

INCH-POUND

MIL-T-5237E
4 September 1990
SUPERSEDING
MIL-T-5237D
2 March 1970

MILITARY SPECIFICATION

TAPE, TEXTILE; WEBBING, TEXTILE; RAYON

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

1. SCOPE

* 1.1 Scope. This specification covers rayon tape and webbing.

1.2 Classification. The rayon tape and webbing shall be of the following types and widths as specified (see 6.2).

Type I - Flat-weave tape
Type Ia - Flat-weave webbing
Type II - Tubular-weave webbing
For widths - (see table I)

2. APPLICABLE DOCUMENTS

* 2.1 Government documents.

* 2.1.1 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 listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

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

AMSC N/A

FSC 8305/8315

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SPECIFICATION

MILITARY

- * MIL-P-43334 - Packaging of Textile Webbing and Tape

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods

MILITARY

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

- " (Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

- " 2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

FEDERAL TRADE COMMISSION

Rules and Regulations Under the Textile Fiber Products Identification Act

(Copies are available from the Federal Trade Commission, Pennsylvania Avenue at Sixth Street, N.W., Correspondence Branch, Washington, DC 20580-0001.)

- " 2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

THE COLOR ASSOCIATION OF THE UNITED STATES

Standard Color Card Of America

(Color cards may be available from the Color Association of the United States, 343 Lexington Avenue, New York, NY 10016-0927. If color cards are not available from the Color Association, individual color samples may be obtained from the contracting activity or as directed by the contracting activity.)

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(Non-Government standards and other publications are normally available from organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

- * 2.3 Order of precedence. 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 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.3.
- " 3.2 Material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.
- * 3.2.1 Yarns. The yarns for the warp and filling shall be bright multifilament viscose rayon (see 6.5) except that the yarns for the type I, 1/2 inch tape shall be bright, semi-dull, or dull multifilament viscose rayon.

3.3 Physical requirements. The finished tape or webbing shall conform to the requirements of table I when tested as specified in 4.4.3.

TABLE I. Physical requirements

| Type | Width (inches) | | Linear yards per pound, min. | Total ends in warp min. | Picks per inch, min. | Breaking strength pounds, min. full width |
|------|----------------|------------|------------------------------|-------------------------|----------------------|---|
| I | 1/2 | $\pm 1/16$ | 400 | 66 | 52 or 104 | 15 |
| I | 9/16 | $\pm 1/32$ | 200 | 48 | 36 or 72 | 50 |
| I | 1-1/8 | $\pm 1/32$ | 100 | 94 | 36 or 72 | 100 |
| I | 1-1/4 | $\pm 1/32$ | 80 | 116 | 30 or 60 | 140 |
| Ia | 3/8 | $\pm 1/32$ | 100 | 30 | 36 or 72 | 160 |
| Ia | 9/16 | $\pm 1/32$ | 40 | 280 | 21 or 42 | 500 |
| Ia | 1 | $\pm 1/32$ | 32 | 90 | 36 or 72 | 500 |
| Ia | 1-5/8 | $\pm 1/16$ | 15 | 136 | 36 or 72 | 750 |
| II | 1/8 | $\pm 1/32$ | 125 | 23 | 24 | 150 |
| II | 3/16 | $\pm 1/32$ | 100 | 30 | 30 | 200 |
| II | 1/2 | $\pm 1/16$ | 40 | 81 | 30 | 500 |
| II | 9/16 | $\pm 1/16$ | 40 | 81 | 30 | 500 |
| II | 5/8 | $\pm 1/16$ | 23 | 130 | 52 | 900 |

1/ Types I and Ia may be woven using 1 yarn per shed on a shuttle loom or 2 yarns per shed using a shuttleless loom.

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3.3.1 Weave. The weave of the tape and webbing shall be as specified in 3.3.1.1 through 3.3.1.3.

3.3.1.1 Type I. For the 9/16, 1-1/8, and 1/2 inch widths of tape, the weave shall be plain, 1 up and 1 down. The 1-1/4 inch tape shall be either plain weave, 1 up and 1 down or a 2 up and 2 down herringbone twill weave, with one reversal of twill in the center of the tape.

3.3.1.2 Type Ia. For the 3/8 inch and 1 inch widths of webbing, the weave shall be a 2 up and 2 down herringbone twill with one reversal of twill in the center of the webbing. For the 9/16 inch webbing, the weave shall be plain 1 up and 1 down. The 1-5/8 inch webbing shall be either plain weave, 1 up and 1 down or a 2 up and 2 down herringbone twill weave with one reversal of twill in the center of the webbing.

3.3.1.3 Type II. The weave for all widths shall be a tubular plain weave, 1 up, 1 down face and back, except that the 3/16 inch width shall have transfer of filling from the face to the back in the center of the webbing.

3.4 Color. Unless otherwise specified (see 6.2), the color of the tape or webbing shall be the natural white of the finished yarn.

3.4.1 Marker thread. When specified (see 6.2), the tape or webbing shall contain 1 end of warp yarn dyed red to match cable No. 70180 and woven into the center of the face of the tape or webbing. The use of solution dyed yarn is permissible.

3.4.2 Colorfastness. The dyed yarn woven into the center of the tape or webbing shall have a colorfastness rating of "good" to water when tested as specified in 4.4.3.

3.4.3 Colorfastness (type I, 1/2 inch). The dyed tape shall show good fastness to wet dry cleaning and crocking, when tested as specified in 4.4.3.

3.4.4 Matching. When a color other than natural white is specified, the color of the dyed tape shall match the standard sample when viewed under filtered tungsten lamps that approximate artificial daylight and that have a correlated color temperature of $7500 \pm 200\text{K}$, with illumination of 100 ± 20 foot candles, and shall be a good match to the standard sample under incandescent lamplight at $2300 \pm 200\text{K}$.

3.5 Finish. The tape or webbing shall have a smooth and even finish.

3.5.1 Nonfibrous materials. The water-soluble and chloroform-soluble materials of the tape or webbing shall not exceed 2.0 percent when tested as specified in 4.4.3.

3.5.2 pH. The pH value of the water extract of the tape or webbing shall be no less than 5.0 nor more than 8.5 when tested as specified in 4.4.3.

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3.6 Length. Unless otherwise specified (see 6.2), the tape and webbing shall be furnished in rolls or on spools as follows:

| | |
|--|--------------------|
| Holders for type I tape and type Ia, webbing | 250 \pm 10 yards |
| Holders for type II webbing | 144 \pm 10 yards |

Not more than two pieces shall be allowed in each roll or spool, and no piece shall be less than 10 yards.

3.7 Fiber identification. The finished tape or webbing shall be labeled or ticketed for fiber content in accordance with the Textile Fiber Products Identification Act.

* 3.8 Workmanship. The tape or webbing shall conform to the quality of product established by this specification and the occurrence of defects shall not exceed the applicable acceptable quality levels.

4. QUALITY ASSURANCE

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 (examinations and tests) 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 this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

* 4.1.1 Responsibility for compliance. All items shall 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 ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract.

4.1.2 Certificates of compliance. When certificates of compliance are submitted, the Government reserves the right to inspect such items to determine the validity of the certification.

* 4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

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

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- * 4.3 First article inspection. When a first article is required (see 3.1 and 6.2), it shall be examined for the defects specified in 4.4.2 through 4.4.2.2.1 and tested for the characteristics specified in 4.4.3.
- * 4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.
- * 4.4.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.4.2 Yard-by-yard examination. The required yardage of each roll or spool shall be inspected on both sides and visual defects classified in accordance with table II. All defects found shall be counted regardless of their proximity one to another, except where two or more defects represent a single local condition of the tape or webbing in which case only the more serious defect shall be counted. A continuous defect shall be counted as one defect for each warpwise yard or fraction thereof in which it occurs. The sample unit for this examination shall be 1 linear yard. The sample size shall be in accordance with inspection level II or MIL-STD-105. The acceptable quality level shall be 0.40 major and 1.5 total defects (major and minor combined) per 100 units (yards). The lot size shall be expressed in units of 1 yard each. An approximate equal number of yards shall be examined from each roll or spool selected. The number of rolls or spools from which the sample is to be selected shall be in accordance with table III.

* TABLE II. End item visual defects

| Examine | Defect | Classification | |
|--|--|----------------|-------|
| | | Major | Minor |
| Abrasion mark | Resulting in a weak place | 101 | |
| Broken or missing end | Two or more continuous | 102 | |
| | Single | | 201 |
| Broken or missing pick | Two or more continuous | 103 | |
| | Single | | 202 |
| Coarse filling bar | Resulting in increased stiffness or thickness of tape or webbing | 104 | |
| Crease or wrinkle, edge folded or rolled | Hard, embedded | | 203 |
| Cut, hole or tear | Any | 105 | |

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

| Examine | Defect | Classification | |
|-------------------------------|--|----------------|-------|
| | | Major | Minor |
| Edge cut, torn or frayed | Any | 106 | |
| Edge | Slack or poorly constructed and extending for 1/4 inch or more along length of tape or webbing | | 204 |
| Fine or light filling bar | <u>1</u> / | 107 | |
| Float | Multiple 1/2 inch or more in either warp or filling directions or single floating over more than 1 inch | 108 | |
| | Multiple less than 1/2 inch in either warp or filling directions or single floating over more than 1/4 inch but not more than 1 inch | | 205 |
| Heavy place | Noticeable stiffer or thicker than adjoining unaffected tape or webbing | 109 | |
| Hitchback, crack, open place | Opening between adjoining picks or warpwise tension area over part of the width resulting in light and heavy places | | 206 |
| Jerked-in-filling, slough-off | More than twice the thickness of the normal yarn | | 207 |
| Kinks | More than three in any 9 linear inches | | 208 |
| Knot | More than one knot in any 9 linear inches | 110 | |
| | Single knot with untrimmed ends extending from surface of tape or webbing | | 209 |
| Mispick, skips (harness) | Resulting in widthwise repeated floats more than 1/4 inch long | 111 | |
| Shade bar, mixed filling | <u>1</u> / | | 210 |

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* TABLE II. End item visual defects (cont'd)

| Examine | Defect | Classification | |
|---|---|----------------|-------|
| | | Major | Minor |
| Slack end | Two or more in the same length, jerked in between picks, or forming loops on surface <u>1</u> / | 112 | |
| | Single, jerked in between picks, or forming loops on surface | | 211 |
| Slub, slug, or gout | More than twice the thickness of the yarn | | 212 |
| Smash | Any | 113 | |
| Spot, stain, or streak | Any <u>1</u> / | | 213 |
| Tight end | Any <u>1</u> / | | 214 |
| Tight pick or filling | Resulting in rolling of tape or webbing | 114 | |
| Wavy or ridgy tape or webbing (will not flatten under pressure) | <u>1</u> / | 115 | |
| Weak, soft or tender spot | Any | 116 | |
| Wrong draw | Extending for more than 9 inches | | 215 |
| Yarns (filling) | Two yarns per shed | 117 | |

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

4.4.2.1 Overall examination. Each defect listed below shall be counted nor more than once in each roll or spool examined. The sample unit for this examination shall be one roll or spool. The sample size and acceptance number shall be as shown in table III. The lot size shall be expressed in units of one yard each.

Defects

Width not within specified tolerance
 Overall uncleanness
 Uneven weaving throughout

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Marker thread - color other than specified
 Off shade (i.e. not within established tolerance), cloudy,
 mottled or streaky throughout, poor color penetration
 (dyed tape and webbing only)
 Finish - Not smooth and even
 Not labeled in accordance with Textile Fiber Products
 Identification Act

4.4.2.2 Length examination.

4.4.2.2.1 Examination for length of the individual roll or spool. Each roll or spool in the sample shall be examined for the defects listed below. The sample unit for this examination shall be one roll or spool. The sample size and acceptance number shall be as shown in table III.

Defects

| | |
|---|---|
| Gross length of any roll or spool | - More than 2 yards less than gross length marked on ticket |
| Length of roll or spool | - Beyond specified tolerances |
| Length of individual piece of tape or webbing | - Less than 10 yards |
| Pieces per roll or spool | - More or less pieces than indicated by suppliers marking on ticket |

4.4.2.2.2 Examination for total yardage in sample. The lot shall be unacceptable if the total of the actual gross lengths of rolls or spools in the sample is less than the total of the gross lengths marked on the tickets.

TABLE III. Sample size

| Lot size in yards | Sample size in spools or rolls | Acceptance number |
|------------------------------------|--------------------------------|-------------------|
| Up to 1200 ^{1/} | 3 | 0 |
| 1201 up to and including 3200 | 5 | 0 |
| 3201 up to and including 10,000 | 8 | 0 |
| 10,001 up to and including 35,000 | 13 | 0 |
| 35,001 up to and including 150,000 | 20 | 1 |
| 150,001 and over | 32 | 2 |

^{1/} If a lot contains less than three rolls or spools, each roll or spool in the lot shall be examined.

* 4.4.3 End item testing. The end item shall be tested for the characteristics listed in table IV. The methods of testing specified in FED-STD-191 wherever applicable and as listed in table IV shall be followed. The lot size shall be

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expressed in units of 1 yard. The sample unit shall be 15 linear yards. Any test failure shall be cause for rejection of the lot. The sample size shall be as follows:

| <u>Lot size (yards)</u> | <u>Sample size (sample units)</u> |
|--------------------------------|-----------------------------------|
| 800 or less | 2 |
| 800 up to and including 22,000 | 3 |
| 22,001 and over | 5 |

* TABLE IV. End item tests

| <u>Characteristic</u> | <u>Requirement reference</u> | <u>Test method</u> |
|---|------------------------------|--------------------|
| Rayon identification | 3.2.1 | 1500 <u>1</u> / |
| Weight (yards per pound) | Table I | 5040 <u>2</u> / |
| Warp - total ends | Table I | 5050 |
| Filling - picks per inch | Table I | 5050 |
| Breaking strength, warp | Table I | 5100 <u>3</u> / |
| Weave | 3.3.1 | Visual |
| Colorfastness to water | 3.4.2 | 5630 |
| Colorfastness (type I, 1/2 inch) to: | | |
| Wet-dry cleaning | 3.4.3 | 5622 |
| Crocking | 3.4.3 | 5651 |
| Nonfibrous materials | 3.5.1 | 2611 <u>1</u> / |
| pH | 3.5.2 | 2811 |

- 1/ Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the stated requirement.
- 2/ The test specimen shall be the 15 yard sample unit. The weight determination shall be made prior to other tests.
- 3/ Breaking strength shall be made in accordance with method 5100 except that the width of the jaws shall not be less than the width of the specimen.

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- 4.4.4 Packaging examination. The examination shall be in accordance with the quality assurance provisions of MIL-P-43334.

5. PACKAGING

- 5.1 Preservation, packing, palletization, and marking. Preservation, packing, palletization, and marking for each level of protection shall be in accordance with the applicable requirements of MIL-P-43334 (see 6.2).

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 tape and webbing is intended for use in the manufacture of parachute canopies for bombs. The type I, 1/2 inch tape is intended for use in finishing the bottom edge of women's skirts.
- 6.2 Acquisition requirements. Acquisition documents must specify the following:
 - a. Title, number, and date of this specification.
 - b. Type and width required (see 1.2).
 - c. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
 - d. When a first article is required (see 3.1, 4.3, and 6.3).
 - e. Color required (see 3.4).
 - f. When marker thread is required (see 3.4.1).
 - g. When length of rolls or spools is other than specified (see 3.6).
 - h. Levels of preservation and packing (see 5.1).
- * 6.3 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.
- 6.4 Samples. For access to samples, address the contracting activity issuing the invitation for bids or request for proposal.
- 6.5 Rayon. The terminology "rayon" used in this specification is in accordance with the Federal Trade Commission Trade Practice Rules for the Rayon and Acetate Industry, promulgated 11 December 1951.

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* 6.6 Subject term (key words) listing.

Flat-weave
Parachute canopies
Tubular-weave
Viscose

6.7 Changes from previous issue. The margins of this specification are marked with asterisks 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.

Custodians:

Army - GL
Navy - AS
Air Force - 11

Preparing activity:

Army - GL
(Project 8305-0340)

Review activities:

Army - EA
Navy - NU
Air Force - 82, 99
DLA - CT

User activities:

Army - AR
Air Force - 45

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

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| | | | |
|--|--|--|--|
| 1. RECOMMEND A CHANGE: | | 1. DOCUMENT NUMBER MIL-T-5237E | 2. DOCUMENT DATE (YYMMDD) 1990 September 4 |
| 3. DOCUMENT TITLE TAPE, TEXTILE; WEBBING, TEXTILE; RAYON | | | |
| 4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.) | | | |
| 5. REASON FOR RECOMMENDATION | | | |
| 6. SUBMITTER | | | |
| a. NAME (Last, First, Middle Initial) | | b. ORGANIZATION | |
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| a. NAME U.S. Army Natick RD&E Center | | b. TELEPHONE (Include Area Code) (1) Commercial 508-651-5221 (2) AUTOVON 256-5221 | |
| c. ADDRESS (Include Zip Code) Commander, U.S. Army Natick RD&E Center ATTN: STRNC-ES Natick, MA 01760-5014 | | IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340 | |