

INCH-POUND

MIL-T-43709B(GL)
13 November 1990
SUPERSEDING
MIL-T-43709A(GL)
6 December 1977

MILITARY SPECIFICATION

TAPE, TEXTILE, ARAMID

This specification is approved for use by the Natick Research, Development, and Engineering Center, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers one type of aramid nylon tape.

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).

SPECIFICATIONS

MILITARY

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

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 8315

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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.

Rules and Regulations Under the Textile Fiber Products Identification Act

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

2.2 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 Standard sample. The dyed tape shall match the standard sample for shade and shall be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced (see 6.4).

- * 3.3 Material. It is encouraged that recycled material be used when practical as long as it meets the requirements of this document.

- * 3.3.1 Yarn. The yarn for the warp and filling shall be made from an approved bright, multi-filament, aramid polyamide (see 6.5), nominal denier of 200 (22 tex) warp and 2-ply, 200 (22 tex) filling. The yarn shall not char at a temperature less than 675°F. The final ply of the filling yarn shall have a minimum of 2-1/2 turns per inch. Testing shall be as specified in 4.4.3.

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3.4 Color. Unless otherwise specified (see 6.2), the color of the tape shall be Olive Green 106 or Sage Green 1565 as specified and shall match the standard sample. The color shall be obtained by the use of melt spun solution dyed fiber.

* 3.4.1 Matching. The color of the finished 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 $2300 \pm 200\text{K}$.

3.4.2 Colorfastness. The dyed and finished tape shall show fastness to light and laundering equal to or better than the standard sample. When no standard sample has been established or designated as applicable to colorfastness, the dyed and finished tape shall show "fair" fastness to light and "good" fastness to laundering when tested as specified in 4.4.3.

3.5 Physical requirements. The finished tape shall conform to the requirements specified in table I when tested as specified in 4.4.3.

TABLE I. Physical requirements

Characteristic	Requirement
Width, inch	$1/4 \pm 1/64$
Weight, oz/lin.yd., max	0.07
Breaking strength, lb., min	100
Yarns, min:	
Warp, full width	58
Filling per inch	32

3.5.1 Weave. The weave shall be a plain weave, except that the warp ends shall weave two ends as one. The filling yarn shall traverse the full width of the tape with one filling yarn per shed.

3.6 Nonfibrous material. The finished tape shall contain no more than 2.0 percent starch and protein including chloroform-soluble and water-soluble material when tested as specified in 4.4.3.

3.7 Length. Unless otherwise specified (see 6.2), the tape shall be furnished on double headed spools or tubes containing 500 ± 10 yards. No spool or tube shall contain more than five pieces, and no piece shall be less than 5 yards long.

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3.8 Identification tickets. Each spool or tube shall have an identification ticket attached to it in accordance with MIL-P-43334.

3.9 Fiber identification. Each spool or tube shall be labeled or ticketed for fiber content in accordance with the Rules and Regulations under the Textile Fiber Products Identification Act.

3.10 Workmanship. The finished tape shall conform to the quality of product established by this specification.

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 (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. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

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).

* 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 and shall be tested for the characteristics specified in 4.4.3.

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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 End item examination.

4.4.2.1 Yard-by-yard examination. The tape shall be examined on both sides for the defects listed in table II. All defects found shall be counted, regardless of their proximity to each other, except when two or more defects represent a single local condition of the tape, 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 lot size shall be expressed in units of yards. The sample unit shall be 1 yard of tape. The inspection level shall be I and the acceptable quality level (AQL), expressed in terms of defects per hundred yards, shall be 4.0. The number of spools or tubes from which the sample yardage is to be selected shall be in accordance with table III. The sample yardage shall be apportioned equally among the selected spools or tubes.

TABLE II. End item visual defects

Examine	Defect
Cut, hole, or tear	Any
Twist or distortion	Will not lay flat upon application of manual pressure
Broken or missing end	Two or more regardless of length or a single exceeding 6 inches in length
Broken or missing pick	Two or more regardless of length
Edges	Frayed, slack, or otherwise poorly constructed and exceeding 1/4 inch in length
Mispick, double pick	Two or more across the full width
Width	Beyond specified tolerances

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- * 4.4.2.2 Overall examination. The tape shall be examined for the defects listed below. Each defect listed shall be counted not more than once in each spool or tube examined. The sample size shall be the applicable number of spools or tubes indicated in table III. Each spool or tube in the sample shall be examined over its entire length. The lot shall be rejected if the total number of defects in the sample exceeds the applicable acceptance number specified in table III.

Defects

Off shade, not within established tolerances

Uneven weaving throughout

Not labeled in accordance with the Textile Fiber Products Identification Act

TABLE III. Sample size

Lot size (yards)	Sample size (rolls) ^{1/}	Acceptance number
1200 or less	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	35	2

^{1/} If a lot contains fewer than 3 rolls, each roll in the lot shall be examined.

- * 4.4.2.3 Length examination. During the overall examination, each spool or tube in the sample shall be examined for the defects listed below. If the total number of length defects in the sample exceeds the applicable acceptance number specified in table III, the lot shall be rejected. In addition, the lot shall be rejected if the total of the actual gross lengths of the spools or tubes in the sample is less than the total of the gross lengths marked on the spool or tube tickets.

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Length defects

Gross length of spool or tube not as specified in 3.7

Gross length of spool or tube is more than 2 yards less than the gross length marked on the ticket

Length of individual piece of tape is less than 5 yards

More than five pieces on a spool or tube

4.4.3 End item testing. The tape 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 physical and chemical values specified in section 3 apply to the average results of determinations made on a sample unit for test purposes as specified in the applicable test methods. All test reports shall contain the individual values used in expressing the final results. The lot shall be expressed in units of yards. The sample unit shall be 10 yards. The lot shall be unacceptable if one or more sample units fail to meet any test requirement specified. The sample size shall be in accordance with the following:

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

TABLE IV. End item tests

Characteristic	Requirement paragraph	Test method
<hr/>		
Yarn:		
Luster	3.3.1	1/
Multifilament	3.3.1	1/
Identification (non-melting, aramid polyamide)	3.3.1	1/
Denier	3.3.1	4021 1/
Ply (filling)	3.3.1	Visual 2/
No charring	3.3.1	1/
Twist (filling)	3.3.1	4054 1/

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TABLE IV. End item tests (cont'd)

Characteristic	Requirement paragraph	Test method
Colorfastness to:		
Light	3.4.2	5660 <u>3/</u>
Laundering	3.4.2	5610
Weight	3.5	5041
Breaking strength	3.5	4108
Warp yarns (full width)	3.5	5050
Filling yarns (per inch)	3.5	5050
Weave	3.5.1	Visual <u>2/</u>
Nonfibrous material	3.6	2611

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

2/ One determination shall be made from each sample unit and the results reported as "pass" or "fail".

3/ Except that the contractor's submission shall be compared with the standard sample or rated adjectively after an exposure of 6 standard fading hours.

* 4.4.4 Packaging inspection. The sampling and inspection of the preservation, packing, palletization, and marking shall be in accordance with the requirements of MIL-P-43334.

* 5. PACKAGING

5.1 Preservation. Preservation shall be level A or Commercial as specified (see 6.2).

5.1.1 Levels A and Commercial. The tape shall be preserved in accordance with the applicable requirements of MIL-P-43334.

5.2 Packing. Packing shall be level A, B, or Commercial as specified.

5.2.1 Levels A, B, and Commercial packing. The tape shall be packed in accordance with the applicable requirements of MIL-P-43334.

5.3 Palletization. When specified (see 6.2), tape, packed as specified in 5.2.1, shall be palletized in accordance with MIL-P-43334.

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5.4 Marking. In addition to any special marking required by the contract or purchase order, shipments shall be marked in accordance with MIL-P-43334.

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 is intended for use as a slide fastener pull thong for Combat Vehicle Crewmen uniforms.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1).
- c. When a first article is required (see 3.1, 4.3, and 6.3).
- d. Color of tape required (see 3.4).
- e. Length required, if other than specified (see 3.7).
- f. Levels of preservation and packing (see 5.1 and 5.2).
- g. When palletization is required (see 5.3).

* 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 Sample. For access to samples, address the contracting activity issuing the invitation for bids.

6.5 Fiber identification. The requirements of the tape can be met with "Nomex Type 432 or 433" aramid fiber manufactured by E.I. duPont de Nemours Company, Wilmington, DE. Approval of other fiber is the responsibility of the U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014 and is based on more extensive tests, including those for toxicity, which are not set forth in this specification.

* 6.6 Subject term (key word) listing.

Combat Vehicle Crewmen
CVC
Slide fastener pull
Thong
Uniform zipper

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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.

Custodian:

Army - GL

Review activities:

Army - MD

DLA - CT

Preparing activity:

Army - GL

(Project 8315-A351)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of 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.

1. RECOMMEND A CHANGE:		1. DOCUMENT NUMBER MIL-T-43709B(GL)	2. DOCUMENT DATE (YYMMDD) 1990 November 13
3. DOCUMENT TITLE Tape, Textile, Aramid			
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	
c. ADDRESS (Include Zip Code)		d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (if applicable)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY			
a. NAME U.S. Army Natick RD&E Center		b. TELEPHONE (Include Area Code) (1) Commercial 508-651-4532	(2) AUTOVON 256-4532
c. ADDRESS (Include Zip Code) Commander, U.S. Army Natick RD&E Center ATTN: STRNC- IFT Natick, MA 01760-5019		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	