

INCH-POUND

MIL-DTL-17124E
w/AMENDMENT 1
13 December 2010

SUPERSEDING
MIL-DTL-17124E
6 March 2001

DETAIL SPECIFICATION

CORD, DETONATING and
DUMMY CORD, DETONATING

Reactivated after 13 December 2010 and may be used for new and existing designs and acquisitions.

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 requirements, examinations and tests for the following items:

CORD, DETONATING and DUMMY CORD, DETONATING

1.2 Classification. The detonating cords covered by this specification are classified into the following types and classes as specified (see Table I).

Type I – contains PETN as major component of explosive core.

Type II - contains RDX as major component of explosive core.

Type III- contains inert powder as a major component of inert core.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited 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 cited in sections 3 and 4 of this specification, whether or not they are listed.

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

AMSC N/A

FSC 1375

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2.2 Government Documents.

Specifications, standards, and handbooks. The following specifications, standards, and handbooks of the exact revision listed below form a part of this specification to the extent specified herein.

MILITARY SPECIFICATIONS

MIL-P-223	- Powder, Black.
MIL-P-387	- Pentaerythrite Tetranitrate (PETN).
MIL-DTL-398	- RDX (Cyclotrimethylenetrinitramine).
MIL-C-46246	- Charge, Demolition, TNT, Block ¼ Pound, 1/2 Pound, and 1 Pound.
MIL-PRF-50449	- Filler, Sheet Form (Laminated Paper, for Use in Ammunition Containers).

FEDERAL STANDARDS

FED-STD-595/17043	- Colors, Bronze, Gold, Brass
FED-STD-595/24084	- Colors, Green
FED-STD-595/31630	- Colors, Pink
FED-STD-595/34088	- Colors, Green
FED-STD-595/35109	- Colors, Light Blue
FED-STD-595/37038	- Colors, Black

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-1916	- DOD Preferred Methods for Acceptance of Product
MIL-STD-1168	- Lot Numbering of Ammunition

(Copies of these documents are available online at <https://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.1 Other Government documents, drawings and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

US ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER (ARDEC) DRAWINGS

8796522	- Marking Diagram and Sealing, For Wood Packing Boxes.
9211789	- Ink, Marking Opaque for Porous Surfaces (For Automatic or semiautomatic Machine Application).

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(Copies of the above drawings are available from U.S. Army RDECOM-ARDEC, ATTN: RDAR-AIS-TD, Bldg. 12, Picatinny Arsenal, NJ 07806-5000 or by email at drawing.request@conus.army.mil .)

2.3 Non-Government publications. The following documents of the exact revision listed below form a part of this specification to the extent specified herein.

ASTM D4976	-Standard Specification for Polyethylene Plastics
ASTM D5486-99a	-Standard Specification for Pressure- Sensitive Tape for Packaging, Box Closure, and Sealing

(Copies of the above document can be obtained from the ASTM headquarters, 100 Barr Harbor Drive, West Conshohocken, PA 19428 or online at www.ASTM.org .)

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 General. The detonating cord shall comply with requirements given in this detailed specification as well as applicable drawings, standards and referenced specifications.

3.2 Material.

3.2.1 PETN (applicable to Type I).

The PETN used in the manufacture of the detonating cord shall comply with MIL-P-387, Classes 1 to 4.

3.2.2 RDX (applicable to Type II).

The RDX used in the manufacture of detonating cord shall comply with MIL-DTL-398, Type I or II, Class 3.

3.2.3 Inert filler (applicable to Type III). The powder used in the production of inert detonating cord shall be inert and the filler shall have a blue color conforming to FED-STD-595/35109.

3.2.4 Thermoplastic resin. The thermoplastic resin used for coating the cord shall comply with ASTM D4976. The plastic outer covering shall be of smooth texture and unless otherwise specified unpigmented and colorless.

3.3 Construction. The construction of the detonating cord for the specified type shall comply with Table I when tested as specified in 4.4.2.5.

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TABLE I. Construction.

Type	Class	Min. Wt ² of Explosive Core per 1000 Feet	Inner construction	Finish/Outer construction	Finish color	Diameter Inches, ^{3,4}	Max. Wt. of Finished Cord Per 1000 Feet	Breaking Strength Minimum
I	a	5 Pounds PETN	Textile	Plastic	Olive Drab FED-STD-595/ 34088	0.175 ±. 010	14 Pounds	60 Pounds
I	b	6 Pounds PETN	Textile	Plastic	Olive Drab FED-STD-595/ 34088	0.216, max	19 Pounds	175 Pounds
I	c	6.4 Pounds PETN	Textile	Plastic	Olive Drab FED-STD-595/ 34088	0.200 ± .005	18 Pounds	175 Pounds
I	d	7 Pounds PETN	Textile	Plastic	Olive Drab FED-STD-595/ 34088	0.200, max	19 Pounds	110 Pounds
I	e	7 Pounds PETN	Textile	Plastic	Olive Drab FED-STD-595/ 34088	0.235, max	22 Pounds	190 Pounds
I	f	12.5 Pounds PETN	Textile	Plastic	Olive Drab FED-STD-595/ 34088	0.245, max	26 Pounds	75 Pounds
I	g	12.5 Pounds PETN	Textile	Plastic	Olive Drab FED-STD-595/ 34088	0.270, max	33 Pounds	190 Pounds
I	h	14.5 Pounds PETN	Textile	Plastic	Olive Drab FED-STD-595/ 34088	0.235, max	29.5 Pounds	110 Pounds
I	j	6.4 Pounds PETN	Textile w/ Plastic Sheath	Textile w/ Wax	Clear wax with textile and plastic colored Olive Drab FED-STD-595/ 34088	0.210, max	18 Pounds	170 Pounds
I	k	3.57 Pounds PETN	Braided or counter-wrapped synthetic textile w/ plastic sheath	Braided or counter-wrapped synthetic textile finished w/ wax	Wax colored Olive Drab FED-STD-595/34088 Or clear wax with textile and plastic colored Olive Drab FED-STD-595/34088	0.162± .008	-	170 Pounds
I	m	7.14 Pounds PETN	Braided or counter-wrapped synthetic textile w/ plastic sheath	Braided or counter-wrapped synthetic textile finished w/ wax	Wax colored Olive Drab FED-STD-595/34088 Or clear wax with textile and plastic colored Olive Drab FED-STD-595/34088	0.225, max; 0.200 to 0.215 ±.010, nominal	-	200 Pounds

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TABLE I. Construction (continued).

I	n	8.5 Pounds PETN	Braided or counter-wrapped synthetic textile w/ plastic sheath	12 strands min. of 0.0200±0.0005 diameter temper soft, bronze wire countered at one twist per inch followed by 12 strands min. of braided or counter-wrapped synthetic textile finished w/ wax	Wax colored Olive Drab FED-STD-595/34088 Or clear wax with textile and plastic colored Olive Drab FED-STD-595/34088	0.275, max	39.5 Pounds	165 Pounds
I	p	1.07 Pounds PETN	Textile	Plastic	Black FED-STD-595/ 37038	0.135, max	-	150 Pounds
II	a	7 Pounds RDX ¹	Textile	Plastic	Olive Drab FED-STD-595/ 34088	0.216, max	19 Pounds	175 Pounds
II	b	8.5 Pounds RDX ¹	Textile	Plastic	Olive Drab FED-STD-595/ 34088	0.235, max	22 Pounds	190 Pounds
II	c	1.07 Pounds RDX ¹	Textile	Plastic	Black FED-STD-595/ 37038	0.135, max	-	150 Pounds
III	<p>All type III detonating cord shall be loaded with an inert powder in accordance with 3.2.3. The finish color shall be bronze/gold/brass conforming to FED-STD-595/17043. The inner construction, finish/outer construction, diameter, and breaking strength requirements shall be the same as indicated above for the Type and Class specified.</p>							
Notes	<p>(1) For identification purposes, the RDX Core shall be dyed pink conforming to FED-STD-595/31630 or similar, with one percent maximum of water soluble dye suitable for combination with the ingredient of the core. (2) In order to change pounds per 1000 feet to grains per foot multiply the number of pounds (per 1000 feet) by 7. (3) If not otherwise indicated. (See 6.5.) (4) Diameter requirement does not include the waterproofed ends.</p>							

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3.4 Detonating velocity (applicable to Type I and Type II, except Type Ip and Type Iic). The detonating velocity shall be not less than 5,900 meters per second when tested as specified in 4.5.5.

3.4.1 Detonating velocity (applicable to Type Ip and Type Iic). The detonating velocity shall be not less than 6,000 meters per second and not greater than 6,800 meters per second when tested as specified in 4.5.5.

3.5 Propagation of detonation (applicable to all Type I, except Ip and Type Iic). The detonating cord shall propagate from a main line to branch line and all branch lines shall be initiated when tested as specified in 4.5.6.

3.5.1 Detonation of TNT (applicable to Type Ib and Type Ic and Type Ij only). Detonating cord shall initiate the TNT, high order when tested as specified in 4.5.6.1.

3.5.2 Propagation of detonation (Type Ip and Type Iic). The detonating cord shall neither render itself nor another detonating cord that it contacts a misfire when tested as specified in 4.5.6.2.

3.6 Sensitivity (applicable to Type I and Type II only).

3.6.1 Flame. The detonating cord shall not detonate when tested as specified in 4.5.7.1.

3.6.2 Impact. The detonating cord shall not detonate through the ends of the sample when tested as specified in 4.5.7.2.

3.7 Waterproofness (applicable to Type I and Type II only). The detonating cord shall withstand immersion in water for not less than 72 hours and function satisfactorily when tested as specified in 4.5.8.

3.8 Sealing ends (applicable to Type I and II only). The ends of each length of cord shall be sealed with tape conforming to ASTM D5486, to prevent spilling of the explosive. The tape shall be approximately 2 inches wide, Type IV, conforming to Olive Drab FED-STD-595/ 24084. The tape shall be placed so that the cord is approximately at the mid point of the tape width. The two sides of the tape shall then be pressed together so as to create a seal at the cord end. No explosive shall spill out of the cord. The cord shall be wrapped around the cord spool, with the first end of the cord inside the barrel. The last end shall be taped down to the outside and sealed. The inspection to determine conformance with the requirement shall be as specified in 4.5.9.

3.9 Flexibility. The plastic coating shall not crack when tested as specified in 4.5.10.

3.10 Temperature conditioning. The following applies to First Article Inspection only for Types I and II.

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3.10.1 Conditioning at 130°F and 360 BTU/Sq. ft./hr. solar radiation. When tested as specified in 4.5.11.1, the detonating cord shall show no change in physical characteristics such as form and color or diameter as given in Table 1.

3.10.2 Conditioning at -65°F. When tested as specified in 4.5.11.2 the detonating cord shall show no change in physical characteristics such as form and color and comply with diameter and breaking strength as given in Table I when tested in accordance with applicable test methods. In addition, the conditioned sample shall comply with 3.4 (Detonating velocity) when tested as specified in 4.5.5.

3.11 First article inspection. This specification contains technical provisions for first article inspection. Requirements for the submission of first article samples by the contractor shall be as specified in the contract.

3.12 Workmanship. The manufacturer shall implement procedures and controls to assure that the process and the product produced are not compromised by foreign material or any other conditions which may degrade the material.

3.13 Splicing all types. Two splices maximum shall be permitted per 1000 feet. One splice maximum shall be permitted per 500 feet. No splice shall be permitted for 100 or 50 feet.

4. VERIFICATION

4.1 General provisions. Deleted.

4.2 Classification of inspections. The following types of inspection shall be conducted on this item:

- a. First article inspection (see 4.3).
- b. Conformance inspection (see 4.4).

4.3 First article inspection. When specified, a sample of five (5) complete spools shall be subjected to first article inspections in accordance with Table II. The sample shall be obtained from the first production lot which has been produced by the contractor using the same production processes, procedures and equipment as will be used in fulfilling the contract. All materials shall be obtained from the same sources of supply as will be used in regular production.

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

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Table II. First article inspection.

Examination/test	Conformance Requirement	Requirement paragraph	Inspection method ref.
Construction			
Weight of finished cord	4.3	3.3	4.5.1
Diameter	4.3	3.3	4.5.2
Breaking strength	4.3	3.3	4.5.3
Weight of explosive	4.3	3.3	4.5.4
Finish color	4.3	3.3	Visual
Inert fill color (Type III)	4.3	3.3	Visual
Detonating velocity	4.3	3.4	4.5.5
Propagation (as applicable)	4.3	3.5	4.5.6
Sensitivity			
Flame	4.3	3.6.1	4.5.7.1
Impact	4.3	3.6.2	4.5.7.2
Waterproofness	4.3	3.7	4.5.8
Sealing end	4.3	3.8	4.5.9
Flexibility	4.3	3.9	4.5.10
Temperature conditioning	4.3	3.10	4.5.11
Workmanship	4.3	3.12	Visual
Splicing	4.4.2.1	3.13	Visual

4.4 Conformance inspection. Conformance inspection shall be performed in accordance with 4.4.2.1 through 4.4.2.5. If any assembly, component or test specimen fails to comply, the lot from which the sample was taken shall be rejected.

4.4.1 Inspection lot formation. Inspection lots shall conform to the requirements of MIL-STD-1916. Visually verify that an ammunition lot number has been assigned to each lot as described in MIL-STD-1168. In addition inspection lots shall contain:

- a. Parts and materials from not more than one manufacturer.
- b. PETN of the same grade from not more than one lot interfix number from one manufacturer.
- c. RDX of the same grade from not more than one lot interfix number from one manufacturer.

4.4.2 Classification of characteristics.

a. Sampling requirements. Inspection sampling requirements for critical, major and minor characteristics are defined in MIL-STD-1916. Unless specified otherwise, 100% inspection 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.

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4.4.2.1 Classification of characteristics – Detonating cord spool.

Classification	Examination/test	Conformance Criteria	Requirement paragraph	Inspection method ref.
<u>Critical:</u>	None defined.			
<u>Major:</u>	None defined			
<u>Minor:</u>				
201	Cord spliced excessively	Level II	3.13	Visual
202	Foreign matter	Level II	3.12	Visual
203	Ends of cord not sealed	Level II	3.8	Visual
204	Ends of cord not taped down onto spool	Level II	3.8	Visual
205	Marking misleading or unidentifiable	Level II	3.12	Visual

4.4.2.2 Classification of characteristics - Box, paper or fiber, sealed.

Classification	Examination/test	Conformance Criteria	Requirement paragraph	Inspection method ref.
<u>Critical:</u>	None defined.			
<u>Major:</u>	None defined			
<u>Minor:</u>				
201	Sealing strip torn, badly wrinkled or otherwise fails to seal box completely	Level II	5.1	Visual
202	Box torn, cut or punctured	Level II	5.1	Visual
203	Contents loose	Level II	5.1	Visual
204	Marking missing, misleading or unidentifiable	Level II	5.1	Visual
205	Barrier bag missing(if applicable)	Level II	5.1	Visual

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4.4.2.3 Classification of characteristics - Sealed wooden packing box.

Classification	Examination/test	Conformance Criteria	Requirement paragraph	Inspection method ref.
<u>Critical:</u>	None defined.			
<u>Major:</u>				
101	Box damaged to the extent that contents are exposed	Level IV	5.1	Visual
102	Strapping missing, broken or loose	Level IV	5.1	Visual
<u>Minor:</u>				
201	Contents loose	Level II	5.1	Manual
202	Marking missing, misleading or unidentifiable	Level II	5.1	Visual

4.4.2.4 Classification of characteristics – Metal drums, sealed (for Navy, if packaged in drums).

Classification	Examination/test	Conformance Criteria	Requirement paragraph	Inspection method ref.
<u>Critical:</u>	None defined.			
<u>Major:</u>				
101	Cover not sealed	Level IV	5.1	Visual
<u>Minor:</u>				
201	Contents loose	Level II	5.1	Manual
202	Gaskets missing, broken or improperly placed	Level II	5.1	Visual
203	Container punctured, dented or cracked	Level II	5.1	Visual
204	Seams cracked or split	Level II	5.1	Visual
205	Locking device bent or cracked	Level II	5.1	Visual
206	Marking missing, misleading or unidentifiable	Level II	5.1	Visual

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4.4.2.5 Detonating cord construction.

Classification	Examination/test	Conformance Criteria	Requirement paragraph	Inspection method ref.
<u>Critical:</u>	None defined.			
<u>Major:</u>				
101	Weight of finished cord	4.4.3.1.1	3.3	4.5.1
102	Diameter	4.4.3.1.1	3.3	4.5.2
103	Breaking strength	4.4.3.1.1	3.3	4.5.3
104	Weight of explosive	4.4.3.1.1	3.3	4.5.4
105	Waterproofness	1 sample	3.7	4.5.8
106	Finish color	4.4.3.1.1	Table I	Visual
107	Flexibility	4.4.3.1.6	3.9	4.5.10
<u>Minor:</u>				
201	Inner construction	4.4.3.1.1	3.3	Visual
202	Finish	4.4.3.1.1	3.3	Visual
203	Inert fill color	4.4.3.1.1	3.3	Visual
204	Workmanship	Level II	3.12	Visual

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4.4.3 Testing. PRECAUTION: This specification covers sampling and testing of toxic and hazardous materials. Accordingly, it is emphasized that all applicable safety rules, regulations and procedures must be followed in handling and processing the detonating cord.

4.4.3.1 Sampling. Five (5) spools shall be randomly selected from the lot and shall be subjected to the following tests:

4.4.3.1.1 Compliance with Table I. From each of these five spools, approximately 18 inches of detonating cord shall be selected and tested. If any sample fails to comply with the requirements given in Table I the lot shall be rejected.

4.4.3.1.2 Detonation velocity. Approximately 6 feet of detonating cord shall be selected from each of the five spools and tested. If any sample fails to meet the requirements given in 3.4 the lot shall be rejected.

4.4.3.1.3 Propagation of detonation. Approximately 3 feet of detonating cord from each of the five spools, plus an additional 20 feet section from any one of the 5 spools for use as a main line, shall be selected and tested. If any sample fails to comply with the requirement given in 3.5, the lot shall be rejected.

4.4.3.1.4 Sensitivity.

4.4.3.1.4.1 Flame. Approximately 6 inches of detonating cord shall be selected from each of the five spools and tested. If any sample fails to comply with the requirement given in 3.6.1 the lot shall be rejected.

4.4.3.1.4.2 Impact. Approximately 6 inches of detonating cord shall be selected from each of the spools and tested. If the sample fails to comply with the requirement given in 3.6.2, the lot shall be rejected.

4.4.3.1.5 Waterproofness. Only one continuous piece 80 feet long shall be selected (if the lot is comprised of 50 foot spools, two 50 foot spools shall be selected for this test. If the sample fails to comply with the requirement given in 3.7, the lot shall be rejected.

4.4.3.1.6 Flexibility. Approximately 2 feet of detonating cord shall be selected from each of the five spools and tested. For Type Ic approximately 10 feet of detonating cord shall be selected from each of the five spools. If any sample fails to comply with the requirement given in 3.9, the lot shall be rejected.

4.4.3.1.7 Temperature conditioning. A 15 foot sample from each spool shall be selected for this test. If any sample fails to comply with the requirements given in 3.10, the first article shall be rejected.

4.4.4 Inspection equipment. Deleted.

4.5 Test methods and procedures (see 6.4).

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4.5.1 Weight of finished cord. Determine the weight of the finished cord as follows: Accurately measure the total length of the five segments selected and record as feet (F). Also, obtain a Total Weight of the five segments and record as grams (w). Calculate the weight of finished cord as follows:

$$\text{Weight of finished cord, lbs} = \frac{W}{F \times 454} \times 1000$$

4.5.2 Diameter. Determine the diameter of each sample with a suitable gauge which has prior approval of the Technical Agency (see 6.3). (The requirement does not apply to the waterproofed ends of the detonating cord).

4.5.3 Breaking strength. Determine the breaking strength (see Table I) of each sample of the finished cord in accordance with a procedure which has prior approval of the Technical Agency (see 6.3).

4.5.4 Weight of explosive. Determine the weight of explosive as follows: After all the tests have been completed to determine conformance with Table I, cut each of the five (5) selected samples to exactly 12.0 ± 0.05 inches. Obtain an accurate total weight (W_T) for these five 12 inch segments. Cut open each of the twelve inch segments and quantitatively remove the explosive without losing any of the construction material and reweigh (W_A). Calculate the weight of explosive per 1000 feet as follows:

$$\text{Weight of explosive per 1000 feet, lbs} = \frac{W_T - W_A}{5 \times 454} \times 1000$$

4.5.5 Detonating velocity.

4.5.5.1 Type I. A number 6 commercial blasting cap shall be attached in parallel, and in close contact with the piece of dry detonating cord by means of adhesive tape, and detonated. The detonating velocity shall be measured by a procedure which has been submitted to the Technical Agency for prior approval (see 6.3).

4.5.5.2 Type II. A number 6 commercial blasting cap shall be securely attached to a square cut dry end of the cord using a butt joint. The end of the blasting cap shall be placed in immediate contact with the explosive core, then detonated. The detonating velocity shall be measured by a procedure which has been submitted to the Technical Agency for prior approval (see 6.3).

4.5.6 Propagation of detonation (applicable to all Type I, except Type Ip). The samples shall be attached by a girth hitch to the main line and tested in accordance with a procedure submitted to the Technical Agency for prior approval (see 6.3).

4.5.6.1 Detonation of TNT (applicable to Type Ib, Ic and Ij). In conformance with Specification MIL-C-46246, the cord shall be snugly tied around a TNT demolition block, with

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three turns plus a half hitch on the end leading to the blasting cap. The other end should be securely tucked beneath all the turns. The procedure used to determine initiation of the TNT, high order, shall be submitted to the Technical Agency for prior approval (see 6.3).

4.5.6.2 Propagation of detonation (applicable to Type Ip). On a piece of cardboard using commercial tape, secure six (6) pieces of detonating cord (referred to as the acceptors) aligned parallel to each other. Then secure another piece of detonating cord (referred to as the donor) across the array at least 3 inches apart with the cross over junctions (node points). The donor shall lie at an angle no greater than 15 degrees from the direction of the acceptors. There shall be contact between the donor and acceptor at each detonating cord intersection. Place a ¼ inch thick, minimum, aluminum plate under each of the node points. The aluminum plate shall be large enough to cover at least a 3 inch radius circle, centered at each node point. The donor shall be initiated. Verify complete detonation of the donor and any acceptors. An acceptor successfully functioned by the donor shall also be considered a success. After the successful initiation of the donor, each acceptor shall be separately activated. Verify complete detonation of each acceptor.

4.5.7 Sensitivity.

4.5.7.1 Flame. Four ounces of black powder complying with MIL-P-223, Class 5, shall be spread around and over (including the open ends) each piece of detonating cord and ignited. The procedure used to determine non-detonation shall be submitted to the Technical Agency for prior approval (see 6.3) to determine compliance with 3.6.1.

4.5.7.2 Impact. Each piece of detonating cord shall be placed on a steel anvil and a 25 pound bar with a diameter of 2 inches at the striking face shall be dropped from a height of 16 feet onto each piece (see 6.3). Procedures used to determine non-detonation shall be submitted to the technical agency for prior approval (see 6.3) to determine compliance with 3.6.2.

4.5.8 Waterproofness. The sample, except for one end approximately five feet long which shall be kept dry, shall be immersed in water not more than one foot in depth for not less than 72 hours. After immersions, the sample shall be cut into a fifty foot length (including the dry end) for use as trunk line and ten three foot sections for branch lines. Beginning fifteen feet from the dry end of the trunk line, the branch lines shall be attached at three foot intervals by means of girth hitch knots. The cord shall then be tested in accordance with a procedure which has prior approval of the Technical Agency, to determine compliance with 3.7 (see 6.3).

4.5.9 Sealing ends. A method which has prior approval of the Technical Agency (see 6.3) shall be used to determine conformance with the applicable requirement.

4.5.10 Flexibility. Condition the samples in a suitable chamber maintained at $-65 \pm 2^{\circ}\text{F}$ for a minimum of 72 hours (refer to 4.4.3.1.6). Remove only one sample and allow the other samples to remain at -65°F . Wrap a portion of the sample, securely, around a 1/4 inch diameter mandrel, a minimum of five times around and visually inspect for cracks. (A 3/4 inch diameter mandrel shall be used for detonating cords with an OD greater than 0.25 inches.) Then repeat the test on the additional samples. In addition, the type 1c detonating cord shall be tied in any of two

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hitches and connections normally encountered in blasting and demolition operations (see 6.7) and visually inspected for cracks. There shall be no delays from time sample is removed from the -65°F chamber until the wrapping operation is performed.

4.5.11 Temperature conditioning.

4.5.11.1 Conditioning at 130 ± 5°F and 360 BTU/sq. ft./hr. solar radiation (see 6.6). A 15 foot long detonating cord test sample shall be coiled in a single circle approximately 4 feet in diameter, and placed in a horizontal plane on a perforated stainless steel tray. The cord shall be exposed to 130 ± 5°F with 360 BTU/sq ft/hr solar simulation radiation for 4 hours minimum in the test chamber. The intensity of solar radiation shall be monitored once/hr during the 4 hours exposure period. Upon completion of the solar radiation test, the chamber temperature shall be restored to laboratory ambient level; the test sample shall be removed and visually inspected to determine that the cord was not broken, cracked, deformed or changed in color. For this visual examination a section of unconditioned detonating cord should be used as a reference standard.

4.5.11.2 Conditioning at -65°F. Using the sample from 4.5.11.1, wind the cord in a loose elliptical coil, approximately one foot by two feet and place in a perforated stainless steel basket. Place the basket containing the sample into a -65°F conditioning chamber and condition at -65 ± 2°F for 72 hours minimum. After the 72 hours, increase the chamber temperature to 70° ± 5°F and condition for 5 hours, minimum. Again visually inspect the sample against the reference sample for form and color. Check the diameter in accordance with 4.5.2, and check the breaking strength in accordance with 4.5.3. Finally perform the detonation test as specified in 4.5.5.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2 and 6.8). When actual packaging of materiel is to be performed by DOD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

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

6.1 Intended use. The detonating cord covered by this specification is intended for military applications and includes: blasting, demolition, cutting charges, initiating devices and explosive initiating grains.

6.2 Acquisition requirements. Acquisition documents should specify the following:

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(ISO 9001, ISO 9002, ISO 9003, ANSI/ASQC 9001, Q9002, Q9003, or comparable non-Government quality system models should be used for inspection system requirements. For Type III, the material used for the inert filler should be specified in the contract or purchase order.)

- a. Title, number and date of this specification.
- b. Packaging requirements. (See 5.1).
- c. Requirements for First Article.(See 4.1).
- d. Government Furnished Material or equipment.
- e. Requirements for acceptance inspection equipment (AIE) designs (See 6.3).
- f. Requirements for ammunition lot numbering, and data card preparation should be in accordance with MIL-STD-1168
- g. Applicable national stock number.
- h. Certificate of conformance for each lot or shipment of product.
- i. Requirements for conformance. (See 4.0).
- j. Applicability of Live Fire T&E requirements under Public Law 1033-355, Section 2366 of Title 10, USC.

6.3 Inspection equipment/test procedures.

6.3.1 Submission of inspection equipment designs for approval. Submit equipment designs as required to Commander, RDECOM-ARDEC, ATTN: RDAR-QEM, Picatinny Arsenal, NJ 07806-5000.

6.3.2 Submission of test procedures for approval. Same as 6.3.1.

6.4 Equivalent test methods. The test methods given in this specification are the official methods to be used. The contractor may request using other methods providing that the proposed method is equivalent (accuracy and precision) to the method given in this specification. Prior approval of the Contracting Officer is required for use of equivalent test methods. A description of the proposed method should be submitted through the Contracting Officer to: Commander, RDECOM-ARDEC, ATTN: RDAR-QEM, Picatinny Arsenal, NJ 07806. This description should include, but not be limited to, the procedures used, the accuracy and precision of the method, test data to demonstrate the accuracy and precision and drawings of any special equipment required.

6.5 International standardization. Certain provisions of this specification (Table I, para. 3.4, 3.7 and 3.9) are the subject of international standardization agreement STANAG 2818. When amendment, revision, or cancellation of this specification is proposed which will modify the international agreement concerned, the preparing activity will take appropriate action through international standardization channels including departmental standardization offices to change the agreement or make other appropriate accommodations.

6.5.1 Cord diameter. Deletion of a minimum diameter from Type I, Class j has not been an oversight. For cord manufactured for use by nations affected by the above international agreement, the diameter of the cord should be as follows, in accordance with this agreement:

Maximum: 0.2165 inch (5.50mm)

Minimum: 0.1950 inch (4.95mm)

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6.6 Solar radiation. The following have been found satisfactory for use in monitoring the intensity of solar radiation:

a. Pyroheliometer, Eppley Laboratory, Inc., Model 10, S/N 27370, Horizontal Surface Type or equal.

b. Portable Potentiometer, Leeds & Northrop, FA #Q3550, S/N 1026920 or equal.

6.7 Hitches and connections. Hitches and connections are described in Chapter 13 of DuPont Blasters Handbook, Fifteenth Edition and in ISEE Blasters Handbook, Seventeenth Edition.

6.8 Acceptable packaging requirements. The following packaging and marking requirements have been used for packaging detonating cords, and is found to be acceptable to the Government. These requirements should be included in the contract or order for the procurement of detonating cords because detonating cords contain hazardous energetic material(s). (Caution: If the following paragraphs are to be included in a contract, they should be modified, using standard contract language, to make them compulsory requirements.)

6.8.1 Spools.

6.8.1.1 Fifty-foot lengths. The 50 foot length of detonating cord should be furnished on a fiberboard or chipboard core, 8 plus or minus 1/4 inch in length, 5/8 inside diameter, 1 plus or minus 1/16 inch outside diameter and 1.30 plus or minus 0.05 ounces in weight. The detonating cord should be wound on the core in three coils. The cord should not extend beyond the ends of the core more than 3/16 inch, and the maximum diameter of the completed reel should not exceed 2 1/2 inches.

6.8.1.2 Lengths. The 100 foot lengths should be furnished on commercial spools. The 500, 1000 and 4000 foot lengths should be furnished on commercial spools.

6.8.2 Splicing all types. Moved to Section 3.

6.8.3 Packaging.

6.8.3.1 Level A. Each spool of detonating cord should be placed in a fiberboard box conforming to ASTM 5118 for a Type CF, Class Domestic, Variety SW, Grade 200 minimum box. Boxes should be closed by applying ASTM D5749 Type II, Grade B tape, 2 inches wide over the full length of the center top and bottom box seam with an approximate 3 inch extension onto the end panels of the box. All corners of each box should be blunted and each box inserted into a barrier bag conforming to MIL-DTL-117 for a Type I or II, Class E, Style 1 or 2. All excess air should be exhausted from the bag and the opening closed by heat sealing. The bag should meet the heat seal test of MIL-STD-2073-1 (Standard Practice for Military Packaging).

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6.8.3.2 Level B. Spools of detonating cord should be packaged in the same manner as described in 6.8.3.1.

6.8.3.3 Level C. Spools of detonating cord should be packaged in the same manner as described in 6.8.3.1 except the barrier bag is not required.

6.8.4 Packing.

6.8.4.1 Level A (for Army use). Detonating cord packaged in accordance with 6.8.3.1 should be packed in wood boxes conforming to MIL-DTL-2427, (Boxes, Ammunition Packing, Wood Nailed), Type I, Class 1 box. All interior surfaces of the box should be lined with fillers, sheet form conforming with MIL-PRF-50449 (Filler, Sheet Form - Laminated Paper for Use in Ammunition Containers). Additional fillers should be placed on top of the box contents as required for a tight pack. The number of rolls per box should be:

a. for Type I and II:

4000 ft. rolls - 1 per box

1000 ft. rolls - 3 per box

500 ft. rolls - 6 per box

100 ft. rolls and 50 ft. rolls - as specified in contract or purchase order.

b. for Type III:

1000 ft. rolls - 3 per box - as specified in contract or purchase order.

Boxes should be closed and strapped in accordance with instructions contained in the appendix of the box specification.

6.8.4.2 Level B. Level B packing should be the same as described in 6.8.4.1.

6.8.4.3 Level C. Detonating Cord Type I and II packaged in accordance with 6.8.3.2 should be packed in accordance with Code of Federal Regulations, Title 49, CFR except if a fiberboard box is used it should conform to Grades V3C or V13V of ASTM D5118 (Standard Practice for Fabrication of Fiber Board Shipping Boxes), Type III, (Inert) cord should be packaged as specified in ASTM D3951 (Standard Practice for Commercial Packaging)

6.8.5 Marking.

6.8.5.1 Marking for Army use. Each spool, unit box and bag should be labeled, stamped, or printed in accordance to marking requirements of Drawing 12982865.

6.8.5.1.1 Outer pack (wood box). The word "SER" should be included only if the serial number is assigned. The parenthesis should not be included in the marking. Letters should be upper case. Letter and number size min. 1/4 inch. Labels should be conforming to white gummed stock. Stamping ink should be black conforming to specification A-A-208 or drawing 9211789.

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On exterior boxes, 2D bar code labels should be conforming to MIL-PRF-61002. The marking provided by this label should be accomplished by a stamping of similar size to the label using black stencil ink IAW A-A-208 or using ink jet printing methods in accordance with A-A-59383. Exterior boxes containing Type I or II detonating cord should be marked in accordance with drawing 8796522. The DOT marking for Detonating cord when the gross weight of the package 100 lbs or less and not exceeding 100 grains/linear foot should be "Cord, Detonating UN 0065". The outer pack should be marked with the following:

a. for Type I and Type II:

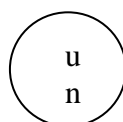
(NSN)-(DODIC)
(No.Ft) FT CORD, DETONATING
TYPE () C1 ()
LOT () SER ()

b. for Type III:

(NSN)-(DODIC)
(No. Ft) FT DUMMY CORD, DETONATING
TYPE III INERT
LOT () SER ()

2D identification bar code should conform to Drawing 12999545.

Mark UN "POP" marking on opposite side of the box as the descriptive nomenclature as follows:


 u 4C1/Y*/S/**
 n USA/DOD/AYD

The letter "u" and "n" should be lower case and enclosed in a circle. At * enter the maximum gross weight in kilograms of the box configuration that was POP tested or will be used for an acceptable analogy IAW 49CFR. The weight of the packed out box should be equal to or less than the POP certified box weight IAW 49CFR. At ** enter the last two digits of the year packed or the year the package is later reconditioned.

Exterior boxes containing Type III (inert) cord should be marked in accordance with Dwg. 8796522 and Drawing 12982865.

6.8.5.1.2 Inner pack (unit box, bag and spool). The word "SER" should be included only if the serial number is assigned. The parenthesis should not be included in the marking. The inner pack should be marked with the following:

a. for Type I and Type II:

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(No.Ft) FT CORD, DETONATING
TYPE () C1 ()
LOT () SER ()

b. for Type III:

(No. Ft) FT DUMMY CORD, DETONATING
TYPE III INERT
LOT () SER ()

6.8.5.1.2.1 Spool marking color. The spool markings should be yellow color No. 33538 in accordance with FED-STD-595 for Type I and Type II. The spool markings should be black color No. 37038 in accordance with FED-STD-595 for Type III.

6.8.5.2 Marking for Navy Use. Each 500 ft spool specified in 6.8.1.2 should be labeled, stamped, or printed in accordance with Drawing 12982865. Mark metal drum in accordance with Drawing 8806652 and Drawing 12982865.

6.9 Subject term (key word) listing.

Explosive devices
Demolition materials
Explosive initiation

6.10 Amendment overview of changes. The following approved Engineering Change Proposals (ECPs) are being incorporated into this document: R10B2003, R10B2005, and R10B2015. The name of the inert cord is specified as Detonating Dummy Cord. The color of the Detonating Dummy Cord was changed from blue to gold. The finish colors of Type I and II were added. Class Ik, Im, and In were added for the Navy. Class Ip and Iic were added for the Army. Outdated references, incorrect grammar, and some formatting have been updated.

6.11 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodian:
Army - AR
Navy-OS

Preparing activity:
Army - AR
(Project 1375-2010-008)

Reviewing activity:
Navy – MC

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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 <https://assist.daps.dla.mil>.