

INCH-POUND

MIL-DTL-226G  
3 JUNE 2009  
SUPERSEDING  
MIL-H-226F  
30 September 1982

## DETAIL SPECIFICATION

### HALYARDS, SIGNAL, BRAIDED TREATED

INACTIVE FOR NEW DESIGN AFTER 16 JUNE 1997

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

#### 1. SCOPE

1.1 SCOPE. This document covers requirements for cotton or cotton/polyester halyards braided with and without core.

1.2 Classification. Halyards will be of the following classes and in the sizes (circumference) specified (see 6.2).

Class 1 – Without core

Class 2 – With 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 standard 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 section 3 and section 4 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.

Comments, suggestions, or questions on this document should be addressed to Defense Supply Center Philadelphia, ATTN: DSCP-NASA, 700 Robbins Avenue, Philadelphia, PA 19111-5096 or email to [dscpg&inspeccomments@dla.mil](mailto:dscpg&inspeccomments@dla.mil). Since 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>.

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FEDERAL SPECIFICATIONS

T-T-616 - Treatment Mildew Resistant for Rope and Cord

FEDERAL STANDARDS

FED-STD-191 - Textile Test Methods

COMMERCIAL ITEM DESCRIPTIONS

A-A-59622 - Tags, Shipping and Stock

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

2.3 Non-Government publications. The following documents 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.

AMERICAN SOCIETY FOR QUALITY (ASQ)

ASQ Z1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Copies of this document are available from [www.asq.org](http://www.asq.org) or the American Society for Quality, 611 East Wisconsin Avenue, Milwaukee, WI 53202.)

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 reference 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 Purchases. The requirements specified in 3.7 and 3.8 apply only to halyards purchased directly by the Government. All other requirements apply to halyards purchased by a manufacturer as a component for an end item and to halyards purchased directly by the Government.

3.2 Materials (see 6.3).

3.2.1 Fiber. The halyards shall be fabricated from 100 percent cotton or cotton/polyester blended yarns of suitable staple length and grade to meet the requirements of this document. When cotton/polyester blended yarn is used, the polyester content shall be not less than 50 percent nor more than 65 percent.

3.2.2 Prohibited materials. The use of casein, glue, gum, starch, dextrin, water-soluble materials, paint dryers, resin or vegetable oil, oxidizing oils or resins modified with such oils, and finishing or loading materials to specifically increase the weight or breaking strength are prohibited. Materials necessary for polishing class 2 halyards are acceptable.

3.3 Construction and physical requirements.

3.3.1 Class 1. The class 1 halyard shall be braided without core from a minimum of 9-ply cotton or cotton/polyester blended yarns and shall conform to the requirements specified in table I when tested as specified in 4.2.4.

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3.3.2 Class 2. The class 2 halyard shall be firmly braided around a cotton core from a minimum of 3-ply cotton or cotton/polyester blended yarns and shall conform to the requirements specified in table I when tested as specified in 4.2.4.

Table I. Physical requirements.

Class	Size circumference inch (± 1/8 inch)	carriers 1/	End per carrier 1/ (minimum)	Length per pound, feet (minimum untreated)	Breaking strength, pounds (minimum)	Picks per inch (minimum)	Core, number of yarns
1	¾	8	4	35.0	500	2-3/4	--
1	1	8	6	23.0	750	2-1/2	--
2	1-1/4	12	23	19.0	675	2-1/4	23

1/ Class 2 halyards may be braided using 18 carriers with 15 ends per carrier.

### 3.4 Finish.

3.4.1 Class 1. The class 1 halyard shall be mildew-resistant treated with copper-8-quinolinolate in conformance with the requirement of T-T-616.

3.4.2 Class 2. The finished class 2 halyard shall have a smooth polished surface and shall have a combination mildew and water resistant finish treatment as specified in 3.4.2.1, 3.4.2.2, and 3.4.2.3.

3.4.2.1 Mildew-resistant phase. The mildew-resistant treatment shall be copper-8-quinolinolate in conformance with the requirements of T-T-616.

3.4.2.2 Water resistant phase. The water resistant treatment shall consist of a solution of amorphous wax or paraffin wax, mineral oil, asphalt, and a volatile solvent formulated to meet the requirements of this document. The use of gilsonite, petrolatum, or equivalent products will be permitted.

3.4.2.3 Water absorption. The class 2 halyard shall absorb not more than 45 percent water by weight when tested as specified in 4.2.4.

3.4.2.4 Chloroform soluble material. The finished class 2 halyard shall contain not more than 30 percent total chloroform soluble material when tested as specified in 4.2.4.

3.5 Staining. Class 1 and 2 halyards shall produce no stains when tested as specified in 4.2.4.

3.6 Color. The color of the halyards shall be the natural shade imparted by the treatment.

### 3.7 Put-up.

3.7.1 Class 1. The class 1 halyard shall be put-up in coils or spools (reels) containing a minimum of 2160 feet and a maximum of 2640 feet. The coil or spool (reel) shall contain not more than three pieces and no piece shall be less than 240 feet in length. The end of the halyard shall have no knots nor shall the ends be otherwise attached to make a continuous length. The halyard shall be so wound that each turn and layer is free from entanglement.

3.7.2 Class 2. The class 2 halyard shall be put-up in coils or spools (reels) containing a minimum of 218 feet and a maximum of 222 feet. The coil or spool (reel) shall be put-up in one continuous length without knots and so wound that each turn and layer is free from entanglement. The ends of the halyard shall be cut off squarely and shall be securely whipped to prevent fraying.

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3.8 Identification. Each coil or spool (reel) shall have a ticket (identification tag) attached to it for identification purposes. The ticket shall conform to the requirements of A-A-59622. The use of identification labels on spools (reels) will be allowed provided that the labels are attached in such a manner as to remain in place and be clearly visible until the entire halyard has been removed. All entries on the ticket or label shall be legibly printed, stamped or typed with water insoluble ink. The ticket or label shall contain the following information:

Stock number  
Item description  
Document number  
Length  
Contract number and date  
Contractor's name

3.9 Workmanship. The finished halyards shall conform to the quality and grade of product established by this document.

#### 4. VERIFICATION

4.1 Certificate of compliance. When certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.

4.2 Conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with ASQ Z1.4. The Acceptable Quality Limits (AQLs) listed in this section shall be used to establish the sample size, however, the acceptance number shall be zero.

4.2.1 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements of referenced documents. In addition, inspection shall be performed for the requirements in table II.

Table II. Component tests.

Characteristic	Paragraph reference	Test method
Material	3.2.1	1/
Prohibited materials	3.2.2	1/
Yarn ply	3.3.1 and 3.3.2	1/
Water resistant finish (class 2)	3.4.2.2	1/

1/ Unless otherwise specified a contractor's certificate of compliance shall be submitted and will be accepted for the stated requirements.

4.2.2 End item visual examination. The end item shall be examined for the defects listed in table III. All defects found shall be counted regardless of their proximity to each other. The sample unit shall be one coil or spool (reel). Ten percent of the length contained on each sample unit, but not less than 100 feet, shall be examined for visual defects. The lot size shall be expressed in coils or spools (reels) as applicable. The inspection level shall be I and the acceptable quality limit (AQL), expressed in terms of defects per hundred units, shall be 1.5 for major defects and 4.0 for total (major and minor combined) defects.

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Table III. End item visual defects

Examine	Defect	Classification	
		Major	Minor
Appearance and workmanship	Any cut	X	
	Chafed or damaged	X	
	Kink	X	
	Knot	X	
	Unevenly braided resulting in open places, break in continuity of braid, or soft spot	X	
	Broken or loose end or strand	X	
	Loosely braided	X	
	Core not completely covered (class 2)	X	
Color	Other than natural	X	
Cleanness	Spot or stain <u>1/</u>		X
Identification ticket or label	Omitted, incorrect, illegible, insecurely attached		X
	Ticket or label not as specified		X

1/ Clearly visible at normal inspection distance (approximately 3 feet).

4.2.3 Length and winding examination. The end item shall be examined for the length and winding defects listed in table IV. The sample unit shall be one coil or spool (reel). Any sample unit found to contain one or more defects shall be classified as a defective. The lot size shall be expressed in units of coils or spools (reels) as applicable. The inspection level shall be S-3 and the AQL, expressed in terms of percent defective, shall be 4.0.

Table IV. Length and winding defects.

Examine	Defect
Length	Calculated length <u>1/</u> is less than the minimum specified or more than 10 percent in excess of the maximum length specified. Calculated length <u>1/</u> is less than length marked on ticket or label by more than 6 feet.
Winding	Improperly or not firmly wound resulting in kinks, knots, entangling or slippage during unwinding or otherwise affecting free unhampered unwinding of halyard. Knotting or otherwise joining of ends to make a continuous length. Any coil or spool (reel) containing more than three pieces (class 1). Any piece in coil or spool (reel) less than 240 feet in length (class 1). Any coil or spool (reel) not in a continuous length (class 2). Put-up not as specified. Ends not cut-off squarely and securely whipped (class 2).

1/ Calculated length (feet) = W x L

Where : W = net weight of spool (reel) or coil (to nearest 0.1 pound).

L = Lot average of length per pound results determined in 4.2.4.

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4.2.4 End item testing. The methods of testing specified in FED-STD-191, wherever applicable, and as listed in table VI shall be followed. The physical and chemical values specified in section 3 apply to the average of the determinations made on a sample unit for test purposes as specified in the applicable test methods. When the data in the "Number of determinations" and "Results reported as" columns are not specified in the table, they shall be as required by the referenced test method. The sample size shall be in accordance with table V. All test reports shall contain the individual values utilized in expressing the final result. The sample unit for testing shall be one coil or spool (reels). The lot size shall be expressed in units of coils or spools (reels). The lot shall be unacceptable if one or more sample units fail to meet any requirement. Tests to determine compliance with document requirements including quantity of delivery may be made under prevailing atmospheric conditions, except as specified herein. In cases of dispute, the test shall be made upon material which has reached equilibrium under standard conditions as defined in section 4 of FED-STD-191.

Table V. Sampling for tests.

Lot size (coils or spools, reels)	Sample size
800 and under	2
801 up to and including 22,000	3
22,001 and above	5

Table VI. End item tests.

Characteristic	Requirement paragraph	Test method	Number of determinations per individual single unit	Results reported as
Construction:				
Class 1	3.3.1	<u>1/</u>	--	--
Class 2	3.3.2	<u>1/</u>	--	--
Circumference	Table I	6003	3	--
No. of carriers	Table I	Visual	3	Avg. of 3 determinations to nearest whole number
Ends per carrier	Table I	Visual	3	Avg. of 3 determinations to nearest whole number
Length per pound	Table I	6004	3	--
Breaking strength	Table I	6016	--	--
Picks per inch	Table I	6001	1	Pass or fail
No. of core yarns (class 2)	Table I	Visual	1	Pass or fail
Water adsorption (class 2)	3.4.2.3	6011	--	--
Chloroform soluble material (class 2)	3.4.2.4	2611	--	--
Staining	3.5	4.2.4.1	1	Pass or fail

1/ Unless otherwise specified, a contractor's certificate of compliance shall be furnished and will be accepted for the stated requirement.

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4.2.4.1 Determination of staining. The specimen shall be wrapped a sufficient number of times around a 4 by 4 inch steel plate to produce an exposed area of at least 2 square inches. A piece of filter paper, Whatman No. 1 or equivalent, shall be placed on the wrapped halyard to produce a load of 2 pounds per square inch for 1 hour. The weight shall then be removed and the filter paper examined for evidence of stain.

## 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 or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from then managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contracting 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 halyards are intended for use as flag halyards and distance lines.

6.2 Ordering data. Acquisition documents should specify the following:

- (a) Title, number, and date of this document.
- (b) Class required (see 1.2, 3.3, and 3.4).
- (c) Size (circumference) required (see table I).
- (d) Packaging requirements (see 5.1)

6.3 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this document (see 3.2).

6.4 Subject term (key word) listing.

Coils  
Core  
Reels  
Spools

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

Custodians:  
Army – GL  
Air Force – 99

Preparing activity:  
DLA – IS  
(Project 4020-2009-001)

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>.