

T-T-616B
June 12, 1986
SUPERSEDING
T-T-616A
September 29, 1969

FEDERAL SPECIFICATION

TREATMENT: MILDEW RESISTANT, FOR ROPE AND CORD

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE

1.1 Scope. This specification covers one type of mildew-resistant treatment of rope and cord.

2. APPLICABLE DOCUMENTS

2.1 Government publications. The following documents, of the issues in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

Federal Standard:

FED-STD-191 - Textile Test Methods.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this specification should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014 by using the self-addressed Standardization Document Improvement Proposal (DD form 1426) appearing at the end of this specification or by letter.

AMSC N/A

FSC 4020

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Military Standard:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.

(Copies of Military specifications and standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Materials.

3.1.1 Rope and cord. The specification governing the rope and cord to be treated under this specification shall be cited in the applicable procurement document (see 6.2). Except as otherwise indicated herein, rope and cord shall conform to the requirements of the applicable specification for the end item prior to and after the mildew-resistant treatment.

3.2 Treatment. The mildew inhibitor shall be copper-8-quinolinolate. The use of any other inhibitor is prohibited. Any petroleum fractions, oils or resins used shall be of the nonoxidizing type and shall be free of naphthenic acids or its salts. The inhibitor shall be thoroughly dispersed and so formulated that it may be applied to effect proper penetration into the rope or cord.

3.2.1 Application (hard and soft fiber ropes - manila, sisal, hemp, or jute). For hard and soft fiber ropes, other than cotton, the copper-8-quinolinolate shall be applied to the fibers, yarns, or strands prior to

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twisting (laying) into the finished rope. The treatment shall be uniformly applied throughout the entire cross section of the rope.

3.2.1.1 Cotton ropes and hard and soft fiber cords. The copper-8-quinolinolate shall be applied to the rope or cord as an after treatment. The copper-8-quinolinolate may be applied to the rope or cord with a water-repellent treatment, when required in the applicable end item specification.

3.2.2 Concentration. The application of the inhibitor shall deposit within the rope or cord a minimum of 0.13 percent to a maximum of 0.40 percent copper as metal from copper-8-quinolinolate when tested as specified in 4.2.4.

3.2.3 Prohibited materials. The use of casein, glue, gum, starch, dextrin, water-soluble materials, paint dryers, resin or vegetable oils, oxidizing oils or resin modified with such oils is prohibited except where required for use in polished finishes on cord.

3.3 Color. Unless otherwise specified in the applicable end-item specification or procurement document, the color of the treated rope or cord shall be the natural color resulting from the treatment (see 6.3).

3.4 Acidity (pH) after aging. The mildew-resistant treated rope or cord shall have a pH value of not less than 5.0 before and after heat aging when tested as specified in 4.2.4.

3.5 Breaking strength. A 10 percent loss in breaking strength, based on the minimum specified for the untreated rope or cord, will be permitted, due to the application of the treatment when tested as specified in 4.2.4.

3.6 Handling characteristics. The inherent handling qualities of the untreated ropes or cords shall not be altered by the application of the mildew-resistant treatment. The mildew-resistant treated finish on the ropes or cords shall not crack, peel, dust or flake from the treated surfaces.

3.7 Workmanship. The treated rope or cord shall conform to the quality of product established by this specification. The occurrence of defects shall not exceed the applicable acceptable quality levels.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

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4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

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

4.2 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

4.2.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced specifications, drawings, and standards unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.2.2 End item visual examination. The end item shall be examined in accordance with the applicable classification of defects for the untreated material and as listed in table I. In the event that a condition listed in table I represents a duplication of a condition cited in another applicable document, the condition shall be counted only once. The defects listed in table I shall be counted regardless of their proximity to each other. The sample unit for this examination shall be one packaged unit of rope or cord. Ten percent of the length contained in each sample unit, but not less than 100 feet, shall be subjected to the visual examination. The lot size for this examination shall be expressed in packaged units of rope or cord. The inspection level shall be level I and the acceptable quality level (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.

TABLE I. End item visual defects

<u>Examine</u>	<u>Defects</u>	<u>Classification</u>	
		<u>Major</u>	<u>Minor</u>
Appearance and workmanship	Cut (any)	X	
	Chafed or damaged	X	
	Finish other than specified	X	
	Finish cracked, peeled, dusted, or flaked	X	
	Lumps		X

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TABLE I. End item visual defects (cont'd)

Examine	Defects	Classification	
		Major	Minor
Cleanness	Spot or stain clearly visible 1/		X
	Overall uncleanliness	X	
Color	Other than natural (unless otherwise specified)	X	
	Specific shade specified not within established tolerances		X

1/ At normal inspection distance (approximately 3 feet).

4.2.3 Examination for weight or length and winding. These examinations shall be conducted in accordance with the provisions of the applicable specification for the untreated material or as specified in the contract or order.

4.2.4 End item testing. The methods of testing specified in FED-STD-191, wherever applicable and as listed in the table III, shall be followed. When the "Number of determinations" and "Results reported as" are not specified in table III, they shall be as required by the referenced test method. 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. The sample size shall be in accordance with table II. The sample unit for testing shall be one packaged unit of rope or cord. The lot size shall be expressed in packaged units of rope or cord. All test reports shall contain the individual values utilized in expressing the final result. The lot shall be unacceptable if one or more sample units fail to meet any requirement. Tests to determine compliance with specification requirements, including quantity of delivery, may be made under prevailing atmospheric conditions, except in settlement of dispute in which case the test should be made upon material which has reached equilibrium under standard conditions as defined in FED-STD-191.

TABLE II. Sampling for tests

<u>Lot size (No. of packaged units of rope or cord)</u>	<u>Sample size (sample units)</u>
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

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TABLE III. End item tests

Characteristic	Requirement paragraph	Test method	Number of determinations per individual sample unit	Results reported as
Treatment:				
Inhibitor and compounds present	3.2	<u>1/</u> <u>2/</u>	-	-
Application to:				
Hard and soft fiber ropes	3.2.1	<u>1/</u>	-	-
Cotton ropes and hard and soft fiber cords	3.2.1.1	<u>1/</u>	-	-
Cross-sectional uniformity	3.2.1	Visual	1	Pass or fail
Concentration of copper-8-quinolinolate (percent copper)	3.2.2	2050	-	-
Prohibited materials	3.2.3	<u>1/</u>	-	-
Acidity (pH) after aging	3.4	4.2.4.1	2	-
Breaking strength	3.5	<u>3/</u>	1	Reported to the nearest 0.1 percent

1/ "Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the stated requirement."

2/ The certificate of compliance for the requirements as specified in 3.2 shall incorporate a statement that specific inhibitor (copper-8-quinolinolate) was used in the treatment of the rope or cord and that any petroleum fractions, oils or resins used are of the nonoxidizing type and are free of naphthenic acid or its salts.

3/ Breaking strength shall be determined in conformance with the method specified in the applicable specification for the untreated material.

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4.2.4.1 Acidity (pH) before and after heat aging.

a. The pH of the mildew resistant treated rope, yarns or cord shall be tested prior to aging in accordance with method 2811 of FED-STD-191.

b. pH after aging. Samples (approximately 10 grams) shall be put in weighing bottles (uncovered at a temperature of 175° to 180°F for 44 hours. At the end of this period the yarns or cord shall be tested for acidity (pH) in accordance with method 2811 of FED-STD-191.

5. PACKAGING. (Not applicable).

6. NOTES

6.1 Intended use. The mildew-resistant treatment is intended for use with ropes or cords.

6.2 Ordering data. Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

- a. Title, number, and date of this specification.
- b. Title, number, and date of specification governing the untreated rope or cord.
- c. Color, if other than required (see 3.3 and 6.3).

6.3 Standard sample. If a specific shade (color) is specified and reference is made to a standard sample, for access to that standard sample address the procuring office issuing the invitation for bids.

MILITARY INTERESTS:

CIVIL AGENCY COORDINATING ACTIVITIES:

Custodians:

Army - GL
Navy - AS
Air Force - 99

GSA-FSS
FPI

PREPARING ACTIVITY:

Army - GL

Review activities:

Navy - MC
Air Force - 82
DLA - ES

Project No. 4020-0284

User activity:

Army - MD

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER T-T-616B		2. DOCUMENT TITLE TREATMENT: MILDEW RESISTANT, FOR ROPE AND CORD	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one)	
		<input type="checkbox"/> VENDOR <input type="checkbox"/> USER <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> OTHER (Specify): _____	
b. ADDRESS (Street, City, State, ZIP Code)			
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

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