AD-A048 586 DELA ENTERPRISES INC COOLIDGE AZ F/G 19/1
FEASIBILITY OF USING SPIRAL WOUND TUBES IN THE MANUFACTURE OF T--ETC(U)
JUN 77 W C COX DAAA21-76-C-0206
UNCLASSIFIED DEI-1 NL

1 OF 1
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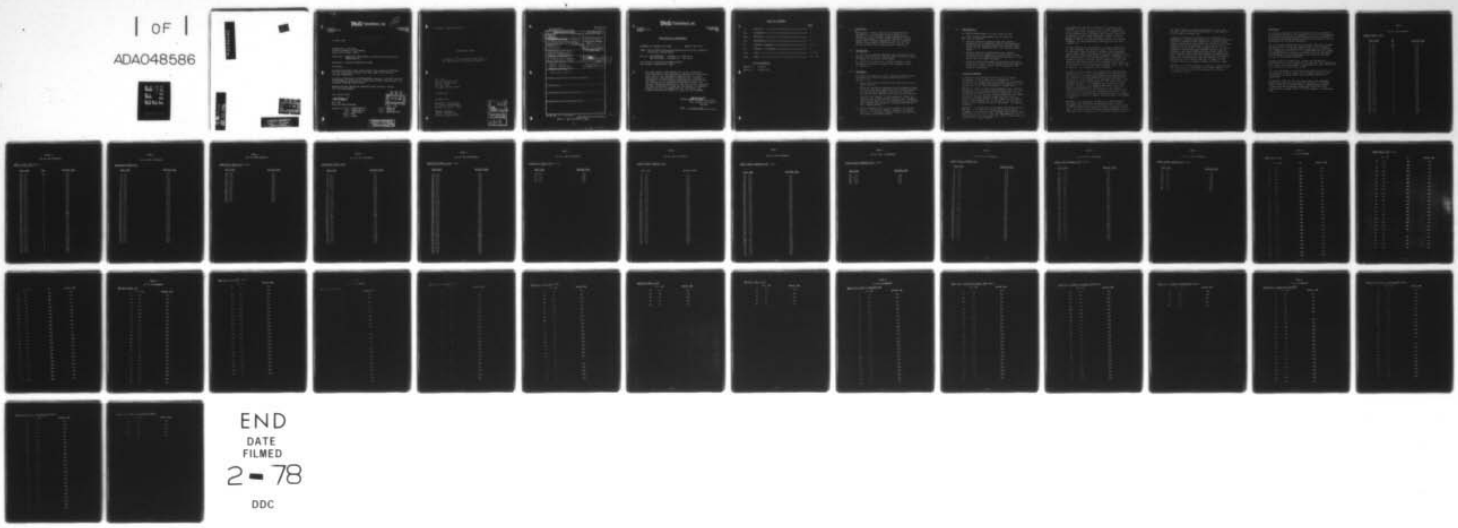

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Dela ENTERPRISES, INC.

P. O. BOX 1407
TELEPHONE (602) 723-5491
TELEX 668399

2000 N. VAVAGES AVENUE
COOLIDGE, ARIZONA
85228

28 July 1977

Department of the Army
US Army Armament R & D Command
Dover, New Jersey 07801

Attention: Ammunition Development & Engineering Directorate
SARPA-AD-E-P-1

Reference: Contract DAAA21-76-C-0206

Gentlemen:

Enclosed herewith is the final report and associated drawings for the referenced contract. All work under this contract has been completed.

A total of 1000 each of DEI77E000E001, Design #1 and 400 each of DEI77E000E002, Design #2 are being held at Dela Enterprises, Inc. awaiting shipping instructions.

Should you have questions regarding this contract, please call the undersigned.

Very truly yours,

W.C. Cox
Vice President/Eng.Mfg.

Copies to: 2/ea - SARPA-AD-E-P-1
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CONTRACT: DAAA21-76-C-0206

FEASIBILITY STUDY

Feasibility Of Using Spiral Wound Tubes In The Manufacture Of The M115A2 Simulator

W.C. Cox
Dela Enterprises, Inc.
2000 N. Vavages Ave.
P.O. Box 1407
Coolidge, Arizona 85228

15 June 1977

Prepared For:

Department of the Army
US Armament R&D Command
Dover, New Jersey 07801

DCASMA - Phoenix
3800 N. Central Ave.
Phoenix, Arizona 85012

UNCLASSIFIED

MIL-STD-847A
31 January 1973

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Figure 6. Report Documentation Page.

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Dela ENTERPRISES, INC.

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COOLIDGE, ARIZONA
85228

CERTIFICATE OF CONFORMANCE

CONTRACT NO. DAAA21-76-C-0206 DATE: 18 May 1977

ITEM: Spiral Wound Experimental Manufactured M115A2 Simulator Projectile, Ground Burst

LOT NO. DEI77E000E001 - Consists of 1,000 units
DEI77E000E002 - Consists of 400 units

Test Samples Complied With MIL-S-10058G
Test Results Tabulated On Pages

The undersigned, individually and as the authorized representative of the Contractor, warrants and represents that: All of the information supplied above is true and accurate; the material covered by this certificate conforms to all the contract requirements (including but not limited to the drawings and specifications); the analysis appearing herein is a true and accurate analysis; and this certificate is made for the purpose of inducing payment and with knowledge that the information and certification may be used as a basis for such payment.

SIGNED: WCCox

W.C. Cox/Vice President
Eng.Mfg.

DATE: 28 July 1977

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LIST OF DRAWINGS

I. OBJECTIVE:

The purpose of this study was to demonstrate the feasibility of using spiral wound tubing as an alternate to the convolute wound tubing specified in the manufacture of the M115A2 Simulator, Ground Burst. Three separate approaches will be evaluated and the requirements of MIL-S-10058G will be used as the criteria for evaluating these designs.

II. BACKGROUND:

a. The present M115A2 Simulator uses convolute wound tubes in the design. At present there is only one source of supply for convolute wound tubes.

b. Spiral wound tubes are a modern method of tube manufacture and are available from a greater number of suppliers.

III. PROCEDURE:

To attain the objectives, the contractor shall perform the following efforts to assure the delivery of a quality item.

1. Review the design considerations and requirements in MIL-S-10058 G.
2. Fabricate sufficient simulators with proposed changes including all three approaches for testing designed to confirm their ability to perform as expected. Standard M115A2 Simulators will be used as controls.
3. Testing will consist of functioning at -65°F. The requirements of MIL-S-10058G shall be met. Fragments from tested rounds will be recovered from each design and compared with fragments normally obtained with the standard M115A2.
4. After evaluation of the three designs, one design will be selected for further evaluation per MIL-S-10058G at a Government Proving Ground and tested in accordance with MIL-G-10058G.

IV. REQUIREMENTS:

a. MIL-S-10058G applies to this scope of work.

b. Three separate approaches will be pursued. They are as follows:

1. Utilize identical manufacturing and assembly procedures as is presently used in the manufacture of the M115A2 Simulator except that spiral wound tubes will be substituted for the convolute wound tubes.

2. Utilize identical manufacturing and assembly procedures as in approach (1) except that a band of tape will be wrapped around the periphery of the outer tubes for added strength.

3. Utilize thicker end closure discs which would have sufficient surface area to provide a strong adhesive joint between disc & tube. Roll crimping of ends would be eliminated.

V. TECHNICAL PROGRAM:

As stated in the objective portion of this report, the purpose of this study was to demonstrate the feasibility of using spiral wound tubing as an alternate to the convolute wound tubing presently specified in the manufacture of the M115A2 Simulator, Ground Burst.

During the course of this investigation, three separate approaches were considered and evaluated with two of the designs being selected for further evaluation testing. The results of our in-house testing indicated that either of the two designs selected would meet the criteria specified in MIL-S-10058G. At the request of Picatinny Arsenal approximately 1500 of design #1 and 500 each of design #2 were fabricated after evaluation testing was completed.

Approach #3 or design #1 was designated as DEI77F000E001. The units were fabricated using spiral wound tubing throughout. The ends were not crimped. The end discs were positioned in the ends of the tube approximately 1/8 of and inch below the top of the tube. The 1/8 inch space was filled with an epoxy mixture.

This particular design incorporated 7 #2 discs, dwg. #7549228-2 in place of 1 ea. disc #1, dwg. #7549228-1, 2 ea. #2 disc, dwg. #754922-2 and spacer #7549232 used in the standard cover assembly. Our original intent was to procure a light weight plug made of paper dust the proper thickness for this assembly; however, we were unable to obtain satisfactory plugs within this contract schedule. The major problem was tooling cost for such a short run.

The main purpose for the plug was to reduce labor costs for this assembly. We therefore used 7 each #2 discs as an alternate which resulted in slightly lower assembly costs. Some concern was expressed that the stacked discs used would be undesirable from a fragment standpoint. Since the only purpose is to take up space, it is possible to extend the whistle tube cap sides another one half (0.5) inch and eliminate 4 discs. The remaining three discs would provide sufficient area for bonding to the side wall of the tube. Of course the standard spacer and 3 discs can be used as in the standard cover assembly.

A total of 305 ea. units were submitted to Yuma Proving Ground on May 18. 1977 for evaluation testing. All units were test fired including the jumbled and vibrated units. The results of the test demonstrated the feasibility of using spiral wound tubing as an alternate material in the fabrication of the M115A2 Simulator. The DB readings all exceeded 140 DB's. The fragments were similar to those normally found with the standard convolute wound units. There was no appreciable difference in size, shape or rupture characteristics. The results of the Yuma testing were witnessed by Picatinny Arsenal representative and the results of the testing were hand carried by him, back to Picatinny Arsenal. A summary of the results is included in Table I.

Approach #1 or design #2, designated as DEI77E000E002. The units were fabricated using spiral wound tubing throughout. The units were constructed in the same manner as the standard M115A2 Simulator units including crimped ends. The only deviation from the standard design was that both ends after crimping were filled with epoxy mixture.

The epoxy material used in both designs is the same material used in the M116A1 Simulator, 1 part Epon 828 to 2.75 parts Versamide 125.

A total of 365 units of design #2 were selected and submitted to Yuma Proving Grounds for evaluation testing. All units including those subjected to vibration and jumble testing were test fired. The results of the test demonstrated the feasibility of using spiral wound tubing as an alternate in the manufacture of the M115A2 Simulator. All DB readings exceeded 140 DB's and the fragments and rupture characteristics were similar to those normally found with the standard convolute wound units. The results of the Yuma testing was witnessed by Picatinny Arsenal Engineering and results were hand carried back to Picatinny Arsenal. A summary of the results obtained is listed in Table II of this report.

Approach #1 in which a piece of tape was wrapped around the unit showed no advantages over either approach, #1 or #2 and therefore was not considered for further evaluation testing.

CONCLUSION

The testing conducted at Dela Enterprises, Inc. during the investigative phase of this program as well as the acceptance testing at Yuma Proving Grounds demonstrated the feasibility of using spiral wound tubing as an alternate material for the manufacture of the M115A2 Simulator.

One of the most significant cost savings (30%) both in labor and piece part cost was the incorporation of the crushed end closure for the whistle tube, replacing the sleeve and disc presently specified. It is recommended that this change be incorporated as a design improvement even if the spiral wound tubing is not incorporated as an alternate material for use in the M115A2 Simulator.

Design #1 offers a labor cost savings over Design #2, particularily in the assembly of the base and cover assemblies. This labor cost saving would be approximately 20% or $0.02 per unit, based on current labor costs.

The real advantage of offering an alternate material is the availability of more sources for the paper products than is currently available when only convolute material is specified.

At present, there is only one known source for convolute wound tubing and their facility is located in the Northeastern part of the United States. Spiral wound tubing is a modern method of manufacturing paper tubes with many more sources availabe which in itself would be of tremendous value.

TABLE I

LOT NO. DEL77E000E001

STATIC PHASE: 70°F

FUSE TIME	DB	WHISTLE TIME
1. 7.2	140	4.0
2. 7.2	140	3.5
3. 6.9	"	2.5
4. 7.1	"	2.9
5. 7.0	"	3.8
6. 7.1	"	3.3
7. 7.2	"	3.3
8. 7.2	"	3.4
9. 7.2	"	3.0
10. 7.4	"	3.3
11. 7.3	"	3.7
12. 7.3	"	3.2
13. 6.8	"	3.3
14. 7.0	"	3.4
15. 7.2	"	3.8
16. 7.2	"	2.9
17. 7.2	"	3.3
18. 7.4	"	3.3
19. 7.4	"	3.0
20. 6.9	"	4.0
21. 7.3	"	3.2
22. 7.2	"	2.9
23. 7.2	"	3.9
24. 7.4	"	2.8
25. 7.1	"	3.3
26. 7.2	"	3.5
27. 7.2	"	2.7
28. 7.5	"	3.4
29. 7.0	"	3.2
30. 7.4	"	3.3
31. 7.1	"	3.3
32. 7.2	"	3.3
33. 7.5	"	3.2
34. 7.4	"	2.9
35. 6.9	"	3.6

TABLE I

LOT NO. DEI77E000E001

STATIC PHASE 70°F (cont)

FUSE TIME	DB	WHISTLE TIME
36. 6.9	140	3.0
37. 7.1	"	3.1
38. 7.1	"	3.2
39. 7.3	"	3.5
40. 7.0	"	3.1
41. 7.0	"	3.3
42. 7.3	"	3.6
43. 7.0	"	3.4
44. 7.2	"	3.9
45. 7.0	"	3.2
46. 7.1	"	3.4
47. 7.3	"	3.4
48. 7.5	"	3.4
49. 7.5	"	3.0
50. 7.2	"	3.2
51. 7.3	"	3.3
52. 7.3	"	3.2
53. 7.4	"	3.7
54. 7.3	"	3.9
55. 7.4	"	3.2
56. 7.2		DUD
57. 7.4	"	3.3
58. 7.3	"	3.6
59. 7.4	"	3.1
60. 7.3	"	3.3
61. 7.2	"	3.2
62. 7.4	"	3.4
63. 6.7	"	3.1
64. 7.4	"	3.5
65. 7.3	"	3.2
66. 7.2	"	3.4
67. 7.4	"	3.6
68. 7.1	"	3.3
69. 7.1	"	2.9
70. 7.2	"	3.8
71. 7.2	"	3.2
72. 7.1	"	3.3
73. 7.4	"	3.3
74. 7.2	"	3.9
75. 7.7	"	3.8

TABLE I

LOT NO. DEI-77E000E001

NON-STATIC PHASE 70°F

	FUSE TIME	WHISTLE TIME
1.	7.1	3.0
2.	7.1	3.1
3.	7.6	3.0
4.	7.0	3.5
5.	7.2	3.0
6.	7.3	3.6
7.	7.4	3.2
8.	7.6	2.5
9.	7.2	3.3
10.	7.4	3.4
11.	7.4	3.9
12.	7.2	3.0
13.	7.4	3.3
14.	7.0	3.7
15.	7.6	3.4
16.	6.9	2.9
17.	6.9	3.7
18.	7.5	3.5
19.	7.3	3.2
20.	7.5	3.1
21.	7.6	3.6
22.	7.3	3.5
23.	7.7	3.4
24.	7.0	3.1
25.	7.2	3.4
26.	6.8	3.0
27.	7.1	3.2
28.	7.0	2.9
29.	7.4	3.2
30.	7.1	3.5
31.	7.3	3.
32.	7.6	3.2
33.	7.1	3.6
34.	7.2	2.9
35.	7.1	3.2

TABLE I

LOT NO. DEI77E000E001

NON-STATIC PHASE 70°F (cont)

	FUSE TIME	WHISTLE TIME
36.	7.0	3.2
37.	6.9	3.4
38.	7.3	3.6
39.	7.1	3.2
40.	7.8	3.4
41.	7.0	3.6
42.	7.2	3.4
43.	7.6	3.7
44.	7.6	3.5
45.	7.1	3.3
46.	7.3	3.0
47.	6.7	3.4
48.	7.2	3.0
49.	7.4	3.4
50.	7.3	3.0

TABLE I

LOT NO. DE1-77E000E001

NON-STATIC PHASE -65°F

	FUSE TIME	WHISTLE TIME
1.	7.3	4.3
2.	7.1	3.7
3.	7.6	3.3
4.	7.5	3.5
5.	7.6	3.5
6.	8.2	3.5
7.	7.5	3.9
8.	7.9	3.4
9.	7.5	3.8
10.		3.4
11.	8.5	4.0
12.	7.5	3.9
13.	7.8	4.3
14.	7.4	3.8
15.	7.5	3.9
16.	7.0	4.1
17.	7.8	3.8
18.	7.1	4.1
19.	7.5	4.5
20.	7.3	4.2
21.	7.3	3.5
22.	DUD	DUD
23.	7.1	3.8
24.	7.5	3.8
25.	7.4	3.5
26.	7.5	3.7
27.	7.6	3.7
28.	7.7	3.7
29.	8.0	3.8
30.	7.4	3.8
31.	7.5	3.7
32.	7.5	4.0
33.	7.5	3.9
34.	7.4	3.6
35.	8.4	3.6

TABLE I

Lot NO. DEI-77E000E001

NON-STATIC PHASE -65°F (cont)

	FUSE TIME	WHISTLE TIME
36.	7.2	4.4
37.	7.4	4.6
38.	8.5	3.7
39.	7.3	3.8
40.	7.5	3.1
41.	7.7	3.3
42.	7.3	3.5
43.	7.8	3.4
44.	7.3	4.3
45.	7.3	4.3
46.	7.5	3.6
47.	7.5	3.7
48.	7.3	3.5
49.	7.0	3.7
50.	7.3	3.6
51.	7.3	3.9
52.	7.5	4.1
53.	7.8	3.7
54.	7.6	4.2
55.	8.1	4.3
56.	7.5	3.7
57.	7.4	3.8
58.	7.7	3.1
59.	7.5	4.4
60.	6.9	3.9
61.	7.6	3.1
62.	7.7	3.9
63.	7.5	3.5
64.	7.6	4.4
65.	7.2	3.2
66.	Dud	Dud
67.	7.4	4.0
68.	8.2	3.6
69.	7.4	3.8
70.	7.4	3.9
71.	7.8	2.9
72.	7.4	3.8
73.	7.6	4.2
74.	7.6	3.4
75.	7.8	4.3

TABLE I

LOT NO. DEI-77E000E001

NON-STATIC PHASE -65°F (cont)

FUSE TIME	WHISTLE TIME
76. 7.6	3.2
77. 7.3	3.7
78. 7.4	3.4
79. 8.2	4.5
80. 7.6	4.2

TABLE I

LOT NO. DET-77E000E001

STATIC PHASE VIBRATED 70°F

	FUSE TIME	WHISTLE TIME
1.	6.8	3.1
2.	6.8	3.4
3.	6.6	3.7
4.	6.8	3.5
5.	7.2	3.3
6.	6.7	3.5
7.	7.4	3.7
8.	7.2	3.6
9.	7.1	3.6
10.	7.0	3.8
11.	7.2	3.6
12.	6.8	4.1
13.	7.1	2.7
14.	7.4	3.7
15.	7.1	4.1
16.	7.3	3.6
17.	7.1	3.5
18.	7.2	4.0
19.	7.0	3.6
20.	7.1	3.4
21.	7.1	3.3
22.	7.1	3.4
23.	7.3	3.5
24.	7.3	3.6
25.	7.1	3.4
26.	7.0	3.5
27.	7.0	3.2
28.	6.9	3.3
29.	6.8	3.2
30.	7.4	3.4
31.	7.1	3.3
32.	7.2	3.4
33.	6.7	3.4
34.	7.1	3.6
35.	7.4	3.3

TABLE I

LOT NO. DEI-77E000E001

STATIC PHASE VIBRATED 70°F (cont)

	FUSE TIME	WHISTLE TIME
36.	7.1	3.4
37.	7.0	3.3
38.	7.9	3.2
39.	7.3	3.3
40.	6.9	3.3
41.	7.2	3.1
42.	6.9	3.4
43.	7.2	3.1
44.	6.9	3.6
45.	6.9	3.8
46.	7.1	3.5
47.	7.2	3.4
48.	7.4	2.9
49.	7.1	4.1
50.	7.2	3.3
51.	7.0	2.9
52.	6.9	3.6
53.	7.0	3.2
54.	7.2	3.3
55.	7.8	3.2
56.	7.2	3.6
57.	7.1	3.1
58.	7.0	3.9
59.	7.1	3.9
60.	7.1	3.4
61.	7.1	3.2
62.	6.9	3.1
63.	7.3	3.3
64.	7.2	3.1
65.	7.2	3.4
66.	7.3	3.3
67.	6.8	3.4
68.	6.9	3.4
69.	7.2	3.6
70.	7.2	3.4
71.	7.3	3.2
72.	7.0	3.6
73.	7.0	3.2
74.	7.6	3.0
75.	7.5	3.2

TABLE I

LOT NO. DEI -77E000E001

STATIC PHASE VIBRATED 70°F (cont)

	FUSE TIME	WHISTLE TIME
76.	7.0	3.7
77.	7.3	3.9
78.	7.2	3.5
79.	7.5	3.1
80.	7.6	3.0

TABLE I

LOT NO. DE1-77E000E001

STATIC PHASE JUMBLED 70°F

	FUSE TIME	WHISTLE TIME
1.	7.5	3.2
2.	7.5	3.0
3.	7.3	3.4
4.	7.4	3.4
5.	7.2	2.8
6.	7.1	3.5
7.	7.7	3.0
8.	7.7	2.9
9.	7.4	3.6
10.	7.2	3.3
11.	8.1	3.2
12.	7.2	3.6
13.	7.3	2.9
14.	7.4	2.9
15.	7.1	3.6
16.	7.6	3.1
17.	7.2	3.1
18.	7.1	3.0
19.	7.6	3.1
20.	6.4	3.3
21.	7.0	3.1
22.	7.3	3.8
23.	6.5	3.7
24.	7.4	3.2
25.	6.8	2.9
26.	7.5	3.2
27.	7.1	3.2
28.	7.2	3.5
29.	6.9	3.3
30.	7.1	3.6
31.	7.3	3.5
32.	7.3	3.2
33.	7.2	3.2
34.	7.3	3.6
35.	7.1	3.2

TABLE I

LOT NO. DE1-77E000E001

STATIC PHASE JUMBLED 70°F (cont)

FUSE TIME		WHISTLE TIME
36.	7.1	3.5
37.	7.4	3.7
38.	7.5	3.2
39.	7.5	3.2
40.	7.0	3.2
41.	7.7	2.8
42.	7.3	3.3
43.	7.3	3.3
44.	7.2	3.5
45.	7.0	4.0
46.	7.4	3.3
47.	7.3	2.9
48.	7.5	2.8
49.	7.0	3.2
50.	7.0	3.3
51.	7.0	3.5
52.	7.3	3.3
53.	7.0	2.6
54.	7.7	2.8
55.	7.1	3.5
56.	7.2	3.1
57.	7.3	3.1
58.	7.0	3.2
59.	7.2	3.1
60.	7.2	3.5
61.	7.3	3.5
62.	6.9	3.9
63.	Dud	Dud
64.	7.5	3.1
65.	7.5	2.9
66.	7.3	3.6
67.	7.5	3.2
68.	7.4	2.7
69.	7.0	3.6
70.	7.2	3.3

TABLE I

LOT NO. DE1-77E000E001

STATIC PHASE JUMBLED 70°F (cont)

	FUSE TIME	WHISTLE TIME
71.	7.3	3.7
72.	7.3	3.5
73.	7.1	3.4
74.	7.2	3.5
75.	7.0	3.7
76.	7.1	3.7
77.	7.1	3.0
78.	7.3	3.0
79.	7.4	3.0
80.	7.0	3.3

TABLE II

LOT NO. DEI-77E000E002

STATIC PHASE: 70°F

	FUZE TIME	DB	WHISTLE TIME
1.	6.9	140	3.6
2.	6.9	140	3.3
3.	7.2	140	3.3
4.	7.1	140	3.5
5.	7.1	140	3.3
6.	6.9	140	3.7
7.	6.9	140	3.2
8.	7.2	140	2.9
9.	7.1	140	3.3
10.	7.6	140	3.2
11.	7.0	140	3.5
12.	6.8	140	3.2
13.	7.2	140	3.4
14.	7.3	140	3.3
15.	7.1	140	3.3
16.	7.2	140	3.1
17.	6.9	140	3.7
18.	7.2	140	3.2
19.	7.0	140	3.1
20.	7.2	140	3.1
21.	7.0	140	3.2
22.	7.8	140	3.2
23.	7.3	140	3.8
24.	7.5	140	3.5
25.	7.1	140	3.0

STATIC PHASE: 70°F (Cont.)

	FUZE TIME	DB	WHISTLE TIME
26.	6.9	140	3.7
27.	6.9	140	3.5
28.	7.1	140	3.4
29.	8.7	140	3.4
30.	7.2	140	3.4
31.	6.7	140	3.2
32.	7.3	140	3.4
33.	7.3	140	2.9
34.	7.5	140	3.6
35.	7.3	140	3.5
36.	6.6	140	3.5
37.	7.0	140	3.3
38.	6.9	140	3.3
39.	7.3	140	3.5
40.	7.1	140	3.5
41.	6.8	140	2.7
42.	7.6	140	3.6
43.	7.2	140	3.1
44.	7.3	140	3.6
45.	7.0	140	4.0
46.	7.1		3.1
47.	7.3	140	4.1
48.	7.3	140	3.7
49.	6.9	140	3.3
50.	7.1	140	3.3

	FUZE TIME	DB	WHISTLE TIME
51.	6.9	140	3.2
52.	7.3	140	3.1
53.	7.3	140	3.5
54.	7.4	140	3.4
55.	7.2	140	2.9
56.	7.1	140	3.2
57.	7.2	140	3.6
58.	6.8	140	2.9
59.	7.1	140	3.3
60.	7.3	140	3.0
61.	6.9	140	3.7
62.	7.4	140	3.1
63.	7.0	140	3.4
64.	7.2	140	2.9
65.	7.2	140	3.5
66.	7.4	140	3.2
67.	7.3	140	3.4
68.	7.0	140	3.4
69.	7.1	140	3.5
70.	7.2	140	3.4
71.	7.3	140	3.3
72.	7.1	140	3.5
73.	7.4	140	3.7
74.	7.4	140	3.2
75.	6.9	140	3.5

TABLE II

LOT NO. DEI77E000E002

NON STATIC PHASE: 70°F

	FUZE TIME	WHISTLE TIME
1.	7.3	3.5
2.	7.3	3.6
3.	7.6	3.4
4.	7.9	3.1
5.	7.3	3.5
6.	6.9	3.4
7.	7.0	3.2
8.	6.8	3.3
9.	7.1	3.2
10.	7.4	3.3
11.	7.4	3.2
12.	7.4	3.4
13.	7.2	3.4
14.	7.2	3.3
15.	7.4	3.3
16.	7.5	3.1
17.	7.6	3.2
18.	7.4	3.5
19.	6.9	3.5
20.	7.4	3.4
21.	7.1	3.4
22.	7.5	3.2
23.	7.3	3.3
24.	7.7	2.5
25.	7.1	3.6

NON STATIC PHASE: 70°F (Cont.)

	FUSE TIME	WHISTLE TIME
26.	7.2	3.4
27.	7.3	3.4
28.	7.2	3.3
29.	7.1	3.1
30.	7.1	3.4
31.	7.5	3.1
32.	7.2	3.3
33.	6.9	3.4
34.	7.8	3.2
35.	7.3	2.7
36.	7.2	3.8
37.	7.3	3.1
38.	7.1	3.3
39.	7.5	3.2
40.	7.3	3.4
41.	7.3	3.3
42.	7.1	3.5
43.	7.3	3.4
44.	7.3	3.3
45.	7.4	2.7
46.	7.1	3.3
47.	7.3	3.4
48.	7.5	3.1
49.	7.1	3.3
50.	7.4	3.2

TABLE II

LOT NO. DE177E000E002

ON STATIC TEST: -65°F

	FUZE TIME	WHISTLE TIME
1.	7.4	3.8
2.	7.2	4.8
3.	7.3	4.3
4.	7.0	3.7
5.	7.8	3.7
6.	7.4	4.0
7.	7.6	3.4
8.	7.9	4.2
9.	7.4	3.6
10.	7.3	4.0
11.	NO	
12.	7.2	4.2
13.	7.3	4.2
14.	7.2	3.7
15.	7.2	3.2
16.	7.0	4.2
17.	7.2	3.4
18.	7.2	4.0
19.	7.3	3.3
20.	7.3	4.0
21.	7.8	3.9
22.	8.0	3.7
23.	7.2	3.1
24.	7.4	3.7
25.	7.5	3.9

NON STATIC PHASE: -65°F (Cont.)

	FUZE TIME	WHISTLE TIME
26.	DUD	
27.	7.3	4.0
28.	7.1	3.9
29.	8.1	3.7
30.	7.7	3.3
31.	7.9	3.5
32.	7.6	4.2
33.	7.3	4.0
34.	7.6	3.9
35.	7.5	4.3
36.	7.6	4.1
37.	7.5	4.1
38.	6.9	4.1
39.	7.2	4.1
40.	7.8	4.0
41.	7.6	3.8
42.	7.8	3.4
43.	7.7	3.8
44.	7.4	3.9
45.	7.2	3.7
46.	7.8	3.8
47.	7.5	3.7
48.	7.8	3.7
49.	7.6	3.9
50.	7.6	4.4

NON STATIC PHASE: -65°F (Cont.)

	FUZE TIME	WHISTLE TIME
51.	7.3	3.7
52.	7.5	4.1
53.	7.4	3.3
54.	7.5	3.6
55.	7.2	4.1
56.	7.8	3.8
57.	7.9	3.7
58.	7.4	4.4
59.	7.3	4.1
60.	7.6	3.6
61.	7.3	4.0
62.	7.2	3.5
63.	7.3	3.8
64.	7.6	3.8
65.	7.0	3.5
66.	6.9	3.5
67.	7.6	3.6
68.	7.2	4.0
69.	7.3	4.1
70.	DUD	
71.	7.7	4.4
72.	7.8	4.2
73.	7.3	3.4
74.	7.5	3.3
75.	8.0	3.2

NON STATIC PHASE: -65°F

	FUZE TIME	WHISTLE TIME
76.	8.0	3.1
77.	7.1	3.4
78.	7.2	3.3
79.	7.3	3.4
80.	7.1	3.7

NON STATIC PHASE: -65°F

	FUZE TIME	WHISTLE TIME
76.	8.0	3.1
77.	7.1	3.4
78.	7.2	3.3
79.	7.3	3.4
80.	7.1	3.7

TABLE II

LOT NO. DEI77E000E002

STATIC PHASE: VIBRATED SIMULATORS 70°F

	FUZE TIME	WHISTLE TIME
1.	7.3	3.4
2.	7.4	3.7
3.	7.4	3.4
4.	7.4	3.4
5.	6.9	3.6
6.	7.2	3.5
7.	7.1	3.4
8.	7.9	3.2
9.	7.4	3.5
10.	7.4	3.8
11.	6.4	3.5
12.	7.3	3.5
13.	7.1	3.5
14.	7.2	3.4
15.	7.0	3.6
16.	7.0	3.3
17.	7.2	3.3
18.	7.0	3.5
19.	7.1	3.1
20.	7.0	3.3
21.	7.5	3.2
22.	7.3	3.1
23.	7.3	3.4
24.	7.2	3.4
25.	7.5	3.3

STATIC PHASE: VIBRATED SIMULATORS 70°F (Cont.)

	FUZE TIME	WHISTLE TIME
26.	7.4	3.2
27.	7.1	3.6
28.	7.2	3.5
29.	7.0	3.6
30.	7.1	3.5
31.	6.8	3.3
32.	7.2	3.7
33.	6.9	3.4
34.	7.3	3.6
35.	7.2	3.5
36.	7.0	3.5
37.	7.0	3.2
38.	7.2	3.2
39.	7.3	3.3
40.	6.4	3.0
41.	7.2	3.2
42.	7.2	3.4
43.	7.0	3.1
44.	6.9	3.8
45.	7.2	3.3
46.	7.1	3.6
47.	7.3	3.3
48.	7.0	3.4
49.	6.5	3.3
50.	7.1	3.3

STATIC PHASE: VIBRATED SIMULATORS 70°F (Cont.)

	FUZE TIME	WHISTLE TIME
51.	7.1	3.3
52.	7.3	3.1
53.	7.2	3.5
54.	7.1	3.2
55.	6.8	3.1
56.	7.0	3.5
57.	6.9	3.6
58.	7.0	3.2
59.	7.4	3.3
60.	6.7	3.1
61.	7.2	3.6
62.	6.9	3.1
63.	7.2	3.4
64.	6.9	3.1
65.	7.1	3.1
66.	7.1	3.4
67.	7.1	3.5
68.	6.8	3.9
69.	7.6	3.0
70.	7.1	3.2
71.	6.6	3.3
72.	6.8	3.2
73.	6.6	3.2
74.	6.8	3.5
75.	7.8	3.4

STATIC PHASE: VIBRATED SIMULATORS 70°F (Cont.)

	FUZE TIME	WHISTLE TIME
76.	7.3	3.4
77.	6.9	2.9
78.	7.0	3.1
79.	7.6	3.1
80.	7.1	3.1

TABLE II

LOT NO. DEI77E000E002

STATIC PHASE: JUMBLED SIMULATORS 70°F

	FUZE TIME	WHISTLE TIME
1.	6.9	3.1
2.	7.0	3.3
3.	7.5	3.1
4.	7.0	3.5
5.	7.4	3.4
6.	7.5	3.4
7.	7.2	
8.	7.4	3.4
9.	7.7	3.5
10.	7.4	3.4
11.	7.2	3.2
12.	7.4	3.1
13.	7.4	3.6
14.	7.1	3.5
15.	7.7	3.0
16.	7.1	3.4
17.	7.4	2.8
18.	7.6	3.2
19.	7.0	3.8
20.	7.5	3.2
21.	7.0	2.8
22.	7.5	3.4
23.	7.5	3.0
24.	6.9	3.3
25.	7.4	3.1

STATIC PHASE: JUMBLED SIMULATORS 70°F (Cont.)

	FUZE TIME	WHISTLE TIME
26.	7.1	3.0
27.	7.0	3.0
28.	7.1	3.5
29.	7.6	3.7
30.	7.5	3.3
31.	7.0	3.3
32.	6.8	3.5
33.	7.1	2.9
34.	7.4	3.5
35.	7.0	3.4
36.	7.2	3.2
37.	7.4	3.0
38.	7.4	3.6
39.	7.3	3.3
40.	7.5	
41.	7.1	3.2
42.	7.2	3.2
43.	6.7	3.5
44.	7.3	3.4
45.	7.1	3.2
46.	7.3	3.3
47.	7.4	3.1
48.	7.2	3.6
49.	7.3	3.2
50.	7.0	3.1

STATIC PHASE: JUNGLES SIMULATORS 70°F (Cont.)

	TOES TIME	WHISTLE TIME
51.	7.1	3.5
52.	6.6	3.4
53.	7.2	3.3
54.	6.9	3.0
55.	7.1	3.6
56.	7.1	3.4
57.	7.6	3.3
58.	7.0	3.0
59.	6.9	3.7
60.	7.1	3.4
61.	7.3	3.7
62.	7.0	3.5
63.	7.4	3.3
64.	7.2	3.0
65.	7.0	3.5
66.	7.2	3.5
67.	7.2	2.9
68.	7.0	3.7
69.	6.9	3.0
70.	7.1	3.4
71.	7.4	3.2
72.	7.1	3.5
73.	6.3	3.2
74.	6.9	3.3
75.	7.1	3.5

STATIC FIRE: JUMBLED SIMULATORS 70°F (Cont.)

	FUSE TIME	WHISTLE TIME
76.	6.9	3.2
77.	6.9	3.2
78.	7.1	3.5
79.	7.4	4.0
80.	6.8	3.4