QUALITY AND RELIABILITY ASSURANCE

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FACTORS AND PROCEDURES FOR APPLYING MIL-STD-105D SAMPLING PLANS TO LIFE AND RELIABILITY TESTING

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(INSTALLATIONS AND LOGISTICS)
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Quality and Reliability Assurance

The content of this technical report was prepared by Professor Henry P. Goode of Cornell University under an Office of Naval Research contract. It was developed to meet a growing need for the use of mathematically sound sampling plans for life and reliability testing where the Weibull Distribution adequately approximates the test data.

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FACTORS AND PROCEDURES FOR APPLYING THE MIL-STD-105D PLANS IN LIFE AND RELIABILITY INSPECTION

Summary

This report presents a procedure and related tables of factors for adapting the MIL-STD-105D sampling plans to acceptance sampling inspection when the item quality of interest is life length or reliability. Factors are provided for three alternative criteria for lot evaluation; mean life, hazard rate, and reliable life. Inspection of the sample is by attributes with testing truncated at the end of some preassigned period of time. The Weibull distribution, together with the exponential distribution as a special case, is used as the underlying statistical model.

Introduction

The procedure and tables presented in this report are based on recent work on the use of the Weibull distribution in acceptance sampling inspection. Details of this work, together with tables of sampling plans of other forms, have been published previously.(1),(2),(3) However, with the introduction of the MIL-STD-105D Sampling Procedures and Tables the publication of tables of new factors for applying these new standard plans to life and reliability applications seemed to be a useful thing to do. Since the basic computations required have already been made, it has been quite easy to provide these new factors. No changes in method or details of application have been made over those described in the publications referenced above. For this reason the text portion of this report has been briefly written. Readers interested in further details are referred to these previous publications. Other sources of material on the underlying theory and approach are also available.(4),(5),(6)

The Acceptance-Sampling Procedure

The procedure to be employed is essentially the same as the one normally used for attribute sampling inspection. The only difference is that sample items are tested for life or survival instead of for some other property. For single-sampling, the following are the required steps:

(a) Using the tables of factors provided in this report, select a suitable sampling inspection plan from those tabulated in MIL-STD-105D.

(b) Draw at random a sample of items of the size specified by the selected MIL-STD-105D plan.

(c) Place the sample of items on life test for the specified period of time, t.

(d) Determine the number of sample items that failed during the test period.

(e) Compare the number of items that failed with the number allowed under the selected MIL-STD-105D plan.

(f) If the number that failed is equal to or less than the acceptable number, accept the lot; if the number failing exceeds the acceptable number, reject the lot.

Note that both the sample sizes and the acceptance numbers used are those specified by the MIL-STD-105D plans. It will be assumed in the discussion and examples that follow that single-sampling plans will be used. However, the matching double-sampling and multiple-sampling plans provided in the 105D Standard can be used if desired. The corresponding sample sizes and acceptance and rejection numbers are employed in the usual way. The specified test truncation time, t, must be employed for all samples.

The probability of acceptance for a lot under this procedure depends only on the probability of a sample item failing before the end of the test truncation time, t. For this reason the actual life at failure need not be determined; only the number of items failing is of interest. It should be noted also that life requirements and test time specifications need not necessarily be measured in chronological terms such as minutes or hours. The life measure may be cycles of operation, revolutions, or miles of travel, for example.

Statistical Assumptions

The underlying lifelength distribution assumed is the Weibull distribution together with the exponential distribution as a special case of the Weibull. The Weibull distribution is a three parameter distribution. One parameter is a scale, or characteristic life parameter. For these plans and procedures the value for this parameter need not be known; the techniques employed are independent of its magnitude. A second parameter is a location or "guaranteed life" parameter. In these plans and procedures it is assumed that this parameter has a value of zero; that there is some risk of item failure right from the start of life. If this is not the case for some application, a simple modification in procedure is available.

The third Weibull parameter, and the one of importance, is the shape parameter. The magnitude of the conversion factors used in the procedures described in this report depend directly on the value for this parameter. For this reason the magnitude of the parameter must be known through experience with the product or must be estimated from past research, engineering, or inspection data. Estimation procedures are available and are outlined in Reference (1). For the common case of random chance failures with the failure rate constant over time rather than failures due to "infant mortality" or wearout, a value of 1 for the shape parameter should be assumed. With this parameter value, the Weibull distribution reduces to the exponential. Tables of conversion factors are provided for ten selected shape parameter values ranging from $\frac{1}{2}$ to 4, the range commonly encountered in industrial and technical practice. The value 1 used for the exponential case is included. Factors for other required shape parameter values within this range may be obtained approximately by interpolation. A more complete discussion of the relationship between failure patterns and the Weibull parameters will be found in References (1), (2), and (3).

Mean Life Conversion Factors

One possible acceptance criterion is the mean life for items making up the lot (symbolized by the letter μ). Mean life conversion factors or values for the dimensionless ratio $100t/\mu$ have been determined to correspond to or replace all the p' or percent defective values associated with the 105D plans. In this factor the letter t represents the specified test truncation time and the letter μ the mean item life for the lot. For reliability or lifelength applications, these factors are used in place of the corresponding p' values normally employed in the use of the 105D plans for attribute inspection of other item qualities. The use of these factors will be demonstrated by several examples.

Table IA lists for each selected shape parameter value $100t/\mu$ ratios for each of the 105D Acceptable Quality Level [p'(%)] values. With acceptance inspection plans selected in terms of these ratios, the probability of acceptance will be high for lots whose mean life meets the specified requirement. The actual probability of acceptance will vary from plan to plan and may be read from the associated operating characteristic curves supplied in the 105D Standard. The curves are entered by using the corresponding p'(%) value. Table IB lists 100t/μ ratios at the Limiting Quality Level for the quality level at which the Consumer's Risk is 0.10. Table IC lists corresponding 100t/μ ratios for a Consumer's Risk of 0.05.

These ratios are to be used directly for the usual case for which the value for the Weibull location or threshold parameter (symbolized by the letter γ) can be assumed as zero. If γ is not zero but has some other known value, all that must be done is to subtract the value for γ from t to get t_0 and from μ to get μ_0. These transformed values, t_0 and μ_0, are then used in the employment of the tables and for all other computations. A solution in terms of μ_0 and t_0 can then be converted back to actual or absolute values by adding the value for γ to each.

Example (1)

A 105D acceptance sampling inspection plan is to be applied to incoming lots of product for which mean item life is the property of interest. An acceptable mean life of 2,000 hours has been specified and under the plan used lots with a mean life of this value or greater should have a high probability of acceptance. A testing truncation time of 250 hours has been specified. From past experience it has been determined that the Weibull distribution can be used as a lifelength model and a shape parameter value of 2½ and a location or threshold parameter value of 0 can be assumed. Single sampling is to be employed. A sample of as many as 300 items or so can be tested at one time. An appropriate sampling inspection plan must be selected. Also, the consumer's risk under use of the selected plan must be determined.

Computation of the 100t/μ ratio at the Acceptable Quality Level gives $100t/\mu = 100 \times 250/2{,}000 = 12.5$. Examination of the ratios in the column for a shape parameter of 2½ in Table IA discloses a value of 12.4 for an Acceptable Quality Level of 0.40 in p'(%) terms. A plan with this AQL is accordingly to be used. Reference now to the MIL-STD-105D indicates for Sample Size Code Letter M the sample size is 315; this value will accordingly be used. Examination of the Master Table for Normal Inspection (Single

Sampling) in the 105D Standard shows for Sample Size Code Letter M and an Acceptable Quality Level of 0.40, the Acceptance Number must be 3 and the rejection number 4. The acceptance procedure will thus be to draw at random a sample of 315 items and submit them to life test for 250 hours. At the end of that time the number that have failed will be determined. If 3 items or less have failed, the lot will be accepted; if 4 or more have failed, it will be rejected.

The consumer's risk at a probability level of 0.10 can be determined by use of Table IB which gives $100t/\mu$ ratios at the Limiting Quality Level for the 0.10 risk value. For a shape parameter value of $2\frac{1}{2}$, a Sample Size Code Letter M, and an Acceptable Quality Level (AQL) of 0.40, the $100t/\mu$ ratio value is found to be 24. With $t = 250$, $100t/\mu = 24$ or $100 \times 250/\mu = 24$ which gives a value for μ of 1,040. Thus if the mean life for the items in the lot is 1,040 hours or less, the probability of acceptance will be 0.10 or less. If the lot quality for which the consumer's risk was 0.05 was desired instead, Table IC might be used which gives ratios at the Limiting Quality Level for this risk value.

Example (2)

A MIL-STD-105D plan with Sample Size Code Letter F and an AQL of 4.0 has been specified for a product for which life length in terms of cycles of operation is the quality of interest. Acceptance is to be in terms of a mean life evaluation. The Weibull distribution can be assumed to apply with a shape parameter value of $\frac{2}{3}$ and a location parameter value of 0. Testing of sample items is to be truncated at 5,000 cycles. The operating characteristics in terms of mean life for this plan are required.

Reference to Table IA which lists ratios at the Acceptable Quality Level gives a $100t/\mu$ value of .62 for an AQL of 4.0 and a shape parameter value of $\frac{2}{3}$. With $t = 5{,}000$, $100t/\mu = .62$ or $100 \times 5000/\mu = .62$ which gives $\mu =$ 810,000. Thus if the mean item life for the lot is 810,000 or more the probability of acceptance will be high. Reference to Table IC which gives ratios at the Limiting Quality Level for a consumer's risk of 0.05, provides a $100t/\mu$ value of 14 for Code Letter F, an AQL of 4.0, and a shape parameter value of $\frac{2}{3}$. Thus $100 \times 5{,}000/\mu = 14$ or $\mu = 36{,}000$. If mean item life for the lot is 36,000 cycles or less, the probability of acceptance will be 0.05 or less.

The sample size and acceptance number will be those specified by MIL-STD-105D for Code Letter F and an AQL of 4.0. For single sampling the sample size will be 20 items and the acceptance number 2. For this example, as in all cases, the matched 105D double-sampling and multiple-sampling plans may be elected instead. No additional changes in procedure are required. The specified test time, which in this case is 5,000 cycles, must be employed for all samples.

Example (3)

In another application it can be assumed the Weibull distribution applies with a shape parameter β value of $3\frac{1}{3}$ and a location or threshold parameter value, γ, of 3,000 hours. An 105D acceptance-inspection plan must be selected under which the probability of acceptance will be low (0.05 or less) if mean item life is 8,000 hours or less. The sample size will be kept large to reduce the testing period time but it cannot exceed 250 items. To further reduce testing time an acceptance number of 0 will be used. The required test truncation time must be determined; also, the Acceptable Quality Level.

Reference to MIL-STD-105D indicates the Code Letter L with a sample size of 200 items must be used. With this Code Letter and an acceptance number of 0, the AQL in 105D terms must be 0.065. Subtraction of the threshold parameter value, γ, of 3,000 hours from the required mean value, μ, of 8,000 hours gives as a converted value for the mean μ_0 = 8,000-3,000 = 5,000 hours. This converted value must now be used in working with the tables of factors. Use of Table IC for $\beta = 3\frac{1}{3}$, Code Letter L, and an AQL of 0.065 gives a $100t/\mu$ value of 31 at the Limiting Quality Level [for P(A) = 0.05]. With $\mu_0 = 5{,}000$, $100\ t_0/\mu_0 = 100\ t_0/5{,}000 = 31$ or t_0 = 1,550 hours. Conversion of this to absolute terms gives $t = t_0 + \gamma$ = 1,550 + 3,000 = 4,550 hours as the required test truncation time.

From Table IA the corresponding ratio at the Acceptable Quality Level may be found. For an AQL of 0.065 and $\beta = 3\frac{1}{3}$, it is 12.3. Thus $100\ t_0/\mu_0$ = 12.3 or $100 \times 1{,}550/\mu_0 = 12.3$ or $\mu_0 = 12{,}600$. Converting this to absolute terms gives $\mu = \mu_0 + \gamma = 12{,}600 + 3{,}000 = 15{,}600$. Thus the mean item life for a lot must be 15,600 hours or more for its probability of acceptance to be high.

Hazard Rate Conversion Factors

Another measure of lot quality is hazard rate or instantaneous failure rate, symbolized by the letters Z(t), at some specified period of time, t. Hazard rate conversion factors or values for the dimensionless product 100 t Z(t) have been determined for all of the p' values that characterize the collection of 105D plans. As for the mean life plans, these products may be used in place of the corresponding p' values when using the 105D plans for life length and reliability applications.

Table 2A lists for each selected value for the shape parameter 100 t Z(t) products for each 105D Acceptable Quality Level value. Table 2B lists corresponding 100 t Z(t) products at the Limiting Quality Level for a consumer's risk of 0.10. Table 2C lists products at the Limiting Quality Level for a consumer's risk of 0.05. Use of these tables of factors is similar to the method of use for the mean life ratios including the variation in method required when some non-zero value for the location or threshold parameter must be assumed.

One point of difference should be noted. This is that the products are for direct application only in cases for which the time t at which the hazard rate is specified or is to be evaluated is the same as the time t at which the lifetesting of sample items is to be truncated. However, a table of Hazard Rate Ratios has been prepared, Table 2D, to use in a simple modification of method which allows the test truncation time to differ from the time at which the hazard rate is specified. All that must be done is to determine the hazard rate at the test truncation time which corresponds to the hazard rate at the specification time. Table 2D provides ratios for making this conversion. It gives for various values of t_2/t_1 the corresponding values for the ratio $Z(t_2)/Z(t_1)$ for all the shape parameter values for which conversion values have been provided. If the test truncation time is shorter than the time for hazard rate specification, t_1 is used to represent the test truncation time and $Z(t_1)$ the corresponding hazard rate at that time. In this case t_2 represents the time of hazard rate specification and $Z(t_2)$ the specified hazard rate. If the test truncation is longer instead, the meanings given the subscripts 1 and 2 are simply reversed.

Example (4)

An acceptance-inspection plan must be selected from the 105D collection for an application for which the Weibull distribution applies and for which it may be assumed the shape parameter value is $1\frac{2}{3}$ and the location parameter value is 0. A hazard rate of no more than .0005 per hr. at 1,000 hours of life can be tolerated so a plan under which the probability of acceptance will be low (0.10) if this rate will be exceeded at this life is required. The test truncation time is likewise to be 1,000 hours.

Computation of the 100 t Z(t) product gives 100 x 1,000 x .0005 = 50. Thus a plan must be used for which this product is found at the Limiting Quality Level for which the consumer's risk is 0.10. Examination of the column for $\beta = 1\frac{2}{3}$ in Table 2B discloses several close possibilities. One is for a plan with Code Letter D and an AQL of 1.5 for which the product is 48; another is Code Letter F and an AQL of 4.0 for which the product is likewise 48; still another is Code Letter G and an AQL of 6.5 for which the product is 53. Any of these will provide fairly closely the required consumer's protection.

The last plan mentioned with its relatively large sample size and acceptance number will discriminate most sharply between good and bad lots and hence provide the most reasonable Acceptable Quality Level. This will be achieved at the expense of a relatively large number of item hours of inspection, of course. With this choice (Code Letter G and an AQL of 6.5) the Acceptable Quality Level can be easily determined. Reference to Table 2A gives a value for 100 t Z(t) of 11.2 for an AQL of 6.5. Thus 100 x 1000 Z(t) = 11.2 or Z(t) = .000112; the "acceptable" hazard rate is .000112 (per hour). If, alternatively, Code Letter D and an AQL of 1.5 had been used, the "acceptable" hazard rate would be .0000252 (per hour) instead.

<u>Example (5)</u>

Suppose the selected plan must have an acceptable hazard rate (a rate for which the probability of acceptance is high) of .0001 per hour at 500 hours of life. However the testing of sample items must be truncated at 200 hours. A value of β of $\frac{2}{3}$ and for γ of 0 can be assumed. A 105D plan must be selected.

In this case use must be made of Table 2D. Letting t_2 = 500 and t_1 = 200, t_2/t_1 = 500/200 = 2.5. Reference to this table with this ratio using the $\beta = \frac{2}{3}$ column, shows $Z(t_2)/Z(t_1)$ to be .734. With $Z(t_2)$ = .0001, $.0001/Z(t_1)$ = .734 or $Z(t_1)$ = .000136. This failure rate figure must be used in selecting the plan. Thus 100 t Z(t) = 100 x 200 x .000136 = 2.72 (note that the testing truncation time of 200 hours is used as t at this point). Reference to Table 2A examining the column for $\beta = \frac{2}{3}$ shows that a 105D plan with an AQL of 4.0% precisely meets this need.

Reliable Life Conversion Factors

A third possible reliability and lifelength measure for the items in a lot or population is reliable life (which will be symbolized by the letters ρ_r). Reliable life can be defined as the life beyond which some specified proportion of the items in the lot or population will survive. The letter r is used to represent this specified proportion.

Tables of conversion factors have been prepared for two different proportions, r = .90 and r = .99. As for the mean life case, these reliable life conversion factors have been prepared in the form of values for the dimensionless ratio 100 t/ρ_r. Ratio values have been determined for all the p'(%) values associated with the MIL-STD-105D plans. Table 3A gives 100 t/ρ_r values at each of the Acceptable Quality Levels for r = .90; Table 4A gives corresponding values for r = .99. Table 3B gives ratio values at the Limiting Quality Level for a consumer's risk of 0.10 for r = .90; Table 4B gives corresponding values for a consumer's risk of 0.10 and r = .99. Table 3C gives ratio values at the Limiting Quality Level for a consumer's risk of 0.05 and for r = .90; Table 4C gives similar ratio values at a consumer's risk of 0.05 and for r = .99. These conversion ratios are used in the same manner that mean life ratios are used, including the manner for application when the location parameter is not zero. An example follows.

Example (6)

A sampling inspection plan must be selected for a product for which item life in terms of feet of travel is the quality of interest. Experience indicates the Weibull distribution will serve well as a statistical model with a shape parameter value of approximately $1\frac{1}{3}$ and with a location parameter of 0. A lot will be considered "acceptable" if the reliable life is 40,000 feet and the probability of acceptance for such lots should be high. For lots for which reliable life is 10,000 feet or less the probability of acceptance should be low, namely 0.05 or less. Reliable life is defined as the life beyond which 90% of the items will survive; that is, r is to be .90. Testing of sample items is to be truncated at 5,000 feet.

At the acceptable quality level the 100 t/ρ_r factor is 100 x 5,000/40,000 = 12.5. Examination of Table 3A shows that for $\beta = 1\frac{1}{3}$

the 100 t/ρ_r ratio for an AQL of 0.65 is 12.4 which is quite close to the desired ratio. Accordingly, a plan with this AQL is to be adopted. At the unacceptable or Limiting Quality Level the 100 t/ρ_r factor is 100 x 5,000/10,000 = 50. Reference to Table 3C which gives ratios at the Limiting Quality Level for P(A) = 0.05 shows that for Code Letter L, an AQL of 0.65 (which is required for this application, as indicated above), and $\beta = 1\frac{1}{3}$ the corresponding ratio is 48 which is close to the desired value of 50. Thus a 105D plan with Code Letter L and an AQL of 0.65 will meet the specified operating requirements. For single sampling the 105D Standard shows the sample size to be 200 items and the acceptance number 3.

Computation of the Conversion Factors

For the attribute acceptance procedure employed with these plans, the probability of acceptance for a lot depends only on the probability, p', of item life being less than (or equal to) the test truncation time, t. With the magnitude of the shape parameter known, the magnitude of the location parameter taken as zero, and the value of test truncation time, t, pre-assigned, p' becomes a function only of the lot quality under evaluation (mean life, hazard rate, or reliable life). The means for the mathematical determination of the specific relationships are outlined below.

Evaluation in Terms of Mean Life (μ)

As noted, p' is a function of the test truncation time, t, and the mean item life, μ, for the lot. To make use of the MIL-STD-105D plans for mean life evaluation, it is necessary to find t and μ combinations equivalent to the p' (per cent defective) values associated with each of the 105D plans. To make the conversion factors available for general use rather than preparing them in terms of specific values of t and μ, the dimensionless ratio t/μ has been used (for ease in tabulation and use, 100 t/μ factors are provided).

The probability p' of an item failing prior to time t is the value of the cumulative density function at time t. For the Weibull distribution (with the location parameter equal to zero) this is given by,

$$p' = F(t) = 1 - \exp[-(t/\eta)^{\beta}] \qquad (1)$$

where η is the scale or characteristic life parameter.

The formula for the mean of the Weibull distribution is,

$$\mu = \eta\,\Gamma(1/\beta + 1) \quad . \tag{2}$$

By substitution of the value for η obtained from Equation (2) for η in Equation (1), the following equation is obtained,

$$p' = 1 - \exp\{-[\frac{t}{\mu}\,\Gamma(1/\beta + 1)]^{\beta}\} \quad . \tag{3}$$

Solving for t/μ gives,

$$t/\mu = [-\ln(1-p')]^{1/\beta}/\Gamma\,(1/\beta + 1) \quad . \tag{4}$$

Further details will be found in Reference (1) and Reference (4).

Evaluation in Terms of Hazard Rate [Z(t)]

The instantaneous failure rate or the hazard rate at any specified time t, which is symbolized by Z(t), is given by the relationship,

$$Z(t) = f(t)/[1-F(t)] \quad , \tag{5}$$

where f(t) is the population density function and F(t) is the cumulative density function.

For the Weibull distribution (with the location parameter equal to zero) the expression for the population density function is,

$$f(t) = (\beta/\eta)(t/\eta)^{\beta-1}\,\exp[-(t/\eta)^{\beta}] \tag{6}$$

The expression for the cumulative density function is,

$$F(t) = 1 - \exp[-(t/\eta)^{\beta}] \quad . \tag{7}$$

From Equations (6) and (7) the following expression for hazard rate may be obtained,

$$Z(t) = (\beta/\eta)(t/\eta)^{\beta-1} \quad . \tag{8}$$

A more useful form for the steps to follow is given if both sides of this equation are multiplied by (t/β) which gives,

$$\frac{tZ(t)}{\beta} = (t/\eta)^{\beta} \quad . \tag{9}$$

The probability, p', of an item failing before the end of the testing time, t, is given by the cumulative density function, F(t), as shown in Equation (7). By combining Equations (9) and (7), p' in terms of Z(t) becomes,

$$p' = 1 - \exp[-\frac{tZ(t)}{\beta}] \quad . \tag{10}$$

By transposing and taking the natural logarithm, the following required expression is found,

$$tZ(t) = -\beta \ln (1-p') \quad . \tag{11}$$

Values for this dimensionless product, tZ(t), may thus be found by use of this expression for all p' (per cent defective) values associated with the MIL-STD-105D plans. One should note that the time t at which the hazard rate is to be evaluated is the same as the test truncation time. Further details may be found in Reference (2) and Reference (5).

<u>Evaluation in Terms of Reliable Life (ρ_r)</u>

With the location parameter equal to zero, the value for reliable life, ρ_r, where r is the proportion of items surviving beyond a life of ρ, is given by the expression,

$$\rho_r = \eta \, (-\ln r)^{1/\beta} \tag{12}$$

The probability, p', of an item failing prior to time t is given by,

$$p' = F(t) = 1 - \exp[-(t/\eta)] \quad . \tag{13}$$

Substitution of the value for η given by Equation (12) for η in Equation (13) gives,

$$p' = 1 - \exp\{-[t(-\ln r)^{1/\beta}/\rho_r]^{\beta}\} \quad .$$

This can be simplified to the following required form,

$$t/\rho_r = [\ln(1-p')/\ln(r)]^{1/\beta} \quad .$$

Values for the dimensionless ratio t/ρ_r (actually, 100 t/ρ_r) have been determined for all the p' (percent defective) values associated with the MIL-STD-105D plans. Further details may be found in Reference (3) and Reference (6).

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TABLE 1A

100t/μ Ratios at the Acceptable Quality Level (normal inspection) for the MIL-STD-105D Plans

Acceptable Quality Level p'(%)	Shape Parameter, β									
	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{2}{3}$	2	$2\frac{1}{2}$	$3\frac{1}{3}$	4
0.010	17-12	50-8	75-6	.010	.11	.45	1.13	2.83	7.03	11.0
0.015	56-12	11-7	14-5	.015	.15	.57	1.38	3.32	7.94	12.2
0.025	26-11	31-7	30-5	.025	.22	.77	1.78	4.08	9.26	13.9
0.040	11-10	80-7	60-5	.040	.31	1.02	2.26	4.93	10.7	15.6
0.065	46-10	21-6	13-4	.065	.44	1.37	2.88	5.98	12.3	17.6
0.10	17-9	50-6	25-4	.10	.61	1.78	3.57	7.11	14.0	19.6
0.15	56-9	11-5	44-4	.15	.83	2.26	4.37	8.36	15.8	21.7
0.25	26-8	31-5	94-4	.25	1.22	3.08	5.64	10.3	18.5	24.7
0.40	11-7	80-5	.019	.40	1.73	4.07	7.14	12.4	21.3	27.8
0.65	46-7	21-4	.040	.65	2.50	5.46	9.12	15.1	24.6	31.4
1.0	17-6	51-4	.076	1.01	3.45	7.08	11.3	17.9	28.0	34.9
1.5	59-6	.011	.14	1.51	4.69	9.07	13.9	21.1	31.7	38.7
2.5	27-5	.032	.30	2.53	6.91	12.3	18.0	25.9	37.0	44.0
4.0	11-4	.083	.62	4.08	9.88	16.4	22.8	31.4	42.7	49.6
6.5	51-4	.23	1.31	6.72	14.4	22.2	29.3	38.3	49.6	56.2
10	.019	.56	2.57	10.5	20.1	29.0	36.6	45.8	56.7	62.9

The negative figure after a ratio shows the number of decimal points to provide. Thus 13-4 = .0013.

TABLE 1B

100t/μ Ratios at the Limiting Quality Level for the MIL-STD-105D Plans - Consumer's Risk = 0.10

Code Letter	AQL	Shape Parameter, β: $\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{2}{3}$	2	$2\frac{1}{2}$	$3\frac{1}{3}$	4
A	6.5	25	68	92	120	120	118	118	116	115	115
B	4.0	7.2	29	50	77	89	95	98	100	102	103
C	2.5	1.6	10	23	46	61	70	77	82	88	91
C	10	11	40	62	89	100	102	103	105	106	106
D	1.5	.38	4.1	11.6	28	43	53	60	68	76	80
D	6.5	2.4	13	28	53	67	76	81	86	91	94
D	10	7.2	[illegible]	50	77	89	95	98	100	102	103
E	1.0	.094	[illegible]	5.6	17	30	39	47	56	66	71
E	4.0	.49	[illegible]	13	31	45	55	63	70	78	82
E	6.5	1.5	10	22	45	59	68	76	80	86	90
E	10	3.5	17	37	60	73	82	87	90	95	97
F	0.65	.026	.66	2.9	11	22	30	38	47	58	64
F	2.5	.14	2.0	6.7	20	33	42	50	58	68	72
F	4.0	.36	4.0	11	28	42	52	59	67	75	80
F	6.5	.80	6.5	16	36	51	61	68	73	81	85
F	10	2.6	14	29	54	68	77	82	87	92	95
G	0.40	62-4	.26	1.4	7.2	15	23	30	39	50	57
G	1.5	.032	.76	3.2	12	22	31	39	48	59	65
G	2.5	.086	1.4	5.3	17	29	38	47	55	65	70
G	4.0	.18	2.4	7.7	22	35	45	53	60	70	74
G	6.5	.52	5.0	13	31	46	56	63	70	78	82
G	10	1.2	8.8	20	42	57	66	73	78	85	89
H	0.25	16-4	.11	.74	4.6	11	17	24	33	44	51
H	1.0	84-4	.31	1.6	7.8	16	24	31	40	51	58
H	1.5	.021	.59	2.6	11	20	29	37	46	57	63
H	2.5	.046	.97	3.9	14	25	34	42	51	61	67
H	4.0	.12	1.8	6.5	19	32	42	49	58	67	72
H	6.5	.27	3.2	9.7	25	39	49	57	65	73	78
H	10	.68	6.0	15	34	49	58	67	73	80	85
J	0.15	40-5	.042	.37	2.9	7.5	13	19	27	38	45
J	0.65	20-4	.12	.80	4.9	11	18	24	33	45	52
J	1.0	54-4	.23	1.3	6.7	14	22	29	38	49	57
J	1.5	.010	.36	1.8	8.3	17	25	32	42	53	59
J	2.5	.030	.72	3.1	12	22	31	39	48	58	64
J	4.0	.063	1.2	4.5	15	27	36	44	53	63	68
J	6.5	.16	2.3	7.5	21	34	44	52	60	69	74
J	10	.34	3.8	11	27	41	51	59	67	75	80

A negative figure after a ratio shows the number of decimal points to provide. Thus 62-4 = .0062.

TABLE 1B (Con.)

Code Letter	AQL	Shape Parameter, β: $\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{2}{3}$	2	$2\frac{1}{2}$	$3\frac{1}{3}$	4
K	0.10	10-5	.017	.19	1.8	5.5	10	15	23	33	40
K	.40	50-5	.049	.41	3.1	8.0	14	20	28	39	46
K	.65	13-4	.093	.67	4.3	10	17	23	32	43	50
K	1.0	27-4	.15	.94	5.4	12	19	26	35	46	53
K	1.5	76-4	.29	1.5	7.6	15	23	31	40	51	58
K	2.5	.015	.47	2.2	9.8	19	27	35	44	55	61
K	4.0	.039	.85	3.5	13	23	33	41	50	60	66
K	6.5	.092	1.5	5.5	17	29	39	47	56	65	70
K	10	.27	3.2	9.7	25	39	49	57	65	73	78
L	0.065	25-6	67-4	.093	1.1	3.8	7.7	12	19	29	36
L	0.25	12-5	.019	.20	1.9	5.7	10	15	23	34	41
L	0.40	33-5	.036	.33	2.7	7.2	12	18	26	37	45
L	0.65	66-5	.058	.47	3.4	8.5	14	20	29	40	47
L	1.0	18-4	.11	.79	4.8	11	18	24	33	44	52
L	1.5	40-4	.18	1.1	6.0	13	20	27	36	48	55
L	2.5	91-4	.32	1.7	8.0	16	24	32	40	52	59
L	4.0	.020	.56	2.6	10	20	29	36	45	56	62
L	6.5	.060	1.1	4.4	15	26	36	44	52	62	68
M	0.040	60-7	26-4	.047	.73	2.7	5.8	9.6	16	25	32
M	0.15	30-6	78-4	.10	1.2	4.0	8.0	12	19	30	37
M	0.25	80-6	.015	.17	1.7	5.1	9.7	14	22	33	40
M	0.40	16-5	.023	.23	2.1	6.0	11	16	24	35	42
M	0.65	45-5	.045	.39	3.0	7.8	13	19	27	38	46
M	1.0	95-5	.074	.56	3.8	9.3	15	22	30	42	49
M	1.5	22-4	.12	.85	5.0	11	18	25	34	45	52
M	2.5	51-4	.22	1.3	6.6	14	22	29	38	49	56
M	4.0	.013	.45	2.1	9.4	18	27	34	43	54	61
N	0.025	14-7	10-4	.024	.46	1.9	4.4	7.6	13	22	28
N	0.10	72-7	31-4	.052	.79	2.8	6.1	10	16	26	32
N	0.15	19-6	56-4	.082	1.0	3.5	7.3	11	18	28	35
N	0.25	40-6	92-4	.11	1.3	4.3	8.4	13	20	30	37
N	0.40	11-5	.017	.19	1.8	5.5	10	15	23	33	40
N	0.65	22-5	.028	.27	2.4	6.6	12	17	25	36	43
N	1.0	50-5	.049	.41	3.1	8.0	14	20	28	39	46
N	1.5	12-4	.083	.62	4.0	9.8	16	22	31	42	49
N	2.5	35-4	.17	1.0	5.9	13	20	27	36	47	54
P	0.015	35-8	40-5	.012	.29	1.3	3.3	6.0	11	19	25
P	0.065	17-7	12-4	.026	.49	2.0	4.6	7.8	13	22	29
P	0.10	44-7	22-4	.041	.67	2.5	5.5	9.2	15	25	31
P	0.15	92-7	34-4	.057	.84	3.0	6.3	10	17	26	33
P	0.25	25-6	68-4	.094	1.1	3.8	7.7	12	19	29	36
P	0.40	51-6	.011	.13	1.4	4.6	8.9	13	20	31	38
P	0.65	12-5	.019	.20	1.9	5.7	10	15	23	34	41
P	1.0	28-5	.033	.30	2.5	6.9	12	18	26	37	44
P	1.5	77-5	.063	.50	3.5	8.8	15	21	29	41	48

TABLE 1B (Con.)

Code Letter	AQL	Shape Parameter, β									
		$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{2}{3}$	2	$2\frac{1}{2}$	$3\frac{1}{3}$	4
Q	0.010	90-9	16-5	63-4	.18	.96	2.5	4.9	9.0	16	23
Q	0.040	44-8	48-5	.013	.31	1.4	3.5	6.2	11	19	26
Q	0.065	11-7	90-5	.021	.43	1.8	4.2	7.4	12	21	28
Q	0.10	22-7	14-4	.029	.53	2.1	4.8	8.2	14	23	30
Q	0.15	62-7	28-4	.048	.75	2.7	5.9	9.7	16	25	32
Q	0.25	13-6	45-4	.069	.95	3.3	6.8	11	17	27	34
Q	0.40	30-6	78-4	.10	1.2	4.1	8.0	12	19	30	37
Q	0.65	70-6	.013	.15	1.6	4.9	9.4	14	22	32	39
Q	1.0	19-5	.026	.26	2.3	6.4	11	17	25	35	43
R	0.025	10-8	18-5	68-4	.19	1.0	2.6	5.0	9.3	17	23
R	0.040	26-8	35-5	.010	.26	1.2	3.2	5.8	10	18	25
R	0.065	54-8	55-5	.015	.33	1.5	3.6	6.5	11	20	26
R	0.10	15-7	11-4	.024	.47	1.9	4.5	7.7	13	22	29
R	0.15	30-7	17-4	.034	.59	2.3	5.1	8.7	14	24	30
R	0.25	70-7	30-4	.051	.78	2.8	6.0	10	16	26	33
R	0.40	17-6	52-4	.075	1.0	3.4	7.1	11	18	28	35
R	0.65	46-6	.010	.12	1.4	4.5	8.7	13	20	31	38

TABLE 1C

100t/μ Ratios at the Limiting Quality Level
for the MIL-STD-105D Plans -- Consumers Risk = 0.05

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
A	6.5	55	120	130	140	140	130	130	120	120	120
B	4.0	16	50	73	100	110	110	110	110	110	110
C	2.5	3.5	18	35	60	74	82	87	90	96	97
C	10	20	59	84	110	120	110	110	110	110	110
D	1.5	.84	6.9	17	36	52	61	69	76	82	86
D	6.5	4.3	20	37	64	77	85	90	93	97	99
D	10	13	43	65	93	100	100	100	110	100	100
E	1.0	.22	2.8	8.6	23	37	47	55	63	72	76
E	4.0	.95	7.4	18	39	53	63	70	76	83	87
E	6.5	2.5	14	28	53	67	76	82	86	92	95
E	10	5.5	24	43	69	82	89	94	97	99	100
F	0.65	.059	1.1	4.4	15	26	35	43	52	62	68
F	2.5	.25	3.1	9.3	25	38	48	56	64	73	77
F	4.0	.60	5.4	14	33	48	57	65	72	79	83
F	6.5	1.2	8.6	20	42	57	66	73	78	85	89
F	10	3.8	19	36	62	75	83	88	92	96	98
G	0.40	.013	.43	2.1	9.3	18	27	34	43	54	61
G	1.5	.059	1.1	4.4	15	26	35	43	52	62	68
G	2.5	.13	1.9	6.7	20	32	42	50	58	67	72
G	4.0	.29	3.4	10	26	30	50	57	65	74	78
G	6.5	.76	6.3	16	35	50	60	67	74	81	85
G	10	1.6	10	23	47	61	70	77	82	88	91
H	0.25	37-4	.18	1.1	5.9	13	20	27	36	47	54
H	1.0	.014	.46	2.2	9.6	18	27	34	42	55	61
H	1.5	.034	.82	3.4	12	23	32	40	49	60	66
H	2.5	.070	1.3	4.9	16	27	37	45	54	64	70
H	4.0	.18	2.5	7.9	22	35	45	53	61	71	75
H	6.5	.40	4.1	11	28	43	53	60	68	76	80
H	10	.93	7.4	18	39	54	63	70	76	83	87
J	0.15	90-5	.072	.55	3.7	9.3	15	22	30	41	49
J	0.65	37-4	.18	1.1	5.9	13	20	27	36	47	54
J	1.0	92-4	.32	1.7	8.0	16	24	32	40	52	58
J	1.5	.016	.48	2.3	9.9	19	28	35	44	57	61
J	2.5	.046	.95	3.9	14	25	34	42	51	61	67
J	4.0	.089	1.5	5.5	17	29	39	47	55	65	70
J	6.5	.18	2.5	7.9	22	35	45	53	61	71	75
J	10	.45	4.6	12	30	44	54	62	69	77	81

A negative figure after a ratio shows the number of decimal points to provide. Thus 92-4 = .0092

1C (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
K	0.10	24-5	.029	.28	2.4	6.6	12	17	25	36	43
K	0.40	10-4	.076	.58	3.8	9.4	16	22	30	42	49
K	0.65	23-4	.13	.87	5.1	11	18	25	34	45	52
K	1.0	46-4	.20	1.2	6.4	13	21	28	37	49	56
K	1.5	.011	.38	1.9	8.7	17	26	33	42	53	60
K	2.5	.030	.72	3.1	12	22	31	39	48	58	64
K	4.0	.059	1.1	4.4	15	26	35	43	52	62	68
K	6.5	.12	1.8	6.5	19	32	42	49	58	67	72
K	10	.34	3.8	11	27	41	51	59	67	75	80
L	0.065	56-6	.011	.14	1.5	4.7	9.0	13	21	31	38
L	0.25	24-5	.029	.28	2.4	6.6	12	17	25	36	43
L	0.40	58-5	.053	.44	3.2	8.3	14	20	28	39	47
L	0.65	11-4	.082	.60	4.0	9.7	16	22	31	42	49
L	1.0	28-4	.15	.95	5.5	12	19	26	35	46	53
L	1.5	56-4	.24	1.3	6.8	14	22	29	38	49	57
L	2.5	.012	.40	2.0	8.9	17	26	33	42	53	60
L	4.0	.027	.67	3.0	11	22	30	38	47	58	64
L	6.5	.070	1.3	4.9	16	27	37	45	54	64	70
M	0.040	13-6	46-4	.070	.96	3.3	6.8	11	17	27	34
M	0.15	56-6	.011	.14	1.5	4.7	9.0	13	21	31	38
M	0.25	13-5	.020	.21	2.0	5.8	10	16	23	34	41
M	0.40	27-5	.032	.30	2.5	6.9	12	18	25	37	44
M	0.65	64-5	.057	.46	3.3	8.5	14	20	29	40	47
M	1.0	13-4	.093	.67	4.3	10	17	23	32	43	50
M	1.5	30-4	.15	.99	5.6	12	19	26	35	46	53
M	2.5	68-4	.27	1.4	7.3	15	23	30	39	50	57
M	4.0	.017	.51	2.4	10	19	28	35	45	56	62
N	0.025	33-7	18-4	.035	.60	2.3	5.2	8.7	14	24	31
N	0.10	13-6	46-4	.070	.96	3.3	6.8	11	17	27	34
N	0.15	40-6	92-4	.11	1.3	4.3	8.4	13	20	30	37
N	0.25	68-6	.013	.15	1.6	4.9	9.3	14	22	32	39
N	0.40	16-5	.022	.23	2.1	6.0	11	16	24	35	42
N	0.65	30-5	.035	.32	2.6	7.0	12	18	26	37	45
N	1.0	70-5	.061	.48	3.4	8.7	14	21	29	40	48
N	1.5	16-4	.10	.70	4.5	10	17	23	32	44	51
N	2.5	44-4	.20	1.2	6.3	13	21	28	37	48	55

1C (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
P	0.015	80-8	72-5	.018	.38	1.6	3.9	6.9	12	21	27
P	0.065	30-7	17-4	.034	.59	2.3	5.1	8.7	14	24	30
P	0.10	67-7	31-4	.053	.80	2.8	6.1	10	16	26	32
P	0.15	14-6	47-4	.072	.98	3.3	7.0	11	17	27	34
P	0.25	40-6	92-4	.11	1.3	4.3	8.4	13	20	30	37
P	0.40	68-6	.013	.15	1.6	4.9	9.3	14	22	32	39
P	0.65	16-5	.022	.23	2.1	6.0	11	16	24	35	42
P	1.0	33-5	.036	.33	2.7	7.2	12	18	26	37	45
P	1.5	10-4	.076	.58	3.8	9.4	16	22	30	42	49
Q	0.010	19-8	28-5	92-4	.024	1.1	3.0	5.5	10	18	24
Q	0.040	80-8	72-5	.018	.38	1.6	3.9	6.9	12	21	27
Q	0.065	18-7	12-4	.026	.50	2.0	4.6	8.0	13	22	29
Q	0.10	35-7	19-4	.036	.63	2.4	5.3	8.9	15	24	31
Q	0.15	92-7	34-4	.057	.84	3.0	6.3	10	17	26	33
Q	0.25	21-6	62-4	.087	1.1	3.7	7.5	12	18	29	35
Q	0.40	46-6	.010	.12	1.4	4.5	8.7	13	20	31	38
Q	0.65	10-5	.017	.18	1.8	5.3	10	15	22	33	40
Q	1.0	24-5	.029	.28	2.4	6.6	12	17	25	36	43
R	0.025	19-8	28-5	92-4	.024	1.1	3.0	5.5	10	18	24
R	0.040	44-8	50-5	.014	.32	1.4	3.6	6.4	11	20	26
R	0.065	88-8	76-5	.018	.39	1.7	4.0	7.1	12	21	27
R	0.10	22-7	14-4	.029	.53	2.1	4.8	8.2	14	23	30
R	0.15	44-7	22-4	.041	.67	2.5	5.5	9.2	15	25	31
R	0.25	10-6	36-4	.059	.85	3.0	6.4	10	17	26	33
R	.040	21-6	62-4	.087	1.1	3.7	7.5	12	18	29	35
R	0.65	56-6	.011	.14	1.5	4.7	9.0	13	21	31	38

TABLE 2A

100t Z(t) Products at the Acceptable Quality Level (normal inspection) for the MIL-STD-105D Plans

Acceptable Quality Level p'(%)	Shape Parameter, β									
	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{2}{3}$	2	$2\frac{1}{2}$	$3\frac{1}{3}$	4
0.010	33-4	50-4	67-4	.010	.013	.017	.020	.025	.033	.040
0.015	50-4	75-4	.010	.015	.020	.025	.030	.038	.050	.060
0.025	83-4	.012	.017	.025	.033	.042	.050	.063	.083	.10
0.040	.013	.020	.027	.040	.053	.067	.080	.10	.13	.16
0.065	.022	.032	.043	.065	.087	.11	.13	.16	.22	.26
0.10	.033	.050	.067	.10	.13	.17	.20	.25	.33	.40
0.15	.050	.075	.10	.15	.20	.25	.30	.38	.50	.60
0.25	.083	.13	.17	.25	.33	.42	.50	.63	.83	1.00
0.40	.13	.20	.27	.40	.54	.67	.80	1.00	1.34	1.60
0.65	.22	.33	.44	.65	.87	1.09	1.30	1.63	2.17	2.61
1.0	.34	.50	.67	1.01	1.34	1.68	2.01	2.51	3.35	4.02
1.5	.50	.76	1.01	1.51	2.02	2.52	3.02	3.78	5.04	6.04
2.5	.84	1.27	1.69	2.53	2.38	4.22	5.06	6.33	8.44	10.1
4.0	1.36	2.04	2.72	4.08	5.44	6.80	8.16	10.2	13.6	16.3
6.5	2.24	3.36	4.48	6.72	8.96	11.2	13.4	16.8	22.4	26.9
10	3.51	5.27	7.02	10.5	14.0	17.6	21.1	26.3	35.1	42.1

The negative figure after a ratio shows the number of decimal points to provide.
Thus 83-4 = .0083

TABLE 2B

100t Z(t) Products at the Limiting Quality Level for the MIL-STD-105D Plans - Consumer's Risk = 0.10

Code Letter	AQL	Shape Parameter, β									
		$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{2}{3}$	2	$2\frac{1}{2}$	$3\frac{1}{3}$	4
A	6.5	37	54	76	110	150	180	220	280	380	470
B	4.0	25	38	50	77	100	130	150	190	260	310
C	2.5	15	22	30	46	61	76	92	110	150	180
C	10	28	43	57	86	110	140	170	210	290	350
D	1.5	9.6	14	19	29	38	48	57	72	96	110
D	6.5	17	26	35	53	71	88	100	130	170	210
D	10	25	38	50	77	100	130	150	190	260	310
E	1.0	5.8	8.7	11	17	23	29	35	42	58	70
E	4.0	10	15	21	31	42	53	63	78	100	120
E	6.5	14	22	29	45	60	75	90	110	150	180
E	10	19	28	38	59	77	97	110	140	190	230
F	0.65	3.9	5.7	7.8	11	15	19	23	29	38	47
F	2.5	6.6	9.9	13	20	26	33	40	50	66	80
F	4.0	9.6	14	19	29	38	48	57	72	96	110
F	6.5	12	18	24	35	47	59	71	89	120	140
F	10	18	27	36	55	73	92	110	130	180	220
G	0.40	2.3	3.5	4.7	7.2	9.5	12	14	18	23	28
G	1.5	4.3	6.4	8.5	13	17	21	25	32	42	51
G	2.5	5.8	8.7	11	17	23	29	35	42	58	70
G	4.0	7.4	11	15	22	30	37	44	56	74	89
G	6.5	10	15	21	31	42	53	63	78	100	120
G	10	13	20	27	42	58	70	85	100	140	170
H	0.25	1.5	2.3	3.0	4.7	6.1	7.6	9.3	11	15	18
H	1.0	2.6	3.9	5.3	7.9	10	13	16	19	26	31
H	1.5	3.5	5.2	7.0	10	14	17	21	26	35	42
H	2.5	4.7	6.9	9.3	14	18	23	28	35	46	56
H	4.0	6.6	9.9	13	20	26	33	40	50	66	80
H	6.5	8.3	12	16	25	33	41	50	62	81	100
H	10	11	17	22	34	46	57	69	86	110	130
J	0.15	.95	1.4	1.8	2.8	3.7	4.7	5.7	7.1	9.5	11
J	0.65	1.6	2.4	3.2	4.9	6.5	8.2	9.9	12	16	19
J	1.0	2.2	3.3	4.5	6.7	8.9	11	13	17	22	27
J	1.5	2.8	4.2	5.7	8.6	11	14	17	21	28	34
J	2.5	3.9	5.7	7.8	11	15	19	23	29	38	47
J	4.0	5.0	7.5	10	15	20	25	30	37	50	61
J	6.5	7.0	10	14	21	28	34	42	53	70	86
J	10	9.1	13	18	27	36	45	55	69	90	110

TABLE 2B (Con.)

Code Letter	AQL	Shape Parameter, β									
		$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{2}{3}$	2	$2\frac{1}{2}$	$3\frac{1}{3}$	4
K	0.10	.60	.90	1.2	1.8	2.4	3.0	3.6	4.5	6.0	7.2
K	0.40	1.0	1.5	2.0	3.1	4.2	5.3	6.3	7.8	10	12
K	0.65	1.4	2.2	2.9	4.4	5.8	7.3	8.9	11	14	17
K	1.0	1.8	2.7	3.6	5.6	7.3	9.2	11	13	18	21
K	1.5	2.5	3.8	5.1	7.6	10	13	15	19	25	30
K	2.5	3.2	4.9	6.6	9.8	13	16	19	23	32	39
K	4.0	4.2	6.4	8.5	13	17	21	25	32	42	51
K	6.5	5.8	8.7	11	17	23	29	35	42	58	70
K	10	8.7	13	17	26	35	43	53	66	86	100
L	0.065	.40	.60	.80	1.2	1.6	2.0	2.4	3.0	4.0	4.8
L	0.25	.67	1.0	1.3	2.0	2.7	3.3	4.0	5.0	6.7	8.1
L	0.40	.91	1.3	1.8	2.7	3.6	4.6	5.5	6.8	9.1	11
L	0.65	1.1	1.6	2.2	3.3	4.4	5.5	6.7	8.4	11	13
L	1.0	1.5	2.3	3.1	4.3	6.3	7.8	9.5	11	15	19
L	1.5	2.0	3.0	4.0	6.1	8.1	10	12	15	20	24
L	2.5	2.6	3.9	5.3	8.0	10	13	16	20	26	32
L	4.0	3.5	5.2	7.0	10	14	17	21	26	35	42
L	6.5	5.0	7.5	10	15	20	25	30	37	50	61
M	0.040	.24	.36	.49	.73	.96	1.2	1.4	1.8	2.4	2.9
M	0.15	.40	.60	.80	1.2	1.6	2.0	2.4	3.0	4.0	4.8
M	0.25	.56	.84	1.1	1.7	2.3	2.8	3.4	4.2	5.7	6.8
M	0.40	.70	1.0	1.4	2.1	2.8	3.5	4.2	5.3	7.0	8.5
M	0.65	.98	1.4	1.9	2.9	3.9	4.9	6.0	7.4	9.8	11
M	1.0	1.2	1.9	2.5	3.8	5.0	6.4	7.6	9.4	12	15
M	1.5	1.6	2.5	3.3	5.0	6.7	8.4	10	12	16	20
M	2.5	2.2	3.3	4.4	6.6	8.7	11	13	16	21	26
M	4.0	3.1	4.6	6.3	9.4	12	15	19	23	31	38
N	0.025	.15	.23	.31	.46	.60	.76	.92	1.1	1.5	1.8
N	0.10	.26	.39	.52	.78	1.0	1.3	1.5	1.9	2.6	3.1
N	0.15	.37	.55	.74	1.1	1.4	1.8	2.2	2.7	3.7	4.4
N	0.25	.44	.65	.88	1.3	1.7	2.2	2.6	3.2	4.4	5.2
N	0.40	.63	.95	1.2	1.9	2.5	3.2	3.8	4.8	6.3	7.6
N	0.65	.80	1.2	1.6	2.4	3.2	4.0	4.8	6.0	8.1	9.7
N	1.0	1.0	1.5	2.0	3.1	4.2	5.3	6.3	7.8	10	12
N	1.5	1.3	2.0	2.7	4.1	5.4	6.8	8.1	10	13	16
N	2.5	1.9	2.8	3.8	5.8	7.7	9.5	11	14	19	23
P	0.015	.096	.14	.19	.29	.36	.48	.58	.72	.95	1.1
P	0.065	.16	.24	.32	.49	.65	.81	.98	1.2	1.6	1.9
P	0.10	.22	.33	.45	.67	.89	1.1	1.3	1.6	2.2	2.7
P	0.15	.28	.42	.56	.84	1.1	1.4	1.7	2.1	2.8	3.4
P	0.25	.40	.60	.80	1.2	1.6	2.0	2.4	3.0	4.0	4.8
P	0.40	.50	.75	1.0	1.5	2.0	2.5	3.0	3.7	5.0	6.0
P	0.65	.64	.95	1.3	1.9	2.5	3.2	3.8	4.8	6.4	7.6
P	1.0	.84	1.2	1.6	2.5	3.3	4.2	5.0	6.3	8.4	10
P	1.5	1.2	1.8	2.3	3.5	4.7	6.0	7.2	8.9	12	14

TABLE 2B (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
Q	0.010	.060	.090	.12	.18	.24	.30	.36	.45	.60	.71
Q	0.040	.10	.15	.20	.31	.40	.51	.62	.77	1.0	1.2
Q	0.065	.14	.21	.29	.43	.56	.71	.87	1.0	1.4	1.7
Q	0.10	.17	.26	.35	.53	.70	.87	1.0	1.3	1.7	2.1
Q	0.15	.25	.37	.50	.74	.97	1.2	1.4	1.8	2.4	3.0
Q	0.25	.31	.47	.63	.94	1.2	1.5	1.9	2.3	3.2	3.8
Q	0.40	.40	.60	.80	1.2	1.6	2.0	2.4	3.0	4.0	4.8
Q	0.65	.54	.80	1.1	1.6	2.1	2.7	3.2	4.0	5.4	6.4
Q	1.0	.77	1.1	1.5	2.3	3.1	3.9	4.7	5.8	7.7	9.3
R	0.025	.067	.10	.13	.20	.26	.33	.40	.50	.66	.80
R	0.040	.089	.13	.18	.27	.35	.45	.54	.67	.89	1.1
R	0.065	.11	.16	.22	.33	.43	.54	.66	.82	1.1	1.3
R	0.10	.15	.23	.31	.46	.60	.76	.92	1.1	1.5	1.8
R	0.15	.19	.29	.39	.59	.78	.97	1.2	1.4	2.0	2.4
R	0.25	.26	.38	.52	.77	1.0	1.2	1.5	1.9	2.5	3.1
R	0.40	.33	.50	.67	1.0	1.3	1.6	2.0	2.5	3.3	4.0
R	0.65	.47	.70	.94	1.4	1.8	2.3	2.8	3.5	4.7	5.6

TABLE 2C

100t Z(t) Products at the Limiting Quality Level
for the MIL-STD-105D Plans - Consumer's Risk = 0.05

Code Letter	AQL	Shape Parameter, β									
		$1/3$	$1/2$	$2/3$	1	$1\tfrac{1}{3}$	$1\tfrac{2}{3}$	2	$2\tfrac{1}{2}$	$3\tfrac{1}{3}$	4
A	6.5	50	77	100	150	200	250	300	380	510	610
B	4.0	32	50	67	99	130	160	200	250	330	400
C	2.5	20	30	40	60	80	100	120	150	200	240
C	10	36	53	72	110	140	180	210	270	360	440
D	1.5	12	18	24	37	49	62	75	93	120	150
D	6.5	21	33	42	65	85	100	130	160	210	250
D	10	30	46	61	93	120	150	180	230	310	370
E	1.0	7.9	11	15	24	31	39	48	59	78	95
E	4.0	12	19	25	38	51	64	77	96	120	150
E	6.5	17	26	35	54	70	88	100	130	170	210
E	10	23	34	46	69	92	110	140	170	230	280
F	0.65	5.0	7.5	10	15	20	25	30	37	50	60
F	2.5	8.3	12	16	25	33	41	50	63	82	100
F	4.0	11	16	21	33	44	55	65	83	110	130
F	6.5	13	20	27	42	56	70	84	100	120	160
F	10	20	30	40	62	82	100	120	150	200	240
G	0.40	3.1	4.6	6.2	9.2	12	15	18	23	31	37
G	1.5	5.0	7.5	10	15	20	25	30	37	50	60
G	2.5	6.6	9.8	13	20	26	33	39	50	66	80
G	4.0	8.7	13	17	26	35	43	52	65	86	100
G	6.5	12	17	23	35	47	59	71	89	120	140
G	10	15	23	30	47	62	77	93	110	150	180
H	0.25	2.0	3.0	3.9	6.0	7.9	9.9	12	15	19	24
H	1.0	3.2	4.7	6.3	9.5	12	16	19	24	31	38
H	1.5	4.2	6.4	8.5	12	17	21	25	32	42	51
H	2.5	5.4	8.1	10	16	21	27	32	40	54	65
H	4.0	7.4	11	15	22	29	37	44	55	74	89
H	6.5	9.6	14	19	28	38	48	57	72	95	110
H	10	12	19	25	38	51	65	77	97	120	150
J	0.15	1.2	1.8	2.5	3.8	5.0	6.3	7.6	9.4	12	15
J	0.65	2.0	3.0	3.9	6.0	7.9	9.9	12	15	19	24
J	1.0	2.6	4.0	5.3	7.9	10	13	16	19	26	32
J	1.5	3.3	4.9	6.5	9.7	13	16	19	24	32	39
J	2.5	4.6	6.9	9.2	14	18	23	28	35	46	56
J	4.0	5.8	8.5	11	17	23	29	35	43	58	70
J	6.5	7.4	11	15	22	29	37	44	55	74	89
J	10	10	15	20	30	40	50	60	76	100	120

TABLE 2C (Con't)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
K	0.10	.80	1.2	1.6	2.4	3.2	4.0	4.9	6.0	8.2	9.7
K	0.40	1.3	1.9	2.6	3.9	5.2	6.5	7.8	9.7	13	15
K	0.65	1.7	2.5	3.4	5.1	6.8	8.5	10	12	17	20
K	1.0	2.1	3.2	4.2	6.4	8.5	10	12	16	21	26
K	1.5	2.9	4.3	5.8	8.7	11	14	17	22	29	35
K	2.5	3.9	5.7	7.7	11	15	19	23	29	38	47
K	4.0	5.0	7.5	10	15	20	25	30	37	50	60
K	6.5	6.6	9.9	13	20	26	33	40	50	66	80
K	10	9.2	13	18	27	36	45	55	69	90	110
L	0.065	.50	.75	1.0	1.5	2.0	2.5	3.0	3.7	5.0	6.0
L	0.25	.80	1.2	1.6	2.4	3.2	4.0	4.9	6.0	8.2	9.7
L	0.40	1.0	1.6	2.1	3.2	4.4	5.4	6.5	8.0	11	13
L	0.65	1.3	2.0	2.6	4.0	5.3	6.7	8.0	10	13	16
L	1.0	1.8	2.7	3.6	5.5	7.3	9.0	11	13	18	22
L	1.5	2.2	3.4	4.5	6.8	9.0	11	13	17	22	27
L	2.5	2.9	4.4	5.9	8.8	11	14	17	22	29	35
L	4.0	3.9	5.7	7.7	11	15	19	23	29	38	47
L	6.5	5.4	8.1	10	16	21	27	32	40	54	65
M	0.040	.31	.47	.64	.95	1.2	1.5	1.9	2.3	3.2	3.8
M	0.15	.50	.75	1.0	1.5	2.0	2.5	3.0	3.7	5.0	6.0
M	0.25	.67	1.0	1.3	2.0	2.7	3.3	4.0	5.0	6.7	8.0
M	0.40	.84	1.2	1.6	2.5	3.3	4.2	5.0	6.3	8.4	10
M	0.65	1.1	1.6	2.2	3.3	4.5	5.6	6.7	8.4	11	13
M	1.0	1.4	2.1	2.8	4.3	5.7	7.2	8.7	10	14	17
M	1.5	1.8	2.7	3.6	5.6	7.4	9.2	11	13	18	22
M	2.5	2.4	3.6	4.8	7.3	9.5	12	14	18	23	29
M	4.0	3.3	5.0	6.7	10	13	16	20	25	33	40
N	0.025	.20	.30	.40	.60	.80	1.0	1.2	1.5	2.0	2.4
N	0.10	.31	.47	.64	.95	1.2	1.5	1.9	2.3	3.2	3.8
N	0.15	.43	.65	.87	1.3	1.7	2.1	2.6	3.3	4.3	5.2
N	0.25	.54	.80	1.0	1.6	2.1	2.7	3.2	4.0	5.3	6.4
N	0.40	.70	1.0	1.4	2.1	2.8	3.5	4.2	5.3	7.0	8.4
N	0.65	.88	1.3	1.7	2.6	3.5	4.4	5.3	6.5	8.8	10
N	1.0	1.1	1.7	2.2	3.5	4.6	5.8	7.0	8.6	11	13
N	1.5	1.5	2.2	3.0	4.5	6.0	7.5	9.1	11	15	18
N	2.5	2.1	3.1	4.1	6.2	8.4	10	12	15	20	25
P	0.015	.12	.19	.25	.38	.50	.63	.76	.95	1.3	1.5
P	0.065	.20	.29	.39	.59	.78	.97	1.1	1.4	1.9	2.4
P	0.10	.26	.39	.53	.79	1.0	1.3	1.6	2.0	2.6	3.2
P	0.15	.32	.48	.65	.96	1.3	1.6	1.9	2.4	3.2	3.9
P	0.25	.44	.65	.88	1.3	1.7	2.2	2.6	3.2	4.4	5.2
P	0.40	.54	.80	1.1	1.6	2.1	2.7	3.2	4.0	5.4	6.4
P	0.65	.70	1.0	1.4	2.1	2.8	3.5	4.2	5.3	7.0	8.5
P	1.0	.91	1.3	1.8	2.7	3.6	4.6	5.5	6.8	9.1	11
P	1.5	1.3	1.9	2.6	3.9	5.2	6.5	7.8	9.7	13	15

TABLE 2C (Con.)

Code Letter	AQL	Shape Parameter, β									
		$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	1	$1\frac{1}{3}$	$1\frac{2}{3}$	2	$2\frac{1}{2}$	$3\frac{1}{3}$	4
Q	0.010	.080	.12	.16	.24	.32	.39	.48	.59	.79	.95
Q	0.040	.12	.19	.25	.38	.50	.63	.76	.95	1.3	1.5
Q	0.065	.16	.25	.33	.50	.66	.83	1.0	1.2	1.6	2.0
Q	0.10	.20	.31	.42	.62	.81	1.0	1.2	1.5	[illegible]	2.5
Q	0.15	.28	.42	.56	.84	1.1	1.4	1.7	2.1	[illegible]	3.4
Q	0.25	.37	.55	.74	1.1	1.4	1.8	2.2	2.7	[illegible]	4.4
Q	0.40	.47	.70	.94	1.4	1.8	2.3	2.8	3.5	4.7	5.6
Q	0.65	.60	.90	1.2	1.8	2.4	3.0	3.6	4.5	6.0	7.2
Q	1.0	.80	1.2	1.6	2.4	3.2	4.0	4.8	6.0	8.1	9.7
R	0.025	.080	.12	.16	.24	.32	.39	.48	.59	.79	.95
R	0.040	.10	.16	.21	.32	.42	.53	.64	.79	1.0	1.3
R	0.065	.13	.19	.26	.39	.51	.65	.78	.97	1.3	1.5
R	0.10	.17	.26	.35	.53	.70	.87	1.0	1.3	1.7	2.1
R	0.15	.22	.33	.44	.66	.88	1.1	1.3	1.6	2.2	2.6
R	0.25	.28	.42	.57	.85	1.1	1.4	1.7	2.1	2.8	3.4
R	0.40	.37	.55	.74	1.1	1.4	1.8	2.2	2.7	3.7	4.4
R	0.65	.50	.75	1.0	1.5	2.0	2.5	3.0	3.7	5.0	6.0

TABLE 2D

Table of Hazard Rate Ratios for t_2/t_1

t_2/t_1	$Z(t_2)/Z(t_1)$									
	Shape Parameter, β									
	1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
1.25	.862	.894	.928	1.00	1.08	1.16	1.25	1.40	1.68	1.95
1.50	.763	.816	.873	1.00	1.14	1.31	1.50	1.84	2.57	3.38
1.75	.689	.756	.823	1.00	1.21	1.45	1.75	2.32	3.69	5.36
2.00	.630	.707	.794	1.00	1.26	1.59	2.00	2.83	5.04	8.00
2.25	.583	.667	.763	1.00	1.31	1.72	2.25	2.38	6.64	11.4
2.50	.543	.632	.734	1.00	1.36	1.84	2.50	3.95	8.49	15.6
2.75	.510	.603	.714	1.00	1.40	1.96	2.75	4.56	10.6	20.8
3.00	.481	.577	.694	1.00	1.44	2.08	3.00	5.20	13.0	27.0
3.25	.456	.555	.675	1.00	1.48	2.19	3.25	5.86	15.6	34.3
3.50	.434	.534	.659	1.00	1.52	2.30	3.50	6.55	18.4	42.9
3.75	.414	.516	.644	1.00	1.55	2.42	3.75	7.26	21.8	52.7
4.00	.397	.500	.630	1.00	1.59	2.52	4.00	8.00	25.4	64.0
4.25	.381	.485	.617	1.00	[illegible]	2.62	4.25	8.76	29.3	76.8
4.50	.367	.472	.606	1.00	1.65	2.73	4.50	9.54	33.4	91.1
4.75	.354	.459	.595	1.00	1.68	2.83	4.75	10.4	37.9	107
5.00	.342	.447	.585	1.00	1.71	2.92	5.00	11.2	42.8	125

TABLE 3A

100t/ρ Ratios at the Acceptable Quality Level (normal inspection)

for the MIL - STD - 105D Plans r = .90

Acceptable Quality Level p'(%)	Shape Parameter, β									
	1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
.010	86-9	90-6	.0029	.095	.54	1.54	3.08	6.18	12.4	17.6
.015	29-8	20-5	.0054	.14	.91	1.96	3.77	7.27	14.0	19.4
.025	13-7	56-5	.016	.24	1.08	2.66	4.87	8.92	16.3	22.1
.040	55-7	14-4	.023	.38	1.53	3.53	6.16	10.8	18.8	24.8
.065	24-6	38-4	.048	.62	2.20	4.72	7.85	13.1	21.7	28.0
0.10	86-6	90-4	.092	.95	3.04	6.12	9.74	15.5	24.7	31.2
0.15	29-5	.020	.17	1.42	4.12	7.80	11.9	18.3	27.9	34.5
0.25	13-4	.056	.37	2.37	6.04	10.6	15.4	22.4	32.6	39.2
0.40	55-4	.15	.74	3.81	8.62	14.1	19.5	27.1	37.5	44.2
0.65	.024	.38	1.54	6.19	12.4	18.8	24.9	32.9	43.4	49.9
1.0	.087	.91	2.95	9.54	17.2	24.4	30.9	39.1	49.4	55.6
1.5	.30	2.06	5.43	14.3	23.3	31.2	37.9	46.0	55.8	61.5
2.5	1.39	5.78	11.8	24.0	34.3	42.5	49.0	56.5	56.2	70.0
4.0	5.82	15.0	24.1	38.7	49.1	56.6	62.2	68.4	75.2	78.9
6.5	26.0	40.7	50.9	63.8	71.4	76.4	79.9	83.6	87.4	89.4
10	100	100	100	100	100	100	100	100	100	100

The negative figure after a ratio shows the number of decimal points to provide. Thus 56-5 = .00056.

TABLE 3B

100t/ρ Ratios at the Limiting Quality Level

for the MIL - STD - 105D Plans - r = .90 - Consumer's Risk = 0.10

Code Letter	Shape Parameter, β										
	AQL	1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
A	6.5	---	---	---	---	600	420	330	260	200	180
B	4.0	---	---	---	720	440	330	270	220	180	160
C	2.5	---	---	880	430	300	240	200	180	150	140
C	10	---	---	---	810	480	350	290	230	180	160
D	1.5	---	740	450	270	210	180	160	140	130	120
D	6.5	---	---	---	490	330	260	220	190	160	140
D	10	---	---	---	720	440	330	270	220	180	160
E	1.0	450	270	210	160	140	130	120	120	110	110
E	4.0	---	920	500	290	220	190	170	150	130	130
E	6.5	---	---	850	420	290	230	200	170	150	140
E	10	---	---	---	540	350	280	230	190	160	150
F	0.65	130	120	110	110	100	100	100	100	100	100
F	2.5	680	350	250	180	160	140	130	130	120	110
F	4.0	---	740	450	270	210	180	160	140	130	120
F	6.5	---	---	620	330	250	200	180	160	140	130
F	10	---	---	---	510	340	260	220	190	160	150
G	0.40	30	46	56	68	74	78	82	85	88	90
G	1.5	180	140	130	120	110	110	110	100	100	100
G	2.5	450	270	210	160	140	130	120	120	110	110
G	4.0	950	440	300	210	170	150	140	130	120	120
G	6.5	---	920	500	290	220	190	170	150	130	130
G	10	---	---	760	390	280	220	190	170	150	130

TABLE 3B (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
H	0.25	8.3	19	28	43	53	60	66	71	77	80
H	1.0	41	56	64	75	79	83	86	89	91	93
H	1.5	100	100	100	100	100	100	100	100	100	100
H	2.5	220	170	150	130	120	110	110	110	100	100
H	4.0	680	350	250	180	160	140	130	130	120	110
H	6.5	---	560	350	230	190	160	150	140	120	120
H	10	---	---	570	320	240	200	170	160	140	130
J	0.15	1.9	7.3	14	27	37	45	52	59	67	71
J	0.65	10	22	31	46	55	63	68	74	79	82
J	1.0	26	40	50	63	71	76	79	83	87	89
J	1.5	53	66	73	80	83	86	88	91	93	95
J	2.5	130	120	110	110	100	100	100	100	100	100
J	4.0	280	200	170	140	130	120	120	110	110	100
J	6.5	810	400	280	200	170	150	140	130	120	110
J	10	---	680	410	260	200	170	160	140	130	120

TABLE 3B (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
K	0.10	.50	3.0	7.1	17	26	35	41	49	59	64
K	0.40	2.6	9.0	16	29	40	48	55	62	69	74
K	0.65	7.3	17	27	41	51	59	65	70	76	80
K	1.0	14	28	38	53	61	67	72	77	82	85
K	1.5	38	53	62	73	78	82	85	88	90	92
K	2.5	81	88	90	93	94	95	95	96	97	98
K	4.0	180	140	130	120	110	110	110	100	100	100
K	6.5	450	270	210	160	140	130	120	120	110	110
K	10	---	620	380	240	190	170	150	140	130	120
L	0.065	.15	1.3	3.8	11	19	27	33	42	52	58
L	0.25	.70	3.6	8.4	19	29	37	43	51	60	66
L	0.40	1.7	6.7	13	26	36	44	51	58	66	71
L	0.65	3.1	10	18	31	42	50	57	63	70	74
L	1.0	9.0	20	30	44	54	61	67	72	78	81
L	1.5	19	33	43	57	65	71	76	80	84	87
L	2.5	43	58	66	76	80	84	87	90	92	93
L	4.0	100	100	100	100	100	100	100	100	100	100
L	6.5	280	200	170	140	130	120	120	110	110	100
M	0.040	.033	.47	1.8	7.0	13	20	26	34	44	51
M	0.15	.15	1.3	3.8	11	19	27	33	42	52	58
M	0.25	.42	2.6	6.5	16	25	33	40	48	57	63
M	0.40	.82	4.0	9.0	20	30	38	45	53	61	66
M	0.65	2.1	7.7	14	27	38	46	53	60	67	72
M	1.0	4.5	12	21	35	46	54	60	66	73	77
M	1.5	10	22	32	47	56	64	69	74	80	83
M	2.5	24	39	47	62	69	75	79	82	86	86
M	4.0	70	79	85	89	90	92	94	95	96	97

TABLE 3 B (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
N	0.025	.0082	.19	.90	4.3	9.3	15	21	28	38	45
N	0.10	.040	.54	2.0	7.4	14	21	27	35	45	52
N	0.15	.11	1.1	3.4	10	18	25	32	40	50	56
N	0.25	.19	1.5	4.4	12	21	28	35	43	53	59
N	0.40	.60	3.3	7.7	18	27	36	43	50	59	65
N	0.65	1.2	5.3	11	23	33	41	48	55	64	68
N	1.0	2.6	9.0	16	29	40	48	55	62	69	74
N	1.5	5.8	15	24	38	49	56	62	68	75	78
N	2.5	16	30	40	55	63	69	74	78	83	86
P	0.015	21-4	.076	.45	2.7	6.6	11	16	23	33	40
P	0.065	0.10	.21	1.0	4.6	10	15	21	29	39	46
P	0.10	.025	.40	1.6	6.3	12	19	25	33	43	50
P	0.15	.050	.63	2.2	8.0	15	22	28	36	46	53
P	0.25	.15	1.3	3.8	11	19	27	33	42	52	58
P	0.40	.29	2.0	5.4	14	23	31	37	46	55	61
P	0.65	.60	3.3	7.7	18	27	36	43	50	59	65
P	1.0	1.3	5.7	11	24	34	42	49	56	65	70
P	1.5	3.8	11	19	33	44	52	58	65	72	76
Q	0.010	52-5	.029	.22	1.7	46	8.7	13	19	29	36
Q	0.040	25-4	.086	.50	2.9	7.0	12	17	24	34	41
Q	0.065	68-4	.16	.81	4.1	8.9	14	20	27	38	44
Q	0.10	.012	.25	1.1	5.0	10	16	22	30	40	46
Q	0.15	.034	.49	1.8	7.1	13	20	26	34	44	51
Q	0.25	.071	.78	2.6	9.0	16	23	30	38	48	54
Q	0.40	.15	1.3	3.8	11	19	27	33	42	52	58
Q	0.65	.35	2.3	6.0	15	24	32	39	47	56	62
Q	1.0	1.0	4.9	10	22	32	40	47	54	63	68

TABLE 3B (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
R	0.025	70-5	.036	.26	1.9	5.1	9.2	13	20	30	37
R	0.040	16-4	.065	.40	2.5	6.3	11	16	23	33	39
R	0.065	30-4	.098	.55	3.1	7.3	12	17	25	35	42
R	0.10	82-4	.19	.90	4.3	9.3	15	21	28	38	45
R	0.15	.017	.31	1.3	5.6	11	17	23	31	42	48
R	0.25	.039	.53	2.0	7.3	14	20	27	35	45	52
R	0.40	.087	.91	2.9	9.5	17	24	30	39	49	55
R	0.65	.24	1.8	4.9	13	22	30	36	44	54	60

The negative figure after a ratio shows the number of decimal points to provide. Thus, 21-4 = .0021.

TABLE 3C

$100t/\rho$ Ratios at the Limiting Quality Level for the

MIL-STD-105D Plans - r = .90 - Consumer's Risk = 0.05

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
A	6.5	---	---	---	----	730	490	380	280	220	190
B	4.0	---	---	---	930	540	380	310	240	190	170
C	2.5	---	---	---	550	360	280	230	200	160	150
C	10	---	---	---	1000	570	410	320	250	200	180
D	1.5	---	---	640	350	250	210	180	160	140	130
D	6.5	---	---	---	590	380	290	240	200	170	150
D	10	---	---	---	860	500	370	290	240	190	170
E	1.0	---	500	320	220	180	160	140	130	120	120
E	4.0	---	---	680	360	260	210	190	160	140	130
E	6.5	---	---	---	490	330	260	220	190	160	140
E	10	---	---	---	660	410	310	250	210	170	160
F	0.65	280	200	170	140	130	120	120	110	110	100
F	2.5	---	560	360	230	190	160	150	140	120	120
F	4.0	---	1000	540	310	230	200	170	150	140	130
F	6.5	---	---	760	390	280	220	190	170	150	130
F	10	---	---	---	570	370	290	240	200	170	150
G	0.40	68	79	83	88	90	92	93	94	96	97
G	1.5	280	200	170	140	130	120	120	110	110	100
G	2.5	680	350	250	180	160	140	130	130	120	110
G	4.0	---	620	380	240	190	170	150	140	130	120
G	6.5	---	---	620	340	250	200	180	160	140	130
G	10	---	---	880	430	300	240	200	180	150	140
H	0.25	18	32	42	57	65	70	75	79	84	86
H	1.0	74	82	87	90	91	92	94	95	96	97
H	1.5	180	140	130	120	110	110	110	100	100	100
H	2.5	360	230	190	150	130	130	120	120	110	110
H	4.0	950	440	300	210	170	150	140	130	120	120
H	6.5	---	740	450	270	210	180	160	150	130	120
H	10	---	---	680	360	260	210	190	160	140	130

TABLE 3C (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
J	0.15	4.5	12	21	35	46	54	60	66	73	77
J	0.65	18	32	42	57	65	70	75	79	84	89
J	1.0	43	58	66	76	80	84	87	90	92	93
J	1.5	81	88	90	93	94	95	95	96	97	98
J	2.5	220	170	150	130	120	110	110	110	100	100
J	4.0	450	270	210	160	140	130	120	120	110	110
J	6.5	950	450	300	210	170	150	140	130	120	120
J	10	---	840	470	280	220	180	160	150	130	120
K	0.10	1.2	5.3	11	23	33	41	48	55	64	68
K	0.40	4.9	13	22	36	47	55	60	67	74	77
K	0.65	11	23	34	48	58	64	69	75	80	83
K	1.0	22	37	47	60	68	73	78	81	85	88
K	1.5	57	70	75	83	86	88	90	92	94	95
K	2.5	130	120	110	110	100	100	100	100	100	100
K	4.0	280	200	170	140	130	120	120	110	110	100
K	6.5	680	350	250	180	160	140	130	130	120	110
K	10	---	680	410	260	200	170	160	140	130	120
L	0.065	.29	2.0	5.4	4	23	31	37	45	55	61
L	0.25	1.2	5.3	11	23	33	41	48	55	64	68
L	0.40	3.0	9.5	17	30	41	49	56	62	70	74
L	0.65	5.4	14	23	37	48	55	62	67	74	78
L	1.0	13	27	37	51	60	67	72	76	81	84
L	1.5	27	42	52	64	71	76	80	84	87	90
L	2.5	59	71	76	84	87	89	90	92	94	95
L	4.0	130	120	110	110	100	100	100	100	100	100
L	6.5	360	230	190	150	130	130	120	120	110	110

TABLE 3C (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
M	0.040	.073	.81	2.7	9.1	16	23	30	38	48	55
M	0.15	.29	2.0	5.4	4	23	31	37	46	55	61
M	0.25	.70	3.6	8.4	19	29	37	43	51	60	66
M	0.40	1.3	5.7	11	24	34	42	49	56	65	70
M	0.65	3.1	10	18	31	42	50	57	63	70	74
M	1.0	6.7	16	26	40	50	58	64	70	76	80
M	1.5	14	28	38	53	61	67	72	77	82	85
M	2.5	32	47	57	69	74	78	82	86	88	90
M	4.0	87	91	93	95	96	97	97	98	98	98
N	0.025	018	.32	1.3	5.7	11	18	24	31	42	48
N	0.10	.074	.80	2.7	9.1	16	23	30	38	48	54
N	0.15	.19	1.5	4 4	12	21	28	35	43	53	59
N	0.25	.35	2.3	6.0	15	24	32	39	47	56	62
N	0.40	.82	4.0	9.0	20	30	38	45	53	61	66
N	0.65	1.5	6.2	12	25	35	43	50	57	65	70
N	1.0	3.5	10	18	32	43	51	57	64	71	75
N	1.5	7.8	18	27	42	52	59	65	71	77	80
N	2.5	21	36	46	59	67	73	77	81	85	88
P	0.015	47-4	.13	.68	3.6	8.1	13	19	26	36	43
P	0.065	.017	.31	1.3	5.6	11	17	23	31	42	48
P	0.10	.042	.56	2.0	7.5	14	21	27	35	45	52
P	0.15	.080	.84	2.8	9.3	16	24	30	38	48	55
P	0.25	.19	1.5	4.4	12	21	28	35	43	53	59
P	0.40	.35	2.3	6.0	15	24	32	39	47	56	62
P	0.65	.82	4.0	9.0	20	30	38	45	53	61	66
P	1.0	1.7	6 7	13	26	36	44	51	58	66	71
P	1.5	4.9	13	22	36	47	55	60	67	74	77

TABLE 3C (Con.)

Code Letter	Shape Parameter, β										
	AQL	1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
Q	0.010	12-4	.052	.34	2.2	5.8	10	15	22	32	38
Q	0.040	47-4	.13	.68	3.6	8.1	13	19	26	36	43
Q	0.065	.011	.22	1.0	4.7	10	16	21	29	40	46
Q	0.10	.020	.34	1.5	5.9	12	18	24	32	42	49
Q	0.15	.050	.63	2.2	8.0	15	22	28	36	46	53
Q	0.25	.11	1.1	3.4	10	18	25	32	40	50	56
Q	0.40	.24	1.8	4.9	13	22	30	36	44	54	60
Q	0.65	50	3.0	7.1	17	26	35	41	49	59	64
Q	1.0	1.2	5.3	11	23	33	41	48	55	64	68
R	0.025	12-4	.052	.34	2.2	5.8	10	15	22	32	38
R	0.040	28-4	.091	.52	3.0	7.1	12	17	24	35	41
R	0.065	50-4	13	.70	3.7	8.3	14	19	26	37	43
R	0.10	.012	.25	1.1	5.0	10	16	22	30	40	46
R	0.15	.025	39	1.5	6.3	12	19	25	33	43	50
R	0.25	.053	65	2.3	8.0	15	22	28	36	46	53
R	0.40	.11	1.1	3.4	10	18	25	32	40	50	56
R	0.65	.29	2.0	5.4	14	23	31	37	45	55	61

The negative figure after a ratio shows the number of decimal points to provide. Thus, 47-4 = .0047

TABLE 4A

100t/ρ Ratios at the Acceptable Quality Level (normal inspection) for the MIL-STD-105D Plans r = .99

Acceptable Quality Level p′(%)	Shape Parameter, β									
	1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
.010	99-6	.010	.10	.99	3.15	6.29	9.98	15.8	25.1	31.6
.015	33-5	.022	.18	1.49	4.26	8.02	12.2	18.6	28.3	34.9
.025	15-4	.062	.39	2.49	6.26	10.9	15.8	22.8	33.0	39.7
.040	63-4	.16	.79	3.98	8.91	14.5	20.0	27.5	38.0	44.7
.065	027	.42	1.64	6.47	12.8	19.3	25.4	33.4	44.0	50.4
0.10	.10	.99	3.14	9.95	17.7	25.0	31.5	39.7	50.0	56.2
0.15	.33	2.23	5.76	14.9	24.0	31.9	38.6	46.7	56.5	62.2
0.25	1.54	6.19	12.4	24.9	35.2	43.4	49.9	57.3	65.9	70.6
0.40	6.35	15.9	25.2	39.9	50.2	57.6	63.2	69.2	75.9	79.5
0.65	27.3	42.1	52.2	64.9	72.3	77.1	80.6	84.1	87.8	89.8
1.0	100	100	100	100	100	100	100	100	100	100
1.5	340	226	184	150	136	128	123	118	113	111
2.5	1600	635	400	252	200	174	159	145	132	126
4.0	6700	1650	818	406	286	232	202	175	152	142
6.5	29900	4470	1730	669	416	313	259	214	177	161
10	116000	11000	3390	1050	582	410	324	256	202	180

The negative figure after a ratio shows the number of decimal points to provide. Thus, 33.5 = .00033.

TABLE 4B

100t/ρ Ratios at the Limiting Quality Level for the

MIL-STD-105D Plans - r = .99 - Consumer's Risk = 0.10

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
A	6.5	---	---	---	---	3300	1700	1000	660	410	320
B	4.0	---	---	---	7700	2500	1300	880	560	360	290
C	2.5	---	---	---	4600	1700	980	680	460	310	250
C	10	---	---	---	8700	2700	1400	930	590	380	300
D	1.5	---	---	---	2800	1200	740	530	380	270	230
D	6.5	---	---	---	5300	1900	1000	720	480	350	260
D	10	---	---	---	7700	2500	1300	880	560	360	290
E	1.0	---	---	7300	1700	840	540	410	310	230	200
E	4.0	---	---	---	3100	1300	770	560	390	280	230
E	6.5	---	---	---	4400	1700	960	660	450	310	250
E	10	---	---	---	5800	2000	1100	760	500	330	270
F	0.65	---	---	3900	1100	620	410	330	260	210	180
F	2.5	---	---	8800	1900	930	590	440	320	240	210
F	4.0	---	---	---	2800	1200	740	530	380	270	230
F	6.5	---	---	---	3500	1400	850	590	410	290	240
F	10	---	---	---	5500	1900	1000	730	490	330	270
G	0.40	---	5000	1800	710	430	320	260	210	180	160
G	1.5	---	---	4500	1200	670	460	350	270	210	180
G	2.5	---	---	7300	1700	840	540	410	310	230	200
G	4.0	---	---	---	2200	1000	640	470	340	250	210
G	6.5	---	---	---	3100	1300	770	560	390	280	230
G	10	---	---	---	4100	1600	920	640	440	300	250

TABLE 4B (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
H	0.25	9400	2100	960	460	310	250	210	180	150	140
H	1.0	---	6100	2200	790	460	340	270	220	180	160
H	1.5	---	---	3300	1000	580	410	320	250	200	180
H	2.5	---	---	5100	1400	7.0	480	370	280	220	190
H	4.0	---	---	8800	1900	930	590	440	320	240	210
H	6.5	---	---	---	2500	1100	670	500	360	260	220
H	10	---	---	---	3400	1400	820	580	400	290	240
J	0.15	2300	800	460	280	210	180	160	150	130	130
J	0.65	---	2400	1000	490	320	260	210	180	160	150
J	1.0	---	4400	1700	660	410	310	250	210	170	160
J	1.5	---	7300	2500	860	490	360	290	230	190	170
J	2.5	---	---	3900	1100	620	410	330	260	210	180
J	4.0	---	---	5800	1500	750	500	380	290	220	190
J	6.5	---	---	9400	2100	970	610	460	330	250	210
J	10	---	---	---	2700	1100	710	520	370	270	220
K	0.10	600	320	240	180	150	140	130	120	120	110
K	0.40	3100	980	540	310	230	200	170	150	140	130
K	0.65	8200	1900	900	440	300	240	200	180	150	140
K	1.0	---	3000	1200	550	350	280	230	190	160	150
K	1.5	---	5800	2100	760	450	340	270	220	180	160
K	2.5	---	9500	3000	980	550	390	310	250	190	170
K	4.0	---	---	4500	1200	670	460	350	270	210	180
K	6.5	---	---	7300	1700	840	540	410	310	230	200
K	10	---	---	---	2600	1100	690	510	360	260	220

TABLE 4B (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
L	0.065	170	140	130	120	110	110	110	100	100	100
L	0.25	810	400	280	200	160	150	140	130	120	110
L	0.40	2000	740	440	270	210	180	160	140	130	120
L	0.65	3700	1100	590	330	240	200	180	160	140	130
L	1.0	9900	2200	1000	470	310	250	210	180	150	140
L	1.5	---	3600	1400	610	380	290	240	200	170	150
L	2.5	---	6300	2200	800	470	350	280	220	180	160
L	4.0	---	---	3300	1000	580	410	320	250	200	180
L	6.5	---	---	5800	1500	750	500	380	290	220	190
M	0.040	38	53	62	72	78	82	84	87	90	92
M	0.15	170	140	130	120	110	110	110	100	100	100
M	0.25	500	290	220	170	150	130	130	120	110	110
M	0.40	950	440	300	210	170	150	140	130	120	120
M	0.65	2500	870	490	290	220	190	170	150	130	130
M	1.0	5300	1400	710	370	260	220	190	160	140	140
M	1.5	---	2500	1100	500	330	260	220	180	160	150
M	2.5	---	4200	1600	660	400	310	250	210	170	160
M	4.0	---	8800	2800	940	530	380	300	240	190	170
N	0.025	9.7	21	30	45	55	62	67	72	79	82
N	0.10	47	60	68	77	82	86	88	90	92	94
N	0.15	130	120	110	110	110	100	100	100	100	100
N	0.25	220	170	150	130	120	110	110	110	100	100
N	0.40	700	360	260	190	160	140	130	120	120	110
N	0.65	1400	580	370	240	190	170	150	140	130	120
N	1.0	3100	980	540	310	230	200	170	150	140	130
N	1.5	6700	1600	810	400	280	230	200	170	150	140
N	2.5	---	3200	1300	580	360	280	230	200	160	150

TABLE 4B (Con.)

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
P	0.015	2.4	8.2	15	28	39	47	53	60	69	73
P	0.065	11	24	34	48	57	64	69	74	80	83
P	0.10	30	44	54	66	73	78	80	84	88	90
P	0.15	59	70	76	83	87	89	90	92	94	95
P	0.25	170	140	130	120	110	110	110	100	100	100
P	0.40	340	220	180	150	130	120	120	110	110	110
P	0.65	700	360	260	190	160	140	130	120	120	110
P	1.0	1600	630	400	250	200	170	150	140	130	120
P	1.5	4500	1200	650	350	250	210	180	160	140	130
Q	0.010	.58	3.2	7.5	18	27	35	42	50	59	64
Q	0.040	2.9	9.3	17	30	41	49	55	62	70	74
Q	0.065	8.0	18	28	42	52	60	64	70	77	80
Q	0.10	15	28	38	52	61	68	72	77	82	85
Q	0.15	40	54	63	73	78	82	85	88	91	93
Q	0.25	80	87	90	92	94	95	96	97	98	98
Q	0.40	170	140	130	120	110	110	110	100	100	100
Q	0.65	410	250	200	160	140	130	120	120	110	110
Q	1.0	1200	530	340	230	180	160	150	140	120	120
R	0.025	.80	3.9	8.8	20	29	37	44	52	61	66
R	0.040	1.9	7.0	14	26	37	45	51	59	67	72
R	0.065	3.6	11	18	32	43	51	56	64	71	75
R	0.10	9.7	21	30	45	55	62	67	72	79	82
R	0.15	20	34	45	58	66	72	76	80	85	87
R	0.25	45	59	66	76	81	84	86	89	92	94
R	0.40	100	100	100	100	100	100	100	100	100	100
R	0.65	270	190	160	140	120	120	110	110	110	100

TABLE 4C

100t/ρ Ratios at the Limiting Quality Level for the

MIL-STD-105D Plans - r = .99 - Consumer's Risk = 0.05

Code Letter	AQL	Shape Parameter, β									
		1/3	1/2	2/3	1	1⅓	1⅔	2	2½	3⅓	4
A	6.5	---	---	---	---	4200	2000	1200	740	450	350
B	4.0	---	---	---	9900	3000	1500	990	620	390	310
C	2.5	---	---	---	6000	2100	1100	760	510	340	270
C	10	---	---	---	---	3200	1600	1000	640	400	320
D	1.5	---	---	---	3700	1400	850	610	420	290	240
D	6.5	---	---	---	6400	2200	1100	790	520	340	280
D	10	---	---	---	9200	2800	1500	950	600	380	300
E	1.0	---	---	---	2300	1000	650	480	350	250	220
E	4.0	---	---	---	3800	1500	870	620	420	290	240
E	6.5	---	---	---	5300	1900	1000	720	480	350	260
E	10	---	---	---	6900	2300	1200	830	540	350	280
F	.65	---	---	5800	1500	750	500	380	290	220	190
F	2.5	---	---	---	2500	1100	670	500	360	260	220
F	4.0	---	---	---	3200	1300	790	570	400	280	230
F	6.5	---	---	---	4100	1600	930	640	440	300	250
F	10	---	---	---	6200	2100	1100	780	510	340	270
G	.40	---	8500	2800	920	530	380	300	240	190	170
G	1.5	---	---	5800	1500	750	500	380	290	220	190
G	2.5	---	---	8800	1900	930	590	440	320	240	210
G	4.0	---	---	---	2600	1100	690	510	360	260	220
G	6.5	---	---	---	3500	1400	850	590	410	290	240
G	10	---	---	---	4600	1700	980	680	460	310	250
H	.25	---	3500	1400	600	370	290	240	200	170	150
H	1.0	---	9000	2900	960	540	380	300	240	190	170
H	1.5	---	---	4500	1200	670	460	350	270	210	180
H	2.5	---	---	6500	1600	800	530	400	300	230	200
H	4.0	---	---	---	2200	1000	640	470	340	250	210
H	6.5	---	---	---	2800	1200	740	530	380	270	230
H	10	---	---	---	3800	1500	880	620	420	290	240
J	.15	5300	1400	710	370	260	220	190	160	140	140
J	.65	---	3500	1400	600	370	290	240	200	170	150
J	1.0	---	6300	2200	800	470	350	280	220	180	160
J	1.5	---	9500	3000	980	550	390	310	250	190	170
J	2.5	---	---	5100	1400	710	480	370	280	220	190
J	4.0	---	---	7300	1700	840	540	410	310	230	200
J	6.5	---	---	---	2200	1000	640	470	340	250	210
J	10	---	---	---	3000	1200	750	540	390	270	230

TABLE 4C (Con.)

Code Letter	AQL	Shape Parameter β									
		1/3	1/2	2/3	1	1 1/3	1 2/3	2	2 1/2	3 1/3	4
K	0.10	1400	580	370	240	190	170	150	140	130	120
K	0.40	5700	1500	740	380	270	220	190	170	150	140
K	0.65	---	2600	1100	510	330	260	220	190	160	150
K	1.0	---	3900	1500	640	390	300	250	200	170	160
K	1.5	---	7600	2500	870	500	360	290	230	190	170
K	2.5	---	---	3900	1100	620	410	330	260	210	180
K	4.0	---	---	5800	1500	750	500	380	290	220	190
K	6.5	---	---	8800	1900	930	590	440	320	240	210
K	10	---	---	---	2700	1100	710	520	370	270	220
L	0.065	340	220	180	150	130	120	120	110	110	110
L	0.25	1400	580	370	240	190	170	150	140	130	120
L	0.40	3400	1000	560	320	230	200	170	150	140	130
L	0.65	6100	1500	770	400	270	230	190	170	150	140
L	1.0	---	2900	1200	540	350	270	230	190	160	150
L	1.5	---	4600	1700	680	410	310	250	210	170	160
L	2.5	---	7700	2600	880	500	370	290	230	190	170
L	4.0	---	---	3900	1100	620	410	330	260	210	180
L	6.5	---	---	6500	1600	800	530	400	300	230	200
M	0.040	85	89	92	94	95	96	96	97	98	98
M	0.15	340	220	180	150	130	120	120	110	110	110
M	0.25	810	400	280	200	160	150	140	130	120	110
M	0.40	1600	630	400	250	200	170	150	140	130	120
M	0.65	3700	1100	590	330	240	200	180	160	140	130
M	1.0	7700	1800	850	430	290	240	200	170	150	140
M	1.5	---	3000	1200	550	350	280	230	190	160	150
M	2.5	---	5200	1900	730	440	330	260	220	180	160
M	4.0	---	9900	3100	1000	560	400	310	250	200	170
N	0.025	21	36	46	59	67	73	76	80	85	88
N	0.10	85	89	92	94	95	96	96	97	98	98
N	0.15	220	170	150	130	120	110	110	110	100	100
N	0.25	410	250	200	160	140	130	120	120	110	110
N	0.40	950	440	300	210	170	150	140	130	120	120
N	0.65	1800	680	410	260	200	180	160	140	130	120
N	1.0	4100	1200	620	340	250	210	180	160	140	130
N	1.5	8800	2000	930	450	300	240	210	180	150	140
N	2.5	---	3900	1500	630	380	300	240	200	170	150

TABLE 4C (Con.)

Code Letter	AQL	Shape Parameter β									
		1/3	1/2	2/3	1	$1\frac{1}{3}$	$1\frac{2}{3}$	2	$2\frac{1}{2}$	$3\frac{1}{3}$	4
P	0.015	5.5	14	23	37	48	55	60	67	74	78
P	0.065	20	34	45	58	66	72	76	80	85	87
P	0.10	49	62	69	78	83	86	88	90	92	94
P	0.15	90	92	94	96	96	96	97	97	97	98
P	0.25	220	170	150	130	120	110	110	110	100	100
P	0.40	410	250	200	160	140	130	120	120	110	110
P	0.65	950	440	300	210	170	150	140	130	120	120
P	1.0	2000	740	440	270	210	180	160	140	130	120
P	1.5	5700	1500	740	380	270	220	190	170	150	140
Q	0.010	1.4	5.7	11	24	34	42	48	56	64	80
Q	0.040	5.5	14	23	37	48	55	60	67	74	78
Q	0.065	12	24	35	49	59	65	70	75	81	84
Q	0.10	23	38	48	61	69	74	77	82	86	88
Q	0.15	59	70	76	83	87	89	90	92	94	95
Q	0.25	130	120	110	110	110	100	100	100	100	100
Q	0.40	270	190	160	140	120	120	110	110	110	100
Q	0.65	600	320	240	180	150	140	130	120	120	110
Q	1.0	1400	580	370	240	190	170	150	140	130	120
R	0.025	1.4	5.7	11	24	34	42	48	56	64	80
R	0.040	3.2	10	17	31	42	50	55	63	70	75
R	0.065	6.0	15	24	38	49	56	61	68	75	79
R	0.10	15	28	38	52	61	68	72	77	82	85
R	0.15	28	43	52	65	72	78	80	84	88	90
R	0.25	60	71	77	84	88	89	90	93	95	96
R	0.40	130	120	110	110	110	100	100	100	100	100
R	0.65	340	220	180	150	130	120	120	110	110	110

* U S GOVERNMENT PRINTING OFFICE 1965 O—779-805