

## INCH-POUND

MIL-DTL-17124F

17 July 2012

SUPERSEDING

MIL-DTL-17124E

06 March 2001

## DETAIL SPECIFICATION

## CORD, DETONATING and DUMMY CORD, DETONATING

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

## 1. SCOPE

1.1 Scope. This specification describes 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 13042072).

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 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 requirements documents 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](mailto: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.dla.mil>.

AMSC N/A

FSC: 1375

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### 2.2 Government documents.

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

#### DEPARTMENT OF DEFENSE 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, ½ Pound, and 1 Pound

#### DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-810 - Environmental Engineering Considerations and Laboratory Tests  
MIL-STD-1168 - Lot Numbering of Ammunition  
MIL-STD-1916 - DOD Preferred Methods for Acceptance of Product

(Copies of these documents are available online at <https://assist.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 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 specification to the extent specified herein.

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

13042072 - Cord, Detonating

(Copies of the above drawings are available from U.S. Army RDECOM-ARDEC, ATTN: RDAR-EIS-PE, Bldg. 12, Picatinny Arsenal, NJ 07806-5000 or by email at [pica.drawing.request@conus.army.mil](mailto:pica.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 INTERNATIONAL

ASTM D4976 - Standard Specification for Polyethylene Plastics

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

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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 Required inspections.

3.1.1 First article. When specified, a sample shall be subjected to the first article inspection in accordance with 4.2.

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

3.2 Materials, components and assemblies. All materials, components and assemblies shall comply with the requirements of 13042072 for all types and classes.

3.2.1 Detonation velocity (applicable to Type I and Type II). The detonation velocity shall comply with 13042072.

3.3 Propagation of detonation (applicable to Type I). The detonating cord shall propagate from a main line to a branch line when attached by a girth hitch. All cords shall detonate completely.

3.4 Cut-off (applicable to Type Ip and Type Iic). The detonating cord shall either completely detonate or remain functional after a neighboring cord is detonated.

3.5 Detonation of TNT (applicable to Type Ib, Ic and Ij). The detonating cord shall initiate TNT conforming to MIL-C-46246 high order.

3.6 Flame sensitivity (applicable to Type I and II). The detonating cord shall not detonate when four (4) ounces of black powder spread around and over the cord (including the open ends) is ignited.

3.7 Impact sensitivity (applicable to Type I and II). The detonating cord shall not propagate when impacted by a bar weighing  $25.0 \pm 0.1$  lbs with a  $2.0 \pm 0.1$  inches striking face diameter dropped from a height of  $16.0 \pm 0.1$  feet.

3.8 Waterproofness (applicable to Type I and II). The detonating cord shall completely detonate after immersion in not less than 12 inches of water for not less than 72 hours.

3.9 Solar radiation (applicable to Type I and II). The detonating cord shall show no change in physical characteristics such as form, color, and diameter after exposure to  $130^\circ \pm 5^\circ\text{F}$  with  $360 \pm 47$  Btu/ft<sup>2</sup>/hr simulated solar radiation for a minimum of 4 hours.

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3.10 Cold conditioning (applicable to Type I and II). The detonating cord shall show no change in physical or performance characteristics - such as form, color, diameter, breaking strength, and velocity of detonation - after being conditioned at  $-65 \pm 5^{\circ}\text{F}$  for a minimum of 72 hours.

3.11 Flexibility (applicable to Type I, II, and III). The detonating cord shall not crack after being conditioned at  $-65 \pm 5^{\circ}\text{F}$  for a minimum of 72 hours and then wrapped five turns around a mandrel. For detonating cords with a measured outer diameter of 0.25 inches or less, a  $0.25 \pm 0.01$  inch diameter mandrel shall be used. For detonating cords with a measured outer diameter greater than 0.25 inches, a  $0.75 \pm 0.01$  inch diameter mandrel shall be used.

3.12 Ammunition lot numbering. Ammunition lot numbers shall be assigned in accordance with MIL-STD-1168.

3.13 Workmanship. All parts, sub-assemblies, and assemblies shall be clean and free of burrs, cracks, blisters, chips, dirt, grease, oil (except where specifically required), rust, salt deposits, corrosion, and other foreign matter. All required markings shall be neat, legible, only where specified, and sharply defined.

## 4. VERIFICATION

TABLE I. Requirement/verification cross reference matrix.

Method of verification				Classes of verification				
1 - Analysis		2 - Demonstration		A – First article				
3 - Examination		4 - Test		B – Conformance				
Section 3	Description	Verification Methods				Verification Class		Section 4
		1	2	3	4	A	B	
3.1.1	First article			X	X	X		4.2
3.1.2	Conformance inspection			X	X		X	4.3
3.2	Materials, components and assemblies			X	X	X	X	4.3.4.1, 4.3.4.2, 4.4 - 4.11
3.2.1	Detonation of velocity (applicable Type I and II)				X	X	X	4.12
3.3	Propagation of detonation (applicable to Type I)				X	X	X	4.13
3.4	Cut-off (applicable to Type Ip)				X	X	X	4.14
3.5	Detonation of TNT (applicable to Type Ib, Ic, Ij)				X	X	X	4.15
3.6	Flame sensitivity (applicable to Type I and II)				X	X	X	4.16
3.7	Impact sensitivity (applicable to Type I and II)				X	X	X	4.17
3.8	Waterproofness (applicable to Type I and II)				X	X	X	4.18
3.9	Solar radiation (applicable to Type I and II)				X	X	X	4.19
3.10	Cold conditioning (applicable to Type I and II)				X	X	X	4.20
3.11	Flexibility (applicable to Type I, II and III)				X	X	X	4.21
3.12	Ammunition lot numbering			X		X	X	4.3.4.1
3.13	Workmanship			X		X	X	4.3.4.1

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4.1 Classification of inspections. The inspection 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, a sample of five (5) complete spools shall be subjected to first article inspections in accordance with Table II or Table III, as applicable. 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.

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

TABLE II. First article tests and inspections for Type I and II.

Examination or test	Drawing	Sample size	Requirement paragraph	Verification
<u>Cord, Detonating.</u>	13042072			
Construction				
Diameter		5 <sup>/1&amp;2</sup>	3.2	4.8
Outer color		5 <sup>/1&amp;2</sup>	3.2	Visual (general match)
Smooth exterior		5 <sup>/1&amp;2</sup>	3.2	Visual
Finish/outer construction		5 <sup>/1&amp;2</sup>	3.2	Visual
Inner construction		5 <sup>/1&amp;2</sup>	3.2	Visual/manual
Weight of finished cord		5 <sup>/1&amp;2</sup>	3.2	4.9
Breaking strength		5 <sup>/1</sup>	3.2	4.10
Weight of explosive		5 <sup>/1&amp;2</sup>	3.2	4.11
Detonation velocity		5 <sup>/1</sup>	3.2.1, 3.2.1	4.12
Propagation (only Type I)		5 <sup>/1</sup>	3.3	4.13
Cut-off (only Type Ip)		5 <sup>/1</sup>	3.4	4.14
Detonation of TNT (only Type Ib, Ic, and Ij)		5 <sup>/1</sup>	3.5	4.15
Flame sensitivity		5 <sup>/1</sup>	3.6	4.16
Impact sensitivity		5 <sup>/1</sup>	3.7	4.17
Waterproofness		5 <sup>/1&amp;3</sup>	3.8	4.18
Solar radiation		5 <sup>/1</sup>	3.9	4.19
Cold conditioning		5 <sup>/1</sup>	3.10	4.20
Flexibility		5 <sup>/1</sup>	3.11	4.21
Ammunition lot numbering		5 <sup>/1</sup>	3.12	Visual
Workmanship		5 <sup>/1</sup>	3.13	Visual
Notes:				
<sup>/1</sup> A total of five (5) spools shall be randomly selected for first article inspection. From each of the spools, cut a random set of samples for inspection and testing. Seal the ends of the samples to prevent explosive spillage.				
<sup>/2</sup> Randomly cut one (1) sample, not less than eighteen (18) inches long, from each of the five (5) spools and sequentially subject them to the specified tests.				
<sup>/3</sup> If the lot is comprised of 50 ft spools, two 50 ft spools shall be selected for this test.				

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TABLE III. First article tests and inspections for Type III.

Examination or test	Drawing	Sample size	Requirement paragraph	Verification
Dummy Cord, Detonating Construction	13042072			
Diameter		5 <sup>/1&amp;2</sup>	3.2	4.8
Outer color		5 <sup>/1&amp;2</sup>	3.2	Visual (general match)
Smooth exterior		5 <sup>/1&amp;2</sup>	3.2	Visual
Finish/outer construction		5 <sup>/1&amp;2</sup>	3.2	Visual
Inner construction		5 <sup>/1&amp;2</sup>	3.2	Visual/manual
Weight of finished cord		5 <sup>/1&amp;2</sup>	3.2	4.9
Color on inert fill		5 <sup>/1&amp;2</sup>	3.2	Visual (general match)
Weight of inert fill		5 <sup>/1&amp;2</sup>	3.2	4.11
Breaking strength		5 <sup>/1</sup>	3.2	4.10
Flexibility		5 <sup>/1</sup>	3.11	4.21
Ammunition lot numbering		5 <sup>/1</sup>	3.12	Visual
Workmanship		5 <sup>/1</sup>	3.13	Visual
Notes:				
1 A total of five (5) spools shall be randomly selected for first article inspection. From each of the spools, cut a random set of samples for inspection and testing.				
2 Randomly cut one (1) sample, not less than eighteen (18) inches long, from each of the five (5) spools and sequentially subject them to the specified tests.				

4.3 Conformance inspection. Conformance inspection shall be performed in accordance with 4.3.2 through 4.3.4.2.

4.3.1 Conformance sampling. For each lot, a total of five (5) spools shall be randomly selected. The number of samples per spool shall be in accordance with 4.3.2 through 4.3.4.2. Samples shall be cut from each of these spools and then subjected to the specified tests.

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

4.3.3 Inspection lot formation. Inspection lots shall conform to the requirements of MIL-STD-1916. In addition inspection lots shall contain materials from not more than one lot interfix number from one manufacturer.

4.3.4 Inspection requirements by classification of characteristics.

a. For the conformance inspection paragraphs 4.3.4.1 through 4.3.4.2, the definitions of critical, major and minor defects are provided in paragraph “Definitions” of MIL-STD-1916.

b. The acceptance criteria for sampling inspection shall be in accordance with the levels provided in conformance examination/test paragraph and MIL-STD-1916.

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4.3.4.1 <u>Detonating cord examinations.</u>				Drawing Number 13042072
				Next Higher Assembly
	Examination	Conformance Criteria	Requirement Paragraph	Paragraph reference/ Inspection Method
<u>Critical</u>	None defined			
<u>Major</u>				
101	Diameter	5 <sup>/1</sup>	3.2	4.8
102	Outer color (general match)	5 <sup>/1</sup>	3.2	Visual
103	Smooth exterior	5 <sup>/1</sup>	3.2	Visual
104	Finish/outer construction	5 <sup>/1</sup>	3.2	Visual
105	Inner construction	5 <sup>/1</sup>	3.2	Visual
106	Inert fill color (general match; Type III only)	5 <sup>/1</sup>	3.2	Visual
107	Ammunition lot number	5 <sup>/1</sup>	3.12	Visual
<u>Minor</u>				
201	Workmanship	Level II	3.2	Visual
Notes:				
<sup>/1</sup> A total of five (5) spools shall be randomly selected. Randomly cut one (1) sample, not less than eighteen (18) inches long, from each of the five (5) spools and sequentially subject them to the specified examinations. Seal the ends of the samples to prevent explosive spillage.				

4.3.4.2 <u>Detonating cord tests.</u>				Drawing Number 13042072
				Next Higher Assembly
	Tests	Conformance Criteria	Requirement Paragraph	Paragraph reference/ Inspection Method
<u>Critical</u>	None defined			
<u>Major</u>				
101	Weight of finished cord	5 <sup>/1</sup>	3.2	4.9
102	Breaking strength	5 <sup>/1</sup>	3.2	4.10
103	Weight of explosive (Type I or II) or inert fill (Type III)	5 <sup>/1</sup>	3.2	4.11
104	Detonation velocity (only Type I and II)	5 <sup>/1</sup>	3.2.1, 3.2.1	4.11
105	Propagation of detonation (only Type I)	5 <sup>/1</sup>	3.3	4.12
106	Cut-off test (only Type Ip)	5 <sup>/1</sup>	3.4	4.13
107	Detonation of TNT (only Type Ib, Ic, and Ij)	5 <sup>/1</sup>	3.5	4.14
108	Flame sensitivity test (only Type I and II)	5 <sup>/1</sup>	3.6	4.16
109	Impact sensitivity test (only Type I and II)	5 <sup>/1</sup>	3.7	4.17
110	Waterproofness (only Type I and II)	1 <sup>/2</sup>	3.8	4.18
111	Flexibility	5 <sup>/1</sup>	3.11	4.21
<u>Minor</u>				
201	Workmanship	5 <sup>/1</sup>	3.2	Visual
Notes:				
<sup>/1</sup> A total of five (5) spools shall be randomly selected for examination. One (1) set of sample lengths shall be cut from each of the five (5) spools and then subjected to each of the specified tests. Seal the ends of the samples to prevent explosive spillage.				
<sup>/2</sup> If the lot is comprised of 50 ft spools, two 50 ft spools shall be subjected for this test.				

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4.4 PETN inspection. The PETN lot shall be verified and accepted/rejected in accordance with MIL-P-387.

4.5 RDX inspection. The RDX lot shall be verified and accepted/rejected in accordance with MIL-DTL-398.

4.6 Thermoplastic resin inspection. The thermoplastic resin shall be verified and accepted/rejected in accordance with ASTM D4976.

4.7 TNT inspection. The TNT lot shall be verified and accepted/rejected in accordance with MIL-C-46246

4.8 Diameter inspection. For each sample, use a permanent marker (or alternative) to mark two locations at least four (4) inches apart from each other and at least three (3) inches from the cut ends. At these marks, measure the maximum diameter of the detonating cord. The samples and lot shall be rejected if any of the detonating cords do not meet the diameter requirement.

4.9 Weight of finished cord test. Cut the samples to  $12.0 \pm 0.05$  inches in length. Weigh each sample in grams (W). Calculate the weight of each finished cord as follows:

$$\text{Weight of finished cord per 1000 ft, lbs} = W \times \frac{1000 \text{ feet}}{454 \text{ grams per lb}}$$

The sample and lot shall be rejected if any of the detonating cords exceed the maximum finished cord weight requirement.

4.10 Breaking strength test. From each of the five (5) spools, cut a sample at least twelve (12) inches in length. For each sample, use appropriate equipment to record failure load and apply an increasing load to the point of breakage. The samples and lot shall be rejected if any of the detonating cords do not meet the breakage strength requirement.

4.11 Weight of explosive or inert fill test. Cut the samples to  $12.0 \pm 0.05$  inches in length. Weigh each sample in grams ( $W_T$ ). Cut open each sample and remove the explosive/fill, while retaining all the construction material. Weigh each sample's construction material in grams ( $W_A$ ), now absent of explosive/fill. For each sample, calculate the weight of explosive/fill per 1000 feet as follows:

$$\text{Weight of explosive per 1000 ft, lbs} = (W_T - W_A) \times \frac{1000 \text{ feet}}{454 \text{ grams per lb}}$$

The samples and lot shall be rejected if any of the detonating cords do not meet the minimum explosive weight requirement.

4.12 Detonation velocity test (Type I and II). From each of the five (5) spools, cut a sample at least three (3) feet in length. Obtain one sample and attach a method to measurement to a portion of the sample at least twelve (12) inches long and at least one (1) foot from both



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ends. Record the distance between the timing start and end points (D). Secure a commercial Number 6 blasting cap to the samples. For Type I samples, secure the blasting cap approximately six (6) inches from the end using adhesive tape, so that it is almost completely covered with tape except for the ends. For Type II samples, secure the blasting cap to the detonating cord's square cut dry end using a butt joint; the end of the blasting cap shall be in immediate contact with the detonating cord's explosive core. Initiate the blasting cap. Measure and record the detonation time in microseconds (T). Calculate the velocity of detonation as follows:

$$\text{Velocity of detonation, meters per second} = \frac{D, \text{ inches}}{T, \mu\text{s}} \times 25400 \frac{\mu\text{s per second}}{\text{inches per meter}}$$

Repeat for the remaining samples. The samples and lot shall be rejected if any of the detonating cords do not exceed the minimum velocity of detonation requirement.

**4.13 Propagation of detonation test (Type I).** From each of the five (5) spools, cut a sample approximately three (3) feet in length to be used as branch lines. From any one of the spools, cut an additional twenty (20) foot length to be used as the main line. Starting approximately six (6) inches from one end of the main line, attach each of the five branch lines to the main line using a girth hitch, see Figure 1, at approximate three foot intervals. Ensure the main line is straight and that the branch lines are at right angles to the main line. Secure a commercial Number 6 blasting cap approximately six (6) inches from the end using adhesive tape, so it is almost completely covered with tape except for the ends. Initiate the blasting cap. The samples and lot shall be rejected if any of samples do not detonate completely.

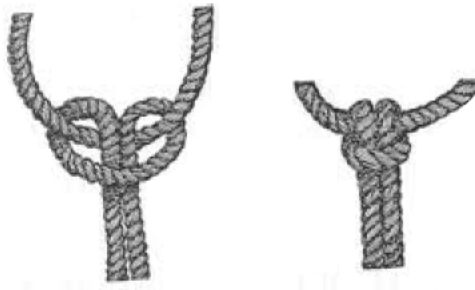


FIGURE 1. Girth hitch.

**4.14 Cut-off test (Type Ip).** From each of the five (5) spools, cut at least twelve (12) inches of detonating cord to be used as witness lines and at least twelve (12) feet of detonating cord to be used as a donor. On a flat board, at least three (3) feet long and one (1) foot wide, place a cardboard sheet to be used as a witness plate. Obtain the five (5) witness lines and position them on parallel and at least six (6) inches from the neighboring line. Secure the witness lines in position using adhesive tape. Wrap the donor around the board so the angles between the donor and witness lines are no greater than fifteen (15) degrees. See Figure 2 for an illustration of a test setup. Ensure there is intimate contact between the donor and acceptor at each detonating cord intersection. Secure a commercial Number 6 blasting cap six (6) inches from an end of the donor using adhesive tape, so it is almost completely covered with tape except for the ends. Initiate the blasting cap. Verify complete detonation of the donor and that no

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witness lines have been completely severed. After the successful initiation of the donor, function any of the remaining witness lines by securing a commercial Number 6 blasting cap six (6) inches to one end of the donor using adhesive tape, so it is almost completely covered with tape except for the ends. Verify complete detonation of each witness line. The sample and lot shall be rejected if any of the samples do not detonate completely.

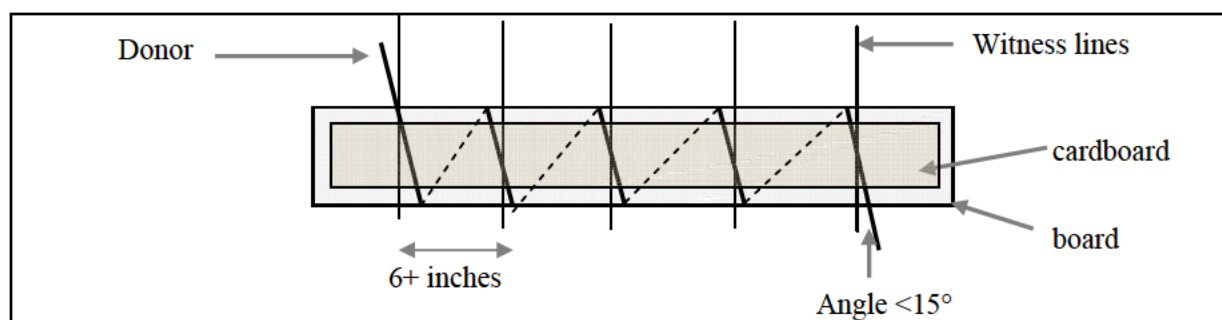


FIGURE 2. Example cutoff test setup (not to scale).

4.15 Detonation of TNT test (Type Ib, Ic and Ij). From each of the five (5) spools, cut approximately six (6) feet. For each sample tie the cord snugly to a TNT demolition block with three turns plus a half hitch on the end leading to the detonating cap. The other end should be securely tucked beneath all the turns. Secure a commercial Number 6 blasting cap approximately 6 inches from the end using adhesive tape, so it is almost completely covered with tape except for the ends. Initiate the blasting cap. The sample and lot shall be rejected if the TNT does not detonate high order.

4.16 Flame sensitivity test (Type I and II). From each of the five (5) spools, cut a sample approximately six (6) inches in length. The specified amount 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 samples and lot shall be rejected if the detonating cord detonates.

4.17 Impact sensitivity test (Type I and II). From each of the five (5) spools, cut a sample approximately six (6) inches in length. Each piece of detonating cord shall be placed on a steel anvil. The specified bar shall be dropped onto the approximate the middle of each detonating cord from the specified height. The detonating cord and lot shall be rejected if the detonating cord detonates through one or both of its ends.

4.18 Waterproofness test (Type I and II). From one of the five (5) spools, cut a sample approximately 80 feet in length. Keep approximately five (5) feet of one end out of the water and immerse the remainder of the sample in water at the specified depth for the specified length of time. After immersion is complete begin at the wet end of the cord and cut ten (10) - three (3) foot lengths to be used as branch lines. The remaining cord shall be used as the main line (approximately 50 feet long and includes the dry portion of the cord). Starting approximately fifteen (15) feet from the dry end of the main line, attach each of the ten branch lines to the main at approximate three foot intervals, using a girth hitch, see Figure 1. Ensure the main line is straight and does not cross over on itself. Ensure the branch lines are at right angles to the main line and do not cross other branch lines. Secure a commercial Number 6 blasting cap to the

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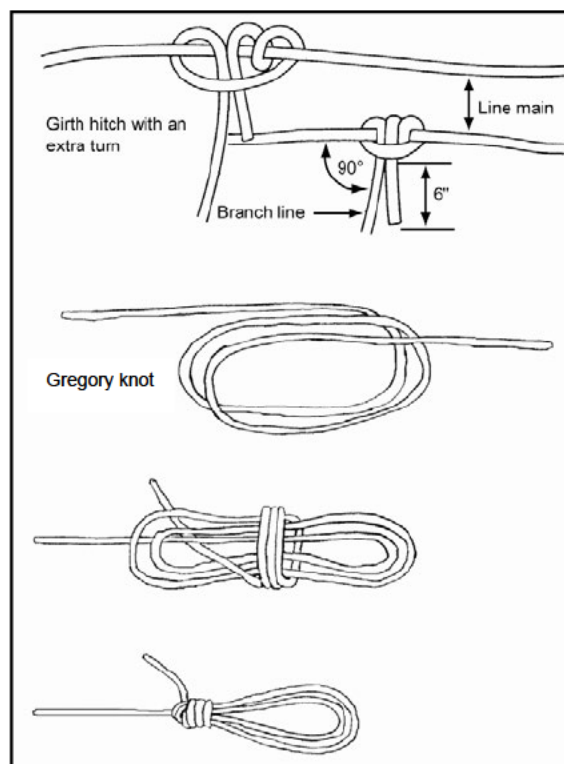
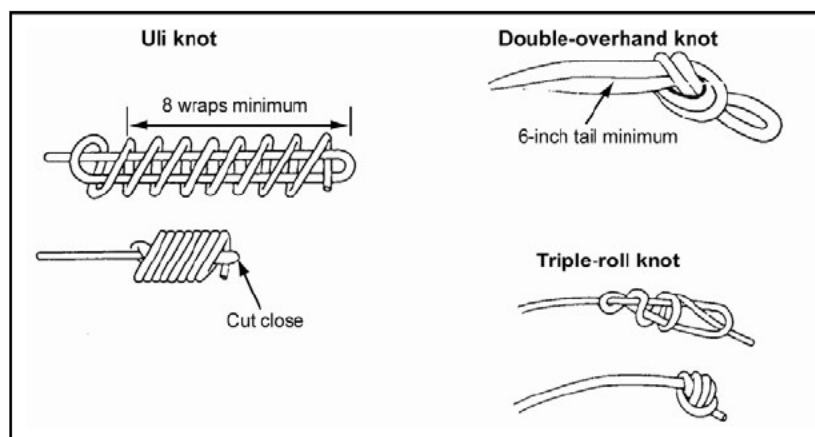
samples. For Type I samples, secure the blasting cap approximately six (6) inches from the end using adhesive tape, so that it is almost completely covered with tape except for the ends. For Type II samples, secure the blasting cap to the detonating cord's square cut dry end using a butt joint; the end of the blasting cap shall be in immediate contact with the detonating cord's explosive core. Initiate the blasting cap. The sample and lot shall be rejected if all samples do not detonate completely.

4.19 Solar radiation test (Type I and II). From each of the five (5) spools, cut a sample approximately fifteen (15) feet in length. The test shall be performed in accordance with MIL-STD-810, Method 505.5, Procedure II at the specified chamber air temperature, radiant energy, and number of hours. The lengths shall be coiled in circles approximately four (4) feet in diameter and placed in a horizontal plane on a perforated stainless steel tray. Upon completion of the solar radiation conditioning visually inspect the sample for degradation such as breaks, cracks, deformation, and changes in color. Compare the samples to a section of unconditioned detonating cord. If applicable, changes in color due to changing wax opacity or migration into the textile wrapping may be permissible if not indicative of degradation and the sample continues to meet the breaking strength and velocity of detonation requirements after the cold conditioning of 4.20. The samples and lot shall be rejected if all samples are not free of visual degradation. At the conclusion of this test, these samples shall be subjected to cold conditioning per 4.20.

4.20 Cold conditioning test (Type I and II). Use the samples subjected to the solar radiation test, 4.19. Wind the cord in loose elliptical coils, approximately one foot by two feet. Place the coils in a perforated stainless steel basket and condition the samples at  $-65 \pm 2^{\circ}\text{F}$  for 72 hours, minimum. After the 72 hours, increase the chamber temperature to laboratory ambient conditions for one (1) hour, minimum. Upon completion of conditioning, measure the samples' diameters in accordance with 4.8 and visually inspect for degradation such as breaks, cracks, deformation, and changes in color. Compare the samples to a section of unconditioned detonating cord. If applicable, changes in color due to changing wax opacity or cracking may be permissible if not indicative of degradation; if wax coated cord changes color perform the detonation test as specified in 4.13 and verify the velocity hasn't changed by subjecting a portion of each sample to 4.12. Verify the breaking strength in accordance with 4.10. The sample and lot shall be rejected if all samples are not free of visual degradation, does not meet the diameter, does not meet the breaking strength requirement, changes in velocity of detonation (if applicable), or does not completely function.

4.21 Flexibility test. From each of the five (5) spools, cut a sample approximately 2 feet in length. For Type I Class C approximately 10 feet of detonating cord shall be selected from each of the five spools. Subject the samples to the specified temperature for the specified length of time. Remove one sample from the conditioning chamber and, without delay, securely wrap a portion of the sample the mandrel. Visually inspect the cord for cracks. For Type I Class C, also tie the detonating cord in any of two hitches and connections normally encountered in blasting and demolition operations, see Figures 3 and 4 (also see 6.4), and then visually inspected for cracks. Repeat the removal/wrapping/tying/inspection procedures for the remainder of the samples. The sample and lot shall be rejected if the detonating cord cracks.

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FIGURE 3. Hitches.FIGURE 4. Knots.

## 5. PACKAGING

**5.1 Packaging.** For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of material is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service of Defense Agency, or within the

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military service's system commands. 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:

- a. Title, number, and date of this specification, and of all reference documents cited in section 2.
- b. Requirement for first article inspection.
- c. Requirement for conformance inspection.
- d. Requirement for ammunition data cards as specified in MIL-STD-1168.
- e. Requirement for acceptance inspection equipment (AIE) and associated test procedures.
- f. Packaging requirements. Special requirements exist for the packaging of this item. Detailed directions and additional information may be obtained from RDAR-EIL-P.
- g. Packaging inspection requirements exist for the packaging of this item. Detailed directions and additional information may be obtained from RDAR-QEM-G.
- h. Requirement for ammunition lot numbering per MIL-STD-1168.
- i. Requirement for ammunition marking.
- j. Requirement for certificates of findings (certificates of analysis) on the PETN/RDX 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.
- k. Requirement for evidence that the explosives are manufactured by qualified sources within the last 5 years.
- l. Clause/CDRL for alternate acceptance plans

6.3 International standardization. Certain provisions of this specification (construction, propagation, waterproofness, and flexibility requirements) 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.



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6.3.1 Cord diameter. For cord manufactured for use by nations affected by the above international agreement, the diameter of Type I, Class J cord should be as follows:

Maximum: 0.2165 inch (5.50mm)

Minimum: 0.1950 inch (4.95mm)

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

6.5 Commonly procured types and classes of detonating cord.

Type	Class	Nomenclature	DODIC	Assembly Drawing	Packing and Marking Drawing	Unitization Procedures
I	e	Cord, Detonating	M456	13042072	13042071	19-48-4116 19-48-4116/127M
I	k	Cord, Detonating, Lightweight	M977	2114301	2114301	19-48-4116 19-48-4116/127L
I	m	Cord, Detonating, Reinforced	M456	2114302	2114302	19-48-4116 19-48-4116/127C
I	n	Cord, Detonating, Wirebound	M457	2114261	2114261	19-48-4116 19-48-4116/127J
I	o	Cord, Detonating, Heavy Load, PETN (100 grains)	MN33	7223937	7223937	7223935
I	p	Cord, Detonating, Heavy Load, PETN (200 grains)	MN34	7223937	7223937	7223935
III of Ie		Dummy Cord, Detonating	M458	13042072	13042071	19-48-4116 19-48-4116/127M

6.6 Precaution. This specification covers sampling and testing of toxic and hazardous materials. Accordingly, it is emphasized that all applicable safety rules, regulation, and procedures should be followed in handling and processing the detonating cord.

6.7 Subject term (key word) listing.

Explosive devices  
Demolition materials  
Explosive initiation

6.8 Revision overview of changes. The following approved Engineering Change Proposals (ECPs) are being incorporated into this document: R12Q2037. The format of the document has been updated for compliance to MIL-STD-961. The type and class construction requirements have been moved to 13042072; the packaging requirements have been moved to 13042071 and the packaging verifications have been moved to 13042077 in accordance with R12B2007.

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6.9 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.

Custodian:  
Army - AR  
Navy-OS

Preparing activity:  
Army - AR  
(Project 1375-2011-004)

Reviewing activity:  
Navy – MC

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.dla.mil>.