

MIL-T-2520D  
1 June 1977  
SUPERSEDING  
MIL-T-2520C  
1 December 1967

## MILITARY SPECIFICATION

### TWINE, FIBROUS, LINEN (WAXED AND BLOCKING)

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

#### 1. SCOPE

1.1 Scope. This specification covers linen twine (see 6.1).

1.2 Classification. The twine shall be of the following types as specified (see 6.2):

Type I - Waxed  
Type II - Blocking

#### 2. APPLICABLE DOCUMENTS

- \* 2.1 Issues of documents. The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

#### SPECIFICATIONS

##### MILITARY

MIL-C-3131 - Cordage; Preparation for Delivery of  
MIL-T-3530 - Thread and Twine; Mildew Resistant or Water  
Repellent Treated

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

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FSC 4020

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## STANDARDS

## FEDERAL

FED-STD-191 - Textile Test Methods

## MILITARY

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

(Copies of specifications, standards, drawings, and publications 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 Government and contractor purchases. The requirements specified in 3.6 apply only to twine purchased directly by the Government. All other requirements apply to twine purchased by a contractor as a component for an end item and to twine purchased directly by the Government.

3.2 Material. The twine shall be fabricated from flax fiber processed to meet the requirements of this specification.

3.3 Color. Unless otherwise specified (see 6.2), the twine shall be furnished in the natural color.

3.4 Physical requirements. The twine shall conform to the requirements specified in tables I and II for the respective types when tested as specified in 4.2.5.

TABLE I. Type I, waxed twine

Piles per strand (min.)	Length per pound (min.) Feet	Breaking strength (min.) Pounds
6	2235	32
12	1110	60
27	510	120

TABLE II. Type II, blocking twine

Twine No.	Diameter <sup>1/</sup> Inches	No. of strands (min.)	Plies per strand (min.)	Length per pound (min.) Feet	Breaking strength (min.) Pounds
20	0.105	4	5	210	230
28	0.125	4	7	150	300

<sup>1/</sup> This is not a specification requirement and is included for information only.

### 3.5 Finish.

- \* 3.5.1 Type I. Type I twine shall be waxed and mildew-resistant treated. The mildew-resistant treatment shall be in accordance with the requirements specified for type I, class 2 inhibitor of MIL-T-3530. The inhibitor may be applied with the wax or to the twine prior to waxing. The chloroform-soluble material of the treated twine shall be not less than 5.0 percent nor more than 25.0 percent when tested as specified in 4.2.5.

3.5.2 Type II. Type II twine shall have a hard polished surface.

3.5.2.1 Acidity pH value. The pH value of the water extract of type II twine shall be not less than 5.5 nor more than 7.5 when tested as specified in 4.2.5.

3.6 Put-up. Unless otherwise specified (see 6.2), the twine shall be furnished without knots or splices on 1-pound minimum net weight balls or tubes. A plus or minus tolerance of 10 percent in weight will be permitted on any one holder provided that the average weight does not fall below the specified minimum. Each holder shall contain not more than three pieces and no piece shall be less than 25 feet in length, or each holder shall contain not more than two pieces with no minimum length applicable. The holders shall be wound so that each turn and layer is free from entanglement.

3.7 Workmanship. The finished linen twine shall conform to the quality and grade 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, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the contractor may use his own or any other facilities suitable for the performance of the

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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 supplies and services conform to prescribed requirements.

4.1.1 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. Sampling for inspection shall be performed in accordance with MIL-STD-105, except when otherwise indicated hereinafter.

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

4.2.2 Examination of the end item for visual defects. The defects listed in table III shall be counted regardless of their proximity to each other, except where two or more defects represent a single local condition, in which case only the more serious defect shall be counted. The sample unit for this examination shall be one holder. Not less than 100 feet of twine from each sample unit shall be subjected to the visual examination. The lot size for this examination shall be expressed in units of one holder. The acceptable quality level (AQL) shall be 1.5 major defects and 4.0 total defects (major and minor combined) per 100 units. The inspection level shall be level I.

TABLE III. Visual examination

Examine	Defect	Classification	
		Major	Minor
Appearance and workmanship	Any cut	X	
	Chafed or damaged	X	
	Kink, broken strand, or loose strand	X	
	Finish other than specified	X	
Cleanness	Spot or stain clearly visible <u>1/</u>		X
Color	Other than natural (unless otherwise specified)	X	
Type	Other than specified	X	

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

4.2.3 Examination for weight and winding. The sample unit for this examination shall be one holder. The inspection level shall be S-3 and the AQL shall be 4.0 percent defective. For lots consisting of 500 or fewer units, the sample size (number of sample units) shall be 13 and the acceptance number 1. The lot size shall be the number of holders in the inspection lot. Defects shall be as listed in 4.2.3.1 and 4.2.3.2.

4.2.3.1 Examination for weight. A defect with regard to weight shall be considered to exist if the net weight of a holder is less than the minimum or more than the maximum specified in 3.6. The number of holders examined shall be utilized in determining the average weight. A lot shall be unacceptable if the average weight is less than the applicable minimum weight specified in 3.6.

4.2.3.2 Examination for winding. Defects with regard to winding shall be considered to exist if any of the following are determined during inspection.

(a) Improperly or not firmly wound resulting in kinking, knotting, entangling, or slippage during unwinding or otherwise affecting free unhampered unwinding of twine.

(b) Put-up not as specified.

(c) Any holder found to contain more than three pieces.

(d) Any piece less than 25 feet in length (except when there are only two pieces per holder).

(e) Any knot or splice.

4.2.4 Inspection of preparation for delivery. Packaging and packing shall be inspected in accordance with the quality assurance provisions of MIL-C-3131, except that the inspection level shall be S-2 and the AQL shall be 2.5 defects per 100 units.

4.2.5 Testing of the end item. The methods of testing specified in FED-STD-191, wherever applicable and as listed in table V shall be followed. 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 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 IV. The sample unit for testing shall be one holder of twine. The lot size shall be expressed in units of one holder. All test reports shall contain the individual values utilized in expressing the final result. The lot shall be unacceptable if one or more units fail to meet any requirement. Tests to determine compliance with specification requirements, including quantity of delivery, may be made under prevailing atmospheric conditions. In cases of dispute, tests shall be made upon material which has reached equilibrium under Standard Conditions as defined in FED-STD-191.

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TABLE IV. Sampling for tests

<u>Number of holders in lot</u>	<u>Sample size</u>
800 or less	2
801 up to and including 22,000	3
22,001 and over	5

TABLE V. Test methods

<u>Characteristic</u>	<u>Requirement paragraph</u>	<u>Test method</u>	<u>No. of determinations per sample unit</u>	<u>Results reported as</u>
Material identification	3.2	1200 <u>1/</u>	-	-
Ply	3.4	Visual	1	Pass or fail
Length per pound	3.4	6004 <u>2/</u>	-	-
Breaking strength	3.4	4102	-	-
Chloroform soluble material (type I)	3.5.1	2611	-	-
Acidity pH value	3.5.2.1	2811	-	-

1/ A contractor's certificate of compliance thereto is required and will be accepted for the requirement.

2/ Except that the test specimen shall be a minimum of 90 feet of twine.

#### 5. PACKAGING

5.1 Preservation-packaging. Packaging shall be level A or C as specified (see 6.2).

5.1.1 Levels A and C. The twine shall be packaged in accordance with the applicable requirements of MIL-C-3131.

5.2 Packing. Packing shall be level A, B, or C as specified (see 6.2).

5.2.1 Levels A, B, and C. Twine shall be packed in accordance with the applicable requirements of MIL-C-3131.

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5.3 Marking. In addition to any special markings required by the contract or order, interior packages and shipping containers shall be marked in accordance with MIL-C-3131.

## 6. NOTES

6.1 Intended use. The twine is intended for use in serving and whipping rope ends and splices, for aircraft rigging, and for use in ammunition fuses.

\* 6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type required (see 1.2).
- (c) Color if other than natural (see 3.3).
- (d) Put-up if other than specified (see 3.6).
- (e) Selection of applicable levels of packaging and packing (see 5.1 and 5.2).

\* 6.3 Changes from previous issue. The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a 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.

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Air Force - 99

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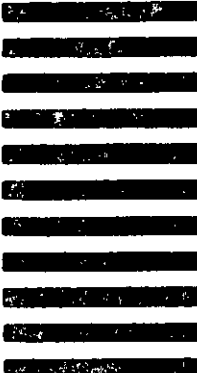


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