pitch diameter		Go [1]	Not go [2]
			Truncated	Full		Truncated	Full	Plus tol. gage	Minus tol. gage	W and X tolerances	W and X tolerances
1	2	3	4	5	6	7	8	9	10	11	12
			in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
5¼-12	N	2	5.2371	5.2500	5.1959	5.2235	5.2499	5.1874	5.1874	5.2500	5.2499
			5.2362	5.2509	5.1956	5.2226	5.2508	5.1877	5.1871	5.2509	5.2508
		3	5.2371	5.2500	5.1959	5.2261	5.2500	5.1900	5.1900	5.2500	5.2500
			5.2362	5.2509	5.1956	5.2252	5.2509	5.1903	5.1897	5.2509	5.2509
5¼-16	N	2	5.2395	5.2500	5.2094	5.2287	5.2485	5.2016	5.2016	5.2500	5.2485
			5.2384	5.2509	5.2091	5.2278	5.2494	5.2019	5.2013	5.2509	5.2494
		3	5.2395	5.2500	5.2094	5.2310	5.2500	5.2039	5.2039	5.2500	5.2500
			5.2384	5.2509	5.2091	5.2301	5.2509	5.2042	5.2036	5.2509	5.2509
5½-8	N	2	5.4829	5.5000	5.4188	5.4587	5.4984	5.4016	5.4016	5.5000	5.4984
			5.4818	5.5011	5.4185	5.4576	5.4995	5.4019	5.4013	5.5011	5.4995
		3	5.4829	5.5000	5.4188	5.4629	5.5000	5.4088	5.4088	5.5000	5.5000
			5.4818	5.5011	5.4185	5.4618	5.5011	5.4091	5.4085	5.5011	5.5011
5½-12	N	2	5.4871	5.5000	5.4459	5.4734	5.4998	5.4373	5.4373	5.5000	5.4998
			5.4862	5.5009	5.4456	5.4725	5.5007	5.4376	5.4370	5.5009	5.5007
		3	5.4871	5.5000	5.4459	5.4760	5.5000	5.4399	5.4399	5.5000	5.5000
			5.4862	5.5009	5.4456	5.4751	5.5009	5.4402	5.4396	5.5009	5.5009
5½-16	N	2	5.4895	5.5000	5.4594	5.4786	5.4984	5.4515	5.4515	5.5000	5.4984
			5.4886	5.5009	5.4591	5.4777	5.4993	5.4518	5.4512	5.5009	5.4993
		3	5.4895	5.5000	5.4594	5.4809	5.5000	5.4538	5.4538	5.5000	5.5000
			5.4886	5.5009	5.4591	5.4800	5.5009	5.4541	5.4535	5.5009	5.5009
5¾-8	N	2	5.7329	5.7500	5.6688	5.7086	5.7482	5.6515	5.6515	5.7500	5.7482
			5.7318	5.7511	5.6685	5.7075	5.7493	5.6518	5.6512	5.7511	5.7493
		3	5.7329	5.7500	5.6688	5.7128	5.7500	5.6587	5.6587	5.7500	5.7500
			5.7318	5.7511	5.6685	5.7117	5.7511	5.6590	5.6584	5.7511	5.7511
5¾-12	N	2	5.7371	5.7500	5.6959	5.7233	5.7497	5.6872	5.6872	5.7500	5.7497
			5.7362	5.7509	5.6956	5.7224	5.7506	5.6875	5.6869	5.7509	5.7506
		3	5.7371	5.7500	5.6959	5.7259	5.7500	5.6898	5.6898	5.7500	5.7500
			5.7362	5.7509	5.6956	5.7250	5.7509	5.6901	5.6895	5.7509	5.7509
5¾-16	N	2	5.7395	5.7500	5.7094	5.7285	5.7483	5.7014	5.7014	5.7500	5.7483
			5.7386	5.7509	5.7091	5.7276	5.7492	5.7017	5.7011	5.7509	5.7492
		3	5.7395	5.7500	5.7094	5.7309	5.7500	5.7038	5.7038	5.7500	5.7500
			5.7386	5.7509	5.7091	5.7300	5.7509	5.7041	5.7035	5.7509	5.7509
6-8	N	2	5.9829	6.0000	5.9188	5.9585	5.9982	5.9014	5.9014	6.0000	5.9982
			5.9818	6.0011	5.9185	5.9574	5.9993	5.9017	5.9011	6.0011	5.9993
		3	5.9829	6.0000	5.9188	5.9627	6.0000	5.9086	5.9086	6.0000	6.0000
			5.9818	6.0011	5.9185	5.9616	6.0011	5.9089	5.9083	6.0011	6.0011
6-12	N	2	5.9871	6.0000	5.9459	5.9732	5.9996	5.9371	5.9371	6.0000	5.9996
			5.9862	6.0009	5.9456	5.9723	6.0005	5.9374	5.9368	6.0009	6.0005
		3	5.9871	6.0000	5.9459	5.9758	6.0000	5.9397	5.9397	6.0000	6.0000
			5.9862	6.0009	5.9456	5.9749	6.0009	5.9400	5.9394	6.0009	6.0009
6-16	N	2	5.9895	6.0000	5.9594	5.9784	5.9982	5.9513	5.9513	6.0000	5.9982
			5.9886	6.0009	5.9591	5.9775	5.9991	5.9516	5.9510	6.0009	5.9991
		3	5.9895	6.0000	5.9594	5.9808	6.0000	5.9537	5.9537	6.0000	6.0000
			5.9886	6.0009	5.9591	5.9799	6.0009	5.9540	5.9534	6.0009	6.0009

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[1] Pitch diameter limits of W basic-crest setting plug gages are given in column 6 of this table. Pitch diameter limits of *X* basic-crest setting plug gages are given in column 4 of table 1.16.

[2] Pitch diameter limits of W basic-crest setting plug gages are given in columns 9 and 10 of this table. Pitch diameter limits of *X* basic-crest setting plug gages are given in columns 6 and 7 of table 1.16.

APPENDIX 2. AMERICAN NATIONAL SCREW THREADS OF SPECIAL DIAMETERS, PITCHES, AND LENGTHS OF ENGAGEMENT

The American National standards for screw threads of special diameters, pitches, and lengths of engagement are republished here as useful information. They are largely superseded by the Unified and American standards which are specified in section IV. If American National threads are specified, they shall conform to the requirements herein.

The tolerances specified in appendix 1 of this handbook apply in general to bolts, nuts, and tapped holes of standard pitches and diameters. They are based on the pitch of the thread and a length of engagement equal to the basic major diameter, but are used for lengths of engagement up to 1½ diameters.

In addition to the foregoing threaded components, there are large quantities of threaded parts produced, such as hub and radiator caps in the automotive industry, threaded collars on machine tools, etc., where the diameters are larger, the pitches finer, and the lengths of engagement shorter than for bolt and nut practice. The following specifications have been adopted for such threaded parts, and the tolerances are based on the diameter, pitch, and length of engagement of the components.

1. FORM OF THREAD

The American National form of thread profile as specified in appendix 1 shall be used.

2. STANDARD PITCHES

In appendix 1 there are given the limits of size for standard thread series. The use of these series, wherever possible, is recommended for all applications.

Whenever sizes and pitches in the American National coarse, fine, or extra-fine, or the 8-, 12-, or 16-thread series are not suitable, it is recommended that one of the following pitches be selected: 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 28, 32, 36, 40, 48, 56, or 64 threads per inch.

Basic thread data for these pitches are given in table 2.1, and also in table 1.1.

3. CLASSIFICATION AND TOLERANCES

There are established herein for general use four classes of screw-thread tolerances and allowances, which are named and numbered to correspond to the regular classification given in appendix 1. These four classes, together with the accompanying specifications, are intended to assure a uniform practice for screw threads not included in the American National coarse, fine, or extra-fine thread series, nor in the 8-, 12-, or 16-thread series.

It is not the intention of the Committee arbitrarily to place a general class or grade of work in a specific class of thread. Each manufacturer and user of screw threads is free to select the class best adapted to his particular needs.

(a) GENERAL SPECIFICATIONS

The following general specifications apply to all classes of thread specified for screw threads of special diameters, pitches, and lengths of engagement.

1. Uniform Minimum Internal Thread.—The pitch diameter of the minimum internal thread corresponds to the basic size.[21]

2. Tolerances.—(*a*) The tolerances specified represent the extreme variations allowed on the product.

(*b*) The tolerance on the internal thread is plus and is applied from the basic size to above basic size.

(*c*) The tolerance on the external thread is minus and is applied from the maximum size to below the maximum size.

(*d*) The pitch diameter tolerances for an external and an internal thread of a given class are the same.

(*e*) The pitch diameter tolerances are obtained by adding three values, or increments; one dependent upon the basic major diameter, another upon the length of engagement, and the third upon the pitch of the thread. These increments are based on formulas given in table 2.2. However, where tolerance values so obtained exceed those given in appendix 1 for corresponding pitches of the American National coarse or fine thread series, and for any diameters equal to or less than these standard sizes and lengths of engagement equal to or less than one diameter, the tolerances given in appendix 1 are used. (See rules for using tolerance tables on p. 180.)

(*f*) Pitch diameter limits of size are interpreted in accordance with appendix 1, par. 5 (*c*), p. 128.

(*g*) The tolerances on the major diameters of the external threads and minor diameters of the internal threads are based on the pitch of the thread, as these control the depth of engagement; they are, therefore, based on the pitch alone.

(*h*) The minimum minor diameter of an external thread of a given pitch is such as to result in a basic flat ($\frac{1}{8} \times p$) at the root when the pitch diameter of the external thread is at its minimum value. When the maximum external thread is basic, the minimum minor diameter of the external thread will be below the basic minor diameter by the amount of the specified pitch diameter tolerance.

(*i*) The maximum minor diameter of an external thread of a given pitch may be such as results from the use of a worn or rounded threading tool, when the pitch diameter is at its maximum value. In no case, however, should the form of the external thread, as results from tool wear, be such as to cause the external thread to be rejected on the maximum minor diameter by a "go" thread ring gage, the minor diameter of which is equal to the minimum minor diameter of the internal thread.

(*j*) The maximum major diameter of the internal thread of a given pitch is such as to result in a flat equal to one-third of the basic flat ($\frac{1}{24} \times p$) when the pitch diameter of the internal thread is at its maximum value. When the minimum internal thread is basic, its maximum major diameter will be above the basic major diameter by the amount of the specified pitch diameter tolerance plus two-ninths of the basic thread depth.

(*k*) The nominal minimum major diameter of an internal thread is the basic major diameter. In no case, however, should the minimum major diameter of the internal thread, as results from a worn tap or cutting tool, be such as to cause the internal thread to be rejected on the minimum major diameter by a "go" plug gage made to the maximum major diameter of the external thread.

(*l*) The tolerance on the minor diameter of an internal thread of a given pitch is one-sixth of the basic thread height regardless of the class of thread.[22]

(b) CLASSIFICATION OF THREADS

1. Class 1.—This class is intended to cover the manufacture of threaded parts where quick and easy assembly is necessary and where an allowance is required.

This class is made with an allowance on the external thread, so as to permit ready assembly, even when the threads are slightly bruised or dirty, in conformity with the practice in appendix 1.[23]

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[21] Special cases will arise, however, when a class 1 thread is required on finished drawn tubing with thin walls, and in such cases, the allowance should be made in the internal thread.

[22] Special threads having a length of engagement considerably less than one diameter will not develop the full strength of the external thread. The minimum minor diameter of the internal thread of the American National form of thread is such as to provide a minimum clearance on diameter at the minor diameter equal to two-ninths of the basic thread depth. If this clearance is reduced by providing a greater percentage of thread depth in the internal thread, the strength of such a fastening is increased. In such cases when the external thread is subject to considerable tension, it is permissible to make the minor diameter of the internal thread less than the minimum specified in order to give the necessary depth of engagement.

On the other hand, when the length of engagement is exceptionally long the minor diameter of the internal thread may be greater than the maximum specified without impairing the strength of the fastening.

[23] See footnote 21.

Tables 2.3 and 2.4 give the limits of size and tolerances for major, pitch, and minor diameters of threads of special diameters, pitches, and lengths of engagement.

2. Class 2.—This class is intended to apply to the major portion of threaded work in interchangeable manufacture, where no allowance is required. It is the same in every particular as class 1 except that it has no allowance and the tolerances are smaller.

Tables 2.3 and 2.5 give the limits of size and tolerances for major, pitch, and minor diameters of threads of special diameters, pitches, and lengths of engagement.

3. Class 3.—This class is intended to apply to the higher grade of interchangeable screw thread work. It is the same as class 2 in every particular except that the tolerances are smaller.

Tables 2.3 and 2.6 give the limits of size and tolerances for major, pitch, and minor diameters of threads of special diameters, pitches, and lengths of engagement.

4. Class 4.—This class is intended for threaded work requiring a fine, snug fit, and where a screwdriver or wrench may be necessary for assembly.

In the manufacture of screw-thread products belonging to this class it may be necessary to use precision tools, gages made to special tolerances for this class (see table VI.6, p. 117), and other refinements. This quality of work should, therefore, be used only in cases where requirements of the mechanism being produced are exacting. In order to secure the fit desired, it may be necessary in some cases to select the parts when the product is being assembled.

The maximum pitch diameters of the external threads are slightly larger than the minimum pitch diameters of the internal threads determined from table 2.3.

Tables 2.3 and 2.7 give the limits of size and tolerances for major, pitch, and minor diameters of threads of special diameters, pitches, and lengths of engagement.

4. TABLES OF DIMENSIONS

In order to simplify the specification of dimensions of special fastening screw threads, tables 2.3, 2.4, 2.5, 2.6, and 2.7 are arranged herein, and are intended to cover all practical combinations of diameter, pitch, length of engagement, and class of thread. The use of these tables instead of the application of formulas to determine limits of size of a special thread facilitates placing dimensions on drawings. Also, in cases of special threads of the same diameter, pitch, and class of thread, but slightly different lengths of engagement, the threads may be gaged by a single set of gages, as identical pitch diameter tolerances will be applied.

1. Arrangement of Tables.—The arrangement of dimensions and tolerances given in these tables has the following features:

All thread dimensions of threads of special diameters, pitches, and lengths of engagement, except pitch diameter tolerances are derived from table 2.3.

Pitch diameter tolerances are taken from tables 2.4, 2.5, 2.6, or 2.7, depending upon the class required. These pitch diamter tolerances were obtained by adding increments, in accordance with table 2.2, corresponding to the major diameters at the top, the threads per inch at the side of the table, and mean lengths of engagement of ¼, 1, and 2¼ inches for pitches from 64 to 12 threads per inch, inclusive, and ½, 2, and 4½ inches for pitches from 10 to 4 threads per inch, inclusive. Thus, the increments of the pitch diameter tolerances based on length of engagement and on diameter vary by definite steps instead of continuously. However, in order that the tolerances given in these tables might be wholly consistent with those given in appendix 1, certain values as listed are greater or less than those yielded by the above method. This modification was made by inserting in the tables, in the positions corresponding to standard sizes, pitches, and lengths of engagement of the American National coarse- and fine-thread series, the pitch diameter tolerances listed in appendix 1. Then, wherever necessary, all values above and to the left of these inserted values were reduced so that none of them should exceed these standard values, and those below and to the right were increased so that none should be less than the standard values. This has the important advantage that in a series of sizes, frequently occurring in practice, consisting partly of standard sizes and partly of special sizes, there will be no undue irregularity in the progression of the pitch diameter tolerance, with consequent difficulties in securing gages, etc.

The maximum pitch diameter tolerances listed are equal to the tolerances on the major diameter of the external threads of the same pitch, as given in table 2.3.

2. Rules for Use of Tables.—For consistent application of the pitch diameter tolerance tables to all cases, adherence to the following rules relative to the use of the tables is necessary:

1. Tolerances on pitch diameter corresponding to major diameters between those for which values are given in the tables shall be those of the next larger diameter.

2. Tolerances on pitch diameter for pitches between those for which values are given in the tables shall be those of the next coarser pitch, except that for screws having 80, 72, 44, 13, 11, 9, 7, 5, or 4½ threads per inch, lengths of engagement of one and one-half diameters or less, and diameters less than the standard diameters for the respective pitches as given in appendix 1, the tolerances given in appendix 1 shall be used.

3. Tolerances on pitch diameter for pitches coarser than 4 threads per inch shall be the same as those for 4 threads per inch.

4. Tolerances on pitch diameter when the length of engagement is exactly ½ or 1½ in. for 12 threads per inch and finer, or 1 or 3 in. for pitches coarser than 12 threads per inch, shall correspond to the interval of which these are the upper limits.

5. Tolerances on pitch diameter for lengths of engagement greater than those for which values are given shall be the maximum values listed for the pitch concerned.

Table 2.1.—*Thread data for recommended pitches for threads of special diameters, pitches, and lengths of engagement*

Threads per inch, n	Pitch, p	Depth of thread, h	Basic width of flat, $p/8$	Minimum width of flat at major diameter of nut, $p/24$
1	2	3	4	5
	in.	*in.*	*in.*	*in.*
64	0.01562	0.01015	0.00195	0.00065
56	.01786	.01160	.00223	.00074
48	.02083	.01353	.00260	.00087
40	.02500	.01624	.00312	.00104
36	.02778	.01804	.00347	.00116
32	.03125	.02030	.00391	.00130
28	.03571	.02320	.00446	.00149
24	.04167	.02706	.00521	.00174
20	.05000	.03248	.00625	.00208
18	.05556	.03608	.00694	.00231
16	.06250	.04059	.00781	.00260
14	.07143	.04639	.00893	.00298
12	.08333	.05413	.01042	.00347
10	.10000	.06495	.01250	.00417
8	.12500	.08119	.01562	.00521
6	.16667	.10825	.02083	.00694
4	.25000	.16238	.03125	.01042

Table 2.2.—*Schedule of tolerance increments for threads of special diameters, pitches, and lengths of engagement*

Class of thread	Diameter increment	Length of engagement increment	Pitch increment
1	2	3	4
Class 1	$0.002\sqrt{D}$	$0.002Q$	$0.020\sqrt{p}$
Class 2	$.002\sqrt{D}$	$.002Q$	$.010\sqrt{p}$
Class 3	$.002\sqrt{D}$	$.002Q$	$.005\sqrt{p}$
Class 4	$.001\sqrt{D}$	$.001Q$	$.0025\sqrt{p}$

6. For pitches finer than 64 threads per inch, apply the formulas in table 2.2. If the resulting tolerance is greater than that for 64 threads per inch as given in tables 2.4 to 2.7, for the same diameter and class, apply the tolerance for 64 threads.

3. EXAMPLES.—The following examples illustrate the use of these tables:

Example: 3¼-in., 16-thread, class 1, with allowance on external threads, ½ in. length of engagement:

From table 2.4:
Pitch diameter tolerance................ =0.0095
Also from table 2.3, for the external thread:
Maximum major diameter=3.2500−0.0018=3.2482
Minimum major diameter=3.2482− .0126=3.2356
Maximum minor diameter=3.2500− .0785=3.1715
Maximum pitch diameter=3.2500− .0424=3.2076
Minimum pitch diameter=3.2076− .0095=3.1981
And for the internal thread:
Minimum major diameter............. =3.2500
Minimum minor diameter=3.2500−0.0677=3.1823
Maximum minor diameter=3.1823+ .0068=3.1891
Minimum pitch diameter=3.2500− .0406=3.2094
Maximum pitch diameter=3.2094+ .0095=3.2189

Example: 3-in., 24-thread, class 2, ⅝ in. length of engagement:

From table 2.5:
Pitch diameter tolerance................ =0.0066

In this instance the pitch diameter tolerance is printed in italics. In accordance with the footnote under table 2.5 it is desirable to avoid the use of tolerances set in italics as the combination of class of thread, length of engagement, pitch, and diameter is disproportionate. If it is decided to use a closer class, class 3 or class 4 may be chosen. Assuming the choice of class 3, the following dimensions are obtained:

From table 2.6:
Pitch diameter tolerance................ =0.0065
From table 2.3 for the external thread:
Maximum major diameter.............. =3.0000
Minimum major diameter=3.0000−0.0066=2.9934
Maximum minor diameter=3.0000− .0511=2.9489
Maximum pitch diameter=3.0000− .0271=2.9729
Minimum pitch diameter=2.9729− .0065=2.9664
And for the internal thread:
Minimum major diameter............... =3.0000
Minimum minor diameter=3.0000−0.0451=2.9549
Maximum minor diameter=2.9549+ .0045=2.9594
Minimum pitch diameter=3.0000− .0271=2.9729
Maximum pitch diameter=2.9729+ .0065=2.9794

If, instead, it is decided to reduce the length of engagement to ½ in., the following dimensions are obtained:

From table 2.5:
Pitch diameter tolerance................ =0.0060
From table 2.3 for the external thread:
Maximum major diameter.............. =3.0000
Minimum major diameter=3.0000−0.0066=2.9934
Maximum minor diameter=3.0000− .0511=2.9489
Maximum pitch diameter=3.0000− .0271=2.9729
Minimum pitch diameter=2.9729− .0060=2.9669
And for the internal thread:
Minimum major diameter.............. =3.0000
Minimum minor diameter=3.0000−0.0451=2.9549
Maximum minor diameter=2.9549+ .0045=2.9594
Minimum pitch diameter=3.0000− .0271=2.9729
Maximum pitch diameter=2.9729+ .0060=2.9789

TABLE 2.3.—*Values for obtaining thread dimensions of screw threads of special diameters, pitches, and lengths of engagement, classes 1, 2, 3, and 4*

Threads per inch	EXTERNAL THREAD SIZES To obtain maximum dimensions for major, pitch, and minor diameters, subtract the values in the "maximum" columns from the basic major diameter. Apply tolerances minus. See tables 2.4, 2.5, 2.6, and 2.7 for pitch diameter tolerances.									INTERNAL THREAD SIZES To obtain minimum dimensions for minor, pitch, and major diameters, subtract the values in the "minimum" columns from the basic major diameter. Apply tolerances plus. See tables 2.4, 2.5, 2.6, and 2.7 for pitch diameter tolerances.			
	Major diameter				Pitch diameter, maximum			Minor diameter,[1] maximum		Minor diameter		Pitch diameter, minimum	Major diameter,[2] minimum
	Maximum		Tolerance							Minimum	Tolerance		
	Class 1	Classes 2, 3, 4	Class 1	Classes 2, 3, 4	Class 1	Classes 2, 3	Class 4	Class 1	Classes 2, 3, 4	Classes 1, 2, 3, and 4			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
64	0.0007	0.0000	0.0052	0.0038	0.0108	0.0101	0.0100	0.0199	0.0192	0.0169	0.0017	0.0101	0.0000
56	.0008	.0000	.0056	.0040	.0124	.0116	.0114	.0227	.0219	.0193	.0019	.0116	.0000
48	.0009	.0000	.0062	.0044	.0144	.0135	.0133	.0265	.0256	.0226	.0023	.0135	.0000
40	.0010	.0000	.0068	.0048	.0172	.0162	.0160	.0317	.0307	.0271	.0027	.0162	.0000
36	.0011	.0000	.0072	.0050	.0191	.0180	.0178	.0352	.0341	.0301	.0030	.0180	.0000
32	.0011	.0000	.0076	.0054	.0214	.0203	.0201	.0394	.0383	.0338	.0034	.0203	.0000
28	.0012	.0000	.0086	.0062	.0244	.0232	.0230	.0450	.0438	.0387	.0039	.0232	.0000
24	.0013	.0000	.0092	.0066	.0284	.0271	.0268	.0524	.0511	.0451	.0045	.0271	.0000
20	.0015	.0000	.0102	.0072	.0340	.0325	.0322	.0628	.0613	.0541	.0054	.0325	.0000
18	.0016	.0000	.0114	.0082	.0377	.0361	.0358	.0698	.0682	.0601	.0060	.0361	.0000
16	.0018	.0000	.0126	.0090	.0424	.0406	.0402	.0785	.0767	.0677	.0068	.0406	.0000
14	.0021	.0000	.0140	.0098	.0485	.0464	.0460	.0897	.0876	.0773	.0077	.0464	.0000
12	.0024	.0000	.0158	.0112	.0565	.0541	.0536	.1046	.1022	.0902	.0090	.0541	.0000
10	.0028	.0000	.0184	.0128	.0678	.0650	.0644	.1255	.1227	.1083	.0109	.0650	.0000
8	.0034	.0000	.0222	.0152	.0846	.0812	.0805	.1568	.1534	[illegible]	.0135	.0812	.0000
6	.0014	.0000	.0290	.0202	.1127	.1083	.1074	.2089	.2045	[illegible]	.0180	.1083	.0000
4	.0064	.0000	.0408	.0280	.1688	.1624	.1611	.3131	.3067	.2706	.0270	.1624	.0000

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[1] Dimensions given for the maximum minor diameter of the external thread are figured to the intersection of the worn tool arc with a center line through crest and root. The minimum minor diameter of the external thread shall be that corresponding to a flat at the minor diameter of the minimum external thread equal to ⅛ × p, and may be determined by subtracting the basic thread depth, h (or 0.6495p) from the minimum pitch diameter of the external thread.

[2] Dimensions for the minimum major diameter of the internal thread correspond to the basic flat (⅛ × p), and the profile at the major diameter produced by a worn tool must not fall below the basic outline. The maximum major diameter of the internal thread shall be that corresponding to a flat at the major diameter of the maximum internal thread equal to 1/24 × p, and may be determined by adding 1 2/9 × h (or 0.7939p) to the maximum pitch diameter of the internal thread.

TABLE 2.4.—*Pitch diameter tolerances for screw threads of special diameters, pitches, and lengths of engagement, class 1*

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—																				
	From—	To and including—	1/16 inch	1/8 inch	3/16 inch	1/4 inch	3/8 inch	1/2 inch	3/4 inch	1 inch	1½ inches	2 inches	3 inches	4 inches	6 inches	8 inches	10 inches	12 inches	14 inches	16 inches	18 inches	20 inches	24 inches
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
64		½	0.0026	0.0026	0.0034	0.0038	0.0042	0.0044	0.0047	0.0050	0.0052												
56		½	.0028	.0028	.0034	.0038	.0044	.0046	.0049	.0052	.0056												
	½	1½	.0052	.0054	.0055	.0056	*.0056*	*.0056*	*.0056*	*.0056*	*.0056*												
48		½	.0031	.0031	.0034	.0038	.0046	.0048	.0051	.0054	.0058	0.0062											
	½	1½	.0054	.0056	.0057	.0057	.0057	.0057	.0057	.0062	*.0062*	*.0062*											
40		½	.0034	[1].0034	.0034	.0038	.0046	.0051	.0054	.0057	.0061	.0065											
	½	1½	.0057	.0057	.0057	.0057	.0057	.0057	.0057	.0068	*.0068*	*.0068*											
36		½		.0036	.0036	.0038	.0045	.0051	.0056	.0058	.0063	.0067	0.0072										
	½	1½		.0057	.0057	.0057	.0057	.0057	.0057	.0070	.0072	*.0072*	*.0072*										
32		½		.0038	.0038	.0038	.0046	.0051	.0057	.0060	.0065	.0069	.0075										
	½	1½		.0057	.0057	.0057	.0057	.0057	.0057	.0070	.0076	*.0076*	*.0076*										
28		½			.0043	[2].0043	.0046	.0051	.0057	.0063	.0067	.0071	.0077	0.0083									
	½	1½			.0057	.0057	.0057	.0057	.0057	.0070	.0079	.0086	*.0086*	*.0086*									
24		½			.0046	.0046	[2].0046	.0051	.0057	.0066	.0070	.0074	.0080	.0086									
	½	1½			.0057	.0057	.0057	.0057	.0057	.0070	.0079	.0089	.0092	*.0092*									
20		½			.0051	[1].0051	.0051	[2].0051	.0057	.0070	.0074	.0078	.0084	.0090	0.0099								
	½	1½			.0057	.0057	.0057	.0057	.0057	.0070	.0079	.0093	.0099	.0102	*.0102*								
	1½	3			.0098	.0100	.0102	*.0102*	*.0102*	*.0102*	*.0102*	*.0102*	*.0102*	*.0102*	*.0102*								
18		½				.0057	.0057	.0057	.0057	.0070	.0077	.0080	.0087	.0092	.0101	0.0109	0.0114						
	½	1½				.0057	.0057	.0057	.0057	.0070	.0079	.0095	.0102	.0107	.0114	*.0114*	*.0114*						
	1½	3				.0102	.0104	.0106	.0109	.0112	.0114	*.0114*	*.0114*	*.0114*	*.0114*	*.0114*	*.0114*						
16		½				.0063	[1].0063	.0063	.0063	.0070	.0079	.0083	.0090	.0095	.0104	.0112	.0118	0.0124					
	½	1½				.0063	.0063	.0063	[2].0063	.0070	.0079	.0098	.0105	.0110	.0119	.0126	*.0126*	*.0126*					
	1½	3				.0105	.0107	.0109	.0112	.0115	.0120	.0123	.0126	*.0126*	*.0126*	*.0126*	*.0126*	*.0126*					
14		½					.0070	.0070	.0070	.0070	.0079	.0087	.0093	.0099	.0108	.0115	.0122	.0128	0.0133	0.0138			
	½	1½					.0070	.0070	.0070	.0070	.0079	.0102	.0108	.0114	.0123	.0130	.0137	.0140	*.0140*	*.0140*			
	1½	3					.0111	.0113	.0116	.0119	.0123	.0127	.0133	.0139	.0140	*.0140*	*.0140*	*.0140*	*.0140*	*.0140*			
12		½					.0075	.0077	.0079	.0079	.0079	.0091	.0097	.0103	.0112	.0119	.0126	.0132	.0138	.0143	0.0148	0.0152	
	½	1½					.0079	.0079	.0079	[1,2].0079	[2].0079	.0106	.0112	.0118	.0127	.0134	.0141	.0147	.0153	.0158	*.0158*	*.0158*	
	1½	3					.0115	.0117	.0120	.0123	.0127	.0131	.0137	.0143	.0152	.0158	*.0158*	*.0158*	*.0158*	*.0158*	*.0158*	*.0158*	
10		1						.0087	[1].0092	.0098	.0102	.0106	.0112	.0118	.0127	.0134	.0141	.0147	.0153	.0158	.0158	.0163	0.0171
	1	3						.0117	.0120	.0123	.0128	.0132	.0138	.0143	.0152	.0160	.0166	.0172	.0178	.0183	*.0184*	*.0184*	*.0184*
	3	6						.0167	.0171	.0173	.0178	.0181	.0184	*.0184*	*.0184*	*.0184*	*.0184*	*.0184*	*.0184*	*.0184*	*.0184*	*.0184*	*.0184*
8		1						.0095	.0098	[1].0111	.0111	.0111	.0115	.0121	.0130	.0137	.0144	.0150	.0156	.0161	.0166	.0170	.0179
	1	3						.0125	.0128	.0131	.0135	.0139	.0145	.0151	.0160	.0167	.0174	.0180	.0186	.0191	.0196	.0200	.0209
	3	6						.0175	.0178	.0181	.0185	.0189	.0195	.0201	.0210	.0217	.0222	*.0222*	*.0222*	*.0222*	*.0222*	*.0222*	*.0222*
6		1							.0109	.0112	.0116	.0120	.0126	.0132	.0141	.0148	.0155	.0161	.0166	.0172	.0176	.0181	.0190
	1	3							.0139	.0142	[1].0145	.0150	.0156	.0162	.0171	.0178	.0185	.0191	.0196	.0202	.0206	.0211	.0220
	3	6							.0189	.0192	.0196	.0200	.0206	.0212	.0221	.0228	.0235	.0241	.0246	.0252	.0256	.0261	.0270
4		1								.0130	.0134	.0138	.0145	.0150	.0159	.0167	.0173	.0179	.0185	.0190	.0195	.0199	.0208
	1	3								.0160	.0164	.0168	[1].0204	.0204	.0204	.0204	.0204	.0209	.0215	.0220	.0225	.0229	.0238
	3	6								.0210	.0215	.0218	.0225	.0230	.0239	.0247	.0253	.0259	.0265	.0270	.0275	.0279	.0288

[1] Standard size of the American National coarse-thread series. [2] Standard size of the American National fine-thread series.

NOTE.—It is preferable to avoid the use of tolerances set in italics by choosing a closer class, shorter length of engagement, coarser pitch, or smaller diameter. When the length of engagement exceeds one diameter and the pitch diameter tolerance exceeds 90 percent of the major diameter tolerance, table 2.3 column 4, the major diameter tolerance shall be 110 percent of the pitch diameter tolerance.

TABLE 2.5.—*Pitch diameter tolerances for screw threads of special diameters, pitches, and lengths of engagement, class 2 (see note 2)*

Threads per inch	Lengths of engagement		Pitch diameter tolerances for diameters up to and including—																				
	From—	To and including—	1/16 inch	1/8 inch	3/16 inch	1/4 inch	3/8 inch	1/2 inch	3/4 inch	1 inch	1½ inches	2 inches	3 inches	4 inches	6 inches	8 inches	10 inches	12 inches	14 inches	16 inches	18 inches	20 inches	24 inches
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
64	---	½	0.0019	0.0019	0.0024	0.0027	0.0030	0.0032	0.0035	0.0038	---	---	---	---	---	---	---	---	---	---	---	---	---
56	---	½	.0020	.0020	.0024	.0027	.0031	.0033	.0036	.0038	0.0040	---	---	---	---	---	---	---	---	---	---	---	---
	½	1½	.0038	.0040	*.0040*	*.0040*	*.0040*	*.0040*	*.0040*	*.0040*	*.0040*	---	---	---	---	---	---	---	---	---	---	---	---
48	---	½	.0022	.0022	.0024	.0027	.0032	.0034	.0037	.0039	.0044	---	---	---	---	---	---	---	---	---	---	---	---
	½	1½	.0039	.0041	.0041	.0041	.0041	.0041	.0041	.0044	*.0044*	---	---	---	---	---	---	---	---	---	---	---	---
40	---	½	.0024	[1].0024	.0024	.0027	.0033	.0035	.0038	.0041	.0045	0.0048	---	---	---	---	---	---	---	---	---	---	---
	½	1½	.0041	.0041	.0041	.0041	.0041	.0041	.0041	.0048	*.0048*	*.0048*	---	---	---	---	---	---	---	---	---	---	---
36	---	½	---	.0025	.0025	.0027	.0033	.0036	.0039	.0042	.0046	.0050	---	---	---	---	---	---	---	---	---	---	---
	½	1½	---	.0041	.0041	.0041	.0041	.0041	.0041	.0049	.0050	*.0050*	---	---	---	---	---	---	---	---	---	---	---
32	---	½	---	.0027	.0027	.0027	.0033	.0036	.0040	.0043	.0047	.0051	0.0054	---	---	---	---	---	---	---	---	---	---
	½	1½	---	.0041	.0041	.0041	.0041	.0041	.0041	.0049	.0054	*.0054*	*.0054*	---	---	---	---	---	---	---	---	---	---
28	---	½	---	---	.0031	[2].0031	.0033	.0036	.0041	.0044	.0048	.0052	.0058	0.0062	---	---	---	---	---	---	---	---	---
	½	1½	---	---	.0041	.0041	.0041	.0041	.0041	.0049	.0056	.0062	*.0062*	*.0062*	---	---	---	---	---	---	---	---	---
24	---	½	---	---	.0033	.0033	[2].0033	.0036	.0041	.0045	.0050	.0054	.0060	.0065	---	---	---	---	---	---	---	---	---
	½	1½	---	---	.0041	.0041	.0041	.0041	.0041	.0049	.0056	.0066	*.0066*	*.0066*	---	---	---	---	---	---	---	---	---
20	---	½	---	---	.0036	[1].0036	.0036	[2].0036	.0041	.0047	.0052	.0056	.0062	.0067	0.0072	---	---	---	---	---	---	---	---
	½	1½	---	---	.0041	.0041	.0041	.0041	.0041	.0049	.0056	.0071	.0072	*.0072*	*.0072*	---	---	---	---	---	---	---	---
18	---	½	---	---	---	.0039	.0041	.0041	.0041	.0049	.0053	.0057	.0063	.0069	.0078	0.0082	---	---	---	---	---	---	---
	½	1½	---	---	---	.0041	.0041	.0041	.0041	.0049	.0056	.0072	.0078	.0082	*.0082*	*.0082*	---	---	---	---	---	---	---
	1½	3	---	---	---	.0079	.0081	.0082	*.0082*	*.0082*	*.0082*	*.0082*	*.0082*	*.0082*	*.0082*	*.0082*	---	---	---	---	---	---	---
16	---	½	---	---	---	.0040	[1].0045	.0045	.0045	.0049	.0054	.0058	.0065	.0070	.0079	.0087	0.0090	---	---	---	---	---	---
	½	1½	---	---	---	.0045	.0045	.0045	[2].0045	.0049	.0056	.0073	.0080	.0085	.0090	*.0090*	*.0090*	---	---	---	---	---	---
	1½	3	---	---	---	.0080	.0082	.0084	.0087	.0090	*.0090*	*.0090*	*.0090*	*.0090*	*.0090*	*.0090*	*.0090*	---	---	---	---	---	---
14	---	½	---	---	---	---	.0045	.0048	.0049	.0049	.0056	.0060	.0066	.0072	.0081	.0088	.0095	0.0098	---	---	---	---	---
	½	1½	---	---	---	---	.0049	.0049	.0049	.0049	.0056	.0075	.0081	.0087	.0096	.0098	*.0098*	*.0098*	---	---	---	---	---
	1½	3	---	---	---	---	.0084	.0086	.0089	.0092	.0096	.0098	*.0098*	*.0098*	*.0098*	*.0098*	*.0098*	*.0098*	---	---	---	---	---
12	---	½	---	---	---	---	.0046	.0048	.0051	.0054	.0056	.0062	.0068	.0074	.0083	.0090	.0097	.0103	0.0109	0.0112	---	---	---
	½	1½	---	---	---	---	.0056	.0056	.0056	[2].0056	[2].0056	.0077	.0083	.0089	.0098	.0105	.0112	*.0112*	*.0112*	*.0112*	---	---	---
	1½	3	---	---	---	---	.0086	.0088	.0091	.0094	.0098	.0100	.0108	.0112	*.0112*	*.0112*	*.0112*	*.0112*	*.0112*	*.0112*	---	---	---
10	---	1	---	---	---	---	---	.0056	.0064	.0069	.0073	.0077	.0083	.0089	.0098	.0105	.0112	.0112	.0116	.0122	0.0126	0.0128	---
	1	3	---	---	---	---	---	.0088	.0091	.0094	.0098	.0100	.0108	.0112	.0121	.0128	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	---
	3	6	---	---	---	---	---	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	---
8	---	1	---	---	---	---	---	.0060	.0064	[1].0076	.0076	.0077	.0083	.0089	.0098	.0105	.0112	.0115	.0120	.0125	.0130	.0135	0.0143
	1	3	---	---	---	---	---	.0090	.0093	.0095	.0100	.0104	.0110	.0115	.0124	.0132	.0139	.0145	.0150	.0152	*.0152*	*.0152*	*.0152*
	3	6	---	---	---	---	---	.0140	.0143	.0145	.0150	.0152	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*
6	---	1	---	---	---	---	---	---	.0068	.0076	.0076	.0079	.0085	.0091	.0100	.0107	.0114	.0120	.0126	.0131	.0136	.0140	.0149
	1	3	---	---	---	---	---	---	.0098	.0101	[1].0101	.0109	.0115	.0121	.0130	.0137	.0144	.0150	.0156	.0161	.0166	.0170	.0179
	3	6	---	---	---	---	---	---	.0148	.0151	.0155	.0159	.0165	.0171	.0180	.0187	.0194	.0200	.0202	*.0202*	*.0202*	*.0202*	*.0202*
4	---	1	---	---	---	---	---	---	---	.0080	.0084	.0088	.0095	.0100	.0109	.0117	.0123	.0129	.0135	.0140	.0145	.0149	.0158
	1	3	---	---	---	---	---	---	---	.0110	.0114	.0118	[1].0140	.0140	.0140	.0147	.0153	.0159	.0165	.0170	.0175	.0179	.0188
	3	6	---	---	---	---	---	---	---	.0160	.0164	.0168	.0175	.0180	.0189	.0197	.0203	.0209	.0215	.0220	.0225	.0229	.0238

[1] Standard size of the American National coarse-thread series.

[2] Standard size of the American National fine-thread series.

NOTE 1.—It is preferable to avoid the use of tolerances set in italics by choosing a closer class, shorter length of engagement, coarser pitch, or smaller diameter. When the length of engagement exceeds one diameter and the pitch diameter tolerance exceeds 90 percent of the major diameter tolerance, table 2.3, column 5, the major diameter tolerance shall be 110 percent of the pitch diameter tolerance.

NOTE 2.—When it is expedient to apply class 2 to new design, the pitch and minor diameter tolerances published in tables 12 and 15 of ASA B1.1-1957, Unified and American Screw Threads, should be applied.

TABLE 2.6.—*Pitch diameter tolerances for screw threads of special diameters, pitches, and lengths of engagement, class 3 (see note 2)*

	Length of engagement		Pitch diameter tolerances for diameters up to and including—																				
	Over	To and including	1/16 inch	1/8 inch	3/16 inch	1/4 inch	3/8 inch	1/2 inch	3/4 inch	1 inch	1½ inches	2 inches	3 inches	4 inches	6 inches	8 inches	10 inches	12 inches	14 inches	16 inches	18 inches	20 inches	24 inches
	in.	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
[illegible]		½	0.0014	0.0014	0.0017	0.0019	0.0023	0.0025	0.0028	0.0031	0.0036	0.0038	......	......	......	......	......	......	......	......	......	......	......
	½	1½	.0030	.0030	.0030	.0030	.0030	.0030	.0030	.0036	.0038	*.0038*	......	......	......	......	......	......	......	......	......	......	......
[illegible]	......	½	.0015	.0015	.0017	.0019	.0024	.0026	.0029	.0032	.0036	.0040	......	......	......	......	......	......	......	......	......	......	......
	½	1½	.0030	.0030	.0030	.0030	.0030	.0030	.0030	.0036	.0040	*.0040*	......	......	......	......	......	......	......	......	......	......	......
[illegible]	......	½	.0016	.0016	.0017	.0019	.0024	.0026	.0029	.0032	.0037	.0041	0.0044	......	......	......	......	......	......	......	......	......	......
	½	1½	.0030	.0030	.0030	.0030	.0030	.0030	.0030	.0036	.0040	.0044	*.0044*	......	......	......	......	......	......	......	......	......	......
40	......	½	.0017	[1].0017	.0017	.0019	.0024	.0026	.0030	.0033	.0037	.0041	.0048	......	......	......	......	......	......	......	......	......	......
	½	1½	.0030	.0030	.0030	.0030	.0030	.0030	.0030	.0036	.0040	.0048	*.0048*	......	......	......	......	......	......	......	......	......	......
36	......	½	......	.0018	.0018	.0019	.0024	.0026	.0030	.0033	.0038	.0042	.0048	0.0050	......	......	......	......	......	......	......	......	......
	½	1½	......	.0030	.0030	.0030	.0030	.0030	.0030	.0036	.0040	.0050	*.0050*	*.0050*	......	......	......	......	......	......	......	......	......
32	......	½	......	.0019	.0019	.0019	.0024	.0026	.0030	.0034	.0038	.0042	.0048	.0054	......	......	......	......	......	......	......	......	......
	½	1½	......	.0030	.0030	.0030	.0030	.0030	.0030	.0036	.0040	.0054	*.0054*	*.0054*	......	......	......	......	......	......	......	......	......
28	......	½	......	......	.0022	[2].0022	.0024	.0026	.0030	.0034	.0039	.0043	.0049	.0054	0.0062	......	......	......	......	......	......	......	......
	½	1½	......	......	.0030	.0030	.0030	.0030	.0030	.0036	.0040	.0058	.0062	*.0062*	*.0062*	......	......	......	......	......	......	......	......
24	......	½	......	......	.0024	.0024	[2].0024	.0026	.0030	.0035	.0040	.0044	.0050	.0055	.0064	......	......	......	......	......	......	......	......
	½	1½	......	......	.0030	.0030	.0030	.0030	.0030	.0036	.0040	.0059	.0065	.0066	*.0066*	......	......	......	......	......	......	......	......
20	......	½	......	......	.0025	[1].0026	.0026	[2].0026	.0030	.0036	.0040	.0045	.0051	.0056	.0065	0.0072	......	......	......	......	......	......	......
	½	1½	......	......	.0030	.0030	.0030	.0030	.0030	.0036	.0040	.0060	.0066	.0071	.0072	.0072	......	......	......	......	......	......	......
	1½	3	......	......	.0065	.0066	.0068	.0070	.0071	*.0071*	*.0071*	*.0072*	*.0072*	*.0072*	*.0072*	*.0072*	......	......	......	......	......	......	......
18	......	½	......	......	......	.0027	.0030	.0030	.0030	.0036	.0040	.0045	.0051	.0057	.0066	.0073	0.0080	......	......	......	......	......	......
	½	1½	......	......	......	.0030	.0030	.0030	.0030	.0036	.0040	.0060	.0066	.0072	.0081	.0082	*.0082*	......	......	......	......	......	......
	1½	3	......	......	......	.0067	.0069	.0071	.0071	.0071	.0071	.0082	*.0082*	*.0082*	*.0082*	*.0082*	*.0082*	......	......	......	......	......	......
16	......	½	......	......	......	.0028	[1].0032	.0032	.0032	.0036	.0040	.0046	.0052	.0058	.0066	.0074	.0081	0.0087	......	......	......	......	......
	½	1½	......	......	......	.0032	.0032	.0032	[2].0032	.0036	.0040	.0061	.0067	.0073	.0081	.0089	.0090	*.0090*	......	......	......	......	......
	1½	3	......	......	......	.0068	.0070	.0071	.0071	.0071	.0071	.0084	.0090	*.0090*	*.0090*	*.0090*	*.0090*	*.0090*	......	......	......	......	......
14	......	½	......	......	......	......	.0032	.0036	.0036	.0036	.0040	.0047	.0053	.0058	.0067	.0075	.0082	.0088	0.0093	0.0098	......	......	......
	½	1½	......	......	......	......	.0036	.0036	.0036	.0036	.0040	.0062	.0068	.0073	.0082	.0090	.0097	.0098	*.0098*	*.0098*	......	......	......
	1½	3	......	......	......	......	.0071	.0071	.0071	.0071	.0071	.0084	.0092	.0098	*.0098*	*.0098*	*.0098*	*.0098*	*.0098*	*.0098*	......	......	......
12	......	½	......	......	......	......	.0032	.0036	.0040	.0040	.0040	.0048	.0054	.0059	.0068	.0076	.0083	.0089	.0094	.0099	0.0104	0.0109	......
	½	1½	......	......	......	......	.0040	.0040	.0040	[1][2].0040	[2].0040	.0063	.0069	.0074	.0083	.0091	.0098	.0104	.0109	.0112	*.0112*	*.0112*	......
	1½	3	......	......	......	......	.0071	.0071	.0071	.0071	.0071	.0084	.0092	.0099	.0108	.0112	*.0112*	*.0112*	*.0112*	*.0112*	*.0112*	*.0112*	......
10	......	1	......	......	......	......	......	.0040	[1].0045	.0054	.0059	.0063	.0069	.0074	.0083	.0091	.0098	.0104	.0109	.0112	.0112	.0115	0.0124
	1	3	......	......	......	......	......	.0071	.0071	.0071	.0071	.0084	.0092	.0099	.0108	.0112	.0119	.0125	.0128	*.0128*	*.0128*	*.0128*	*.0128*
	3	6	......	......	......	......	......	.0120	.0123	.0126	.0128	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*	*.0128*
8	......	1	......	......	......	......	......	.0042	.0045	[1].0054	.0059	.0063	.0069	.0074	.0083	.0091	.0098	.0104	.0109	.0112	.0113	.0117	.0126
	1	3	......	......	......	......	......	.0071	.0071	.0071	.0071	.0086	.0092	.0099	.0108	.0114	.0121	.0127	.0132	.0138	.0143	.0147	.0152
	3	6	......	......	......	......	......	.0122	.0125	.0128	.0132	.0136	.0142	.0148	.0152	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*	*.0152*
6	......	1	......	......	......	......	......	......	.0048	.0054	.0059	.0063	.0069	.0074	.0083	.0091	.0098	.0104	.0109	.0112	.0115	.0120	.0128
	1	3	......	......	......	......	......	......	.0071	.0071	[1].0071	.0089	.0095	.0100	.0109	.0117	.0124	.0130	.0135	.0140	.0145	.0150	.0158
	3	6	......	......	......	......	......	......	*.0122*	.0130	.0135	.0139	.0145	.0150	.0159	.0167	.0174	.0180	.0185	.0190	.0195	.0200	.0202
4	......	1	......	......	......	......	......	......	......	.0055	.0059	.0063	.0070	.0075	.0084	.0092	.0098	.0104	.0110	.0115	.0120	.0124	.0133
	1	3	......	......	......	......	......	......	......	.0085	.0089	.0093	[1].0097	.0105	.0114	.0122	.0128	.0134	.0140	.0145	.0150	.0154	.0163
	3	6	......	......	......	......	......	......	......	.0135	.0139	.0143	.0150	.0155	.0164	.0172	.0178	.0184	.0190	.0195	.0200	.0204	.0213

[1] Standard size of the American National coarse-thread series.

[2] Standard size of the American National fine-thread series.

NOTE 1.—It is preferable to avoid the use of tolerances set in italics by choosing a closer class, shorter length of engagement, coarser pitch, or smaller diameter. When the length of engagement exceeds one diameter and the pitch diameter tolerance exceeds 90 percent of the major diameter tolerance, table 2.3, column 5, the major diameter tolerance shall be 110 percent of the pitch diameter tolerance.

NOTE 2.—When it is expedient to apply class 3 to new design, the pitch and minor diameter tolerances published in tables 13 and 15 of ASA B1.1-1957, Unified and American Screw Threads, should be applied.

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TABLE 2.7.—*Pitch diameter tolerances for screw threads of special diameters, pitches, and lengths of engagement, class 4*

[illegible]	[illegible]	[illegible]	Pitch diameter tolerances for diameters up to and including—																	
			1/4 inch	3/8 inch	1/2 inch	3/4 inch	1 inch	1½ inches	2 inches	3 inches	4 inches	6 inches	8 inches	10 inches	12 inches	14 inches	16 inches	18 inches	20 inches	24 inches
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
[illegible]		½	0.0011	0.0012	0.0013	0.0015	0.0017	0.0019	0.0021	0.0024	0.0027	0.0032	0.0036	0.0039	0.0042	0.0045	0.0047	0.0050	0.0052	0.0056
	½	1½	.0015	.0015	.0015	.0015	.0018	.0020	.0029	.0032	.0035	.0039	.0043	.0046	.0049	.0052	.0055	.0057	.0059	.0062
	1½	3	.0032	.0033	.0034	.0036	.0036	.0036	.0041	.0044	.0047	.0052	.0056	.0059	.0062	*.0062*	*.0062*	*.0062*	*.0062*	*.0068*
24	--------	½	.0012	[1] .0012	.0013	.0015	.0018	.0020	.0022	.0025	.0028	.0032	.0036	.0039	.0042	.0045	.0048	.0050	.0052	.0057
	½	1½	.0015	.0015	.0015	.0015	.0018	.0020	.0029	.0032	.0035	.0040	.0043	.0047	.0050	.0052	.0055	.0057	.0060	.0064
	1½	3	.0033	.0034	.0035	.0036	.0036	.0036	.0042	.0045	.0048	.0052	.0056	.0059	.0062	.0055	.0066	*.0066*	*.0066*	*.0066*
20	--------	½	[2].0013	.0013	[1].0013	.0015	.0018	.0020	.0022	.0025	.0028	.0033	.0036	.0040	.0043	.0046	.0043	.0050	.0053	.0057
	½	1½	.0015	.0015	.0015	.0015	.0018	.0020	.0030	.0033	.0036	.0040	.0044	.0047	.0050	.0053	.0056	.0058	.0060	.0065
	1½	3	.0033	.0034	.0035	.0036	.0036	.0036	.0042	.0045	.0048	.0053	.0056	.0060	.0063	.0066	.0068	.0070	.0072	.0072
18	--------	½	.0013	.0015	.0015	.0015	.0018	.0020	.0023	.0026	.0028	.0033	.0037	.0040	.0043	.0046	.0048	.0051	.0053	.0057
	½	1½	.0015	.0015	.0015	.0015	.0018	.0020	.0030	.0033	.0036	.0040	.0044	.0047	.0050	.0053	.0056	.0058	.0061	.0065
	1½	3	.0033	.0034	.0035	.0036	.0036	.0036	.0042	.0046	.0048	.0053	.0057	.0060	.0063	.0066	.0068	.0071	.0073	.0077
16	--------	½	.0014	[2].0016	.0016	.0016	.0018	.0020	.0023	.0026	.0029	.0033	.0037	.0040	.0043	.0046	.0049	.0051	.0053	.0058
	½	1½	.0016	.0016	.0016	[1].0016	.0018	.0020	.0030	.0033	.0036	.0041	.0044	.0048	.0051	.0054	.0056	.0059	.0061	.0065
	1½	3	.0034	.0035	.0036	.0036	.0036	.0036	.0042	.0046	.0049	.0053	.0057	.0060	.0063	.0066	.0069	.0071	.0073	.0078
14	--------	½	--------	.0016	.0018	.0018	.0018	.0020	.0023	.0026	.0029	.0034	.0038	.0041	.0044	.0047	.0049	.0052	.0054	.0058
	½	1½	--------	.0018	.0018	.0018	.0018	.0020	.0031	.0034	.0037	.0041	.0045	.0048	.0051	.0054	.0057	.0059	.0061	.0066
	1½	3	--------	.0035	.0036	.0036	.0036	.0036	.0042	.0046	.0049	.0054	.0058	.0061	.0064	.0067	.0069	.0072	.0074	.0078
12	--------	½	--------	.0016	.0018	.0020	.0020	.0020	.0024	.0027	.0030	.0034	.0038	.0041	.0044	.0047	.0050	.0052	.0054	.0059
	½	1½	--------	.0020	.0020	.0020	‡[1].0020	[1].0020	.0031	.0034	.0037	.0042	.0046	.0049	.0052	.0055	.0057	.0060	.0062	.0066
	1½	3	--------	.0036	.0036	.0036	.0036	.0036	.0042	.0046	.0050	.0054	.0058	.0061	.0054	.0067	.0070	.0072	.0074	.0079
10	--------	1	--------	--------	.0020	[2].0023	.0023	.0023	.0031	.0034	.0037	.0042	.0046	.0049	.0052	.0055	.0057	.0060	.0062	.0066
	1	3	--------	--------	.0036	.0036	.0036	.0036	.0042	.0046	.0050	.0054	.0058	.0061	.0064	.0067	.0070	.0072	.0074	.0079
	3	6	--------	--------	.0060	.0062	.0063	.0065	.0067	.0070	.0073	.0077	.0081	.0084	.0088	.0090	.0093	.0095	.0098	.0102
8	--------	1	--------	--------	.0021	.0023	[2].0027	.0027	.0031	.0034	.0037	.0042	.0046	.0049	.0052	.0055	.0057	.0060	.0062	.0066
	1	3	--------	--------	.0036	.0036	.0036	.0036	.0043	.0046	.0050	.0054	.0058	.0061	.0064	.0067	.0070	.0072	.0074	.0079
	3	6	--------	--------	.0061	.0062	.0064	.0066	.0068	.0071	.0074	.0078	.0082	.0085	.0088	.0091	.0094	.0096	.0099	.0103
6	--------	1	--------	--------	--------	.0024	.0027	.0027	.0031	.0034	.0037	.0042	.0046	.0049	.0052	.0055	.0057	.0060	.0062	.0066
	1	3	--------	--------	--------	.0036	.0036	[2].0036	.0044	.0047	.0050	.0055	.0058	.0062	.0065	.0068	.0070	.0073	.0075	.0079
	3	6	--------	--------	--------	.0064	.0065	.0057	.0069	.0072	.0075	.0080	.0083	.0087	.0090	.0093	.0095	.0098	.0100	.0104
4	--------	1	--------	--------	--------	--------	.0028	.0030	.0032	.0035	.0038	.0042	.0046	.0049	.0052	.0055	.0058	.0060	.0062	.0066
	1	3	--------	--------	--------	--------	.0043	.0045	.0047	[2].0048	.0053	.0057	.0061	.0064	.0067	.0070	.0073	.0075	.0077	.0082
	3	6	--------	--------	--------	--------	.0068	.0070	.0072	.0075	.0078	.0082	.0086	.0089	.0092	.0095	.0098	.0100	.0102	.0106

[1] Standard size of the American National fine-thread series. [2] Standard size of the American National coarse-thread series.

NOTE.—*It is preferable to avoid the use of tolerances set in italics* by choosing a shorter length of engagement, coarser pitch, or smaller diameter. When the length of engagement exceeds one diameter and the pitch diameter tolerance exceeds 90 percent of the major diameter tolerance, table 2.3, column 5, the major diameter tolerance shall be 110 percent of the pitch diameter tolerance.

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5. GAGES

The classification of gages as presented in section VI applies also to gages for special threads.

In ordering gages for a special thread, the length of engagement of the component thread (as distinct from the length of the gage), and the diameter, pitch, and class of thread, should be stated, in order that the minimum material product limit, (pitch diameter of "not go" gage) may be determined correctly. With regard to the length of the "go" gage, and gage tolerances, for threads of exceptionally long lengths of engagement, the following practices are recommended: (1) For threads of classes 1 or 2, use the standard length of "go" gage as given in Commercial Standard CS8, and apply *X* tolerances; (2) for threads of classes 3 or 4, make the length of the "go" gage equal to the length of engagement and apply *W* tolerances.

With regard to the marking of gages, each gage shall be plainly marked, for identification, with the diameter, threads per inch, thread series—that is, "NS" to indicate a special thread of American National form—and class of thread.

APPENDIX 3. HOLE SIZE LIMITS

Recommended hole size limits before threading and the corresponding tolerances are derived, to provide for optimum strength of fastenings and tapping conditions, from the minimum and maximum minor diameters of the internal thread, using the following rules, as illustrated in figure 3.1:

> For the range to and including ⅓ *D* the minimum hole size is equal to the minimum minor diameter of the internal thread and the maximum hole size is larger by one-half the minor diameter tolerance.
>
> For the range from ⅓ *D* to ⅔ *D* the minimum and maximum hole sizes are each one quarter of the minor diameter tolerance larger than the corresponding limits for the length of engagement to and including ⅓ *D*.
>
> For the range from ⅔ *D* to 1½ *D* the minimum hole size is larger than the minimum minor diameter of the internal thread by one-half the minor diameter tolerance, and the maximum hole size is equal to the maximum minor diameter.
>
> For the range from 1½ *D* to 3 *D* the minimum and maximum hole sizes are each one quarter of the minor diameter tolerance of the internal thread larger than the corresponding limits for the ⅔ *D* to 1½ *D* length of engagement.

From the foregoing it will be seen that the difference between limits in each range is the same and equal to one-half of the minor diameter tolerance. This is a general rule. However, the minimum differences for sizes below ¼ in. are equal to the minor diameter tolerances given in tables IV.10 and IV.11 for lengths of engagement to and including ⅓ *D*. For lengths of engagement greater than ⅓ *D* and for sizes ¼ in. and larger the values are adjusted so that the difference between limits is never less than 0.0040 in.

For diameter-pitch combinations other than those given in tables 3.1 and 3.2, the tolerances given in table III.10, or the tolerance derived from the formula, should be similarly applied to determine the hole size limits.

Internal threads requiring modified minor diameters for lengths of engagement less than ⅔ *D* to develop the optimum strength of the fastening, or longer than 1½ *D* to reduce tapping difficulties, should be designated in accordance with par. 3, p. 26.

For National Miniature threads the distribution of hole size limits differs from the above, to accord with conditions peculiar to miniature threads, and is shown in figure 3.2. The maximum limits are based on providing a functionally adequate fastening for the most common applications, where the material of the externally threaded member is of a strength essentially equal to or greater than that of its mating part. In applications where, because of considerations other than the fastening, the screw is made of an appreciably weaker material, the use of smaller hole sizes is usually necessary to extend thread engagement to a greater depth on the external thread. However, hole sizes down to the minimum limit of the minor diameters must be avoided to allow for the spin-up developed as the result of the negative rake with which these small taps are ground.

Recommended hole size limits are tabulated in tables 3.1, 3.2, and 3.3.

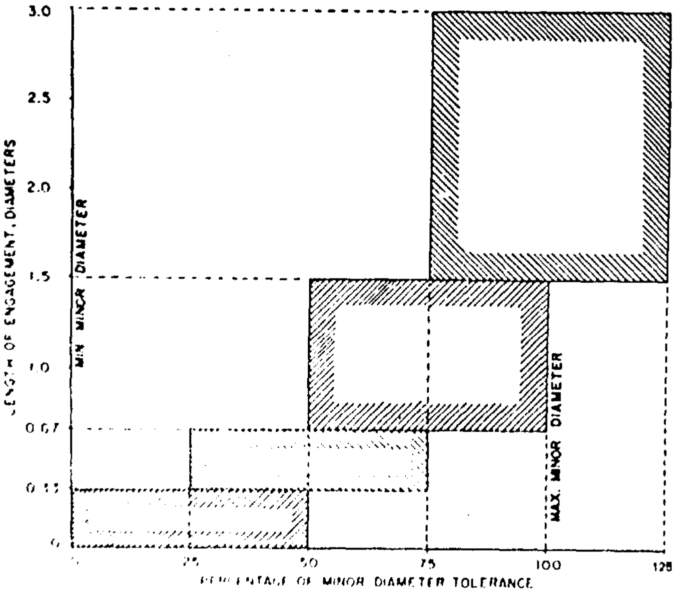


Figure 3.1.—*Distribution of hole size limits before tapping, Unified and American threads.*

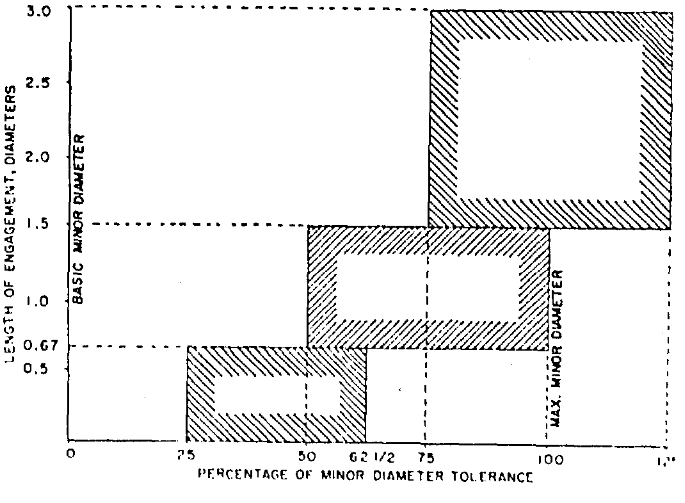


Figure 3.2.—*Distribution of hole size limits before tapping, National Miniature threads.*

TABLE 3.1.—*Recommended hole size limits before threading for different lengths of engagement, UNC, UNF, UNEF, UN, UNS, NC, NF, NEF, and N series, classes 1B and 2B*

(Based on table IV.10 [a])

Designation		Minor diameter, internal threads				Recommended hole size limits for different lengths of engagement							
Thread size	Threads per inch	Minimum	Percent of basic thread height [b]	Maximum [c]	Percent of basic thread height [b]	To and including 1/3 D		Above 1/3 D to 2/3 D		Above 2/3 D to 1½ D		Above 1½ D to 3 D	
						Min	Max	Min	Max	Min	Max	Min	Max
No. *in.*		*in.*		*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
0 .060	80	0.0465	83.1	0.0514	‡53.0	0.0465	0.0500	0.0479	0.0514	0.0479	0.0514	0.0479	0.0514
1 .073	64	.0561	83.3	.0623	52.7	.0561	.0599	.0585	.0623	.0585	.0623	.0585	.0623
1 .073	72	.0580	83.1	.0635	52.7	.0580	.0613	.0596	.0629	.0602	.0635	.0602	.0635
2 .086	56	.0667	83.2	.0737	53.0	.0667	.0705	.0686	.0724	.0699	.0737	.0699	.0737
2 .086	64	.0691	83.3	.0753	52.7	.0691	.0724	.0707	.0740	.0720	.0753	.0720	.0753
3 .099	48	.0764	83.5	.0845	53.6	.0764	.0804	.0785	.0825	.0805	.0845	.0806	.0846
3 .099	56	.0797	83.2	.0865	53.9	.0797	.0831	.0814	.0848	.0831	.0865	.0823	.0867
4 .112	40	.0849	83.4	.0939	55.7	.0849	.0894	.0871	.0916	.0894	.0939	.0902	.0947
4 .112	48	.0894	83.5	.0968	56.2	.0894	.0931	.0912	.0949	.0931	.0968	.0939	.0978
5 .125	40	.0979	83.4	.1062	57.9	.0979	.1020	.1000	.1041	.1021	.1062	.1036	.1077
5 .125	44	.1004	83.3	.1079	57.9	.1004	.1042	.1023	.1060	.1042	.1079	.1060	.1097
6 .138	32	.104	83.8	.114	59.1	.104	.109	.106	.112	.109	.114	.112	.117
6 .138	40	.111	83.1	.119	58.5	.111	.115	.113	.117	.115	.119	.117	.121
8 .164	32	.130	83.8	.139	61.6	.130	.134	.132	.137	.134	.139	.137	.141
8 .164	36	.134	83.1	.142	61.0	.134	.138	.136	.140	.138	.142	.140	.144
10 .190	24	.145	83.1	.156	62.8	.145	.150	.148	.154	.150	.156	.152	.159
10 .190	32	.156	83.8	.164	*64.0	.156	.160	.158	.162	.160	.164	.162	.166
12 .216	24	.171	83.1	.181	64.7	.171	.176	.174	.179	.176	.181	.178	.184
12 .216	28	.177	84.1	.186	64.7	.177	.182	.179	.184	.182	.186	.184	.188
12 .216	32	.182	83.8	.190	*64.0	.182	.186	.184	.188	.186	.190	.188	.192
1/4	20	.196	83.1	.207	66.2	.196	.202	.199	.204	.202	.207	.204	.210
1/4	28	.211	84.1	.220	64.7	.211	.216	.213	.218	.216	.220	.218	.222
1/4	32	.216	83.8	.224	*64.0	.216	.220	.218	.222	.220	.224	.222	.226
1/4	36	.220	83.1	.226	66.5	.220	.224	.221	.225	.224	.226	.225	.227
5/16	18	.252	83.8	.265	65.8	.252	.259	.255	.262	.259	.265	.262	.268
5/16	24	.267	84.1	.277	65.6	.267	.272	.270	.275	.272	.277	.275	.280
5/16	32	.279	82.5	.286	65.3	.279	.283	.281	.285	.283	.286	.285	.289
5/16	36	.282	84.5	.289	65.1	.282	.286	.284	.288	.285	.289	.287	.291
3/8	16	.307	83.8	.321	66.5	.307	.314	.311	.318	.314	.321	.318	.325
3/8	24	.330	84.1	.340	64.7	.330	.335	.333	.338	.335	.340	.338	.343
3/8	32	.341	83.8	.349	*64.0	.341	.345	.343	.347	.345	.349	.347	.351
3/8	36	.345	83.1	.352	63.7	.345	.349	.346	.350	.347	.352	.349	.353
7/16	14	.360	83.5	.376	66.3	.360	.368	.364	.372	.368	.376	.372	.380
7/16	20	.383	83.9	.395	65.4	.383	.389	.386	.391	.389	.395	.391	.397
7/16	28	.399	83.0	.407	65.7	.399	.403	.401	.406	.403	.407	.406	.410
1/2	13	.417	83.1	.434	*66.0	.417	.426	.421	.430	.426	.434	.430	.438
1/2	12	.410	83.1	.428	66.5	.410	.419	.414	.424	.419	.428	.424	.433
1/2	20	.446	83.1	.457	66.2	.446	.452	.449	.454	.452	.457	.454	.460
1/2	28	.461	84.1	.470	64.7	.461	.467	.463	.468	.466	.470	.468	.472
9/16	12	.472	83.6	.490	‡67.0	.472	.479	.476	.486	.479	.490	.486	.495
9/16	18	.502	83.8	.515	65.8	.502	.509	.505	.512	.509	.515	.512	.518
9/16	24	.517	84.1	.527	65.6	.517	.522	.520	.525	.522	.527	.525	.530
9/16	28	.524	83.0	.532	65.7	.524	.528	.526	.531	.528	.532	.531	.535
5/8	11	.527	83.0	.546	‡66.9	.527	.536	.532	.541	.536	.546	.541	.551
5/8	12	.535	83.1	.553	66.5	.535	.544	.540	.549	.544	.553	.549	.558
5/8	18	.565	83.1	.578	65.1	.565	.572	.568	.575	.572	.578	.575	.581
5/8	24	.580	83.1	.590	64.7	.580	.585	.583	.588	.585	.590	.588	.593
5/8	28	.586	84.1	.595	64.7	.586	.591	.588	.593	.591	.595	.593	.597
11/16	12	.597	83.6	.615	67.0	.597	.606	.602	.611	.606	.615	.611	.620
11/16	24	.642	84.1	.652	65.6	.642	.647	.645	.650	.647	.652	.650	.655
3/4	10	.642	83.1	.663	67.0	.642	.655	.647	.658	.653	.663	.658	.668
3/4	12	.660	83.1	.678	66.5	.660	.669	.665	.674	.669	.678	.674	.682
3/4	16	.682	83.8	.696	66.5	.682	.689	.686	.693	.689	.696	.693	.700
3/4	20	.696	83.1	.707	66.2	.696	.702	.699	.704	.702	.707	.704	.710
3/4	28	.711	84.1	.720	64.7	.711	.716	.713	.718	.716	.720	.718	.722
13/16	12	.722	83.6	.740	67.0	.722	.731	.727	.736	.731	.740	.736	.745
13/16	16	.745	83.1	.759	65.9	.745	.752	.749	.756	.752	.759	.756	.763
13/16	20	.758	83.9	.770	65.4	.758	.764	.761	.766	.764	.770	.766	.772
7/8	9	.755	83.1	.778	67.2	.755	.767	.761	.773	.767	.778	.773	.785
7/8	12	.785	83.1	.803	66.5	.785	.794	.790	.799	.794	.803	.799	.808
7/8	14	.798	83.0	.814	65.7	.798	.806	.802	.810	.806	.814	.810	.818
7/8	16	.807	83.8	.821	66.5	.807	.814	.811	.818	.814	.821	.818	.825
7/8	20	.821	83.1	.832	66.2	.821	.827	.824	.829	.827	.832	.829	.835
7/8	28	.836	84.1	.845	64.7	.836	.840	.838	.843	.840	.845	.843	.847
15/16	12	.847	83.6	.865	67.0	.847	.856	.852	.861	.856	.865	.861	.870
15/16	16	.870	83.1	.884	65.9	.870	.877	.874	.881	.877	.884	.881	.888
15/16	20	.883	83.9	.895	65.4	.883	.889	.886	.891	.889	.895	.891	.897
1	8	.865	83.1	.890	67.7	.865	.878	.871	.884	.878	.890	.884	.896
1	12	.910	83.1	.928	66.5	.910	.919	.915	.924	.919	.928	.924	.933
1	14	.923	83.0	.938	66.8	.923	.931	.927	.934	.931	.938	.934	.942
1	16	.932	83.8	.946	66.5	.932	.939	.936	.943	.939	.946	.943	.950
1	20	.946	83.1	.957	66.2	.946	.952	.949	.954	.952	.957	.954	.960
1	28	.961	84.1	.970	64.7	.961	.966	.963	.968	.966	.970	.968	.972
1 1/16	12	.972	*83.6	.990	67.0	.972	.981	.977	.986	.981	.990	.986	.995
1 1/16	16	.995	83.1	1.009	65.9	.995	1.002	.999	1.005	1.002	1.009	1.005	1.012
1 1/16	18	1.002	83.8	1.015	68.8	1.002	1.009	1.005	1.012	1.009	1.015	1.012	1.018

See footnotes at end of table.

TABLE 3.1.—*Recommended hole size limits before threading for different lengths of engagement, UNC, UNF, UNEF, UN, UNS, NC, NF, NEF, and N series, classes 1B and 2B*—Continued

(Based on table IV.10 [a])

Designation		Minor diameter, internal threads				Recommended hole limits for lengths of engagement							
Thread size	Threads per inch	Minimum	Percent of basic thread height [b]	Maximum [c]	Percent of basic thread height [b]	To and including ⅓ D		Above ⅓ D to ⅔ D		Above ⅔ D to 1½ D		Above 1½ D to 3 D	
						Min	Max	Min	Max	Min	Max	Min	Max
No. in.		*in.*		*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
1⅛	7	0.970	83.5	0.998	68.4	0.970	0.984	0.977	0.991	0.984	0.998	0.991	1.005
1⅛	8	.990	83.1	1.015	67.7	.990	1.003	.996	1.009	1.003	1.015	1.009	1.021
1⅛	12	1.035	83.1	1.053	66.5	1.035	1.044	1.040	1.049	1.044	1.053	1.049	1.058
1⅛	16	1.057	83.8	1.071	66.5	1.057	1.064	1.061	1.068	1.064	1.071	1.068	1.075
1⅛	18	1.065	83.1	1.078	65.1	1.065	1.072	1.068	1.075	1.072	1.078	1.075	1.081
1⅛	20	1.071	83.1	1.082	66.2	1.071	1.077	1.074	1.079	1.077	1.082	1.079	1.085
1⅛	28	1.086	84.1	1.095	64.7	1.086	1.091	1.088	1.093	1.091	1.095	1.093	1.097
1³⁄₁₆	12	1.097	83.6	1.115	67.0	1.097	1.106	1.102	1.111	1.106	1.115	1.111	1.120
1³⁄₁₆	16	1.120	83.1	1.134	65.9	1.120	1.127	1.124	1.131	1.127	1.134	1.131	1.138
1³⁄₁₆	18	1.127	83.8	1.140	65.8	1.127	1.134	1.130	1.137	1.134	1.140	1.137	1.143
1¼	7	1.095	83.5	1.123	68.4	1.095	1.109	1.102	1.116	1.109	1.123	1.116	1.130
1¼	8	1.115	83.1	1.140	67.7	1.115	1.128	1.121	1.134	1.128	1.140	1.134	1.146
1¼	12	1.160	83.1	1.178	66.5	1.160	1.169	1.165	1.174	1.169	1.178	1.174	1.183
1¼	16	1.182	83.8	1.196	66.5	1.182	1.189	1.186	1.193	1.189	1.196	1.193	1.200
1¼	18	1.190	83.1	1.203	65.1	1.190	1.197	1.193	1.200	1.197	1.203	1.200	1.206
1¼	20	1.196	83.1	1.207	66.2	1.196	1.202	1.199	1.204	1.202	1.207	1.204	1.210
1⁵⁄₁₆	12	1.222	83.6	1.240	67.0	1.222	1.231	1.227	1.236	1.231	1.240	1.236	1.245
1⁵⁄₁₆	16	1.245	83.1	1.259	65.9	1.245	1.252	1.249	1.256	1.252	1.259	1.256	1.263
1⁵⁄₁₆	18	1.252	83.8	1.265	65.8	1.252	1.259	1.256	1.262	1.259	1.265	1.262	1.268
1⅜	6	1.195	83.1	1.225	69.3	1.195	1.210	1.203	1.221	1.210	1.225	1.221	1.239
1⅜	8	1.240	83.1	1.265	67.7	1.240	1.253	1.246	1.259	1.253	1.265	1.259	1.271
1⅜	12	1.285	83.1	1.303	66.5	1.285	1.294	1.290	1.299	1.294	1.303	1.299	1.308
1⅜	16	1.307	83.8	1.321	66.5	1.307	1.314	1.311	1.318	1.314	1.321	1.318	1.325
1⅜	18	1.315	83.1	1.328	65.1	1.315	1.322	1.318	1.325	1.322	1.328	1.325	1.331
1⁷⁄₁₆	12	1.347	83.6	1.365	67.0	1.347	1.354	1.350	1.361	1.354	1.365	1.361	1.370
1⁷⁄₁₆	16	1.370	83.1	1.384	65.9	1.370	1.377	1.374	1.381	1.377	1.384	1.381	1.388
1⁷⁄₁₆	18	1.377	83.8	1.390	65.8	1.377	1.384	1.380	1.387	1.384	1.390	1.387	1.393
1½	6	1.320	83.1	1.350	69.3	1.320	1.335	1.328	1.346	1.335	1.350	1.346	1.364
1½	8	1.365	83.1	1.390	67.7	1.365	1.378	1.371	1.384	1.378	1.390	1.384	1.396
1½	12	1.410	83.1	1.428	66.5	1.410	1.419	1.415	1.424	1.419	1.428	1.424	1.433
1½	16	1.432	83.8	1.446	66.5	1.432	1.439	1.436	1.443	1.439	1.446	1.443	1.450
1½	18	1.440	83.1	1.452	66.5	1.440	1.446	1.443	1.450	1.446	1.452	1.450	1.456
1½	20	1.446	83.1	1.457	66.2	1.446	1.452	1.449	1.454	1.452	1.457	1.454	1.460
1⁹⁄₁₆	16	1.495	83.1	1.509	65.9	1.495	1.502	1.499	1.506	1.502	1.509	1.506	1.513
1⁹⁄₁₆	18	1.502	83.8	1.515	65.8	1.502	1.509	1.505	1.512	1.509	1.515	1.512	1.518
1⅝	8	1.490	83.1	1.515	67.7	1.490	1.498	1.496	1.509	1.498	1.515	1.509	1.521
1⅝	12	1.535	83.1	1.553	66.5	1.535	1.544	1.540	1.549	1.544	1.553	1.549	1.558
1⅝	16	1.557	83.8	1.571	66.5	1.557	1.564	1.561	1.568	1.564	1.571	1.568	1.575
1⅝	18	1.565	83.1	1.578	65.1	1.565	1.572	1.568	1.575	1.572	1.578	1.575	1.581
1¹¹⁄₁₆	16	1.620	83.1	1.634	65.9	1.620	1.627	1.624	1.631	1.627	1.634	1.631	1.638
1¹¹⁄₁₆	18	1.627	83.8	1.640	65.8	1.627	1.634	1.630	1.637	1.634	1.640	1.637	1.643
1¾	5	1.531	83.1	1.568	70.1	1.534	1.551	1.543	1.560	1.551	1.568	1.560	1.577
1¾	8	1.615	83.1	1.640	67.7	1.615	1.628	1.621	1.634	1.628	1.640	1.634	1.646
1¾	12	1.660	83.1	1.678	66.5	1.660	1.669	1.665	1.674	1.669	1.678	1.674	1.683
1¾	16	1.682	83.8	1.696	66.5	1.682	1.689	1.686	1.693	1.689	1.696	1.693	1.700
1¾	20	1.696	83.1	1.707	66.2	1.696	1.702	1.699	1.704	1.702	1.707	1.704	1.710
1¹³⁄₁₆	16	1.745	83.1	1.759	65.9	1.745	1.752	1.749	1.756	1.752	1.759	1.756	1.763
1⅞	8	1.740	83.1	1.765	67.7	1.740	1.752	1.746	1.759	1.752	1.765	1.759	1.771
1⅞	12	1.785	83.1	1.803	66.5	1.785	1.794	1.790	1.799	1.794	1.803	1.799	1.808
1⅞	16	1.807	83.8	1.821	66.5	1.807	1.814	1.810	1.818	1.814	1.821	1.818	1.825
1¹⁵⁄₁₆	16	1.870	83.1	1.884	65.9	1.870	1.877	1.874	1.881	1.877	1.884	1.881	1.888
2	4½	1.759	83.5	1.795	71.0	1.759	1.777	1.768	1.786	1.777	1.795	1.786	1.804
2	8	1.865	83.1	1.890	67.7	1.865	1.878	1.871	1.884	1.878	1.890	1.884	1.896
2	12	1.910	83.1	1.928	66.5	1.910	1.919	1.915	1.924	1.919	1.928	1.924	1.933
2	16	1.932	83.8	1.946	66.5	1.932	1.939	1.936	1.943	1.939	1.946	1.943	1.950
2	20	1.946	83.1	1.957	66.2	1.946	1.952	1.949	1.954	1.952	1.957	1.954	1.960
2¹⁄₁₆	16	1.995	83.1	2.009	65.9	1.995	2.002	2.000	2.006	2.002	2.009	2.006	2.012
2⅛	8	1.990	83.1	2.015	67.7	1.990	2.003	1.996	2.009	2.003	2.015	2.009	2.021
2⅛	12	2.035	83.1	2.053	66.5	2.035	2.044	2.040	2.049	2.044	2.053	2.049	2.058
2⅛	16	2.057	83.8	2.071	66.5	2.057	2.064	2.061	2.068	2.064	2.071	2.068	2.075
2³⁄₁₆	16	2.120	83.1	2.134	65.9	2.120	2.127	2.124	2.131	2.127	2.134	2.131	2.138
2¼	4½	2.009	83.5	2.045	71.0	2.009	2.027	2.018	2.036	2.027	2.045	2.036	2.054
2¼	8	2.115	83.1	2.140	67.7	2.115	2.128	2.121	2.134	2.128	2.140	2.134	2.146
2¼	12	2.160	83.1	2.178	66.5	2.160	2.169	2.165	2.174	2.169	2.178	2.174	2.182
2¼	16	2.182	83.8	2.196	66.5	2.182	2.189	2.186	2.193	2.189	2.196	2.193	2.200
2¼	20	2.196	83.1	2.207	66.2	2.196	2.202	2.199	2.204	2.202	2.207	2.204	2.210
2⁵⁄₁₆	16	2.245	83.1	2.259	65.9	2.245	2.252	2.249	2.256	2.252	2.259	2.256	2.263
2⅜	12	2.285	83.1	2.303	66.5	2.285	2.294	2.290	2.299	2.294	2.303	2.299	2.308
2⅜	16	2.307	83.8	2.321	66.5	2.307	2.314	2.311	2.318	2.314	2.321	2.318	2.325
2⁷⁄₁₆	16	2.370	83.1	2.384	65.9	2.370	2.377	2.374	2.381	2.377	2.384	2.381	2.388

See footnotes at end of table.

TABLE 3.1.—*Recommended hole size limits before threading for different lengths of engagement, UNC, UNF, UNEF, UN, UNS, NC, NF, NEF, and N series, classes 1B and 2B*—Continued

(Based on table IV.10 [a])

Designation		Minor diameter, internal threads				Recommended hole size limits for different lengths of engagement							
Thread size	Threads per inch	Minimum	Percent of basic thread height [b]	Maximum [c]	Percent of basic thread height [b]	To and including ⅓ *D*		Above ⅓ *D* to ¾ *D*		Above ¾ *D* to 1½ *D*		Above 1½ *D* to 3 *D*	
						Min	Max	Min	Max	Min	Max	Min	Max
No. *in.*		*in.*		*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
2½	4	2.229	83.4	2.267	71.7	2.229	2.248	2.238	2.258	2.248	2.267	2.258	2.277
2½	8	2.365	83.1	2.390	67.7	2.365	2.378	2.371	2.384	2.378	2.390	2.384	2.396
2½	12	2.410	83.1	2.428	66.5	2.410	2.419	2.415	2.421	2.419	2.428	2.424	2.433
2½	16	2.432	83.8	2.446	66.5	2.432	2.439	2.436	2.443	2.439	2.446	2.443	2.450
2½	20	2.446	83.1	2.457	66.2	2.446	2.452	2.449	2.454	2.452	2.457	2.454	2.460
2⅝	12	2.535	83.1	2.553	66.5	2.535	2.544	2.540	2.549	2.544	2.553	2.549	2.558
2⅝	16	2.557	83.8	2.571	66.5	2.557	2.564	2.561	2.568	2.564	2.571	2.568	2.575
2¾	4	2.479	83.4	2.517	71.7	2.479	2.498	2.489	2.508	2.498	2.517	2.508	2.527
2¾	8	2.615	83.1	2.640	67.7	2.615	2.628	2.621	2.634	2.628	2.640	2.634	2.644
2¾	12	2.660	83.1	2.678	66.5	2.660	2.669	2.665	2.674	2.669	2.678	2.674	2.683
2¾	16	2.682	83.8	2.696	66.5	2.682	2.689	2.686	2.693	2.689	2.696	2.693	2.700
2⅞	12	2.785	83.1	2.803	66.5	2.785	2.794	2.790	2.809	2.794	2.803	2.809	2.808
2⅞	16	2.807	83.8	2.821	65.5	2.807	2.814	2.811	2.815	2.814	2.821	2.818	2.825
3	4	2.729	83.4	2.767	71.7	2.729	2.748	2.739	2.758	2.748	2.767	2.758	2.777
3	8	2.865	83.1	2.890	67.7	2.865	2.878	2.871	2.884	2.878	2.890	2.884	2.896
3	12	2.910	83.1	2.928	66.5	2.910	2.919	2.915	2.924	2.919	2.928	2.924	2.933
3	16	2.932	83.8	2.946	66.5	2.932	2.939	2.936	2.943	2.939	2.946	2.943	2.950
3⅛	12	3.035	83.1	3.053	68.5	3.035	3.044	3.040	3.049	3.044	3.053	3.049	3.058
3⅛	16	3.057	83.8	3.071	66.5	3.057	3.064	3.061	3.068	3.064	3.071	3.068	3.075
3¼	4	2.979	83.4	3.017	71.7	2.979	2.998	2.989	3.008	2.998	3.017	3.008	3.027
3¼	8	3.115	82.1	3.140	67.7	3.115	3.128	3.121	3.134	3.128	3.140	3.134	3.146
3¼	12	3.160	83.1	3.178	66.5	3.160	3.169	3.165	3.174	3.169	3.178	3.174	3.183
3¼	16	3.182	83.8	3.196	66.5	3.182	3.189	3.186	3.193	3.189	3.196	3.193	3.200
3⅜	12	3.285	83.1	3.303	66.5	3.285	3.294	3.290	3.299	3.294	3.303	3.299	3.299
3⅜	16	3.307	83.8	3.321	66.5	3.307	3.314	3.311	3.318	3.314	3.321	3.317	3.325
3½	4	3.229	83.4	3.267	71.7	3.229	3.248	3.239	3.258	3.248	3.267	3.258	3.277
3½	8	3.365	83.1	3.390	67.7	3.365	3.378	3.371	3.384	3.378	3.390	3.384	3.396
3½	12	3.410	83.1	3.428	66.5	3.410	3.419	3.415	3.424	3.419	3.428	3.424	3.433
3½	16	3.432	83.8	3.446	66.5	3.432	3.439	3.436	3.443	3.439	3.446	3.443	3.450
3⅝	12	3.535	83.1	3.553	66.5	3.535	3.544	3.544	3.549	3.544	3.553	3.549	3.553
3⅝	16	3.557	83.8	3.571	66.5	3.557	3.564	3.561	3.568	3.567	3.571	3.568	3.575
3¾	4	3.479	83.4	3.517	71.7	3.479	3.498	3.489	3.508	3.498	3.517	3.508	3.527
3¾	8	3.615	83.1	3.640	67.7	3.615	3.628	3.615	3.634	3.628	3.640	3.634	3.646
3¾	12	3.660	83.1	3.678	66.5	3.660	3.669	3.665	3.674	3.669	3.678	3.674	3.683
3¾	16	3.682	83.8	3.696	66.5	3.682	3.689	3.686	3.693	3.689	3.696	3.693	3.700
3⅞	12	3.785	83.1	3.803	66.5	3.785	3.794	3.790	3.799	3.794	3.803	3.799	3.808
3⅞	16	3.807	83.8	3.821	66.5	3.807	3.814	3.811	3.818	3.814	3.821	3.818	3.825
4	4	3.729	83.4	3.767	71.7	3.729	3.748	3.739	3.758	3.748	3.767	3.758	3.777
4	8	3.865	83.1	3.890	67.7	3.865	3.878	3.871	3.884	3.878	3.890	3.884	3.896
4	12	3.910	83.1	3.928	66.5	3.910	3.919	3.915	3.924	3.919	3.928	3.924	3.953
4	16	3.932	83.8	3.946	66.5	3.932	3.939	3.936	3.943	3.939	3.946	3.943	3.950
4¼	4	3.979	83.4	4.017	71.7	3.979	3.998	3.989	4.008	3.998	4.017	4.008	4.027
4¼	8	4.115	83.1	4.140	67.7	4.115	4.128	4.121	4.134	4.128	4.140	4.134	4.146
4¼	12	4.160	83.1	4.178	66.5	4.160	4.169	4.165	4.174	4.169	4.178	4.174	4.183
4¼	16	4.182	83.8	4.196	66.5	4.182	4.189	4.186	4.193	4.189	4.196	4.193	4.200
4½	4	4.229	83.4	4.267	71.7	4.229	4.248	4.239	4.258	4.248	4.267	4.258	4.277
4½	8	4.365	83.1	4.390	67.7	4.365	4.378	4.371	4.384	4.378	4.390	4.384	4.396
4½	12	4.410	83.1	4.428	66.5	4.410	4.419	4.419	4.424	4.419	4.428	4.424	4.433
4½	16	4.432	83.8	4.446	66.5	4.432	4.439	4.437	4.444	4.439	4.446	4.444	4.455
4¾	8	4.615	83.1	4.640	67.7	4.615	4.628	4.621	4.646	4.628	4.640	4.646	4.646
4¾	12	4.660	83.1	4.678	66.5	4.660	4.669	4.665	4.674	4.669	4.678	4.674	4.683
4¾	16	4.682	83.8	4.696	66.5	4.682	4.689	4.686	4.693	4.689	4.696	4.693	4.700
5	8	4.865	83.1	4.890	67.7	4.865	4.878	4.871	4.884	4.878	4.890	4.884	4.896
5	12	4.910	83.1	4.928	66.5	4.910	4.919	4.915	4.924	4.919	4.928	4.924	4.933
5	16	4.932	83.8	4.946	66.5	4.932	4.939	4.936	4.943	4.939	4.946	4.943	4.950
5¼	8	5.115	83.1	5.140	67.7	5.115	5.128	5.121	5.134	5.128	5.140	5.134	5.146
5¼	12	5.160	83.1	5.178	66.5	5.160	5.169	5.165	5.174	5.169	5.178	5.174	5.183
5¼	16	5.182	83.8	5.196	66.5	5.182	5.189	5.186	5.193	5.189	5.196	5.193	5.200
5½	8	5.365	83.1	5.390	67.7	5.365	5.378	5.371	5.384	5.378	5.390	5.384	5.396
5½	12	5.410	83.1	5.428	66.5	5.410	5.419	5.415	5.424	5.419	5.428	5.424	5.433
5½	16	5.432	83.8	5.446	66.5	5.432	5.439	5.436	5.442	5.439	5.446	5.442	5.450
5¾	8	5.615	83.1	5.640	67.7	5.615	5.628	5.621	5.634	5.628	5.640	5.634	5.646
5¾	12	5.660	83.1	5.678	66.5	5.660	5.669	5.665	5.674	5.669	5.678	5.674	5.683
5¾	16	5.682	83.8	5.696	66.5	5.682	5.689	5.686	5.693	5.689	5.696	5.693	5.700
6	8	5.865	83.1	5.890	67.7	5.865	5.878	5.871	5.896	5.878	5.890	5.896	5.896
6	12	5.901	83.1	5.928	66.5	5.910	5.919	5.915	5.924	5.919	5.928	5.924	5.933
6	16	5.932	83.8	5.946	66.5	5.932	5.939	5.935	5.943	5.939	5.946	5.943	5.950

[a] The differences between limits are equal to the minor-diameter tolerances given in table IV.10 for lengths of engagement to and including ⅓ *D*. However, the minimum values for lengths of engagement greater than ⅓ *D* in sizes ¼ in. and larger are adjusted so that the difference between limits is never less than 0.0010 in. For diameter-pitch combinations other than those given in this table, the tolerances given in table IV.10 should be similarly applied to determine hole size limits.

[b] Based on values as rounded off in the preceding column.

[c] Based on a length of engagement equal to the nominal diameter.

TABLE 3.2.—*Recommended hole size limits before threading for different lengths of engagement, UNC, UNF, UNEF, UN, UNS, NC, NF, NEF, and N series, class 3B*

(Based on table IV.11[a])

Designation		Minor diameter, internal threads				Recommended hole size limits for different lengths of engagement							
Thread size	Threads per inch	Minimum	Percent of basic thread height [b]	Maximum [c]	Percent of basic thread height [b]	To and including ⅓ *D*		Above ⅓ *D* to ⅔ *D*		Above ⅔ *D* to 1½ *D*		Above 1½ *D* to 3 *D*	
						Min	Max	Min	Max	Min	Max	Min	Max
No. in.		*in.*		*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
0 0.060	80	0.0465	83.1	0.0514	[d]53.0	0.0465	0.0500	0.0479	0.0514	0.0479	0.0514	0.0479	0.0514
1 .073	64	.0561	83.3	.0623	52.7	.0561	.0599	.0585	.0623	.0585	.0623	.0585	.0623
1 .073	72	.0580	83.1	.0635	52.7	.0580	.0613	.0596	.0629	.0602	.0635	.0602	.0635
2 .086	56	.0667	83.2	.0737	53.0	.0667	.0705	.0686	.0724	.0699	.0737	.0699	.0737
2 .086	64	.0691	83.3	.0753	52.7	.0691	.0724	.0707	.0740	.0720	.0753	.0720	.0753
3 .099	48	.0764	83.5	.0845	53.6	.0764	.0804	.0785	.0825	.0805	.0845	.0806	.0846
3 .099	56	.0797	83.2	.0865	53.9	.0797	.0831	.0814	.0848	.0831	.0865	.0833	.0867
4 .112	40	.0849	83.4	.0939	55.7	.0849	.0894	.0871	.0916	.0894	.0939	.0902	.0947
4 .112	48	.0894	83.5	.0968	56.2	.0894	.0931	.0912	.0949	.0931	.0968	.0939	.0976
5 .125	40	.0979	83.4	.1062	57.9	.0979	.1020	.1000	.1041	.1021	.1062	.1036	.1077
5 .125	44	.1004	83.3	.1079	57.9	.1004	.1042	.1023	.1060	.1042	.1079	.1060	.1097
6 .138	32	.1040	83.8	.1140	59.1	.1040	.1091	.1066	.1115	.1091	.1140	.1115	.1164
6 .138	40	.1110	83.1	.1186	59.7	.1110	.1148	.1128	.1167	.1147	.1186	.1166	.1205
8 .164	32	.1300	83.8	.1389	61.8	.1300	.1345	.1324	.1367	.1346	.1389	.1367	.1410
8 .164	36	.1340	83.1	.1416	62.1	.1340	.1377	.1359	.1397	.1378	.1416	.1397	.1435
10 .190	24	.1450	83.1	.1555	63.7	.1450	.1502	.1475	.1528	.1502	.1555	.1528	.1581
10 .190	32	.1560	83.8	.1641	63.8	.1560	.1601	.1581	.1621	.1601	.1641	.1621	.1661
12 .216	24	.1710	83.1	.1807	65.2	.1710	.1758	.1733	.1782	.1758	.1807	.1782	.1831
12 .216	28	.1770	84.1	.1857	65.3	.1770	.1815	.1794	.1836	.1815	.1857	.1836	.1878
12 .216	32	.1820	83.8	.1895	65.3	.1820	.1858	.1837	.1877	.1855	.1895	.1873	.1913
¼	20	.1960	83.1	.2067	66.7	.1960	.2013	.1986	.2040	.2013	.2067	.2040	.2094
¼	28	.2110	84.1	.2190	66.8	.2110	.2152	.2131	.2171	.2150	.2190	.2169	.2209
¼	32	.2160	83.8	.2229	66.8	.2160	.2196	.2172	.2212	.2189	.2229	.2206	.2246
¼	36	.2200	83.1	.2258	67.1	.2200	.2243	.2199	.2243	.2214	.2258	.2220	.2273
5⁄16	18	.2520	83.8	.2630	68.6	.2520	.2577	.2551	.2604	.2577	.2630	.2604	.2657
5⁄16	24	.2670	84.1	.2754	68.5	.2670	.2714	.2694	.2734	.2714	.2754	.2734	.2774
5⁄16	32	.2790	83.5	.2847	68.5	.2790	.2817	.2792	.2832	.2807	.2847	.2822	.2862
5⁄16	36	.2820	84.5	.2877	68.7	.2820	.2863	.2824	.2863	.2837	.2877	.2850	.2890
⅜	16	.3070	83.8	.3182	70.0	.3070	.3127	.3101	.3155	.3128	.3182	.3155	.3209
⅜	24	.3300	83.1	.3372	69.5	.3300	.3336	.3314	.3354	.3332	.3372	.3351	.3391
⅜	32	.3410	83.8	.3469	69.2	.3410	.3441	.3415	.3455	.3429	.3469	.3444	.3484
⅜	36	.3450	83.1	.3501	69.0	.3450	.3488	.3449	.3488	.3461	.3501	.3474	.3514
7⁄16	14	.3600	83.5	.3717	70.9	.3600	.3660	.3630	.3688	.3659	.3717	.3688	.3746
7⁄16	20	.3830	83.9	.3916	70.7	.3830	.3875	.3855	.3896	.3875	.3916	.3896	.3937
7⁄16	28	.3990	83.0	.4051	[d]69.8	.3990	.4020	.3995	.4035	.4011	.4051	.4017	.4067
½	13	.4170	83.1	.4284	71.7	.4170	.4225	.4196	.4254	.4226	.4284	.4255	.4313
½	12	.4100	83.1	.4223	71.8	.4100	.4161	.4129	.4192	.4160	.4223	.4192	.4255
½	20	.4460	83.1	.4537	71.3	.4460	.4498	.4477	.4517	.4497	.4537	.4516	.4556
½	28	.4610	84.1	.4676	[d]69.8	.4610	.4645	.4620	.4660	.4636	.4676	.4652	.4692
9⁄16	12	.4720	83.6	.4843	72.2	.4720	.4783	.4753	.4813	.4783	.4843	.4813	.4873
9⁄16	18	.5020	83.8	.5106	71.9	.5020	.5065	.5045	.5086	.5065	.5106	.5086	.5127
9⁄16	24	.5170	84.1	.5244	70.4	.5170	.5209	.5186	.5226	.5204	.5244	.5221	.5261
9⁄16	28	.5240	83.0	.5301	69.8	.5240	.5270	.5245	.5285	.5261	.5301	.5277	.5317
⅝	11	.5270	83.0	.5391	72.7	.5270	.5328	.5298	.5360	.5329	.5391	.5360	.5422
⅝	12	.5350	83.1	.5463	72.7	.5350	.5406	.5377	.5435	.5405	.5463	.5434	.5492
⅝	18	.5650	83.1	.5730	72.1	.5650	.5690	.5670	.5711	.5690	.5730	.5711	.5752
⅝	24	.5800	83.1	.5869	70.4	.5800	.5834	.5811	.5851	.5829	.5869	.5846	.5886
⅝	28	.5860	84.1	.5926	69.8	.5860	.5895	.5870	.5910	.5886	.5926	.5902	.5942
11⁄16	12	.5970	83.6	.6085	73.0	.5970	.6029	.6001	.6057	.6029	.6085	.6057	.6113
11⁄16	24	.6420	84.1	.6494	70.4	.6420	.6459	.6436	.6476	.6454	.6494	.6471	.6511
¾	10	.6420	83.1	.6545	73.5	.6420	.6481	.6449	.6513	.6481	.6545	.6513	.6577
¾	12	.6600	83.1	.6707	73.3	.6600	.6652	.6626	.6680	.6653	.6707	.6680	.6734
¾	16	.6820	83.8	.6908	72.9	.6820	.6866	.6844	.6887	.6865	.6908	.6886	.6929
¾	20	.6960	83.1	.7037	71.3	.6960	.6998	.6977	.7017	.6997	.7037	.7016	.7056
¾	28	.7110	84.1	.7176	69.8	.7110	.7145	.7120	.7160	.7136	.7176	.7152	.7192
13⁄16	12	.7220	83.6	.7329	73.5	.7220	.7276	.7250	.7303	.7276	.7329	.7303	.7356
13⁄16	16	.7450	83.1	.7533	72.9	.7450	.7491	.7469	.7512	.7490	.7533	.7511	.7554
13⁄16	20	.7580	83.9	.7662	71.3	.7580	.7623	.7602	.7642	.7622	.7662	.7641	.7681
⅞	9	.7550	83.1	.7681	74.1	.7550	.7614	.7580	.7647	.7614	.7681	.7647	.7714
⅞	12	.7850	83.1	.7952	73.7	.7850	.7900	.7874	.7926	.7900	.7952	.7926	.7978
⅞	14	.7980	83.0	.8068	73.5	.7980	.8022	.8000	.8045	.8023	.8068	.8045	.8090
⅞	16	.8070	83.8	.8158	72.9	.8070	.8116	.8094	.8137	.8115	.8158	.8136	.8179
⅞	20	.8210	83.1	.8287	71.3	.8210	.8248	.8227	.8267	.8247	.8287	.8266	.8306
⅞	28	.8360	84.1	.8426	69.8	.8360	.8395	.8370	.8410	.8386	.8426	.8402	.8442
15⁄16	12	.8470	83.6	.8575	73.9	.8470	.8524	.8499	.8550	.8524	.8575	.8550	.8601
15⁄16	16	.8700	83.1	.8783	72.9	.8700	.8741	.8719	.8762	.8740	.8783	.8761	.8804
15⁄16	20	.8830	83.9	.8912	71.3	.8830	.8873	.8852	.8892	.8872	.8912	.8891	.8931

See footnotes at end of table.

TABLE 3.2.—*Recommended hole size limits before threading for different lengths of engagement, UNC, UNF, UNEF, UN, UNS, NC, NF, NEF, and N series, class 3B*—Continued

(Based on table IV.11[a])

Designation		Minor diameter, internal threads				Recommended hole size limits for different lengths of engagement							
Thread size	Threads per inch	Minimum	Percent of basic thread height [b]	Maximum [c]	Percent of basic thread height [b]	To and including ⅓ D		Above ⅓ D to ⅔ D		Above ⅔ D to 1½ D		Above 1½ D to 3 D	
						Min	Max	Min	Max	Min	Max	Min	Max
No. in.		*in.*		*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
1	8	0.8650	83.1	0.8797	74.1	0.8650	0.8722	0.8684	0.8759	0.8722	0.8797	0.8760	0.8835
1	12	.9100	83.1	.9198	74.1	.9100	.9148	.9123	.9173	.9148	.9198	.9173	.9223
1	14	.9230	83.0	.9315	73.8	.9230	.9271	.9249	.9293	.9271	.9315	.9293	.9337
1	16	.9320	83.8	.9408	72.9	.9320	.9366	.9344	.9387	.9365	.9408	.9386	.9429
1	20	.9460	83.1	.9537	71.3	.9460	.9498	.9477	.9517	.9497	.9537	.9516	.9556
1	28	.9610	84.1	.9676	69.8	.9610	.9645	.9620	.9660	.9636	.9676	.9652	.9692
1 1/16	12	.9720	83.6	.9823	74.1	.9720	.9773	.9748	.9798	.9773	.9823	.9798	.9848
1 1/16	16	.9950	83.1	1.0033	72.9	.9950	.9991	.9969	1.0012	.9990	1.0033	1.0011	1.0054
1 1/16	18	1.0020	83.8	1.0105	72.1	1.0020	1.0065	1.0044	1.0085	1.0064	1.0105	1.0085	1.0126
1 1/8	7	.9700	84.0	.9875	74.1	.9700	.9790	.9747	.9833	.9789	.9875	.9832	.9918
1 1/8	8	.9900	83.1	1.0047	74.1	.9900	.9972	.9934	1.0009	.9972	1.0047	1.0010	1.0085
1 1/8	12	1.0350	83.1	1.0448	74.1	1.0350	1.0398	1.0373	1.0423	1.0398	1.0448	1.0423	1.0473
1 1/8	16	1.0570	83.8	1.0658	72.9	1.0570	1.0616	1.0594	1.0637	1.0615	1.0658	1.0636	1.0679
1 1/8	18	1.0650	83.1	1.0730	72.1	1.0650	1.0690	1.0669	1.0710	1.0689	1.0730	1.0710	1.0751
1 1/8	20	1.0710	83.1	1.0787	71.3	1.0710	1.0748	1.0727	1.0767	1.0747	1.0787	1.0766	1.0806
1 1/8	28	1.0860	84.1	1.0923	69.8	1.0860	1.0895	1.0870	1.0910	1.0886	1.0926	1.0902	1.0942
1 3/16	12	1.0970	83.6	1.1073	74.1	1.0970	1.1023	1.0998	1.1048	1.1023	1.1073	1.1048	1.1098
1 3/16	16	1.1200	83.1	1.1283	72.9	1.1200	1.1241	1.1219	1.1262	1.1240	1.1283	1.1261	1.1304
1 3/16	18	1.1270	83.8	1.1355	72.1	1.1270	1.1315	1.1294	1.1335	1.1314	1.1355	1.1335	1.1276
1 1/4	7	1.0950	83.5	1.1125	74.1	1.0950	1.1040	1.0997	1.1083	1.1039	1.1125	1.1082	1.1168
1 1/4	8	1.1150	83.1	1.1297	74.1	1.1150	1.1222	1.1184	1.1259	1.1222	1.1297	1.1260	1.1335
1 1/4	12	1.1600	83.1	1.1698	74.1	1.1600	1.1648	1.1623	1.1673	1.1648	1.1698	1.1673	1.1723
1 1/4	16	1.1820	83.8	1.1908	72.9	1.1820	1.1866	1.1844	1.1887	1.1865	1.1908	1.1886	1.1929
1 1/4	18	1.1900	83.1	1.1980	72.1	1.1900	1.1940	1.1919	1.1960	1.1939	1.1980	1.1960	1.2001
1 1/4	20	1.1960	83.1	1.2037	71.3	1.1960	1.1998	1.1977	1.2017	1.1997	1.2037	1.2016	1.2056
1 5/16	12	1.2220	83.6	1.2323	74.1	1.2220	1.2273	1.2248	1.2298	1.2273	1.2323	1.2298	1.2348
1 5/16	16	1.2450	83.1	1.2533	72.9	1.2450	1.2491	1.2469	1.2512	1.2490	1.2533	1.2511	1.2554
1 5/16	18	1.2520	83.8	1.2605	72.1	1.2520	1.2565	1.2544	1.2585	1.2564	1.2605	1.2585	1.2626
1 3/8	6	1.1950	83.1	1.2146	74.1	1.1950	1.2046	1.1996	1.2096	1.2046	1.2146	1.2096	1.2196
1 3/8	8	1.2400	83.1	1.2547	74.1	1.2400	1.2472	1.2434	1.2509	1.2472	1.2547	1.2510	1.2585
1 3/8	12	1.2850	83.1	1.2948	74.1	1.2850	1.2898	1.2873	1.2923	1.2898	1.2948	1.2923	1.2973
1 3/8	16	1.3070	83.8	1.3158	72.9	1.3070	1.3116	1.3094	1.3137	1.3115	1.3158	1.3136	1.3179
1 3/8	18	1.3150	83.1	1.3230	72.1	1.3150	1.3190	1.3169	1.3210	1.3189	1.3230	1.3210	1.3251
1 7/16	12	1.3470	83.6	1.3573	74.1	1.3470	1.3523	1.3498	1.3548	1.3523	1.3573	1.3548	1.3598
1 7/16	16	1.3700	83.1	1.3783	72.9	1.3700	1.3741	1.3719	1.3762	1.3740	1.3783	1.3761	1.3804
1 7/16	18	1.3770	83.8	1.3855	72.1	1.3770	1.3815	1.3794	1.3835	1.3814	1.3855	1.3835	1.3876
1 1/2	6	1.3200	83.1	1.3396	74.1	1.3200	1.3296	1.3246	1.3346	1.3296	1.3396	1.3346	1.3446
1 1/2	8	1.3650	83.1	1.3797	74.1	1.3650	1.3722	1.3684	1.3759	1.3722	1.3797	1.3760	1.3835
1 1/2	12	1.4100	83.1	1.4198	74.1	1.4100	1.4148	1.4123	1.4173	1.4148	1.4198	1.4173	1.4223
1 1/2	16	1.4320	83.8	1.4408	72.9	1.4320	1.4366	1.4344	1.4387	1.4365	1.4408	1.4386	1.4429
1 1/2	18	1.4400	83.1	1.4480	72.1	1.4400	1.4440	1.4419	1.4460	1.4439	1.4480	1.4460	1.4501
1 1/2	20	1.4460	83.1	1.4537	71.3	1.4460	1.4498	1.4477	1.4517	1.4497	1.4537	1.4516	1.4556
1 9/16	16	1.4950	83.1	1.5033	72.9	1.4950	1.4991	1.4969	1.5012	1.4990	1.5033	1.5011	1.5054
1 9/16	18	1.5020	83.8	1.5105	72.1	1.5020	1.5065	1.5044	1.5085	1.5064	1.5105	1.5085	1.5126
1 5/8	8	1.4900	83.1	1.5047	74.1	1.4900	1.4972	1.4934	1.5009	1.4972	1.5047	1.5010	1.5085
1 5/8	12	1.5350	83.1	1.5448	74.1	1.5350	1.5398	1.5373	1.5423	1.5398	1.5448	1.5423	1.5473
1 5/8	16	1.5570	83.8	1.5658	72.9	1.5570	1.5616	1.5594	1.5637	1.5615	1.5658	1.5636	1.5679
1 5/8	18	1.5650	83.1	1.5730	72.1	1.5650	1.5690	1.5669	1.5710	1.5689	1.5730	1.5710	1.5751
1 11/16	16	1.6200	83.1	1.6283	72.9	1.6200	1.6241	1.6219	1.6262	1.6240	1.6283	1.6261	1.6304
1 11/16	18	1.6270	83.8	1.6355	72.1	1.6270	1.6315	1.6294	1.6335	1.6314	1.6355	1.6335	1.6376
1 3/4	5	1.5340	83.1	1.5575	74.1	1.5340	1.5455	1.5395	1.5515	1.5455	1.5575	1.5515	1.5635
1 3/4	8	1.6150	83.1	1.6297	74.1	1.6150	1.6222	1.6184	1.6259	1.6222	1.6297	1.6260	1.6335
1 3/4	12	1.6600	83.1	1.6698	74.1	1.6600	1.6648	1.6623	1.6673	1.6648	1.6698	1.6673	1.6723
1 3/4	16	1.6820	83.8	1.6908	72.9	1.6820	1.6866	1.6844	1.6887	1.6865	1.6908	1.6886	1.6929
1 3/4	20	1.6960	83.1	1.7037	71.3	1.6960	1.6998	1.6977	1.7017	1.6997	1.7037	1.7016	1.7056
1 13/16	16	1.7450	83.1	1.7533	72.9	1.7450	1.7491	1.7469	1.7512	1.7490	1.7533	1.7511	1.7554
1 7/8	8	1.7400	83.1	1.7547	74.1	1.7400	1.7472	1.7434	1.7509	1.7472	1.7547	1.7510	1.7585
1 7/8	12	1.7850	83.1	1.7948	74.1	1.7850	1.7898	1.7873	1.7923	1.7898	1.7948	1.7923	1.7973
1 7/8	16	1.8070	83.8	1.8158	72.9	1.8070	1.8116	1.8094	1.8137	1.8115	1.8158	1.8136	1.8179
1 15/16	16	1.8700	83.1	1.8783	72.9	1.8700	1.8741	1.8719	1.8762	1.8740	1.8783	1.8761	1.8804
2	4½	1.7590	83.5	1.7861	74.1	1.7590	1.7727	1.7661	1.7794	1.7728	1.7861	1.7794	1.7927
2	8	1.8650	83.1	1.8797	74.1	1.8650	1.8722	1.8684	1.8759	1.8722	1.8797	1.8760	1.8835
2	12	1.9100	83.1	1.9198	74.1	1.9100	1.9148	1.9123	1.9173	1.9148	1.9198	1.9173	1.9223
2	16	1.9320	83.8	1.9408	72.9	1.9320	1.9366	1.9344	1.9387	1.9365	1.9408	1.9386	1.9429
2	20	1.9460	83.1	1.9537	71.3	1.9460	1.9498	1.9477	1.9517	1.9497	1.9537	1.9516	1.9556
2 1/16	16	1.9950	83.1	2.0033	72.9	1.9950	1.9991	1.9969	2.0012	1.9990	2.0033	2.0011	2.0054
2 1/8	8	1.9900	83.1	2.0047	74.1	1.9900	1.9972	1.9934	2.0009	1.9972	2.0047	2.0010	2.0085
2 1/8	12	2.0350	83.1	2.0448	74.1	2.0350	2.0398	2.0373	2.0423	2.0398	2.0448	2.0423	2.0473
2 1/8	16	2.0570	83.8	2.0658	72.9	2.0570	2.0616	2.0594	2.0637	2.0615	2.0658	2.0636	2.0679

See footnotes at end of table.

TABLE 3.2.—*Recommended hole size limits before threading for different lengths of engagement, UNC, UNF, UNEF, UN, UNS, NC, NF, NEF, and N series, class 3B*—Continued

(Based on table IV.11[a])

Designation		Minor diameter, internal threads				Recommended hole size limits for different lengths of engagement							
Thread size	Threads per inch	Minimum	Percent of basic thread height [b]	Maximum [c]	Percent of basic thread height [b]	To and including 1/3 *D*		Above 1/3 *D* to 2/3 *D*		Above 2/3 *D* to 1½ *D*		Above 1½ *D* to 3 *D*	
						Min	Max	Min	Max	Min	Max	Min	Max
No. in.		*in.*		*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
2 3/16	16	2.1200	83.1	2.1283	72.9	2.1200	2.1241	2.1219	2.1262	2.1240	2.1283	2.1261	2.1304
2 1/4	4½	2.0090	83.5	2.0361	74.1	2.0090	2.0227	2.0161	2.0294	2.0228	2.0361	2.0294	2.0427
2 1/4	8	2.1150	83.1	2.1297	74.1	2.1150	2.1222	2.1184	2.1259	2.1222	2.1297	2.1260	2.1335
2 1/4	12	2.1600	83.1	2.1698	74.1	2.1600	2.1648	2.1623	2.1673	2.1648	2.1698	2.1673	2.1723
2 1/4	16	2.1820	83.8	2.1908	72.9	2.1820	2.1866	2.1844	2.1887	2.1865	2.1908	2.1886	2.1929
2 1/4	20	2.1960	83.1	2.2037	71.3	2.1960	2.1998	2.1977	2.2017	2.1997	2.2037	2.2016	2.2056
2 5/16	16	2.2450	83.1	2.2533	72.9	2.2450	2.2491	2.2469	2.2512	2.2490	2.2533	2.2511	2.2554
2 3/8	12	2.2850	83.1	2.2948	74.1	2.2850	2.2898	2.2873	2.2923	2.2898	2.2948	2.2923	2.2973
2 3/8	16	2.3070	83.8	2.3158	72.9	2.3070	2.3116	2.3094	2.3137	2.3115	2.3158	2.3136	2.3179
2 7/16	16	2.3700	83.1	2.3783	72.9	2.3700	2.3741	2.3719	2.3762	2.3740	2.3783	2.3761	2.3804
2 1/2	4	2.2290	83.4	2.2594	74.1	2.2290	2.2444	2.2369	2.2519	2.2444	2.2594	2.2519	2.2669
2 1/2	8	2.3650	83.1	2.3797	74.1	2.3650	2.3722	2.3684	2.3759	2.3722	2.3797	2.3760	2.3835
2 1/2	12	2.4100	83.1	2.4198	74.1	2.4100	2.4148	2.4123	2.4173	2.4148	2.4198	2.4173	2.4223
2 1/2	16	2.4320	83.8	2.4408	72.9	2.4320	2.4366	2.4344	2.4387	2.4365	2.4408	2.4386	2.4429
2 1/2	20	2.4460	83.1	2.4537	71.3	2.4460	2.4498	2.4478	2.4517	2.4497	2.4537	2.4516	2.4556
2 5/8	12	2.5350	83.1	2.5448	74.1	2.5350	2.5398	2.5373	2.5423	2.5398	2.5448	2.5423	2.5473
2 5/8	16	2.5570	83.8	2.5658	72.9	2.5570	2.5616	2.5594	2.5637	2.5615	2.5658	2.5636	2.5679
2 3/4	4	2.4790	83.4	2.5094	74.1	2.4790	2.4944	2.4869	2.5019	2.4944	2.5094	2.5019	2.5169
2 3/4	8	2.6150	83.1	2.6297	74.1	2.6150	2.6222	2.6184	2.6259	2.6222	2.6297	2.6260	2.6335
2 3/4	12	2.6600	83.1	2.6698	74.1	2.6600	2.6648	2.6623	2.6673	2.6648	2.6698	2.6673	2.6723
2 3/4	16	2.6820	83.8	2.6908	72.9	2.6820	2.6866	2.6844	2.6887	2.6865	2.6908	2.6886	2.6929
2 7/8	12	2.7850	83.1	2.7948	74.1	2.7850	2.7898	2.7873	2.7923	2.7898	2.7948	2.7923	2.7973
2 7/8	16	2.8070	83.8	2.8158	72.9	2.8070	2.8116	2.8094	2.8137	2.8115	2.8158	2.8136	2.8179
3	4	2.7290	83.4	2.7594	74.1	2.7290	2.7444	2.7369	2.7519	2.7444	2.7594	2.7519	2.7669
3	8	2.8650	83.1	2.8797	74.1	2.8650	2.8722	2.8684	2.8759	2.8722	2.8797	2.8760	2.8835
3	12	2.9100	83.1	2.9198	74.1	2.9100	2.9148	2.9123	2.9173	2.9148	2.9198	2.9173	2.9223
3	16	2.9320	83.8	2.9408	72.9	2.9320	2.9366	2.9344	2.9387	2.9365	2.9408	2.9386	2.9429
3 1/8	12	3.0350	83.1	3.0448	74.1	3.0350	3.0398	3.0373	3.0423	3.0398	3.0448	3.0423	3.0473
3 1/8	16	3.0570	83.8	3.0658	72.9	3.0570	3.0616	3.0594	3.0637	3.0615	3.0658	3.0636	3.0679
3 1/4	4	2.9790	83.4	3.0094	74.1	2.9790	2.9944	2.9869	3.0019	2.9944	3.0094	3.0019	3.0169
3 1/4	8	3.1150	83.1	3.1297	74.1	3.1150	3.1222	3.1184	3.1259	3.1222	3.1297	3.1260	3.1335
3 1/4	12	3.1600	83.1	3.1698	74.1	3.1600	3.1648	3.1623	3.1673	3.1648	3.1698	3.1673	3.1723
3 1/4	16	3.1820	83.8	3.1908	72.9	3.1820	3.1866	3.1844	3.1887	3.1865	3.1908	3.1886	3.1929
3 3/8	12	3.2850	83.1	3.2948	74.1	3.2850	3.2898	3.2873	3.2923	3.2898	3.2948	3.2923	3.2973
3 3/8	16	3.3070	83.8	3.3158	72.9	3.3070	3.3116	3.3094	3.3137	3.3115	3.3158	3.3136	3.3179
3 1/2	4	3.2290	83.4	3.2594	74.1	3.2290	3.2444	3.2369	3.2519	3.2444	3.2594	3.2519	3.2669
3 1/2	8	3.3650	83.1	3.3797	74.1	3.3650	3.3722	3.3684	3.3759	3.3722	3.3797	3.3760	3.3835
3 1/2	12	3.4100	83.1	3.4198	74.1	3.4100	3.4148	3.4123	3.4173	3.4148	3.4198	3.4173	3.4223
3 1/2	16	3.4320	83.8	3.4408	72.9	3.4320	3.4366	3.4344	3.4387	3.4365	3.4408	3.4386	3.4429
3 5/8	12	3.5350	83.1	3.5448	74.1	3.5350	3.5398	3.5373	3.5423	3.5398	3.5448	3.5423	3.5473
3 5/8	16	3.5570	83.8	3.5658	72.9	3.5570	3.5616	3.5594	3.5637	3.5615	3.5658	3.5636	3.5679
3 3/4	4	3.4790	83.4	3.5094	74.1	3.4790	3.4944	3.4869	3.5019	3.4944	3.5094	3.5019	3.5169
3 3/4	8	3.6150	83.1	3.6297	74.1	3.6150	3.6222	3.6184	3.6259	3.6222	3.6297	3.6260	3.6335
3 3/4	12	3.6600	83.1	3.6698	74.1	3.6600	3.6648	3.6623	3.6673	3.6648	3.6698	3.6673	3.6723
3 3/4	16	3.6820	83.8	3.6908	72.9	3.6820	3.6866	3.6844	3.6887	3.6865	3.6908	3.6886	3.6929
3 7/8	12	3.7850	83.1	3.7948	74.1	3.7850	3.7898	3.7873	3.7923	3.7898	3.7948	3.7923	3.7973
3 7/8	16	3.8070	83.8	3.8158	72.9	3.8070	3.8116	3.8094	3.8137	3.8115	3.8158	3.8136	3.8179
4	4	3.7290	83.4	3.7594	74.1	3.7290	3.7444	3.7369	3.7519	3.7444	3.7594	3.7519	3.7669
4	8	3.8650	83.1	3.8797	74.1	3.8650	3.8722	3.8684	3.8759	3.8722	3.8797	3.8760	3.8835
4	12	3.9100	83.1	3.9198	74.1	3.9100	3.9148	3.9123	3.9173	3.9148	3.9198	3.9173	3.9223
4	16	3.9320	83.8	3.9408	72.9	3.9320	3.9366	3.9344	3.9387	3.9365	3.9408	3.9386	3.9429
4 1/4	4	3.9790	83.4	4.0094	74.1	3.9790	3.9944	3.9869	4.0019	3.9944	4.0094	4.0019	4.0169
4 1/4	8	4.1150	83.1	4.1297	74.1	4.1150	4.1222	4.1184	4.1259	4.1222	4.1297	4.1260	4.1335
4 1/4	12	4.1600	83.1	4.1698	74.1	4.1600	4.1648	4.1623	4.1673	4.1648	4.1698	4.1673	4.1723
4 1/4	16	4.1820	83.8	4.1908	72.9	4.1820	4.1866	4.1844	4.1887	4.1865	4.1908	4.1886	4.1929
4 1/2	4	4.2290	83.4	4.2594	74.1	4.2290	4.2444	4.2369	4.2519	4.2444	4.2594	4.2519	4.2669
4 1/2	8	4.3650	83.1	4.3797	74.1	4.3650	4.3722	4.3684	4.3759	4.3722	4.3797	4.3760	4.3835
4 1/2	12	4.4100	83.1	4.4198	74.1	4.4100	4.4148	4.4123	4.4173	4.4148	4.4198	4.4173	4.4223
4 1/2	16	4.4320	83.8	4.4408	72.9	4.4320	4.4366	4.4344	4.4387	4.4365	4.4408	4.4386	4.4429
4 3/4	8	4.6150	83.1	4.6297	74.1	4.6150	4.6222	4.6184	4.6259	4.6222	4.6297	4.6260	4.6335
4 3/4	12	4.6600	83.1	4.6698	74.1	4.6600	4.6648	4.6623	4.6673	4.6648	4.6698	4.6673	4.6723
4 3/4	16	4.6820	83.8	4.6908	72.9	4.6820	4.6866	4.6844	4.6887	4.6865	4.6908	4.6886	4.6929
5	8	4.8650	83.1	4.8797	74.1	4.8650	4.8722	4.8684	4.8759	4.8722	4.8797	4.8760	4.8835
5	12	4.9100	83.1	4.9198	74.1	4.9100	4.9148	4.9123	4.9173	4.9148	4.9198	4.9173	4.9223
5	16	4.9320	83.8	4.9408	72.9	4.9320	4.9366	4.9344	4.9387	4.9365	4.9408	4.9384	4.9429

See footnotes at end of table.

TABLE 3.2.—*Recommended hole size limits before threading for different lengths of engagement, UNC, UNF, UNEF, UN, UNS, NC, NF, NEF, and N series, class 3B*—Continued

(Based on table IV.11[a])

Designation		Minor diameter, internal threads				Recommended hole size limits for different lengths of engagement							
Thread size	Threads per inch	Minimum	Percent of basic thread height[b]	Maximum[c]	Percent of basic thread height[b]	To and including ⅓ D		Above ⅓ D to ⅔ D		Above ⅔ D to 1½ D		Above 1½ D to 3 D	
						Min	Max	Min	Max	Min	Max	Min	Max
No. in.		*in.*		*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
5¼	8	5.1150	83.1	5.1297	74.1	5.1150	5.1222	5.1184	5.1259	5.1222	5.1297	5.1260	5.1335
5¼	12	5.1600	83.1	5.1698	74.1	5.1600	5.1648	5.1623	5.1673	5.1648	5.1698	5.1673	5.1723
5¼	16	5.1820	83.8	5.1908	72.9	5.1820	5.1866	5.1844	5.1887	5.1865	5.1908	5.1886	5.1929
5½	8	5.3650	83.1	5.3797	74.1	5.3650	5.3722	5.3684	5.3759	5.3722	5.3797	5.3760	5.3835
5½	12	5.4100	83.1	5.4198	74.1	5.4100	5.4148	5.4123	5.4173	5.4148	5.4198	5.4173	5.4223
5½	16	5.4320	83.8	5.4408	72.9	5.4320	5.4366	5.4344	5.4387	5.4365	5.4408	5.4386	5.4429
5¾	8	5.6150	83.1	5.6297	74.1	5.6150	5.6222	5.6184	5.6259	5.6222	5.6297	5.6260	5.6335
5¾	12	5.6600	83.1	5.6698	74.1	5.6600	5.6648	5.6623	5.6673	5.6648	5.6698	5.6673	5.6723
5¾	16	5.6820	83.8	5.6908	72.9	5.6820	5.6866	5.6844	5.6887	5.6865	5.6908	5.6886	5.6929
6	8	5.8650	83.1	5.8797	74.1	5.8650	5.8722	5.8684	5.8759	5.8722	5.8797	5.8760	5.8835
6	12	5.9100	83.1	5.9198	74.1	5.9100	5.9148	5.9123	5.9173	5.9148	5.9198	5.9173	5.9223
6	16	5.9320	83.8	5.9408	72.9	5.9320	5.9366	5.9344	5.9387	5.9365	5.9408	5.9386	5.9420

[a] The differences between limits are equal to the minor-diameter tolerances given in table IV.11 for lengths of engagement to and including ⅓ D. However, the minimum values for lengths of engagements greater than ⅓ D in sizes ¼ in. and larger are adjusted so that the difference between limits is never less than 0.0040 in. For diameter-pitch combinations other than those given in this table, the tolerances given in table IV.11 should be similarly applied to determine hole size limits.

[b] Based on values as rounded off in the preceding column.

[c] Based on a length of engagement equal to the nominal diameter.

TABLE 3.3.—*Recommended hole size limits before threading for different lengths of engagement, National Miniature thread series*

Designation		Minor diameter internal threads				Recommended hole size limits for different lengths of engagement[b]					
Thread designation[a]	Pitch	Minimum	Percent basic thread height	Maximum	Percent basic thread height	To and including ⅔ D		Above ⅔ D to 1½ D		Above 1½ D to 3 D	
						Min.	Max.	Min.	Max.	Min.	Max.
	mm	*mm*		*mm*		*mm*	*mm*	*mm*	*mm*	*mm*	*mm*
30NM	0.080	0.217	100	0.254	54.8	0.226	0.240	0.236	0.254	0.245	0.264
35NM	.090	.256	100	.297	56.4	.267	.282	.277	.297	.287	.307
40NM	.100	.296	100	.340	57.7	.307	.324	.318	.340	.329	.351
45NM	.100	.346	100	.390	57.7	.357	.374	.368	.390	.379	.401
50NM	.125	.370	100	.422	60.0	.383	.402	.396	.422	.409	.435
55NM	.125	.420	100	.472	60.0	.433	.452	.446	.472	.459	.485
60NM	.150	.444	100	.504	61.5	.459	.482	.474	.504	.489	.519
70NM	.175	.518	100	.586	62.6	.535	.560	.552	.586	.569	.603
80NM	.200	.592	100	.668	63.5	.611	.640	.630	.668	.649	.687
90NM	.225	.666	100	.750	64.1	.687	.718	.708	.750	.729	.771
100NM	.250	.740	100	.832	64.6	.763	.798	.786	.832	.809	.855
110NM	.250	.840	100	.932	64.6	.863	.898	.886	.932	.909	.955
120NM	.250	.940	100	1.032	64.6	.963	.998	.986	1.032	1.009	1.055
140NM	.300	1.088	100	1.196	65.4	1.115	1.156	1.142	1.196	1.169	1.223
	Threads per inch	*in.*		*in.*		*in.*	*in.*	*in.*	*in.*	*in.*	*in.*
30NM	318	0.0085	100	0.0100	54.8	0.0089	0.0095	0.0093	0.0100	0.0096	0.0104
35NM	282	.0101	100	.0117	56.4	.0105	.0111	.0109	.0117	.0113	.0121
40NM	254	.0117	100	.0134	57.7	.0121	.0127	.0125	.0134	.0130	.0138
45NM	254	.0136	100	.0154	57.7	.0141	.0147	.0145	.0154	.0149	.0158
50NM	203	.0146	100	.0166	60.0	.0150	.0158	.0156	.0166	.0161	.0171
55NM	203	.0165	100	.0186	60.0	.0170	.0178	.0176	.0186	.0181	.0191
60NM	169	.0175	100	.0198	61.5	.0181	.0190	.0187	.0198	.0193	.0204
70NM	145	.0204	100	.0231	62.6	.0211	.0221	.0217	.0231	.0224	.0237
80NM	127	.0233	100	.0263	63.5	.0241	.0252	.0248	.0263	.0256	.0270
90NM	113	.0262	100	.0295	64.1	.0270	.0283	.0279	.0295	.0287	.0304
100NM	102	.0291	100	.0327	64.6	.0300	.0314	.0309	.0327	.0319	.0337
110NM	102	.0331	100	.0367	64.6	.0340	.0354	.0349	.0367	.0358	.0376
120NM	102	.0370	100	.0406	64.6	.0379	.0393	.0388	.0406	.0397	.0415
140NM	85	.0428	100	.0471	65.4	.0439	.0455	.0450	.0471	.0460	.0481

[a] Sizes shown in italics are preferred. It is recommended that selections be confined to these sizes insofar as possible.

[b] The limits recommended in this table are subject to further exploration. Limited experience with this new standard to date indicates these sizes to be [illegible] machinable materials (brass, nickel-silver, etc.). For materials more difficult to machine, hole size limits in the next larger category are suggested. In the cases where hole sizes in excess of the maximum minor diameter are necessary, the excess is usually recovered in the thread form by the spin-up [illegible] rake with which these small taps must be ground.

APPENDIX 4. WIRE METHODS OF MEASUREMENT OF PITCH DIAMETER OF 60° THREADS

Pitch diameter is defined in section II, p. 4, as follows: "On a straight thread, the pitch diameter is the diameter of the coaxial cylinder, the surface of which would pass through the thread profiles at such points as to make the width of the groove equal to one-half of the basic pitch. On a perfect thread this occurs at the points where the widths of the thread and groove are equal.

"On a taper thread, the pitch diameter at a given position on the thread axis is the diameter of the pitch cone at that position."

The degree of accuracy to which the pitch diameter can be measured will depend on the accuracy of lead, helix, and form of thread. As thread plug gages and thread setting plug gages have highly accurate threads, their pitch diameters may be measured to a correspondingly high degree of accuracy by applying the methods described in this appendix. In turn, the virtual diameters (or effective sizes) of thread ring, snap, and indicating gages may be determined by fitting or comparison with such plug gages.

As most threads of mechanical fasteners and components are made to a lesser degree of accuracy than that of gage threads, their pitch diameters are not susceptible to accurate determination by direct measuring methods. On such threads the pitch diameter is to be regarded as the pitch cylinder or cone which would bound, on the maximum material side, the approximately cylindrical or conical surface which would pass through the thread profiles at all points such that the widths of the thread and groove are equal. Accordingly, the conformity of such threads with specified pitch diameter limits is determined by gaging means and methods specified in section VI.

The accurate measurement of pitch diameter of a thread, which may be perfect as to form and lead, presents certain difficulties which result in some uncertainty as to its true value. The adoption of a standard uniform practice in making such measurements is, therefore, desirable in order to reduce such uncertainty of measurement to a minimum. The so-called "three-wire method" of measuring pitch diameter, as here outlined, has been found to be the most generally satisfactory method when properly carried out, and is recommended for universal use in the direct measurement of thread plug and thread setting plug gages. (See fig. 4.1.)

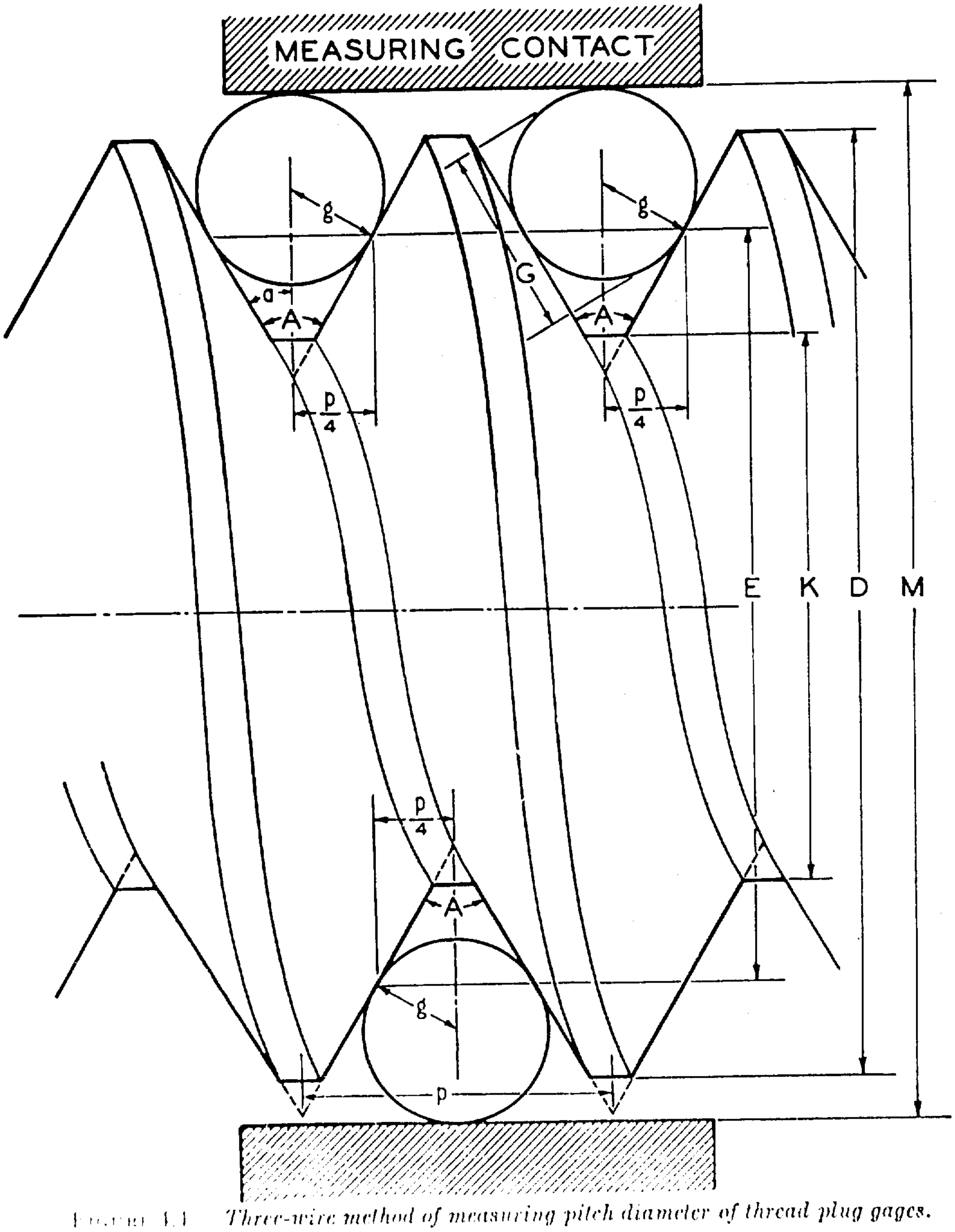


FIGURE 4.1. *Three-wire method of measuring pitch diameter of thread plug gages.*

1. SIZE OF WIRES

In the three-wire method of measuring pitch diameter small hardened steel cylinders or wires of correct size are placed in the thread space, two on one side of the screw and one on the opposite side, as shown in figure 4.1. The contact face of the comparator, measuring machine, or micrometer anvil or spindle over the two wires must be sufficiently large in diameter to touch both wires; that is, the diameter must be greater than the pitch of the thread. It is best to select wires of such a size that they touch the sides of the thread at the midslope, for the reason that the measurement of pitch diameter is least affected by any error in thread angle that may be present when such size is used. The size of wire that touches exactly at the midslope of a perfect thread of a given pitch is termed the "best-size" wire for that pitch. Any size, however, may be used that will permit the wires to rest on the sides of the thread and also project above the crest of the thread.

The depth at which a wire of given diameter will rest in a thread space depends primarily on the pitch and included angle of the thread; and secondarily, on the angle made by the helix, at the point of contact of the wire and the thread, with a plane perpendicular to the axis of the thread. Inasmuch as variation in the lead angle has a very small effect in determining the diameter of the wire that touches at the midslope of the thread, and as it is desirable to use one size of wire to measure all threads of a given pitch and included angle, the best size wire is taken as that size which will touch at the midslope of a groove cut around a cylinder perpendicular to the axis of the cylinder, and of the same angle and depth as the thread of the given pitch. This is equivalent to a thread of zero lead angle. The size of wire touching at the midslope, or "best-size" wire, is given by the formula:

$$G=\frac{p}{2}\sec\alpha$$

in which

G=diameter of wire
p=pitch
α=½ included angle of thread.

This formula reduces to—

$$G=0.57735\times p,\text{ for }60^\circ\text{ threads.}$$

It is frequently desirable, as, for example, when a best-size wire is not available, to measure pitch diameter by means of wires of other than the best size. The minimum size that may be used is limited to that permitting the wire to project above the crest of the thread, and the maximum to that permitting the wire to rest on the sides of the thread just below the crest, and not ride on the crest of the thread. The diameters of the best size, maximum, and minimum wires for Unified and American, American National, hose-coupling, and pipe threads are given in tables 4.1 and 4.2.

2. METHODS OF MEASURING AND USING WIRES

The computed value for the pitch diameter of a screw thread gage obtained from readings over wires will depend upon the accuracy of the measuring instrument used, the contact load, and the value of the diameter of the wires used in the computations. In order to measure the pitch diameter of a screw-thread gage to an accuracy within 0.0001 in. by means of wires, it is necessary to know the wire diameters to 0.00002 in. If the diameters of the wires are known only to an accuracy of 0.0001 in., an accuracy better than 0.0003 in. in the measurement of pitch diameter cannot be expected. Accordingly, it is necessary to use a measuring instrument that reads accurately to 0.00001 in.

Variations in diameter around the wire should be determined by rotating the wire between a measuring contact and an anvil having the form of a V-groove cut on a cylinder. The V-groove may be the thread space in a hardened and well-finished thread plug gage. Variations in diameter along the wire should be determined by measuring between a flat contact and a cylindrical anvil.

A wire presses on the sides of a 60° thread with the load that is applied to the wire by the measuring instrument. This fact would indicate that the diameter of the wire should be determined by readings made on the wire over a hardened and lapped cylinder having a radius equal to the radius of curvature of the helical surface of the thread at the point of contact, using the load to be used in determining the pitch diameter of the gage. However, it is not practical to employ such a variety of cylinders as would be required, and it is recommended for standard practice that diameters of wires be measured between a flat contact and a 0.750-in. hardened and accurately ground and lapped steel cylinder with the load used in measuring the pitch diameter of the gage. The plane of the flat contact should be parallel to the contact element of the cylinder within 0.00001 in.

To avoid a deformation of the material of the wires and gages it is necessary to limit the contact load, and for consistent results a standard practice as to contact load in making wire measurements of hardened screw thread gages is necessary. Such a standard practice is included in the specifications below, and in section VI, p. 109. The use of different contact loads will cause a difference in the readings over the wires, and such errors can be compensated only by the use of a value for the diameter of the wires depending on the contact load used. The effect of variation in contact load in measuring threads of fine pitches is indicated by the difference in readings obtained with 2

TABLE 4.1.—*Wire sizes and constants, Unified and American, American National, hose-coupling, and pipe threads (60°)*

Threads per inch, n	Pitch, $p=\frac{1}{n}$	Pitch/2, $\frac{p}{2}=\frac{1}{2n}$	Depth of V thread, $\frac{\cot 30^\circ}{2n}$	Wire sizes[1]		
				Best, $0.577350p$	Maximum, $1.010363p$	Minimum, $0.505182p$
1	2	3	4	5	6	7
	in.	*in.*	*in.*	*in.*	*in.*	*in.*
80	0.012500	0.00625	0.010825	0.00722	0.01263	0.00631
72	.013889	.00694	.012028	.00802	.01403	.00702
64	.015625	.00781	.013532	.00902	.01579	.00789
56	.017857	.00893	.015465	.01031	.01804	.00902
50	.020000	.01000	.017321	.01155	.02021	.01010
48	.020833	.01042	.018042	.01203	.02105	.01052
44	.022727	.01136	.019682	.01312	.02296	.01148
40	.025000	.01250	.021651	.01443	.02526	.01263
36	.027778	.01389	.024056	.01604	.02807	.01403
32	.031250	.01562	.027063	.01804	.03157	.01579
30	.033333	.01667	.028868	.01925	.03368	.01684
28	.035714	.01786	.030929	.02062	.03608	.01804
27	.037037	.01852	.032075	.02138	.03742	.01871
26	.038462	.01923	.033309	.02221	.03886	.01943
24	.041667	.02083	.036084	.02406	.04210	.02105
22	.045455	.02273	.039365	.02624	.04592	.02296
20	.050000	.02500	.043301	.02887	.05052	.02526
18	.055556	.02778	.048113	.03208	.05613	.02807
16	.062500	.03125	.054127	.03608	.06315	.03157
14	.071429	.03571	.061859	.04124	.07217	.03608
13	.076923	.03846	.066617	.04441	.07772	.03886
12	.083333	.04167	.072169	.04811	.08420	.04210
11½	.086957	.04348	.075307	.05020	.08786	.04393
11	.090909	.04545	.078730	.05249	.09185	.04593
10	.100000	.05000	.086603	.05774	.10104	.05052
9	.111111	.05556	.096225	.06415	.11226	.05613
8	.125000	.06250	.108253	.07217	.12630	.06315
7½	.133333	.06667	.115470	.07698	.13472	.06736
7	.142857	.07143	.123718	.08248	.14434	.07217
6	.166667	.08333	.144338	.09623	.16839	.08420
5½	.181818	.09091	.157459	.10497	.18370	.09185
5	.200000	.10000	.173205	.11547	.20207	.10104
4½	.222222	.11111	.192450	.12830	.22453	.11226
4	.250000	.12500	.216506	.14434	.25259	.12630

[1] These wire sizes are based on zero lead angle. Also maximum and minimum sizes are based on a width of flat at the crest equal to ⅛ × p. The width of flat of American Standard pipe thread gages is slightly less than this, so that the minimum size listed is slightly too small for such gages. In any case the use of wires of either extreme size is to be avoided.

TABLE 4.2. —*Relation of best wire diameters and pitches*[1] *—wires for Unified and American, American National, hose-coupling, and pipe threads (60°)*

Best wire sizes (in inches)	80	72	64	56	50	48	44	40	36	32	30	28	27	26	24	22	20	18	16	14	13	12	11½	11	10	9	8	7½	7	6	5½	5	4½	4
0.00722	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.00802	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.00902	×	×	⊗	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.01031	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.01155	×	×	×	×	⊗	×	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.01203	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.01312	...	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.01443	...	...	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.01604	...	...	...	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.01804	...	...	...	...	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.01924	...	...	...	...	×	×	×	×	×	×	⊗	×	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.02062	...	...	...	...	...	×	×	×	×	×	×	⊗	×	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.02138	...	...	...	...	...	...	×	×	×	×	×	×	⊗	×	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.02221	...	...	...	...	...	...	×	×	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.02406	...	...	...	...	...	...	...	×	×	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.02624	...	...	...	...	...	...	...	...	×	×	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.02887	...	...	...	...	...	...	...	...	...	×	×	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.03208	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.03608	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	×	⊗	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
0.04124	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...	...	...	...
0.04441	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	⊗	×	×	...	...	...	...	...	...	...	...	...	...	...
0.04811	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	⊗	×	×	...	...	...	...	...	...	...	...	...	...
0.05020	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...	...
0.05249	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...	...
0.05774	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...	...
0.06415	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	×	⊗	×	...	...	...	...	...	...	...
0.07217	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	×	⊗	×	...	...	...	...	...	...
0.07698	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	×	×	⊗	×	...	...	...	...	...
0.08248	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	×	×	⊗	...	...	...	...	...
0.09623	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	⊗	×	...	...	...
0.10497	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	⊗	×	...	...
0.11547	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	⊗	×	...
0.12830	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	×	⊗	×
0.14434	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	×	×	×	×	⊗

[1] The crosses (×) indicate those wire diameters which can be used for each pitch. An encircled cross (⊗) indicates the "best wire" diameter for that pitch which heads the column.

and 5 lb loads on a 24-pitch thread plug gage. The reading over the wires with 5 lb load was 0.0001 in. less than with 2 lb load. The common shop practice of holding the wires in contact with the thread by means of elastic bands has a tendency to prevent the wires from adjusting themselves to the proper position in the thread spaces; thus a false measurement is obtained. In some cases it has also been the practice to support the gage being measured on two wires, which are in turn supported on a horizontal surface, and measuring from this surface to the top of a wire placed in a thread over the gage. If the gage is of large diameter, its weight causes a distortion of the wires and an inaccurate reading is obtained. For these reasons these practices should be avoided.

Measurements of a thread plug gage made in accordance with these instructions, with wires that conform to the following specifications, should be accurate to within 0.0001 in.

3. STANDARD SPECIFICATION FOR WIRES AND STANDARD PRACTICE IN MEASUREMENT OF WIRES

The following specifications represent present practice relative to thread measuring wires:

1. COMPOSITION.—The wires shall be accurately finished hardened steel cylinders of the maximum possible hardness without being brittle. The hardness shall not be less than that corresponding to a Knoop indentation number of 630. A wire of this hardness can be cut with a file only with difficulty. The surface shall not be rougher than the equivalent of one measuring 3 microinches average deviation from a true cylindrical surface, as measured with a tracer instrument.

2. CONSTRUCTION.—The working surface shall be at least 1 in. in length. The wire may be provided with a suitable means of suspension.

3. CONTAINER AND MARKING.—A suitable container shall be provided for each set of wires, and the pitch for which the wires are the best size and the diameter of the working part of the wires, as determined by measurements under standard conditions as specified below, shall be marked on the container.

4. DIAMETER OF WIRES.—One set of wires shall consist of three wires that shall have the same diameter within 0.00002 in., and this common diameter shall be within 0.0001 in. of that corresponding to the best size for the pitch for which the wire is to be used. Wires shall be measured between a flat contact and a 0.750-in. hardened and accurately ground and lapped steel cylinder with contact loads as follows: Wires for 60° threads and pitches finer than 20 threads per inch, 1 lb; wires for pitches of 20 threads per inch and coarser, 2½ lb. It is recommended that wires, which are to be used where the contact of the wire is a line contact, be measured between flat, parallel measuring contacts under a 1-lb load.

5. VARIATIONS IN DIAMETER.—Variations in diameter around the wire (roundness) shall not exceed 0.00002 in., as determined by measuring between a measuring contact and a hardened and well-finished 60° V-groove cut on a cylinder. Variations in diameter along the wire (taper), over the ½ in. interval at the center of its length, shall not exceed 0.00002 in., as determined by measuring between a flat contact and a cylindrical contact.

Tests for compliance of thread-measuring wires with the above specifications are made by the National Bureau of Standards for a stated fee.

4. GENERAL FORMULA FOR MEASUREMENT OF PITCH DIAMETER

The general formula for determining the pitch diameter of any thread whose sides are symmetrical with respect to a line drawn through the vertex and perpendicular to the axis of the thread, in which the slight effect of lead angle is taken into account, is

$$E = M_w + \frac{\cot \alpha}{2n} - w[1 + (\operatorname{cosec}^2\alpha + \cot^2\alpha\tan^2\lambda')^{\frac{1}{2}}], \qquad (1)$$

in which

E = pitch diameter
M_w = measurement over wires
α = half angle of thread
n = number of threads per inch $= 1/p$
w = mean diameter of wires
λ' = angle between axis of wire and plane perpendicular to axis of thread.

This formula is a very close approximation, being based on certain assumptions regarding the positions of the points of contact between the wire and the thread.

Formula 1 can be converted to the following simplified form, which is particularly useful when measuring threads of large lead angle:

$$E = M_w + \frac{\cot \alpha}{2n} - w(1 + \operatorname{cosec}\alpha'), \qquad (2)$$

in which α' = the angle whose tangent $= \tan \alpha \cos \lambda'$.

When formula 1 is used, the usual practice is to expand the square root term as a series, retaining only the first and second terms, which gives the following:

$$E = M_w + \frac{\cot \alpha}{2n} - w\left(1 + \operatorname{cosec} \alpha + \frac{\tan^2 \lambda' \cos \alpha \cot \alpha}{2}\right). \qquad (3)$$

For large lead angles it is necessary to measure the wire angle, λ', but for lead angles of 5° or less, if the "best-size" wire is used, this angle may be assumed to be equal to the lead angle of the thread at the pitch line, λ. The value of $\tan \lambda$, the tangent of the lead angle, is given by the formula

$$\tan \lambda = \frac{l}{3.1416E} = \frac{1}{3.1416NE},$$

in which

l = lead
N = number of turns per inch
E = nominal pitch diameter, or an approximation of the measured pitch diameter.

5. MEASUREMENT OF PITCH DIAMETER OF UNIFIED, AMERICAN, AND AMERICAN NATIONAL STRAIGHT THREADS

For threads of the Unified, American, and American National coarse, fine, extra-fine, 8-, 12-, and 16-thread series, the term

$$\frac{w \tan^2 \lambda' \cos \alpha \cot \alpha}{2}$$

is neglected, as its value is small, being in all cases less than 0.00015 in. for standard fastening screws when the best-size wire is used, and the above formula 3 takes the simplified form

$$E = M_w + \frac{\cot \alpha}{2n} - w\ (1 + \operatorname{cosec} \alpha). \qquad (4)$$

The practice is permissible provided that it is uniformly followed, and in order to maintain uniformity of practice, and thus avoid confusion, the National Bureau of Standards uses formula 4 for such threads. The Bureau also uses formula 4 for special 60° threads, except when the value of the term

$$\left(\frac{w \tan^2 \lambda' \cos \alpha \cot \alpha}{2}\right)$$

exceeds 0.00015 in., as in the case of multiple threads, or other threads having exceptionally large lead angles. For 60° threads this term exceeds 0.00015 when $NE\sqrt{n}$ is less than 17.1.

For a 60° thread of correct angle and thread form the formula 4 simplifies to

$$E = M_w + \frac{0.86603}{n} - 3w. \qquad (5)$$

For a given set of best-size wires

$$E = M_w - C$$

when

$$C = w\ (1 + \operatorname{cosec} \alpha) - \frac{\cot \alpha}{2n}.$$

The quantity C is a constant for a given thread angle, and, when the wires are used for measuring threads of the pitch and angle for which they are the best size, the pitch diameter is obtained by the simple operation of subtracting this constant from the measurement taken over the wires. In fact, when best-size wires are used, this constant is changed very little by a moderate deviation or error in the angle of the thread. Consequently, the constants for the various sets of wires in use may be tabulated, thus saving a considerable amount of time in the inspection of gages. However, when wires of other than the best size are used, this constant changes appreciably with a deviation in the angle of the thread.

It has been shown that, with the exception of coarse pitch screws, variation in angle from the basic size causes no appreciable change in the quantity C for the best-size wires. On the other hand, when a wire near the maximum or minimum allowable size is used, a considerable change occurs, and the values of the cotangent and cosecant of the actual measured half angle are to be used. It is apparent, therefore, that there is a great advantage in using wires very closely approximating the best size. For convenience in carrying out computations, the values of $\cot \alpha/2n$ for standard pitches are given in table 4.1, p. 195.

6. MEASUREMENT OF PITCH DIAMETER OF AMERICAN STANDARD TAPER THREADS

The pitch diameter of a taper thread plug gage is measured in much the same manner as that of a straight thread gage, except that a definite position at which the measurement is to be made must be located. A point at a known distance L from the reference end of the gage is located by means of a combination of precision gage blocks and the cone point furnished as an accessory with these blocks, as shown in the inset in figure 4.2. The gage is set vertically on a surface plate, the cone point is placed with its axis horizontal at the desired height, and the plug is turned until the point fits accurately into the thread. The position of this point is marked carefully with a pencil or a bit of prussian blue.

(a) TWO-WIRE METHOD.—Assuming that the measurement is to be made with a horizontal comparator, the gage is set in the comparator with its axis vertical, that *is*, the line of measurement and the thread axis are perpendicular to each other. The measurement is made with two wires, as shown in figure 4.2, one of which is placed in the thread to make contact at the same axial section of the thread as was touched by the cone point. This wire is designated the fixed wire. The second wire is placed in the thread space, on the the opposite side of the gage, which is next above the fixed wire, and the measurement over the wires is made. The second wire is then placed in the thread space next below the fixed wire, and a second measurement is made. The average of these two measurements is M_w, the measurement over the wires at the position of the fixed wire.

The general formula for a taper thread, corresponding to formula 3 is

$$E = M_w + \frac{\cot \alpha - \tan^2 \beta \tan \alpha}{2n}$$
$$- w\left(1 + \operatorname{cosec} \alpha + \frac{\tan^2 \lambda' \cos \alpha \cot \alpha}{2}\right), \qquad (6)$$

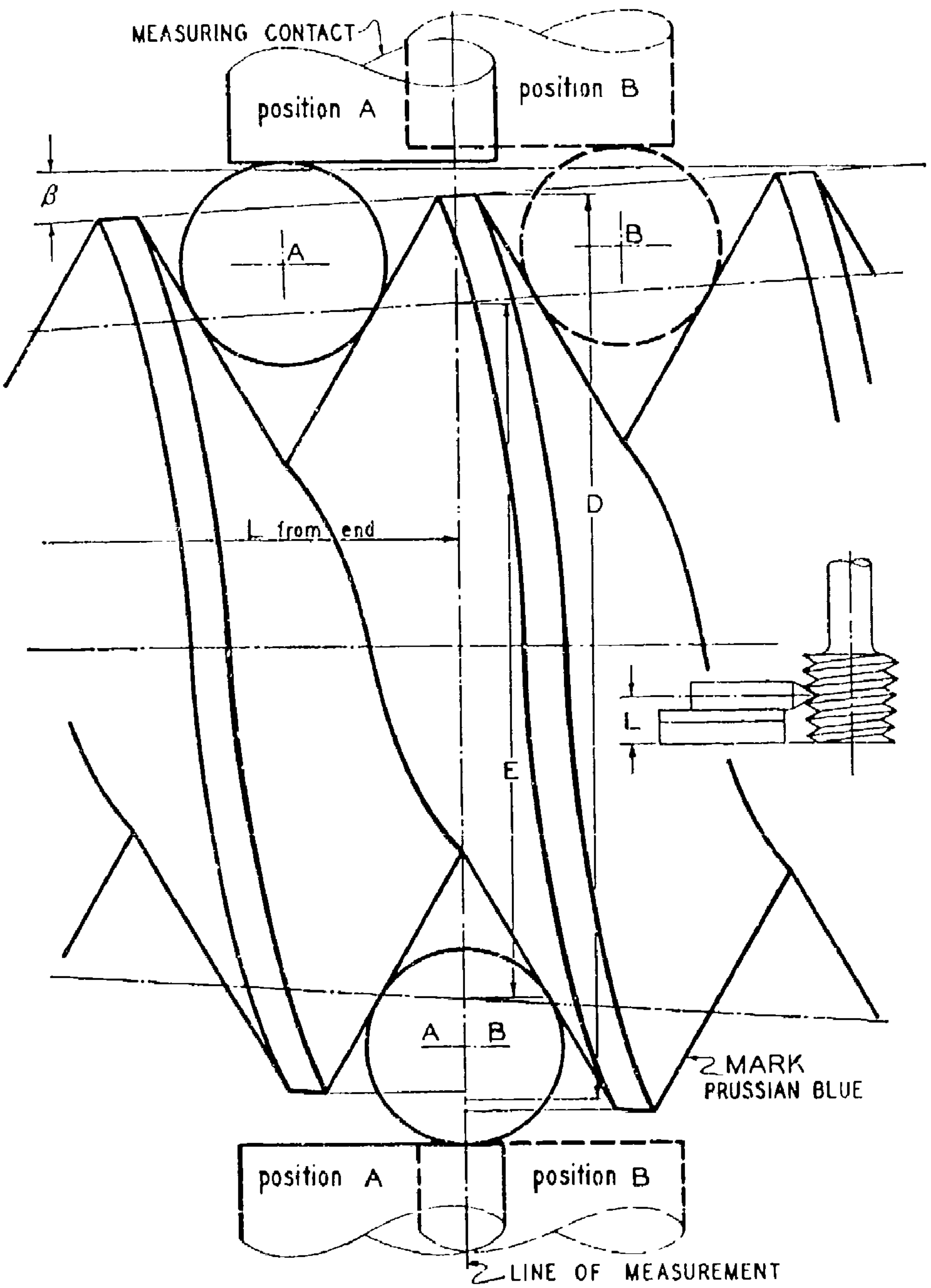

MEASURING CONTACT
position A
position B
β
A
B
D
L from end
E
L
A
B
MARK
PRUSSIAN BLUE
position A
position B
LINE OF MEASUREMENT

FIGURE 4.2.—*Measurement of pitch diameter of taper thread gages by the 2-wire method.*

in which

E = pitch diameter
M_w = measurement over wires
β = half angle of taper of thread
n = number of threads per inch = $1/p$
α = half angle of thread
w = mean diameter of wires
λ' = wire angle.

The term

$$\frac{\cot \alpha - \tan^2 \beta \tan \alpha}{2n}$$

is the exact value of the depth of the fundamental triangle of a taper thread, which is less than that of the same-pitch thread cut on a cylinder. For steep-tapered thread gages, having an included taper larger than ¾ in./ft this more accurate term should be applied. For such a thread, which has a small lead angle, formula 6 takes the form

$$E = M_w + \frac{\cot \alpha - \tan^2 \beta \tan \alpha}{2n} - w(1 + \operatorname{cosec} \alpha) \tag{7}$$

Otherwise, as for American standard taper pipe threads having an included taper of ¾ in./ft, the simplified formula 5

$$E = M_w + \frac{0.86603}{n} - 3w$$

for 60° threads may be used. This simplified formula gives a value of E that is 0.00005 in. larger than that given by the above general formula 6 for the 2½ in.-8 American Standard taper pipe thread, the worst case in this thread series.

The pitch diameter at any other point along the thread, as at the gaging notch, is obtained by multiplying the distance parallel to the axis of the thread, between this point and the point at which the measurement was taken, by the taper per inch, then adding the product to or subtracting it from the measured pitch diameter according to the direction in which the second point is located with respect to the first.

2. Three-Wire Method.—Depending on the measuring facilities available or other circumstances, it is sometimes more convenient to use three wires. In such cases measurement is made in the usual manner, but care must be taken that the measuring contacts touch all three wires, as the line of measurement is not perpendicular to the axis of the screw when there is proper contact (see fig. 4.3).

On account of this inclination, the measured distance between the axes of the wires must be multiplied by the secant of the half angle of the taper of the thread. The formula for the pitch diameter of any taper thread plug gage, the threads of which are symmetrical with respect to a line perpendicular to the axis, then has the form corresponding to formula 4:

$$E=(M_w-w)\sec\beta+\frac{\cot\alpha}{2n}-w\operatorname{cosec}\alpha, \tag{8}$$

in which β = half-angle of taper of thread. Thus the pitch diameter of an American Standard pipe-thread gage having correct angle (60°) and taper (¾ in./ft.) is then given by the formula

$$E=1.00049(M_w-w)+0.86603\,p-2w. \tag{9}$$

An adaption of the three-wire method is frequently used to reduce the time required when the pitch diameter of a

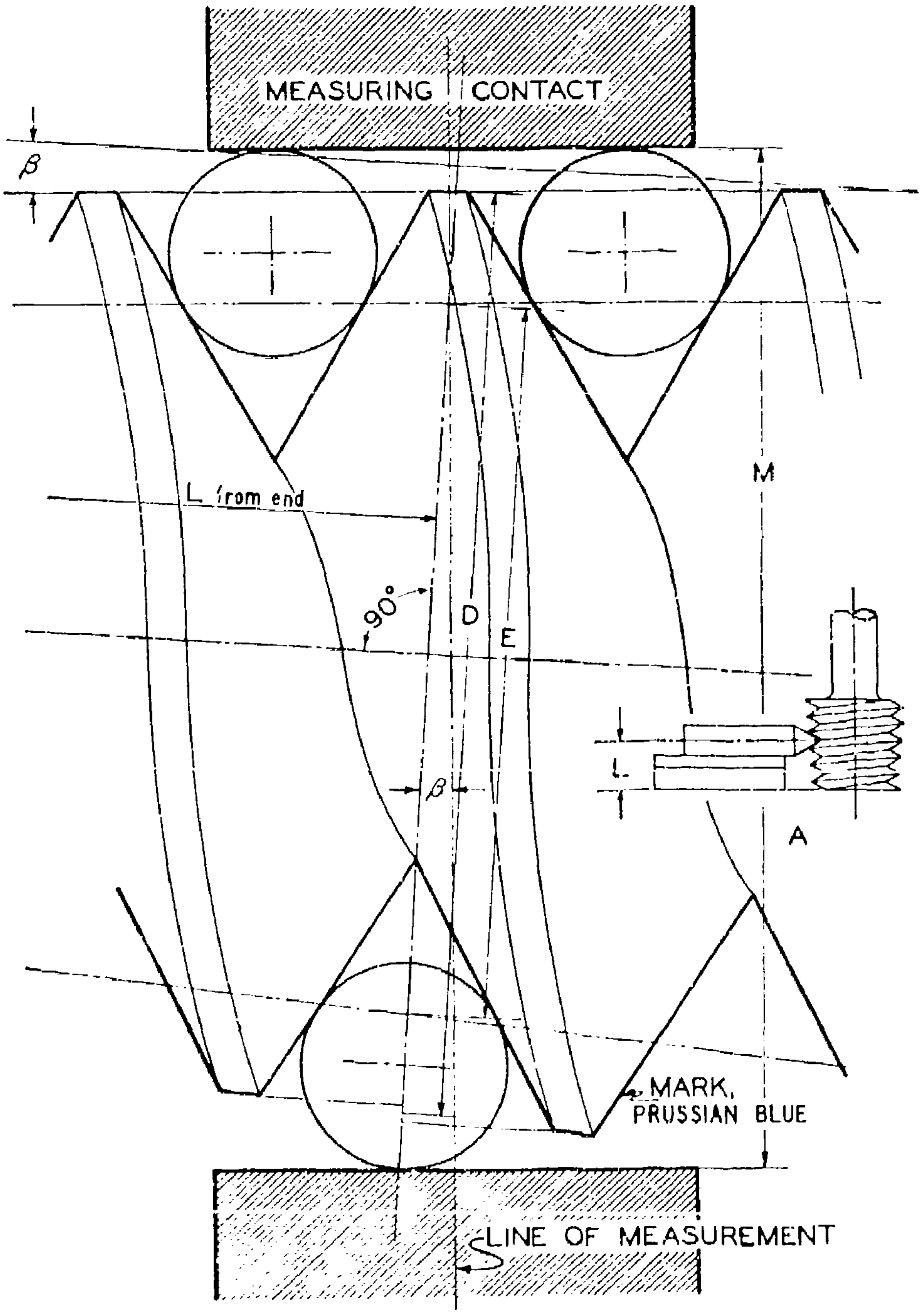


Figure 4.3.—*Measurement of pitch diameter of taper thread gages by the 3-wire method*

number of gages of the same size is to be measured. Only light gages, up to about 2 in., can be measured accurately by this method. The gage is supported on two wires placed several threads apart, which are in turn supported on a taper thread testing fixture. The third wire is placed in the threads at the top of the gage and measurement is made from the top of this wire to the bottom of the fixture with a vertical comparator having a flat anvil, using a gage block combination as the standard. The fixture consists of a block, the upper surface of which is at an angle to the base plane equal to the nominal angle of taper of the thread, 2β. Thus the element of the cone at the top of the thread gage is made parallel to the base of the instrument. The direction of measurement is not perpendicular to the axis of the gage but at an angle, β, from perpendicularity. A stop is provided at the thick end of the block with respect to which the gage is positioned on the fixture. As the plane of the end of the gage may not be perpendicular to the axis, a roll approximately equal to the diameter of the gage should be inserted between the stop and the gage to assure contact at the axis of the gage. For a given fixture and roll, a constant is computed which, when subtracted from the measured distance from the top of the upper wire to the base plane, gives M corresponding to the pitch diameter, E_0, at the small end of the gage. E_0 is then determined by applying formula 8 or 9.

3. Four-Wire Method.—A four-wire method of measurement that yields measurements of the pitch diameter, E_0, at the small end of the gage, and the half-angle of taper, β, is also sometimes used. This method is illustrated in figure 4.4 and requires four thread wires of equal diameter, a pair of gage blocks of equal thickness, and two pairs of rolls of different diameters, the rolls of each pair being equal in diameter. Two measurements, M_1 and M_2, are made over the rolls and formulas are applied as follows:

$$\cot \frac{90-\beta}{2}=\frac{M_2-M_1+d_1-d_2}{d_2-d_1}, \tag{10}$$

$$M_u=M_2-d_2\left(1+\cot \frac{90^\circ-\beta}{2}\right)-2g \sec \beta, \tag{11}$$

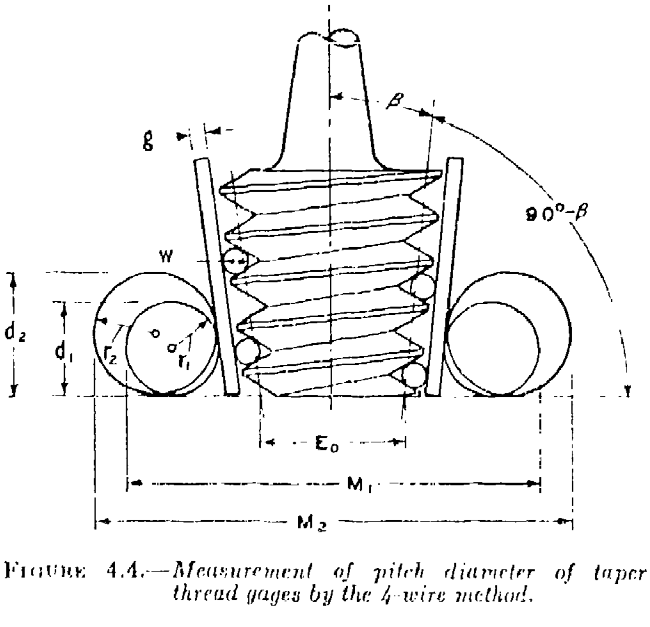


Figure 4.4.—*Measurement of pitch diameter of taper thread gages by the 4-wire method.*

in which

M_2 = measurement over larger rolls
M_1 = measurement over smaller rolls
d_2 = diameter of larger rolls
d_1 = diameter of smaller rolls
β = actual half-angle of taper of thread
g = thickness of each gage block.

To determine E_0, the pitch diameter at the small end of the gage, M_u, as determined from formula 11, is substituted in formula 6 or 7.

The errors of measurement by this method may be slightly but not significantly larger than by the other methods described, on account of elastic deformations of the rolls and gage blocks under the measuring load, and differing conditions of loading of the thread wires.

7. MEASUREMENT OF PITCH DIAMETER OF THREAD RING GAGES

The application of direct methods of measurement to determine the pitch diameter of thread ring gages presents serious difficulties, particularly in securing proper contact load when a high degree of precision is required. The usual practice is to fit the ring gage to a threaded setting plug. When the thread ring gage is of correct lead, angle, and thread form, within close limits, this method is satisfactory and represents standard American practice. It is the only method available for small sizes of threads. For the larger sizes, various more or less satisfactory methods have been devised, but none of these have found wide application.

APPENDIX 5. DESIGN OF SPECIAL THREADS

1. GENERAL

In general, any given problem in thread design may be susceptible to several more or less satisfactory solutions based on the preliminary selection of certain elements of the design and the proper adjustment of the other elements. In other words, thread design is to a large extent empirical and is partially based on previous experience with similar designs and the judgment of the designer. Accordingly, it is not practicable to present a definite system of approach to the design of a threaded assembly but merely to present a discussion of various design factors.

The interrelation of length of engagement, minimum major diameter of the external thread, maximum minor diameter of the internal thread, and the strength of the assembled thread needs to be understood and carefully considered in order to produce the optimum design of a special thread. It is not economical to use either a length of thread engagement which is longer than required or shorter than that which will develop the full strength of the externally threaded member. Other factors, such as control of tap breakage, proper seating of a threaded part on a shoulder, the prevention of cross threading, conditions of loading when the assembled parts are not concentric, and possible collapse of a hollow externally threaded member, require careful analysis and adjustment of the design with respect to selection of the diameter-pitch combination, the class of thread, length of engagement, and major and minor diameter tolerances.

In redesigning threads from American National to Unified standards, it should be remembered that exact correspondence between the old and new class numbers does not exist. For most, but not all, diameter-pitch combinations, the combined tolerances and allowances of the Unified classes are somewhat larger than American National classes of corresponding number. Recommended procedure is to convert the thread to the corresponding class of Unified thread, compare the new major, pitch, and minor diameter tolerances with the old tolerances, and then give careful consideration to the desirability of the new limits of size.

Taking, for example, the conversion of a class 1 thread to classes 1A and 1B: Under ordinary conditions where the thread is being used only as a simple fastener and the length of engagement is normal, such substitution may be made. If, for any reason, the previously specified tolerances may not be exceeded, it may be necessary to specify class 2A or 2B or both. Also, if the thread must carry a high axial stress or if concentricity of the two mating parts is a factor, the conversion should be from class 1 to classes 2A and 2B.

A close fitting thread assembly under some conditions may fail, whereas the cause of failure may be eliminated by providing a looser fit. A cap screw that seats only on one side of the bearing surface under the head may break off when the screw is tightened. When a screw has a large bearing surface under the head or when the head must be square with a projecting pin, sufficient pitch diameter clearance must be provided to allow for any out-of-squareness of the screw axis with the bearing surface under the head. Thus, as large a pitch diameter tolerance as possible, together with providing proper tolerances on squareness of face with the thread axis where seating is required, may avoid the necessity for specifying a heat treated bolt.

2. ECCENTRICITY OF ASSEMBLY AND CROSS THREADING

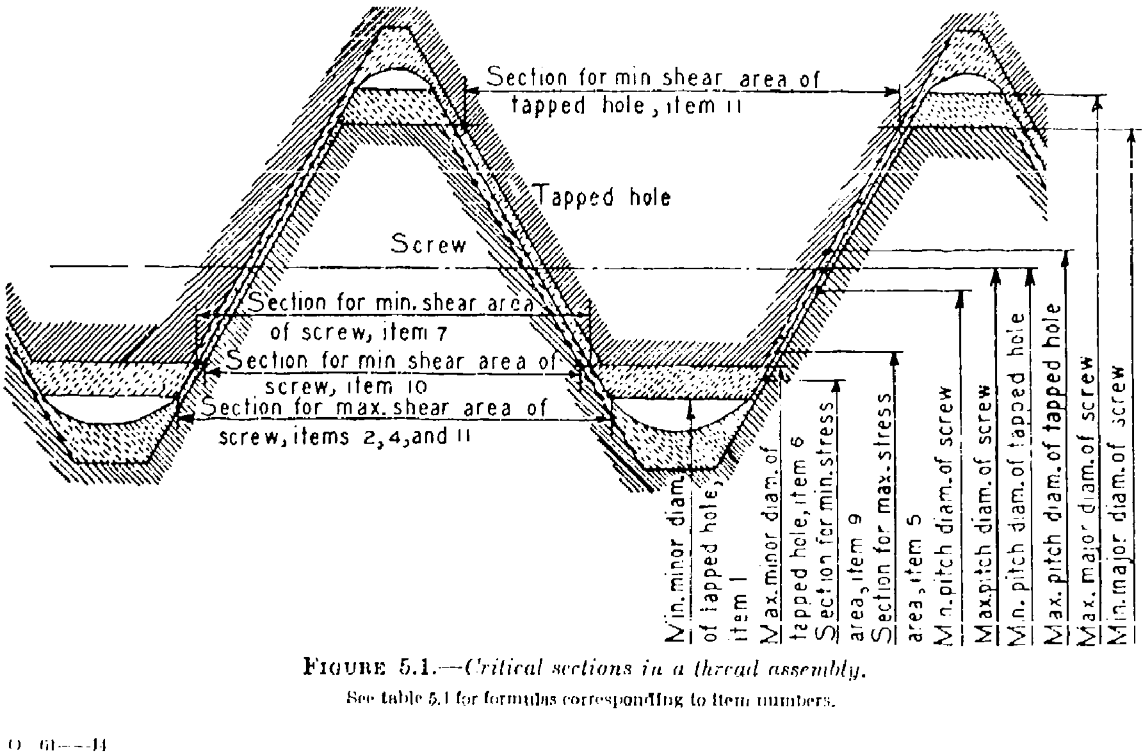
In assembly and use, the combined tolerances and allowances on both mating parts should not allow threads to disengage on one side when assembly is eccentric. The axis of the internal thread can be displaced radially from coincidence with the axis of the external thread by an amount equal to the sum of the pitch diameter tolerances and the allowance. This radial displacement may be sufficient so that the flank contact is entirely on one side and on the opposite side the crest of the external thread will be in line with the crest of the internal thread with the following results when the screw is constrained in such a position in a tapped hole: (1) There will be danger of crossing the threads in starting, and (2) the screw may pull out of the hole when tension is exerted in this constrained position. The minimum amount of overlap is arbitrary and controversial, but the following general rule can be used in lieu of more specific data:

As the first step to assure the minimum safe overlap on both sides when the assembly is concentric, the difference between the minimum major diameter of the external thread and the maximum minor diameter of the internal thread should not be less than twice the addendum of the external thread ($\frac{3}{4}$ *H*, table III. 1, p. 12). (Otherwise stated, the sum of the major-diameter tolerance and allowance, if any, of the external thread and the minor-diameter tolerance of the internal thread should not be greater than 4/3 the addendum of the external thread, *H*/2, table III. 1. This provides for a minimum of 50 percent thread engagement. As the second step, to assure the minimum safe overlap on one side when the assembly is eccentric, the difference between the maximum pitch diameter of the internal thread and the minimum pitch diameter of the external thread should not be greater than twice the addendum of the external thread ($\frac{3}{4}$ *H*, table III. 1). Otherwise stated, the sum of the pitch-diameter tolerances of both threads and the allowance, if any, should not be greater than twice the addendum of the external thread, $\frac{3}{4}$ *H*, table III. 1). This provides for an eccentric assembly condition equal to the addendum of external thread ($\frac{3}{8}$ *H*, table III. 1) and zero minimum overlap on one side. If the results from the limits of size selected violate the above rules, the tolerances should be reduced by using a closer class of tolerance, assuming tolerances consistent with manufacturing possibility, or a coarser pitch should be used to increase the amount of overlap. The major-diameter tolerance of the external thread or minor-diameter tolerance of the internal thread should not be less than the pitch-diameter tolerance of the respective thread to maintain thread form.

It should be noted that, if the tolerance on the minor diameter of the internal thread must necessarily be large, the major diameter of the external thread must be held close to the maximum major diameter and vice versa.

3. STRENGTH FACTORS

1. Critical Areas.—The critical areas of mating threads, as related to the tensile strength of the thread assembly, are: The effective cross-sectional area, or stress area, of the external thread, (2) the shear area of the external thread that depends principally on the minor diameter of the tapped hole, and (3) the shear area of the internal thread that depends principally on the major diameter of the external thread. The formulas for tensile stress area and thread shear area are given in section II, p. 5, and these areas are indicated in figure 5.1.



Section for min shear area of tapped hole, item 11
Tapped hole
Screw
Section for min. shear area of screw, item 7
Section for min shear area of screw, item 10
Section for max. shear area of screw, items 2, 4, and 11
Min. minor diam. of tapped hole, item 1
Max. minor diam. of tapped hole, item 6
Section for min. stress area, item 9
Section for max. stress area, item 5
Min. pitch diam. of screw
Max. pitch diam. of screw
Min. pitch diam. of tapped hole
Max. pitch diam. of tapped hole
Max. major diam. of screw
Min. major diam. of screw

Figure 5.1.—*Critical sections in a thread assembly.*

See table 5.1 for formulas corresponding to item numbers.

If failure of a thread assembly should occur it is desirable that the external thread (screw) will break rather than that either the external or internal thread will strip. In other words, the length of thread engagement shall be sufficient to develop the full strength of the screw. Thus, the length of internal thread and the dimensions of this thread, particularly its minor diameter, should be such that, taking into account a possible difference in strength of material of the internal and external threads, the threaded portion of the external thread will break before either the external or internal threads strip.

2. LENGTH OF THREAD ENGAGEMENT.—The length of engagement of a threaded unit, which will develop maximum strength of assembled threads with external and internal threads manufactured of materials of equal tensile strength, is computed from the following formula:

$$L_e=\frac{2\times\text{stress area}}{3.1416nK_n\ \max\left[\frac{1}{2n}+0.57735(E_s\ \min-K_n\ \max)\right]}$$

The factor 2 used in the numerator of this formula means that it is assumed that the area in shear must be twice the tensile stress area to develop the full strength of the screw. This assumption is based on experiments made by the National Bureau of Standards in 1929, in which it was found that for hot-rolled and cold-rolled steel, and brass screws and nuts, this factor varied from 1.7 to 2.0. Taking the factor as 2 provides in general a small factor of safety against stripping of the threads.

To facilitate the application of this formula various notations, constants, and formulas applicable to the determination of the relation of critical areas to thread dimensions are given in table 5.1 and are discussed below.

(*a*) *Length of engagement determined by shear area of external thread.*—Formula 8, table 5.1, gives the length of engagement required to develop the full strength of the screw when the strength of the material in which the hole is tapped is the same as, or slightly less than, the strength of the material of the screw. The value of L_e thus obtained is sufficient for a permanently-fastened connection. If, however, the screw is an adjusting or lead screw, or if the connection will be frequently unscrewed, L_e should be increased to allow for the expected wear on the flanks of the threads during the useful life of the components.

For tapped holes in sheet metal, the maximum size of the screw to be specified should be such that the thickness of sheet equals the L_e required to develop full strength. In order to use the largest possible screw, it is necessary that the tolerance, T_{K_n}, on the minor diameter of the hole should be the practical minimum. If it should prove to be impracticable to reduce the minor diameter tolerance to such a value, it may be necessary to decrease the minimum minor diameter of the internal thread and to increase the minor diameter tolerance by the same amount. If this is done, the maximum minor diameter of the screw must be reduced by the same amount to prevent interference, and the minor diameter of the "go" thread ring gage must likewise be decreased, as this is the only control of the minor diameter of the screw. In all such cases, where dimensions are altered from those calculated according to the standard, the method of designation for modified threads, stated in section III, p. 26, should be followed.

(*b*) *Length of engagement determined by shear area of internal thread.*—The ratio of the area in shear in the screw and the area in shear in the tapped hole is given by formula 12, table 5.1. This ratio, R_1, will usually be less than 1 and the strength of the material of the tapped hole can be less than the strength of the material of the screw by this ratio with no indicated increase in

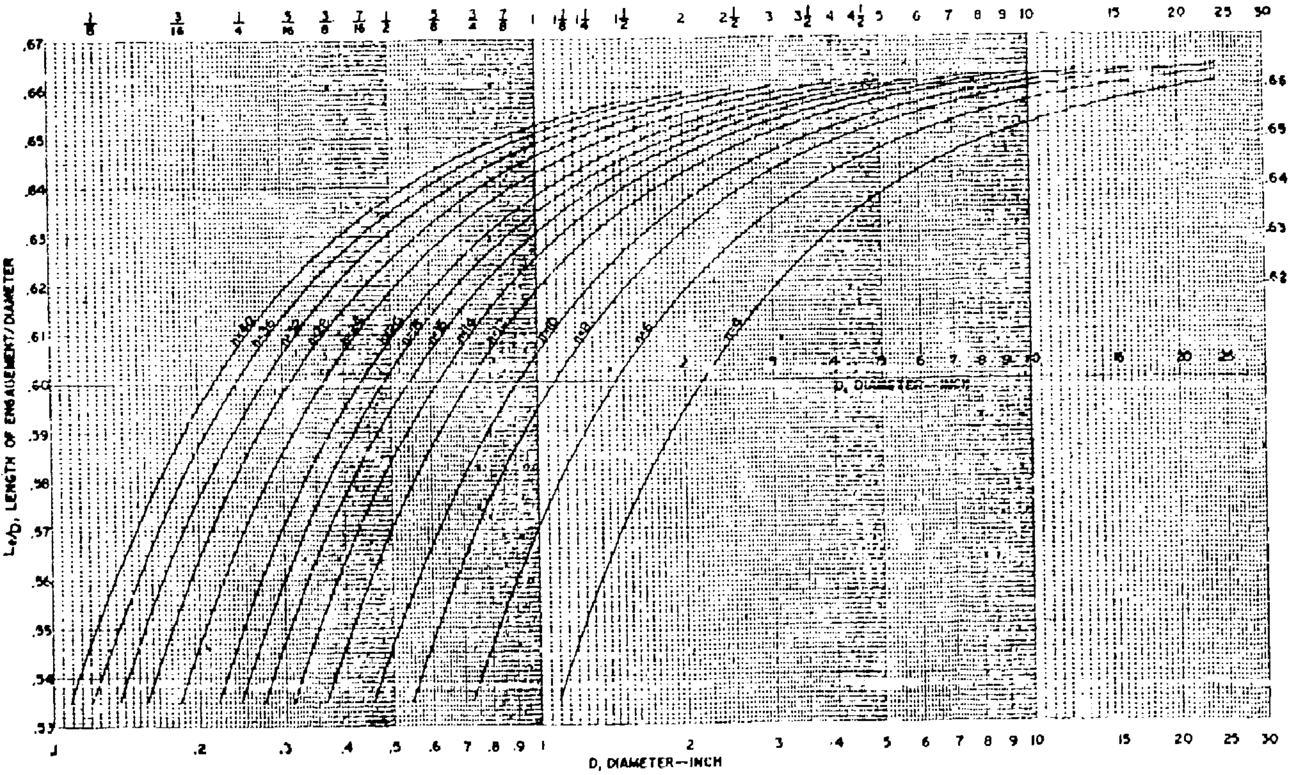


FIGURE 5.2.—*Chart for determining minimum length of thread engagement.*

L_e by formula 8. If, however, the ratio

$$R_2=\frac{\text{tensile strength of the material of the tapped hole}}{\text{tensile strength of the material of the screw}}$$

is less than R_1, then L_e should be multiplied by R_1/R_2 to provide sufficient length of thread to prevent stripping of the threads in the tapped hole.

For retaining collars on shafts where the expected axial force resisted by the collar is appreciably less than the tensile force that the shaft itself is capable of resisting, L_e need only be long enough to withstand the expected axial force on the collar. If F_c is the axial force to be carried by the collar and *uts* is the tensile strength of the material of the shaft in pounds per square inch, then the length of thread engagement required on the shaft is equal to $2F_c/(uts\times S_s \text{ min})$, where S_s min is given by formula 7, when the strength of material of the collar is the same or slightly less than the strength of material of the shaft. Ratios R_1 and R_2 should be computed as previously explained to determine whether or not a greater length is required to prevent stripping of the threads in the collar.

(*c*) *Hollow externally threaded parts.*—For screws with through axial holes, the length of engagement required is of course less than if the screw is solid. For this condition, formula 8 becomes

$$L_e \text{ max}=\frac{2(A_s \text{ max}-A_n \text{ max})}{S_s \text{ min per inch}},$$

where A_n is the cross-sectional area of the hole.

However, as the wall thickness of either or both the internal and external members becomes thin, the tendency of the external member to enlarge and the internal member to neck down in the thread means that an L_e greater than given by the above formula must be used, also that the tolerances on minor diameter of the internal thread and major diameter of the external thread, T_{K_n} and T_{D_s}, must be small to obtain the maximum practicable depth of thread engagement. For components having threads on thin-wall tubing, tests under actual working conditions should be made to determine proper selection of wall thicknesses, length of engagement, and pitch of thread.

TABLE 5.1.—*Data for determining strength factors in special thread design*

NOTATION

D = basic major diameter.
D_s = major diameter of external thread.
K_n = minor diameter of internal thread.
T_{K_n} = tolerance on minor diameter of internal thread.
T_{E_s} = tolerance on pitch diameter of external thread.

G = allowance on all diameters of external thread.
L_e = length of thread engagement.
A_s = stress area of external thread.
S_s = area in shear on external thread in line with K_n.
S_n = area in shear in internal thread in line with D_s.

CONSTANTS

$C_1=\frac{3}{4}\pi=2{,}356$	Threads per inch, n														
	40	36	32	28	27	24	20	18	16	14	12	10	8	6	4
$C_2=\frac{5}{8}\frac{\cot 30^\circ}{n}=\frac{1.08253}{n}=$	0.0271	0.0301	0.0338	0.0387	0.0401	0.0451	0.0541	0.0601	0.0677	0.0773	0.0902	0.1083	0.1353	0.1804	0.02706
$C_3=\frac{9}{16}\frac{\cot 30^\circ}{n}=\frac{0.974279}{n}=$	.0241	.0271	.0304	.0348	.0361	.0406	.0487	.0541	.0609	.0696	.0812	.0974	.1218	.1624	.2436
$C_4=n\tan 30^\circ=0.57735n=$	23.09	20.78	18.48	16.17	15.59	13.86	11.55	10.39	9.328	8.083	6.928	5.774	4.619	3.464	2.309
$C_5=\pi n\tan 30^\circ=1.8138n=$	72.55	65.30	58.04	50.79	48.97	43.53	36.25	32.65	29.02	25.39	21.76	18.14	14.51	10.88	7.255

FORMULAS

MAXIMUM MATERIAL FOR BOTH EXTERNAL AND INTERNAL THREADS

Item

1. $K_n \text{ min}=D-C_2$.
2. Max area in shear of external thread per inch $=S_s$ max per inch $=C_1K_n$ min.
3. Min length of thread engagement, $L_e \text{ min}=\frac{L_e}{D}\times D_s$ max, with $\frac{L_e}{D}$ taken from graph, figure 5.2.
4. Area in shear of external thread in length L_e min $=S_s$ max per inch $\times L_e$ min (= item 2 × item 3).
5. Max stress area of external thread $=A_s \text{ max}=\frac{S_s \text{ max per inch}\times L_e \text{ min}}{2}\left(=\frac{1}{2}\text{ item 4}\right)=\frac{C_1K_n \text{ min}\times\frac{L_e}{D}\times D_s \text{ max}}{2}$.

MAXIMUM MATERIAL EXTERNAL THREAD, K_n MAXIMUM

6. $K_n \text{ max}=K_n \text{ min}+T_{K_n}$.
7. Min area in shear of external thread per inch $=S_s$ min per inch $=K_n \text{ max }(C_1-C_5\,T_{K_n})$.
8. L_e required to develop full strength of external thread for T_{K_n} selected $=\frac{2\,A_s \text{ max}}{S_s \text{ min per inch}}=\left(\frac{2\times\text{item 5}}{\text{item 7}}\right)$ or $\left(\frac{\text{item 4}}{\text{item 7}}\right)$.

MINIMUM MATERIAL FOR BOTH EXTERNAL AND INTERNAL THREADS

9. Min stress area of external thread $=A_s \text{ min}=0.7854\,[D-C_3-(T_{E_s}+G)]^2$.
10. Min area in shear of external thread in length $L_e=S_s \text{ min}=K_n \text{ max }[C_1-C_5\,(T_{K_n}+T_{E_s}+G)]\,L_e$, or $=\pi K_n \text{ max }[0.75-C_4\,(T_{K_n}+T_{E_s}+G)]\,L_e$.
11. Min area in shear of internal thread in length $L_e=S_n \text{ min}=\pi D_s \text{ min }[0.875-C_4\,(T_{D_s}+T_{E_n}+G)]\,L_e$.

MINIMUM TAPPED HOLE, D_s MINIMUM, WHEN TAPPED MATERIAL IS WEAKER THAN SCREW MATERIAL

12. $R_1=\frac{\text{area in shear of screw in length } L_e}{\text{area in shear of tapped hole in length } L_e}=\left(\frac{\text{item 4}}{\text{item 11}}\right)=\frac{0.75\,K_n \text{ min}}{D_s \text{ min }[0.875-C_4\,(T_{D_s}+T_{E_n}+G)]}$.
13. $R_2=\frac{\text{ultimate tensile strength of tapped material}}{\text{ultimate tensile strength of screw material}}$.
14. If $R_2<R_1$, then L_e required $=L_e$ for T_{K_n} selected $\times\frac{R_1}{R_2}=\left(\frac{\text{item 8}\times\text{item 12}}{\text{item 13}}\right)$.

4. THREAD PROPORTIONS IN RELATION TO TAPPING

In the production of threads it is considered impractical to tap a thread unless its diameter is greater than six times the basic thread height; therefore, when the ratio of D to H is less than 4.5, the use of a larger diameter, a finer pitch of thread, or both, should be considered.

The size of K_n is a factor in controlling tap breakage. Tap breakage is infrequent if the diameter of the tap is over ½ in. or if the length of thread to be tapped is less than ½D. For sizes less than ½ in. and length of thread over ½D, tap breakage can be minimized by use of a large K_n, that is T_{K_n} maximum. However, this means that L_e may have to be increased to develop the full strength of the screw.

5. EXAMPLES OF THREAD DESIGN

The design of special threads for particular purposes is illustrated by the following examples:

Example: A gun barrel is subjected to an internal explosive pressure that produces a tensile stress in the threaded end. The length of engagement of the threads should be sufficient to produce a minimum area in shear on the threads of the screw in line with the minor diameter of the tapped hole threads equal to twice the maximum stress area of the threaded portion of the barrel.

Assume that the thread on the barrel is 1.5-8N-2A and the minimum internal diameter of the barrel at the threaded end is 0.792 in.

In table III.10 will be found the following maximum dimensions of the external thread:

$$D_s \text{ max}=1.4978 \text{ in.}$$

$$E_s \text{ max}=1.4166 \text{ in.}$$

$$K_s \text{ max}=1.3441 \text{ in.}$$

From table III.10, K_n min$=1.365$ in. If we select the tolerance for minor diameter of hole $T_{K_n}=0.0250$ in., K_n max will equal $1.365+0.025=1.390$, which will permit the use of a 1⅜ (1.375)-in. tap drill.

The minimum area in shear per inch can be computed, using formula 7, table 5.1:

$$\begin{aligned} S_s \text{ min} &= K_n \text{ max } (C_1-C_6T_{K_n}) \\ &= 1.390\ (2.356-14.51\times 0.025) \\ &= 2.7703 \text{ in.}^2 \end{aligned}$$

The maximum stress area of the external thread, if solid, using formula 5, table 5.1, is

$$A_s \text{ max}=\frac{C_1K_n \text{ min}\times\frac{L_e}{D}\times D_s \text{ max}}{2},$$

$$\frac{L_e}{D}\text{ from chart}=0.622,$$

$$=\frac{2.356\times 1.365\times 0.622\times 1.4978}{2}=1.4977$$

Area of minimum center hole

$$=(\pi/4)\times 0.792^2=0.4926$$

Max stress area of external threaded member

$$=1.0051$$

Length of thread engagement required

$$\begin{aligned} =L_e &= \frac{2\times \text{max } A_s}{S_s \text{ min}} \\ &= \frac{2\times 1.005}{2.7703} \\ &= 0.726 \text{ in.} \end{aligned}$$

If a length of engagement of 0.73 in. cannot be obtained, the tolerance on minor diameter, T_{K_n}, of the internal thread should be reduced. If a space for a longer length of engagement is available, T_{K_n} can be increased.

Example: The dimension is required of the largest steel cap screw that can be used to hold a bracket on a cast iron body. The tensile strength of the steel is 60,000 lbs/in.², the tensile strength of the cast iron 20,000 lb./in.², and the thickness of the cast iron is such that the length of thread engagement cannot exceed 1.750 in. The screws on the top side of the bracket will be in tension. From the ratio of the tensile strengths of the two materials, $R_2=20{,}000/60{,}000=0.333$, it is evident that the length of the tapped hole thread must be considerably longer than the length of thread engagement required to develop the full strength of the screw. R_1 will be of the order of 0.85 and the length of thread in the tapped hole will be approximately $R_1/R_2=0.85/0.333=2.55$ times as long as the length required to develop the full strength of the screw. L_e required to develop the full strength of the screw must be of the order of $1.750/2.55=0.686$ in.

Inasmuch as the hole is tapped in cast iron, a relatively coarse thread would be required, that is UNC or coarser. For such threads L_e/D, as shown on the chart, figure 5.2, varies between 0.57 and 0.61. Taking $L_e/D=0.59$, the approximate diameter required is $0.686/0.59=1.163$. Try $D=1\frac{1}{16}=1.0625$ in. The selected pitch could be either 10 or 8 threads per inch with 8 threads per inch preferred. For a bracket screw, class 2A would be the preferred class. Thus, the screw is $1\frac{1}{16}$–8NS–2A and the hole $1\frac{1}{16}$–8NS–2B.

Next, compute the dimensions of the screw and hole to determine whether or not the above selection is correct.

Max major diameter of screw, D_s max, table IV.2,
$=\text{basic } D-G=1.0625-0.0021=1.0604$

Min major diameter of screw, D_s min, table IV.3,
$=D_s \text{ max}-T_{D_s}=1.0604-0.0150=1.0454$

Min minor diameter of tapped hole, K_n min, table IV.1,
$=D-1\frac{1}{4}H=1.0625-0.1353=0.9272$

The number of $1\frac{1}{16}$–8 screws required will depend on the torque that may develop on the bracket that will produce tension in the screws. It should be possible to tighten these screws to the yield strength of the steel without stripping the cast iron threads.

The complete table of dimensions of the tapped hole and screw is

Internal thread, $1\frac{1}{16}$–8NS–2B

in.
Min major diameter $=1.0625$
Min pitch diameter, table IV.1, $1.0625-0.0812=0.9813$
Max pitch diameter, table IV.8, $0.9813+0.0089=0.9902$
Min minor diameter, table IV.1, $1.0625-0.1353=0.9272$
Max minor diameter, table IV.10, $0.9272+0.0312=0.9584$

External thread, $1\frac{1}{16}$–8NS–2A

in.
Max major diameter, table IV.2, $1.0625-0.0021=1.0604$
Min major diameter, table IV.3, $1.0604-0.0150=1.0454$
Max pitch diameter, table IV.1, $1.0604-0.0812=0.9792$
Min pitch diameter, table IV.5, $0.9792-0.0068=0.9724$
Max minor diameter, table IV.1, $1.0604-0.1534=0.9070$

L_e/D from chart, figure 5.2 $=0.5990$

$$L_e \text{ min} = L_e/D \times D_s \text{ max} = 0.5990 \times 1.0604 = 0.6352$$

$$T_{En} \text{ (table IV.8)} = 0.0089$$

$$R_1\text{, table 5.1, formula 12} = \frac{0.75\ K_n \text{ min}}{D_s \text{ min } [0.875 - C_4(T_{En} + T_{Ds} + G)]}$$

$$= \frac{0.75 \times 0.9272}{1.0454\ [0.875 - 4.619(0.0089 + 0.0150 + 0.0021)]}$$

$$= 0.8812$$

$$L_e \text{ required in hole} = L_e \text{ min} \times \frac{R_1}{R_2} = 0.6352 \times 0.8812/0.3333 = 1.6794 \text{ in.,}$$

which is less than the L_e (1.750 in.) permitted.

APPENDIX 6. REFERENCES

The following Federal Specifications may be obtained at the prices indicated upon application, accompanied by check, money order, cash, or Government Printing Office coupons to the Business Service Center, General Services Administration, Regional Office Building, Seventh and D Streets SW., Washington 25, D. C.

Federal Specifications:

FF-B-561.	Bolts, Lag (10 cents).
FF-B-575.	Bolts, Hexagon and Square (15 cents).
FF-B-00584.	Bolts (Square Neck, Machine, Ribbed Neck, Finned Neck, Tee Head, Key Head) (Round Head).
FF-B-588.	Bolts, Toggle (5 cents).
FF-D-00200.	Devices, Anchoring, Masonry.
FF-N-836.	Nuts, Hexagon and Square (25 cents).
FF-N-845.	Nut, Plain, Wing.
FF-S-85.	Screws, Cap, Slotted and Hexagon Head (15 cents).
FF-S-86.	Screws, Cap, Socket Head (25 cents).
FF-S-88.	Screw Eyes (10 cents).
FF-S-92.	Screws, Machine; Slotted or Cross-Recessed (25 cents).
FF-S-103.	Screws, Set (10 cents).
FF-S-107.	Screws, Tapping, Slotted and Plain Head (Sheet Metal, Machine, and Drive) (20 cents).
FF-S-00109.	Screws, Wood; Cross-Recessed Head.
FF-S-111.	Screws, Wood, Slotted-Head (10 cents).
FF-T-305.	Thumbscrews (10 cents).
FF-W-84.	Washers, Lock (Spring) (15 cents).
FF-W-92.	Washers, Metal, Flat (Plain) (15 cents).
FF-W-00100.	Washers, Tooth Lock.

The following standards and specifications may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Commercial Standards of the U. S. Department of Commerce, Office of Technical Services:

CS8.	Gage Blanks (40 cents).

Simplified Practice Recommendations of the U. S. Department of Commerce, Business and Defense Services Administration:

R23.	Bolts, plow (5 cents).
R51.	Chasers for Self-opening and Adjustable Die Heads (10 cents).
R60.	Bolts, Carriage, Machine and Lag; Packaging of (5 cents).
R169.	Machine, Carriage, and Lag Bolts (Steel), (Stock Production Sizes (10 cents)).

The following standards have been approved and promulgated by the American Standards Association, and issued by The American Society of Mechanical Engineers, 29 West 39th Street, New York 18, N. Y.:

B1.1.	Unified and American Screw Threads for Screws, Bolts, Nuts, and Other Threaded Products ($3.00).
B1.2.	Screw Thread Gages and Gaging ($4.00).
B1.5.	Acme Screw Threads ($2.25).
B1.7.	Nomenclature, Definitions, and Letter Symbols for Screw Threads (50 cents).
B1.8.	Stub Acme Screw Threads ($1.25).
B1.9.	Buttress Screw Threads ($1.50).
B2.1.	Pipe Threads ($1.50).
B5.4.	Taps, Cut and Ground Threads ($1.50).
B5.12.	Twist Drills, Straight Shank and Taper Shank (75 cents).
B18.2.	Square and Hexagon Bolts and Nuts ($2.00).
B18.3.	Socket Head Cap Screws and Socket Set Screws ($1.00).
B18.5.	Round Head Bolts ($1.00).
B18.6.1.	Slotted and Recessed Head Wood Screws ($1.00).
B18.6.2.	Tapping Screws.
B18.6.3.	Slotted and Recessed Head Machine Screws.
B18.8.	High-Strength, High-Temperature Internal Wrenching Bolts (50 cents).
B18.9.	Plow Bolts (55 cents).
B18.10.	Track Bolts and Nuts ($1.00).

INDEX

A

Page

- Abbreviations, screw thread, 7, 10
- Acceptability of threads, 118
- Actual fit, definition, 3
- Actual size, definition, 2
- Addendum, definition, 4
- Allowance, definition, 2
- Allowances (*see* Tolerances and allowances)
- Altered threads, 100
- American National screw threads, 121
  - Comparison with Unified screw threads, 10
  - Form of thread, 121
  - Limits of gage sizes, 145
  - Limits of thread sizes, 128
  - Method of designating, 132
  - Thread classes, 130
  - Thread form, 121
  - Thread series, 122
    - Coarse, 122, 128, 133
    - Extra-fine, 123, 128, 137
    - Fine, 122, 128, 135
    - 8-thread, 123, 130, 138
    - 16-thread, 124, 132, 143
    - 12-thread, 123, 131, 140
  - Tolerances and allowances, 124, 128, 131, 145
- American National special screw threads, 179
  - Form of thread, 179
  - Gages for, 186
  - Recommended pitches, 179
  - Thread classes, 179
    - Selection of, 124
  - Tolerances and allowances, 126
- American Standard screw threads (*see under* Unified and American)
- Angle deviations, diameter equivalent of, 22, 32
- Angle, included, of thread, definition, 4
- Axis of thread, definition, 3

B

- Base of thread, definition, 3
- Basic form of thread, definition, 3
- Basic hole system, definition, 3
- Basic size, definition, 2
- Basic shaft system, definition, 3
- Bilateral tolerance, definition, 2
- Bilateral tolerance system, definition, 2
- Blunt start, definition, 4

C

- Classes of threads, 18
  - 1, 130, 179
  - 1A, 23, 79
  - 1AR, 75, 79
  - 1B, 23, 79
  - 2, 130, 180
  - 2A, 23, 79
  - 2B, 23, 79
  - 3, 131, 180
  - 3A, 23, 98
  - 3B, 23, 98
  - 4, 131, 180
  - 5, 132
- Classes of threads, definition, 18
- Clearance fit, definition, 3
- Clearance (or trailing) flank, definition, 3
- Coarse-thread series, 13, 16, 122
- Coated threads, 23
- Complete thread, definition, 3
- Core diameter (*see* Minor diameter)
- Crest, definition, 3
- Crest clearance, definition, 5
- Crest truncation, definition, 4
- Cross threading, 201

D

- Dedendum, definition, 4
- Definitions, 2
- Depth of thread engagement, definition, 5
- Design forms of thread, definition, 3
- Design forms of threads, 3
  - American National, 122-125
  - National miniature, 103
  - Unified, 11
- Design information, screw threads of special diameters, pitches, and lengths of engagement, 200
  - American National, 180
  - Unified, 98
- Design size, definition, 2
- Designating screw threads, 8
  - Method of, 26
  - Method of, special thread, 98
- Designations, identification, screw thread, 8, 26
- Diameter equivalent, 22, 32
  - Of angle deviations, 22, 32
  - Of lead deviations, 23, 32
- Dimension, definition, 2
- Drills, tap, sizes of, 68

E

Page

- Effective size, definition (*see* Virtual diameter)
- Effective thread, definition, 3
- Eight-thread series, 14, 17, 123, 130, 138
- Engagement, depth of, definition, 5
- Engagement, length of, 22, 128
  - Definition, 5
- External thread, definition, 2
- External thread tolerances, 19, 75
  - Major diameter, 21, 76
  - Minor diameter, 21, 76
  - Pitch diameter, 21, 79, 128
- Extra-fine-thread series, 14, 17, 123, 129, 137

F

- Fine-thread series, 11, 16, 122, 129
- Fit, definition, 2
- Flank, definition, 3
- Flank angle, definition, 4
- Following flank, definition, 3
- Form of thread, definition, 3
- Fundamental triangle, definition, 3

G

- Gage classification, 108
- Gage sizes, limits of, 38, 145
- Gage tolerances and wear allowances, 117
- Gages, 38, 106, 107
  - Constants for computing dimensions of, 115
  - Direction of tolerance on, 109
  - For reference, 108
    - Master, 108
    - Plain plug acceptance check, 108
    - Setting (check), 108
  - General design, 109
  - Limit, 108
    - Maximum-metal ("go"), 108
    - Minimum-metal ("not go"), 108
  - Limits of size, 38, 113
    - Plain and thread, 39, 113, 146
    - Setting plug, 38, 56, 114, 164
  - Marking of, 116
  - Standard temperature, 109
  - Thread form, 110
    - "Go" and "Not go" thread gages, 110
    - Setting plug gages, 111
  - Thread length, 114
- Gages, ring, 118
  - Measurement of pitch diameter of, 199
- Gaging practices, recommended, 118
  - Procedure in setting adjustable thread ring gages, 118
  - Procedure for determining clearance in thread ring gages, 120
  - Uses of W and X thread gages, 118
- Gaging, screw thread, 107
  - Practices, 118
    - Virtual (or effective size), 118
    - Single element, 118

H

- Height of fundamental triangle, definition, 4
- Height of thread, definition, 4
- High-temperature, high-strength applications, 23
- Hole size limits, 186

I

- Incomplete thread, definition, 3
- Included angle, definition, 4
- Interference fit, definition, 3
- Internal thread, definition, 2
- Internal thread tolerances, 19, 75
  - Major diameter, 21, 76
  - Minor diameter, 21, 77
  - Pitch diameter, 21, 79, 128

L

- Lead, definition, 4
- Lead angle, definition, 4
- Lead deviations, diameter equivalent of, 23, 32
- Lead, variations in, 32
- Leading flank, definition, 3
- Left-hand thread, definition, 2
- Length of engagement, 22, 128
- Length of thread engagement, definition, 5
- Limit gages, maximum-metal or "go", 108
  - Minimum-metal or "not go", 108
- Limits of size, 26, 79, 128
  - Definition, 2
  - Gages (*see* Gage sizes)
  - General, 22, 79, 128
  - Thread (*see under* Screw threads)

M

Page

- Major cone, definition 6
- Major diameter, definition 4
- Major cylinder or cone, definition 3
- Maximum material limit, definition 2
- Measuring pressure 109
- Measurement of pitch diameter 194
  - Wire method of 194
- Method of designating threads 26, 98, 132
- Miniature screw threads (*see* National Miniature screw threads)
- Minimum material limit, definition 2
- Minor cone, definition 6
- Minor cylinder or cone, definition 3
- Minor diameter, definition 4
- Modified threads 26, 98
- Multiple thread, definition 2

N

- National Miniature screw threads 100
  - Limits of thread size 105
  - Thread designations 105
  - Thread form 101
  - Tolerances 104
- Net tolerances, basis of 128
- Nomenclature (*see* Definitions)
- Nominal size, definition 2

P

- Personnel of the Committee 1
- Pipe thread 9
  - Symbols 9
  - Designations 10
- Plating, screw thread (*see* Coated threads)
- Pitch, definition 4
- Pitch cone, definition 6
- Pitch cylinder or cone, definition 3
- Pitch diameter (simple effective diameter), definition 4
- Pitch line, definition 3
- Preferred diameters and pitches 75, 179
- Pressure flank, definition 3

R

- Recommended gage practices 118
- References 205
- Right-hand thread, definition 2
- Root, definition 3
- Root truncation, definition 4
- Rules for use of tables, special threads 180

S

- Screw thread 2
  - Classes 18, 75, 130, 179
  - Definition 2
  - Designating, method of 26, 98, 132
  - Elements, definitions 3
  - Forms 12, 101, 121
    - American National (*see* American National screw threads)
    - National Miniature (*see* National Miniature screw threads)
    - Unified (*see* Unified and American screw threads)
  - Limits of size 22, 79, 105, 128
  - Series 13, 104, 122
    - Definition 13
  - Shear area 5, 202
    - Definition 5
    - Formula 5
  - Symbols 7
  - Types, definitions 2
- Sharp crest (or crest apex), definition 3
- Sharp major cone, definition 6
- Sharp minor cone, definition 7
- Sharp root (or root apex), definition 3
- Shear area, thread (*see* Screw thread shear area)
- Single thread, definition 2
- Sixteen-thread series 14, 19, 124, 143
- Size, actual, basic, design, etc. definitions 2
- Special screw threads (*see* Unified and American special screw threads; American National special screw threads)
  - Design 200
- Standoff, definition 7
- Strength factors in thread design 201
- Stress area (*see* Tensile stress area)
- Symbols 9, 13
  - Pipe thread 9
  - Screw thread 9

T

Page

- Tap drill sizes 68
- Taper screw thread elements, definitions 6
- Taper threads, measurement of 197
- Tapping, thread proportions in relation to 204
- Temperature at which gages shall be standard 109
- Tensile stress area 5, 16–19
  - Definition 5
  - Formula 5
- Terminology (*see* Definitions).
- Thickness of thread, definition 4
- Thread (*see* Screw threads).
- Thread design, examples of 204
- Thread engagement 5, 22, 128
  - Depth of, definition 5
  - Eccentric 201
  - Length of, definition 5
- Threads per inch, definition 4
- Thread shear area, definition 5
- Tolerance, definition 2
- Tolerance limit, definition 2
- Tolerance, unilateral, bilateral, definitions 2
- Tolerances and allowances 20
  - Basic formula for 20
  - Definition of 2
  - Direction and scope of 19, 75, 104, 125, 179
  - Direction on gages 109
  - Gages 117
  - Major diameter 21
  - Minor diameter 21
  - Pitch diameter 21
  - Screw thread classes 18, 23
- Total thread, definition 3
- Transition fit, definition 3
- Turns per inch, definition 4
- Twelve-thread series 14, 18, 123, 140

U

- Unified and American screw threads 10
  - Applications 13
  - Limits of gage sizes 38
  - Limits of thread sizes 22, 79
  - Method of designating 26
  - Tap drill sizes 68
  - Thread classes 18, 75
  - Thread form 12
  - Thread series 13
    - Coarse 13, 16
    - Extra-fine 14, 17
    - Fine 14, 16
    - 8-thread 14, 17
    - 16-thread 14, 19
    - 12-thread 14, 18
  - Tolerances and allowances 18
  - Variations in 22
- Unified and American special screw threads 74
  - Diameter-pitch combinations 13, 15
  - Directions for determining limits of size of 109
  - Method for calculation of dimensions 99
  - Method of designating 98
  - Preferred diameters and pitches 75
  - Thread classes 75, 79
    - Selection of 98
  - Thread form 75
  - Tolerances and allowances 79
- Unified form of thread 12

- Unified thread series (*see under* Unified and American)
- Uniform pitch series 14
- Unilateral tolerance, definition 2
- Unilateral tolerance system, definition 2

V

- Vanish cone, definition 4
- Vanish point, definition 4
- Variations in lead and angle 32
- Virtual diameter (or effective size), definition 5

W

- Wire methods of measurement of pitch diameter 194
  - Measuring pressure for 109
- Wires, thread measuring 195
  - Methods of measuring 195
  - Methods of using 195
  - Size of 195
  - Specifications for 196

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