

INCH-POUND

MIL-DTL-45144E
29 December 2009
SUPERSEDING
MIL-F-45144D (AR)
08 June 1984

DETAIL SPECIFICATION

FUSE, BLASTING, TIME – M700, AND DUMMY FUSE, BLASTING, TIME - INERT LOADING, ASSEMBLING AND PACKING

Reactivated for new design and may be used for
either new or existing design acquisition.

This specification is approved for use by all
Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the design, materials, quality assurance provisions and preparation for delivery of two types of fuses: FUSE, BLASTING, TIME: M700 and DUMMY FUSE, BLASTING, TIME, INERT.

1.2 Classification. The following are descriptions of the two fuse types:

1.2.1 Type I. The FUSE, BLASTING, TIME: M700 is a safety type, suitable for firing M7 Non-Electric Blasting Cap. The fuse consists of a continuous delay train of fuse powder, tightly wrapped with three cotton yarns, and enclosed by ten jute yarns. The fuse is then counter-wound with ten cotton yarns, coated with asphalt material, then covered by an extruded plastic sheath.

1.2.2 Type II. The Dummy Fuse, Blasting, Time, Inert is of the same configuration as the Type I except it contains an inert material in place of the fuse powder.

2. APPLICABLE DOCUMENTS

Comments, suggestions, or questions on this document, should be addressed to the Commander, U.S. Army ARDEC, ATTN: RDAR-QES-E, Picatinny Arsenal, New Jersey 07806-5000 or emailed to ardecdtdzn@conus.army.mil. Because contact information can change, you may want to verify the currency of this address information using the ASSIST online database at <http://assist.daps.dla.mil>.

AMSC N/A

FSC 1375

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2.1 General. The documents listed in this section are specified in sections 3, 4 or 5 of this specification. This section does not include documents in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4 and 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

FEDERAL STANDARDS

- FED-STD-595/17043 - Colors Used in Government Procurement/Gold, Gloss
- FED-STD-595/33538 - Colors Used in Government Procurement/Yellow, Flat
- FED-STD-595/34088 - Colors Used in Government Procurement/Green, Flat
- FED-STD-595/37038 - Colors Used in Government Procurement/Black, Flat

FEDERAL SPECIFICATIONS

- L-P-390 - Plastic, Molding and Extrusion Material, Polyethylene and Copolymers (Low, Medium, and High Density)

COMMERCIAL ITEM DESCRIPTION

- A-A-208 - Ink, Marking, Stencil. Opaque, (Porous and Non-porous Surfaces)
- A-A-59138 - Charcoal (For Use In Ammunition)
- A-A-59383 - Marking Media, Opaque (Porous and Non-Porous Surfaces)

DEPARTMENT OF DEFENSE SPECIFICATIONS

- MIL-P-156 - Potassium Nitrate
- MIL-S-14929 - Sulfur: Commercial Grade (For Use In Ammunition)
- MIL-P-15011 - Pallets, Material Handling, Wood Post Construction, 4-Way Entry
- MIL-C-43438 - Crimper, Blasting Cap, M-2, Pliers Type. W/Fuse Cutter
- MIL-C-45469 - Cap, Blasting, Non-Electric: M7, Loading Assembling and Packing

DEPARTMENT OF DEFENSE STANDARDS

- MIL-STD-1168 - Ammunition Lot Numbering and Ammunition Data Cards
- MIL-STD-1916 - DoD Preferred Methods for Acceptance of Product
- MIL-STD-2073-1 - Standard Practice for Military Packaging

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or from

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the Standardization Documents Order Desk, 700 Robbins Avenue, Bldg. 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings and publications. The following other Government documents, drawings and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

ARDEC DRAWINGS

- 9242364 - Can, Metal, Packing, Ammunition For Fuse, Blasting, Time, M700
- 9242365 - Box, Packing, Ammunition, For Fuse, Blasting, Time, M700
- 9242366 - Box, Fiberboard, Ammunition, For Fuse, Blasting, Time, M700
- 9242367 - Box, Packing, Ammunition, For Fuse, Blasting, Time, M700

(These drawings may be requested online Pica.Drawing.Request@conus.army.mil or from U.S. ARMY ARDEC, RDAR-EIS-PE, Picatinny Arsenal, NJ 07806-5000.)

ARMY MATERIEL COMMAND DRAWINGS

- 19-48-4116/130A – The Basic Unitization Procedures Drawing
- 19-48-4116/130B – The Basic Unitization Procedures Drawing

(These drawings may be requested online at <http://www.dac.army.mil/det/order/draworder.html> or from Defense Ammunition Center, SJMAC-DET, 1 C Tree Road, Bldg. 35, McAlester, OK 74501.)

U.S. BUREAU OF ALCOHOL, TOBACCO, AND FIREARMS
Title 27, Code of Federal Regulations

(Copies of this document are available online at www.access.gpo.gov or from the Superintendent of Documents, U.S. Government Printing Office, North Capitol & “H” Streets, N.W., Washington, DC 20402-0002.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

ASTM INTERNATIONAL

- ASTM D 5 - Standard Test Method for Penetration of Bituminous Materials
- ASTM D 6 - Standard Test Method for Loss on Heating of Oil and Asphaltic Compounds - AASHTO No.: T 47
- ASTM D 36 - Standard Test Method for Softening Point of Bitumen (Ring and Ball Apparatus)
- ASTM B 117 - Standard Practice for Operating Salt Spray (Fog) Apparatus
- ASTM D 1423 - Standard Test Method for Twist in Yarns by Direct-Counting

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- ASTM D 1578 - Standard Test Method for Breaking Strength of Yarn in Skein Form
- ASTM D 1907 - Standard Test Method for Linear density of Yarn (Yarn Number) by the Skein Method
- ASTM D 2256 - Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method
- ASTM D 2257 - Standard Test Method for Extractable Matter in Textiles
- ASTM D 2645 - Standard Tolerances for Yarns Spun on the Cotton or Worsted Systems
- ASTM D 638 - Standard Test Method for Tensile Properties of Plastics

(ASTM publications may be ordered online at www.astm.org, or from 100 Barr Harbor Drive PO Box C700, West Conshohocken, PA 19428-2959.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1. First article inspection. When specified (see 6.6), a sample shall be subjected to first article inspection in accordance with 4.2.

3.2. Conformance inspection. A sample shall be subjected to conformance inspection in accordance with 4.3.

3.3. Fuse powder train (Type I). Fuse powder train shall contain the following by weight: 69% to 73% potassium nitrate in accordance with MIL-P-156 Class 1; approximately 10% sulfur in accordance with MIL-S-14929; and 16% charcoal in accordance with A-A-59138. The fuse powder train shall be continuous throughout the length of the train and shall be of such density and formulation as to comply with the requirements specified herein for the finished fuse.

3.4. Inert fuse powder train (Type II). A non-energetic, inert material shall be used. The material color shall be visually distinct from the Type I fuse powder. The inert fuse powder train shall be continuous throughout the length of the train and shall be of such density and formulation as to comply with the requirements specified herein for the finished fuse.

3.5. Cotton yarn.

3.5.1. Cotton center longitudinal yarns. The three yarns shall be of 15/3 or 10/2 or 24/2/2 size/ply absorbent cotton yarns and shall be in the center of the fuse powder of 3.3 and 3.4.

3.5.2. Cotton counter yarns. Cotton yarn countering shall be performed on top of jute yarn spinning of 3.6.1. The countering shall consist of a tight spiral wrap of 10 cotton yarns of 10/2 size/ply applied with a Z twist, also known as left hand twist.

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3.5.3. Cotton yarn construction. Cotton yarn used in the manufacture of the fuse shall be natural, unfinished yarn spun from thoroughly clean, staple carded cotton fiber.

3.5.4. Cotton yarn imperfections. The cotton shall be evenly drawn, spun, and twisted into a smooth and even yarn, free from any lumps, lint, or other imperfections which would adversely affect the finished fuse.

3.5.5. Cotton yarn number. Yarn number shall be as specified herein for the particular use and shall be taken as the number of 840 yard hanks per pound.

3.5.6. Cotton yarn skein breaking strength. The breaking strength of the yarn shall not be less than the standard obtained as follows, when tested in skeins equivalent to 120 yards of single end:

Standard Breaking Strength = (1800 divided by the yarn number) plus (the # of plies multiplied by 3).

3.5.7. Cotton yarn single strand breaking strength. The breaking strength of single strands in ounces shall be not less than 12.5 percent of the standard breaking strength in pounds.

3.6. Jute yarn. The jute yarn spinning shall be applied on top of the fuse powder train of 3.3 and 3.4.

3.6.1. Jute yarn spinning. The spinning shall consist of a tight spiral wrap of 10 jute yarns applied with a right hand or S twist. The wrap shall completely enclose the fuse powder train.

3.6.2. Jute yarn construction. The yarn shall be batched with a single application containing an emulsion of water, mineral oil, and a suitable emulsifying agent, which will not adversely affect the finished yarn. The yarn shall be otherwise untreated and shall have a natural color.

3.6.3. Jute yarn imperfections. All jute yarns shall be essentially level and free from bark, rove, large and loose knots, slubs, and excess of root fibers. The allowable imperfections must pass through a cleaner to remove all foreign material larger than 0.051 inch diameter.

3.6.4. Jute yarn number. The yarn shall be number 14.5 plus or minus 20%. The average yarn number of the spinning jute yarns shall range from 13.77 to 15.23. Yarn number shall be taken as 496 yard hanks per pound.

3.6.5. Jute yarn breaking strength. The single yarn breaking strength shall be not less than 9.7 pounds.

3.6.6. Jute yarn twist. The yarn shall be spun with a Z twist, also known as left hand twist.

3.6.7. Jute turns per inch. The average number of turns per inch (tpi) shall be 3.36 tpi plus or minus 10 percent.

3.6.8. Jute yarn oil content. Oil (natural or other) content of the yarn shall be not greater than one percent by weight.

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3.6.9. Jute yarn volatile matter. Volatile matter shall be not greater than 13.5 percent by weight.

3.7. Asphalt. The fuse shall be treated with asphalt following the cotton yarn spinning of 3.5.2.

3.7.1. Asphalt coating weight. The fuse shall be wiped to give a coating from 1.1 to 1.6 pounds per 1000 feet of fuse.

3.7.2. Asphalt softening point. The asphalt softening point shall be not less than 148° and not greater than 162° Fahrenheit (F).

3.7.3. Asphalt penetration. The asphalt penetration shall be 2.2 millimeters plus or minus 0.2 millimeters at 77°F and not greater than 130 millimeters at 115°F.

3.7.4. Asphalt volatile matter. The asphalt's volatile matter shall be not greater than 0.1% by weight.

3.8. Plastic. A plastic coating shall be applied following the application of asphalt.

3.8.1. Plastic extrusion. The plastic coating shall be applied with cross head extrusion equipment. The plastic used for coating the fuse shall comply with L-P-390 except for pigment or dye required to comply with 3.8.5 for Type I and 3.8.6 for Type II. The addition of pigment or dye shall not adversely affect the physical and chemical properties of the plastic.

3.8.2. Plastic coating wall thickness. The wall thickness of the plastic coating shall be not less than 0.012 inch.

3.8.3. Plastic coating imperfections. The plastic coating shall be smooth and free of foreign matter, pin holes, bubbles, breaks, discontinuity, or other defects which would adversely affect the function of the finished fuse.

3.8.4. Plastic elongation. The elongation shall be not less than 70%.

3.8.5. Color (Type I). The plastic shall be green conforming to FED-STD-595/34088.

3.8.6. Color (Type II). The plastic shall be gold conforming to FED-STD-595/17043.

3.9. Fuse diameter after cotton yarn counter spinning. The fuse diameter shall be not greater than 0.164 inch after the delay train's cotton yarn is counter spun.

3.10. Fuse diameter of the finished fuse. The outside diameter of the finished fuse shall be 0.200 plus or minus 0.005 inch.

3.11. Fuse length. The finished fuse shall be cut into 50 feet plus 0.50 feet minus 0 feet.

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3.12. Maximum number of splices. The fuse shall contain no splices.

3.13. Marking (Type I). All required markings shall be neat and sharply defined.

3.13.1. Marking single band increments. The fuse shall be clearly marked with single bands every 18 inches plus 0.50 minus 0.25 inches. The tolerance is noncumulative.

3.13.2. Marking double band increments. The fuse shall be clearly marked with double bands every 90 inches plus 1.50 minus 0.50 inches. The tolerance is noncumulative.

3.13.3. Marking application. The marking shall be made using a heat stamp and foil.

3.13.4. Marking color. The marking shall be yellow conforming to FED-STD-595/33538.

3.13.5. Marking width. The width of the marking shall be not less than 0.25 inch plus 0.01 minus 0.01 inch.

3.13.6. Marking coverage. Marking shall be on not less than 60° of the fuse's circumference.

3.14. Marking (Type II). The fuse shall be marked as specified in 3.13 except the marking color shall be black conforming to FED-STD-595/37038. In addition, the fuse shall be marked "INERT" using 1/8 inch high black lettering on each end and every 5 feet in between the ends.

3.15. Burn time. The burning time of 36 inches plus 0.5 minus 0.5 inches lengths of the fuse at sea level and 70°F shall be 120 seconds plus or minus 12 seconds.

3.16. Flame intensity. The flame of the fuse shall ignite an M7 blasting cap in accordance with MIL-C-45469.

3.17. Operating temperatures. The M700 shall show no evidence of material degradation, damage or failure, and its performance shall not be degraded when functioned throughout the temperature range of -50°F to 125°F.

3.18. Waterproofness. The fuse shall withstand submersion in water for 24 hours and afterwards shall function satisfactorily by igniting the blasting cap in 120 seconds plus 12 minus 50 seconds.

3.19. Workmanship. All parts and assemblies shall be free of holes, tears, voids, blisters, pores, dirt, grease, fungus, and other foreign matter, and defects which would affect their serviceability. The cleaning method used shall not be injurious to any part no shall the parts be contaminated by the cleaning agent. All required markings shall be neat and sharply defined.

4. VERIFICATION

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TABLE I. Requirement/verification cross-reference matrix.

Method of Verification		Classes of Verification						
1- Analysis 2- Demonstration (end item test) 3- Examination 4- Test		A – First Article B – Conformance						
Section 3	Description	Verification Method				Verification Class		Section 4
		1	2	3	4	A	B	
3.1	First article inspection			X	X	X		4.2
3.2	Conformance inspection			X	X		X	4.3
3.3	Fuse powder train(Type I)				X	X	X	4.3.3.1
3.4	Inert fuse powder train (Type II)			X		X	X	4.3.3.3
3.5	Cotton yarn			X	X	X	X	4.3.3.1/4.3.3.3/
3.5.1	Cotton center longitudinal yarns			X		X	X	4.3.3.5
3.5.2	Cotton counter yarns			X		X	X	4.3.3.1/4.3.3.3
3.5.3	Cotton yarn construction			X		X	X	4.3.3.1/4.3.3.3
3.5.4	Cotton yarn imperfections			X		X	X	4.3.3.5
3.5.5	Cotton yarn number				X	X	X	4.3.3.5
3.5.6	Cotton yarn skein breaking strength				X	X	X	4.3.3.5
3.5.7	Cotton yarn single strand breaking strength				X	X	X	4.3.3.5
3.6	Jute yarn			X	X	X	X	4.3.3.5
3.6.1	Jute yarn spinning			X		X	X	4.3.3.1/4.3.3.3
3.6.2	Jute yarn construction			X		X	X	4.3.3.6
3.6.3	Jute yarn imperfections			X		X	X	4.3.3.1/4.3.3.3
3.6.4	Jute yarn number				X	X	X	4.3.3.6
3.6.5	Jute yarn breaking strength				X	X	X	4.3.3.6
3.6.6	Jute yarn twist				X	X	X	4.3.3.6
3.6.7	Jute turns per inch				X	X	X	4.3.3.6
3.6.8	Jute yarn oil content				X	X	X	4.3.3.6
3.6.9	Jute yarn volatile matter				X	X	X	4.3.3.6
3.7	Asphalt				X	X	X	4.3.3.6
3.7.1	Asphalt coating weight				X	X	X	4.3.3.6
3.7.2	Asphalt softening point				X	X	X	4.3.3.2/4.3.3.4
3.7.3	Asphalt penetration				X	X	X	4.3.3.7
3.7.4	Asphalt volatile matter				X	X	X	4.3.3.2/4.3.3.4

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TABLE I. Requirement/verification cross-reference matrix. – Continued.

Method of Verification		Classes of Verification						
1- Analysis 2- Demonstration (end item test) 3- Examination 4- Test		A – First Article B – Conformance						
Section 3	Description	Verification Method				Verification Class		Section 4
		1	2	3	4	A	B	
3.8	Plastic			X	X	X	X	4.3.3.2/4.3.3.4 /4.3.3.8
3.8.1	Plastic extrusion			X		X	X	4.3.3.2/4.3.3.4
3.8.2	Plastic coating wall thickness				X	X	X	4.3.3.2/4.3.3.4
3.8.3	Plastic coating imperfections			X		X	X	4.3.3.8
3.8.4	Plastic elongation				X	X	X	4.3.3.8
3.8.5	Color (Type I)			X		X	X	4.3.3.2
3.8.6	Color (Type II)			X		X	X	4.3.3.4
3.9	Fuse diameter after cotton yarn spinning			X		X	X	4.3.3.1/4.3.3.3
3.10	Fuse diameter of the finished fuse			X		X	X	4.3.3.2/4.3.3.4
3.11	Fuse length			X		X	X	4.3.3.2/4.3.3.4
3.12	Maximum number of splices			X		X	X	4.3.3.2/4.3.3.4
3.13	Marking (Type I)			X		X	X	4.3.3.2
3.13.1	Marking single band increments			X		X	X	4.3.3.2
3.13.2	Marking double band increments			X		X	X	4.3.3.2
3.13.3	Marking application			X		X	X	4.3.3.2
3.13.4	Marking color			X		X	X	4.3.3.2
3.13.5	Marking width			X		X	X	4.3.3.2
3.13.6	Marking coverage			X		X	X	4.3.3.2
3.14	Marking (Type II)			X		X	X	4.3.3.4
3.15	Burn time				X	X	X	4.3.3.2
3.16	Flame intensity				X	X	X	4.3.3.2
3.17	Operating temperatures				X	X	X	4.3.3.2
3.18	Waterproofness				X	X	X	4.3.3.2
3.19	Workmanship			X		X	X	4.4.8

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4.1. Classification of verification. The verification requirements specified herein are classified as follows:

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2. First article inspection. When specified (see 6.2), a sample shall be subjected to first article verification in accordance with Table I and either Table II or Table III.

TABLE II. First article tests and inspections (Type I).

EXAMINATION OR TEST	DRAWING NUMBER	SAMPLE SIZE	REQUIREMENT PARAGRAPH	VERIFICATION
Fuse, Blasting, Time: M700	N/A	80	3.3/ 3.5 through 3.8.5 and 3.8.7 though 3.13.6	4.3.3.1/4.3.3.2
Functioning		30 at Hot; 80 at Ambient; 30 at Cold	3.3/3.15/ 3.16/3.17	4.3.3.2
Waterproofness		80	3.18	4.3.3.2
Can, Metal, Packing, Ammunition For Fuse, Blasting, Time, M700	9242364	10	5.1.1	4.3.3.9
Salt Spray (Major)	9242364	10	5.1.1	ASTM B 117
Box, Packing, Ammunition, For Fuse, Blasting, Time, M700	9242365	10	5.1.2	4.3.3.11/4.3.3.12
Pallet	N/A	MIL-P-15011	5.1.4.1	4.3.3.15
Unit load	19-48-4116/130B	1	5.1.4.2	4.3.3.15

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TABLE III. First article tests and inspections (Type II)

EXAMINATION OR TEST	DRAWING NUMBER	SAMPLE SIZE	REQUIREMENT PARAGRAPH	VERIFICATION
Dummy Fuse, Blasting, Time, Inert	N/A	80	3.4 through 3.8.4/ 3.8.6 through 3.12/ 3.14	4.3.3.3/4.3.3.4
Box, Fiberboard, Ammunition, For Fuse, Blasting, Time, M700	9242366	10	5.2.1	4.3.3.10
Box, Packing, Ammunition, For Dummy Fuse, Blasting, Time, Inert	9242367	10	5.2.2	4.3.3.13 / 4.3.3.14
Pallet	N/A	MIL-P-15011	5.2.41	4.3.3.16
Unit load	19-48-4116/130A	1	5.2.4.2	4.3.3.16

4.2.1. First article rejection. If any assembly, component or test specimen fails to comply, the sample shall be rejected.

4.3. Conformance inspection. Conformance samples shall be randomly drawn during production. Conformance inspection shall be performed in accordance with 4.3.3.1 through 4.3.3.16.

4.3.1. Conformance rejection. If any assembly, component or test specimen fails to comply, the lot from which the sample was taken shall be rejected.

4.3.2. Lot formation. The lots shall conform to the requirements of MIL-STD-1916 and the lot number shall be in accordance with MIL-STD-1168. In addition lots shall contain:

- a. Fuse powder components from not more than one lot interfix number from one manufacturer.
- b. Materials from not more than of one lot interfix number from one manufacturer.

4.3.3. Classification of characteristics.

a. Sampling requirements. Inspection sampling requirements for critical, major and minor characteristics are defined in MIL-STD-1916. Unless specified otherwise, Inspection Level VII shall be used for all characteristics defined as Critical, Inspection Level IV shall be used for all characteristics defined as Majors and Inspection Level II for all Minor characteristics.

b. Inspection. Conformance inspection shall be performed in accordance with 4.3.3.1 through 4.3.3.16 using the applicable attribute sampling plans. For all conformance inspections the same specimen may be used for all non-destructive examinations or tests.

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4.3.3.1. Fuse Blasting Time: M700, prior to asphalt coating.		SHEET 1 OF 1		DRAWING NUMBER
				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
<u>Critical</u>	None defined.			
<u>Major</u>				
101	Diameter of fuse.	IV	3.9	Gage
102	Presence of 3 cotton center longitudinal yarns.	IV	3.5.1	Visual
103	Fuse powder composition.	IV	3.3	CoC
104	Continuous train of fuse powder.	IV	3.3	Visual
105	Presence of 10 spinning jute yarns.	IV	3.6.1	Visual
106	Jute yarn spinning twist.	IV	3.6.1	Visual
107	Jute yarn spinning covers the fuse powder.	IV	3.6.1	Visual
108	Presence of 10 countering cotton yarns.	IV	3.5.2	Visual
109	Cotton countering yarn twist.	IV	3.5.2	Visual
<u>Minor</u>				
201	Workmanship	II	3.19	4.4.8

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4.3.3.2. Fuse Blasting Time: M700, finished.		SHEET 1 OF 1		DRAWING NUMBER	
				NEXT HIGHER ASSEMBLY	
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD	
EXAMINATIONS					
<u>Critical</u>	None defined.				
<u>Major</u>					
101	Color of plastic.	IV	3.8.5	Visual	
102	Diameter of fuse.	IV	3.10	Gage	
103	Length of fuse.	IV	3.11	Gage	
104	Asphalt coating weight.	IV	3.7.1	Visual	
105	Plastic coating thickness.	IV	3.8.2	Gage	
106	Marking color.	IV	3.13.4	Gage	
107	Marking width.	IV	3.13.5	Visual	
108	Marking coverage.	IV	3.13.6	Gage	
109	Marking application method and materials.	IV	3.13.3	Visual	
110	Single band marking.	IV	3.13/3.13.1	Gage	
111	Double band marking.	IV	3.13/3.13.2	Gage	
112	No splices.	IV	3.12	Visual	
113	Functioning	10 at Hot; 30 at Ambient; 10 at Cold	3.3/3.15/ 3.16/3.17	4.4.1	
114	Waterproofness.	30	3.18	4.4.2	
<u>Minor</u>					
201	Plastic workmanship.	II	3.8.3	Visual	
202	Workmanship	II	3.19	4.4.8	

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4.3.3.3. Dummy Fuse Blasting Time, Inert, prior to asphalt coating.		SHEET 1 OF 1		DRAWING NUMBER	
				NEXT HIGHER ASSEMBLY	
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD	
EXAMINATION					
<u>Critical</u>	None defined.				
<u>Major</u>					
101	Diameter of fuse.	IV	3.9	Gage	
102	Presence of 3 cotton center longitudinal yarns.	IV	3.5.1	Visual	
103	Continuous train of inert fuse powder.	IV	3.4	CoC	
104	Presence of 10 spinning jute yarns.	IV	3.6.1	Visual	
105	Jute yarn spinning twist.	IV	3.6.1	Visual	
106	Jute yarn spinning covers the fuse powder.	IV	3.6.1	Visual	
107	Presence of 10 countering cotton yarns.	IV	3.5.2	Visual	
108	Cotton countering yarn twist.	IV	3.5.2	Visual	
109	Color of fuse powder	IV	3.4	Visual	
<u>Minor</u>					
201	Workmanship	II	3.19	4.4.8	

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4.3.3.4. Dummy Fuse Blasting Time, Inert, finished.		SHEET 1 OF 1		DRAWING NUMBER	
				NEXT HIGHER ASSEMBLY	
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD	
EXAMINATION					
<u>Critical</u>	None defined.				
<u>Major</u>					
101	Color of plastic.	IV	3.8.6	Visual	
102	Diameter of fuse.	IV	3.10	Gage	
103	Length of fuse.	IV	3.11	Gage	
104	Marking color.	IV	3.13.4/3.14	Visual	
105	Marking width.	IV	3.13.5/3.14	Gage	
106	Marking coverage.	IV	3.13.6/3.14	Gage	
107	Marking application method and materials.	IV	3.13.3/3.14	Visual	
108	Asphalt coating weight.	IV	3.7.1	Gage	
109	Plastic coating thickness.	IV	3.8.2	Gage	
110	Single band marking.	IV	3.13/3.13.1/3.14	Gage	
111	Double band marking.	IV	3.13/3.13.2/3.14	Gage	
112	No splices.	IV	3.12	Visual	
<u>Minor</u>			3.8.3	Visual	
201	Plastic workmanship.	II	3.19	4.4.8	
202	Workmanship	II	3.8.6	Visual	

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4.3.3.5. Cotton yarn.		SHEET 1 OF 1		DRAWING NUMBER	
				NEXT HIGHER ASSEMBLY	
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD	
<u>Critical</u>	None defined.				
<u>Major</u>					
101	Construction.	5	3.5.3	ASTM D 2645	
102	Imperfections.	5	3.5.4	Visual	
103	Yarn number.	5	3.5.5	ASTM D 2645	
104	Skein breaking strength.	5	3.5.6	ASTM D 1578	
105	Single strand breaking strength.	5	3.5.7	4.4.4	
<u>Minor</u>					
201	Workmanship	II	3.19	4.4.8	

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4.3.3.6. Jute yarn.		SHEET 1 OF 1		DRAWING NUMBER	
				NEXT HIGHER ASSEMBLY	
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD	
<u>Critical</u>	None defined.				
<u>Major</u>					
101	Construction.	5	3.6.2	Visual	
102	Imperfections.	5	3.6.3	Visual	
103	Yarn number.	5	3.6.4	ASTM D 1907	
104	Single strand breaking strength.	5	3.6.5	4.4.4	
105	Twist.	5	3.6.6	Visual	
106	Turns per inch.	5	3.6.7	ASTM D 1423	
107	Oil content.	5	3.6.8	4.4.5	
108	Volatile matter.	5	3.6.9	4.4.5	
<u>Minor</u>					
201	Workmanship	II	3.19	4.4.8	

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4.3.3.7. Asphalt		SHEET 1 OF 1		DRAWING NUMBER	
				NEXT HIGHER ASSEMBLY	
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD	
<u>Critical</u>	None defined.				
<u>Major</u>					
101	Softening point	5	3.7.2	ASTM D 36	
102	Penetration	5	3.7.3	ASTM D 5	
103	Volatile matter	5	3.7.4	ASTM D 6	
<u>Minor</u>					
201	Workmanship	II	3.19	4.4.8	

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4.3.3.8. Plastic.		SHEET 1 OF 1		DRAWING NUMBER	
				NEXT HIGHER ASSEMBLY	
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD	
<u>Critical</u>	None defined.				
<u>Major</u> 101	Plastic.	5	3.8.1	L-P-390	
102	Elongation.	5	3.8.4	ASTM D 638	
<u>Minor</u> 201	Workmanship	II	3.19	4.4.8	

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4.3.3.9. Can, Metal, Packing, Ammunition, for Fuse, Blasting, Time, M700.		SHEET 1 OF 1		DRAWING NUMBER 9242364
				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
<u>Critical</u>	None defined.			
<u>Major</u>				
101	Leakage test.	IV	5.1.1	4.4.3
102	Inside diameter.	IV	5.1.1	Gage
103	Moisture content	4.4.7	5.1.1	4.4.7
<u>Minor</u>				
201	Container dented or deformed.	II	5.1.1	Visual
202	Number of assemblies in can incorrect.	II	5.1.1	Visual
203	Marking missing, incorrect, or unidentifiable.	II	5.1.3	4.4.6
204	Workmanship	II	3.19	4.4.8

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4.3.3.10. Box, Fiberboard, Ammunition, For Dummy Fuse, Blasting, Time, Inert.		SHEET 1 OF 1		DRAWING NUMBER 9242366	
				NEXT HIGHER ASSEMBLY	
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD	
<u>Critical</u>	None defined.				
<u>Major</u>					
101	Heat seal.	IV	5.2.1	MIL-STD-2073-1	
102	Moisture content.	4.4.7	5.2.1	4.4.7	
<u>Minor</u>			5.2.1	Visual	
201	Wrapping, 50 foot lengths.	II	5.2.1	Visual	
202	Number of assemblies in carton incorrect.	II	5.2.3	4.4.6	
203	Marking missing, incorrect, or unidentifiable.	II	3.19	4.4.8	
204	Workmanship	II	5.2.1	MIL-STD-2073-1	

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4.3.3.11. Box, Packing, Ammunition, for Fuse, Blasting, Time, M700, Prior to Closing.		SHEET 1 OF 1		DRAWING NUMBER 9242365
				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
<u>Critical</u>	None defined.			
<u>Major</u> 101	Box meets requirements of MIL-DTL-2427	MIL-DTL-2427	5.1.2	MIL-DTL-2427
<u>Minor</u> 201	Number of metal cans or cartons incorrect (as applicable).	II	5.1.2	Visual
202	Contents missing.	II	5.1.2	Visual
203	Marking missing, incorrect, or unidentifiable.	II	5.1.3	4.4.6
204	Workmanship	II	3.19	4.4.8

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4.3.3.12. Box, Packing, Ammunition, for Fuse, Blasting, Time, M700, Sealed.		SHEET 1 OF 1		DRAWING NUMBER 9242365
				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
<u>Critical</u>	None defined.			
<u>Major</u>				
101	Contents loose.	IV	5.1.2	Manual
102	Strapping broken or loose.	IV	5.1.2	Manual/Visual
103	Box, damaged to the extent that contents are exposed.	IV	5.1.2	Visual
104	DOT markings missing or incorrect.	IV	5.1.3	4.4.6
105	Board, broken or split.	IV	5.1.2	Visual
<u>Minor</u>				
201	Strapping improperly engaged.	II	5.1.2	Manual/Visual
202	Metallic seal, unsealed or improperly positioned.	II	5.1.2	Manual/Visual
203	Marking missing, incorrect, or unidentifiable.	II	5.1.3	4.4.6
204	Workmanship	II	3.19	4.4.8

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4.3.3.13. Box, Packing, Ammunition, For Dummy Fuse, Blasting, Time, Inert, Prior to Closing.		SHEET 1 OF 1		DRAWING NUMBER 9242367
				NEXT HIGHER ASSEMBLY
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
<u>Critical</u>	None defined.			
<u>Major</u> 101	Box meets requirements of MIL-DTL-2427	MIL-DTL-2427	5.2.2	MIL-DTL-2427
<u>Minor</u> 201	Number of cartons incorrect (as applicable).	II	5.2.2	Visual
202	Contents missing.	II	5.2.2	Visual
203	Marking missing, incorrect, or unidentifiable.	II	5.1.3	4.4.6
204	Workmanship	II	3.19	4.4.8

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4.3.3.14. Box, Packing, Ammunition, for Dummy Fuse, Blasting, Time, Inert, Sealed.		SHEET 1 OF 1		DRAWING NUMBER 9242367	
		NEXT HIGHER ASSEMBLY			
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD	
<u>Critical</u>	None defined.				
<u>Major</u>					
101	Contents loose.	IV	5.2.2	Manual	
102	Strapping broken or loose.	IV	5.2.2	Manual/Visual	
103	Box, damaged to the extent that contents are exposed.	IV	5.2.2	Visual	
104	Board, broken or split.	IV	5.2.2	Visual	
105	DOD symbol missing or incorrect.	IV	5.1.3	4.4.6	
<u>Minor</u>					
201	Strapping improperly engaged.	II	5.2.2	Manual/Visual	
202	Metallic seal, unsealed or improperly positioned.	II	5.2.2	Manual/Visual	
203	Marking missing, incorrect, or unidentifiable.	II	5.2.3	4.4.6	
204	Workmanship	II	3.19	4.4.8	

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4.3.3.15. Unitization, M700.		SHEET 1 OF 1		DRAWING NUMBER 19-48-4116/130B
		NEXT HIGHER ASSEMBLY		
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
<u>Critical</u>	None defined.			
<u>Major</u>				
101	Pallet not in accordance with requirements.	Note 1	5.1.4.1	Visual
102	Pallet markings missing, incorrect or not located properly.	IV	5.1.4.1	4.4.6
103	Boxes incorrectly oriented or positioned on pallet.	IV	5.1.4.1	Visual
104	Filler assembly if required, not made, treated or marked correctly.	IV	5.1.4.1	Visual
105	Strapping incorrectly routed, not located correctly or material incorrect.	IV	5.1.4.1	Visual/Gage
106	Unit load not tightly strapped or any strap loose.	IV	5.1.4.2	Visual
107	Strapping seal not properly crimped.	IV	5.1.4.2	Visual
<u>Minor</u>				
201	Workmanship	II	3.19	4.4.8
NOTES: 1. Inspection shall be in accordance with MIL-P-15011 except that for examinations MIL-STD-1916 shall be used. Verification level shall be IV for major defects and II for minor defects.				

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4.3.3.16. Unitization, Dummy Fuse.		SHEET 1 OF 1		DRAWING NUMBER 19-48-4116/130A
		NEXT HIGHER ASSEMBLY		
CATEGORY	EXAMINATION OR TEST	CONFORMANCE CRITERIA	REQUIREMENT PARAGRAPH	PARAGRAPH REFERENCE/ INSPECTION METHOD
<u>Critical</u>	None defined.			
<u>Major</u>				
101	Pallet not in accordance with requirements.	Note 1	5.1.4.1	Visual
102	Pallet markings missing, incorrect or not located properly.	IV	5.1.4.1	4.4.6
103	Boxes incorrectly oriented or positioned on pallet.	IV	5.1.4.1	Visual
104	Filler assembly if required, not made, treated or marked correctly.	IV	5.1.4.1	Visual
105	Strapping incorrectly routed, not located correctly or material incorrect.	IV	5.1.4.1	Visual/Gage
106	Unit load not tightly strapped or any strap loose	IV	5.1.4.2	Visual
107	Strapping seal not properly crimped.	IV	5.1.4.2	Visual
<u>Minor</u>				
201	Workmanship	II	3.19	4.4.8
NOTES:				
1. Inspection shall be in accordance with MIL-P-15011 except that for examinations MIL-STD-1916 shall be used. Verification level shall be IV for major defects and II for minor defects.				

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4.3.4. Ammunition lot numbering. Visually verify that an ammunition lot number has been assigned to each lot as described in MIL-STD-1168.

4.4. Methods of verification.

4.4.1. Functioning. Each specimen shall be cut to 36 inches plus 0.5 minus 0.5 inches long from each sample fuse to be tested. On each specimen, one end shall be inserted into an M7 Blasting Cap per MIL-C-45469 and double-crimped with an M2 Cap Crimper per MIL-C-43438. Divide the specimens into the three temperature groups per Table II and 4.3.3.2, as applicable. Expose each group to the respective temperature range for a minimum of two (2) hours. The temperature ranges shall be as follows:

- | | |
|------------|--------------|
| a. Hot | 120°F + 5°F |
| b. Ambient | 70°F +/- 5°F |
| c. Cold | -35°F - 15°F |

4.4.1.1. Visually verify that the specimen remains in compliance with the workmanship requirements using the guidance in 4.4.8. Within 15 minutes after the removal of the conditioned specimen, initiate the specimen. Verify the ambient samples meet the burn time requirement of 3.15; the hot and cold samples shall have their burn time measured for information purposes only. For all samples, verify the initiation of the blasting cap and record the specimen lengths, burn times, barometric pressure, and humidity. The burning time shall be measured by means of an approved timing system with the accuracy of not worse than 1/5th of a second. The fuse length shall be measured by means of a device with the accuracy of not worse than an 1/8th of an inch.

4.4.2. Waterproofness. A specimen of three-feet six-inches shall be cut from each sample fuse to be tested. Each specimen shall be tied so that the two ends of each length form a separate loop. Each loop shall be submerged in a suitable vessel of water to within four inches of the ends. Each end of the fuse shall be sealed by crimping on an empty blasting cap cup with a double cutthroat bench type cap crimper. The vessel shall be closed and pneumatic or hydraulic pressure within the vessel increased to 75 pounds per square inch (psi) and maintained above 70 psi during the test. The sample shall remain in the vessel under pressure for the specified time and then removed. A three-inch section with the cup shall be cut off from each end of the sample fuse lengths and discarded. One end of the remaining sample fuse lengths shall be inserted into an M7 Blasting Cap and double crimped with an M2 Cap Crimper. Then the resultant sample shall be immersed in 2 1/2 inches of water at 70° plus or minus 10° F with 2 inches of the opposite end of the fuse out of the water. The fuse shall be ignited. Verify the burn time and detonation of the M7 blasting cap.

4.4.3. Leakage test of metal packing can. The sealed can containing the fuse shall be placed in a test chamber and a measured volume of air introduced into the chamber to provide the required pressure. Observation shall be made to determine if failure occurs as evidenced by any drop in pressure during the time specified on the applicable Drawing 9242364.

4.4.4. Single strand breaking strength. Cut a 10 inch sample of single strand yarn. Proceed as directed in ASTM D 2256 using Configuration A and Condition 1 at a speed of 12 ± 0.5 in/minute.

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4.4.5. Extractable matter. Use ASTM D 2257 Option 1. The primary solvent shall be either ethylene dichloride or trichloroethylene. All solvents shall be ACS reagent grade or USP grade. The solvent for secondary extraction shall be either neutral ethyl alcohol (C₂H₅OH) or specifically denatured alcohol, conforming to Formula 3A of the U.S. Bureau of Alcohol, Tobacco, and Firearms, Formula 3A is described in ATFs Title 27, Code of Federal Regulations, Part 2.2.19.

4.4.6. Correctness and durability of markings. Packaging shall be visually inspected for presence and correctness of markings and that markings are clear and not smeared. Markings shall meet the performance requirements of A-A-59383. If using the alternative marking specification, A-A-208, the packaging shall demonstrate resistance to rubbing as tested in accordance with A-A-208, paragraph 5.4, fifteen minutes after marking. To demonstrate water resistance, subsequent to the marking drying one hour, the packaging shall demonstrate a resistance to water by testing in accordance with A-A-208, paragraph 5.5 “Resistance to Water”. Packaging with missing, illegible, or incorrect markings or those whose markings do not meeting the durability tests for resistance to rubbing or water shall be classified as nonconforming.

4.4.7. Packaging material moisture content. At the start of each production day, three (3) samples of packaging material shall be randomly selected and subjected to moisture content analysis. Ten (10) grams of each sample shall be accurately weighed and placed in a tared weighing dish. Each dish and contents shall be weighed and placed in an oven and dried at 100 ± 2°C, or 212 ± 4°F, for 2 hours. Each dish and contents shall be cooled in a desiccator for a minimum of 15 minutes and weighed. The loss in weight shall be calculated as percent moisture in each sample.

4.4.8. Workmanship. Visually verify they are free of holes, tears, voids, blisters, pores, dirt, grease, fungus, and other foreign matter, and defects which would affect their serviceability. Visually verify the cleaning method used shall not be injurious to any part no shall the parts be contaminated by the cleaning agent. Visually verify all required markings shall be neat and sharply defined.

5. PACKAGING

5.1. Type I.

5.1.1. Preservation – packaging. Fuse shall be packaged in accordance with Drawing 9242364.

5.1.2. Packing. Fuse shall be packed in accordance with Drawing 9242365.

5.1.3. Marking. Unit and exterior containers shall be marked in accordance with instructions contained in Drawings 9242364 and 9242365.

5.1.4. Unitization.

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5.1.4.1. Pallet. The pallet used in the unit load packaging shall conform to MIL-P-15011.

5.1.4.2. Unit load. The unit load shall conform to 19-48-4116/130B shall be securely strapped, and shall contain all subcomponents, subassemblies and markings conforming to requirements.

5.2. Type II.

5.2.1. Preservation – packaging. Inert fuse shall be packaged in accordance with Drawing 9243266, except no DOT marking shall appear on the box.

5.2.2. Packing. Inert fuse shall be packaged in accordance with Drawing 9242367.

5.2.3. Marking. Unit and exterior containers shall be marked in accordance with instructions contained in Drawings 9242366 and 9242367.

5.2.4. Unitization.

5.2.4.1. Pallet. The pallet used in the unit load packaging shall conform to MIL-P-15011.

5.2.4.2. Unit load. The unit load shall conform to 19-48-4116/130A shall be securely strapped, and shall contain all subcomponents, subassemblies and markings conforming to requirements.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful but is not mandatory.)

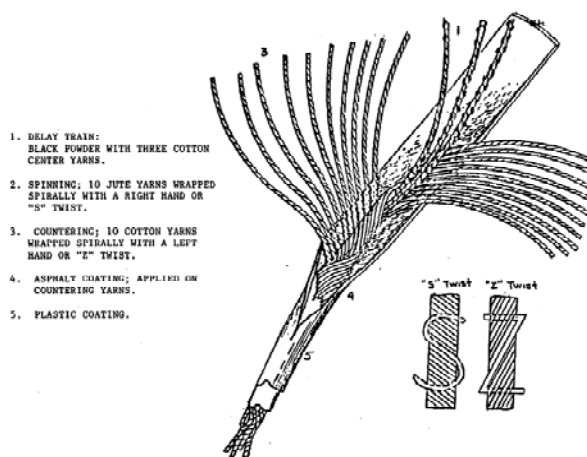
6.1. Intended use. M700 fuse is a flexible, waterproof cord that burns at a steady rate and is used for igniting military explosives. It contains military characteristics beyond those used in industry.

6.2. Burn time variation. The burn time of the fuse is dependent on altitude and temperature conditions. A test burn is conducted before fuse usage to calibrate the atmospheric conditions effect on the burn rate.

6.3. Burn time requirements. The burn time and waterproofness requirements in this specification have different burn rate tolerances. The burn time of the fuse after being submerged in water at a depth of 157 feet is faster than the burn rate of the fuse at sea level and ambient conditions. The environmental pressure increases the density of the fuse components and therefore accelerates the burn time.

6.4. Type I construction. Construction of the fuse is depicted on Figure 1.

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FIGURE 1. Type I construction

6.5. Type II construction. Construction of the fuse is as depicted on Figure 1, except it contains an inert fuse powder in place of the fuse powder.

- 6.6. Acquisition requirements. Acquisition documents should specify the following:
- a. Title, number, and date of this specification, and of all reference documents cited in Section 2 and applicable documents from Section 6.
 - b. Requirement for first article inspection.
 - c. Requirement for conformance inspection.
 - d. Packaging requirements (see 5.1). Special requirements exist for the packaging of this item in accordance with 9242364, 9242365, 9242366, and 9242367. Detailed directions and additional information may be obtained from RDAR-EIL-P.
 - e. Requirement for Ammunition Data Cards as specified in MIL-STD-1168.
 - f. Requirement for ammunition lot numbering per MIL-STD-1168.
 - g. Ammunition marking requirements.
 - h. Acceptance Inspection Equipment (AIE) requirements. Inspection equipment used for acceptance of product should be capable of repeatable measurements, by various experienced inspection/test personnel, to an accuracy of 10% of the total tolerance of the characteristic being inspected. This inspection requirement should also be specified in the contract.”
 - i. Requirement for certificates of findings (certificates of analysis) on all charge powders and certificates of conformance on all remaining materials purchased by the contractor or subcontractor when such material is controlled by Government or commercial specifications referenced in any of the contractual documents.
 - j. Requirement for evidence that the explosives are manufactured by qualified sources within the last 5 years.

6.7. Type I COAI: 13026660

6.8. Type II COAI: 13026661

6.9. Bitumen. Bitumen and bituminous materials are referred to as asphalt.

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6.10 Right hand twist. Yarn has right hand or “S” twist, if when held vertically, the spirals or twists are seen to incline upward in a left hand direction.

6.11 Left hand twist. Yarn has left hand or “Z” twist, if when held vertically, the spirals or twists incline upward in a right hand direction.

6.12 Delay train. The delay train consists of the cotton center longitudinal yarns and fuse powder.

6.13 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

6.14 Subject term (key word) listing.

Demolition

Custodian:
Army-AR
Navy - AS
Air Force - 70

Preparing activity:
Army-AR

(Project Number: 1375-2009-005)

Review activities:
Navy – MC, NP
Air Force – 11, 99

Civil agency:
GSA - FAS

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://assist.daps.dla.mil>.