

HH-T-1782
 October 30, 1973
 SUPERSEDING
 MIL-T-4117A
 February 12, 1960
 (See 6.3)

FEDERAL SPECIFICATION
 TAPE, ASBESTOS

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

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers a range of classes, grades, and types of asbestos industrial tapes having heat and chemical resistance, for use as thermal insulation and for other high temperature applications (see 6.1).

1.2 Classification. Asbestos tape shall be of the following classes, grades, and types as specified (see 6.2).

Class 1 - Plain (nonmetallic).

Grades

- AAAA - 99 percent asbestos, by weight, min.
- AAA - 95 percent asbestos, by weight, min.
- AA - 90 percent asbestos, by weight, min.
- U.G. - 80 percent asbestos, by weight, min.
- C.G. - 75 percent asbestos, by weight, min.

For types see table I.

Class 2 - Metallic (wire inserted). (The same grades of tape as above shall apply.)

For types see table I.

2. APPLICABLE DOCUMENTS

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

Federal Specifications:

- QQ-W-321 - Wire, Copper Alloy.
- UU-P-268 - Paper, Kraft, Untreated, Wrapping.
- MMM-A-260 - Adhesive, Water-Resistant, (For Sealing Waterproofed Paper).
- PPP-B-566 - Boxes, Folding, Paperboard.
- PPP-B-601 - Boxes, Wood, Cleated-Plywood.
- PPP-B-621 - Boxes, Wood, Nailed and Lock-Corner.
- PPP-B-636 - Box, Fiberboard.
- PPP-B-665 - Boxes; Paperboard, Metal Stayed (Including Stay Material).
- PPP-B-676 - Boxes, Setup.
- PPP-B-1055 - Barrier Material, Waterproofed, Flexible.
- PPP-T-76 - Tape, Pressure-Sensitive Adhesive Paper, (For Carton Sealing).

Federal Standards:

- Fed. Std. No. 123 - Marking for Domestic Shipment (Civil Agencies).
- Fed. Test Method Std. No. 191/GEN - Textile Test Methods.
- Fed. Test Method Std. No. 191/5010 - Determination of Length of Textile Materials.
- Fed. Test Method Std. No. 191/5020 - Determination of Width of Textile Materials.
- Fed. Test Method Std. No. 191/5030 - Determination of Thickness of Textile Materials.
- Fed. Test Method Std. No. 191/5040 - Weight of Cloth Cut, Roll, or Bolt Method.

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(Single copies of this specification and other Federal Specifications required by activities outside the Federal Government for bidding purposes are available without charge from Business Service Centers at the General Services Administration Regional Offices in Boston, New York, Washington, DC, Atlanta, Chicago, Kansas City, MO, Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, WA.

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications and Standards from established distribution points in their agencies.)

Military Standards:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129 - Marking for Shipment and Storage.

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless a specific issue is identified, the issue in effect on date of invitation for bids or request for proposal shall apply.

National Motor Freight Traffic Associations, Inc., Agent:

National Motor Freight Classification.

(Application for copies should be addressed to the American Trucking Associations, Inc., Tariff Order Section, 1616 P Street, N.W., Washington, DC 20036.)

Uniform Classification Committee, Agent:

Uniform Freight Classification.

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

3. REQUIREMENTS

3.1 Materials.

3.1.1 Class 1, plain nonmetallic. Class 1 asbestos tape shall be woven of chrysotile asbestos yarn of uniform size and shall contain no rubber or other filling materials, except organic fiber.

3.1.2 Class 2, wire inserted. Class 2 asbestos tape shall be woven of wire-inserted yarn. The yarn shall be as specified in 3.1.1 and the wire shall be as specified in 3.2.2.

3.2 Composition.

3.2.1 Asbestos.

3.2.1.1 Hygroscopic moisture. The hygroscopic moisture in the asbestos tape, based on the weight of tape without wire, shall average not more than 5 percent when tested as specified in 4.5.1.1.1.

3.2.1.2 Asbestos content. The asbestos content in the tape shall be as specified in 1.2 (see 6.2) when tested as specified in 4.5.1.1.2.

3.2.1.3 Chemically combined water. The dry asbestos fiber shall contain not less than 12 percent by weight of chemically combined water (water of crystallization) when tested as specified in 4.5.1.1.3.

3.2.2 Wire. Unless otherwise specified, the wire shall be 0.008 + .001 inch in diameter and shall conform to specification QQ-W-321, Copper Alloy No. 270, (see 4.5.1.2). The wire shall be either 1 or 2 plies as specified in table I.

3.3 Physical properties. The physical properties of tape shall be in accordance with the requirements as specified in table I and as otherwise specified herein.

3.4 Put-up. Unless otherwise specified, (see 6.2) the asbestos tape shall be furnished in rolls 95 to 105 feet in length. No more than three rolls in ten shall contain two pieces.

3.5 Workmanship. The asbestos tape shall be reasonably free from nap, uneven threads, broken threads, and knots; and shall present a comparatively uniform surface free from excessive irregularities which would affect the serviceability or appearance.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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.

4.2 Lot. Unless otherwise specified (see 6.2), a lot shall consist of all tape of any one type and grade manufactured as one production run, and offered for delivery at one time.

4.3 Sampling.

4.3.1 Sampling of rolls. Rolls of tape for examination of length and workmanship shall be selected at random with the number of rolls in accordance with table II.

4.3.2 Sampling for physical properties. For each sample roll selected in accordance with 4.3.1 a 1-yard sample shall be taken to determine compliance with the physical requirements of this specification.

4.4 Examination.

4.4.1 For workmanship. The rolls of tape selected in accordance with 4.3.1 shall be visually examined to determine compliance with the requirements of workmanship (see 3.5).

4.4.2 For construction. Tape selected in accordance with 4.3.2 shall be examined for requirements of construction listed in table III.

4.4.3 Packaging, packing, and marking for shipment. Examination shall be made for compliance with the requirements of section 5 and as required by specifications referenced therein. Except as required by referenced specifications, inspection lots and sampling shall be in accordance with Standard MIL-STD-105 with level of inspection S-2, and an AQL of 4.0 percent defective.

4.5 Tests.

4.5.1 Composition.

4.5.1.1 Specimen. From each 1-yard sample of asbestos tape selected in accordance with 4.3.2 a representative specimen of asbestos yarn from which the wire has been removed, and weighing not less than 5 grams, shall be taken for tests.

4.5.1.1.1 Hygroscopic moisture. Specimens of asbestos yarn selected in accordance with 4.5.1.1 and each weighing not less than 5 grams, shall be weighed and then dried for 1 hour at 105° to 110°C. (221° to 230°F.), in an electric oven, cooled for 1 hour in a desiccator containing anhydrous calcium chloride, and weighed. The loss in weight is termed the hygroscopic moisture. This weight divided by the weight of the specimen and multiplied by 100 gives the percentage of hygroscopic moisture in the specimen.

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4.5.1.1.2 Asbestos content. Specimens used in 4.5.1.1.1 shall be used to determine the asbestos content. Specimens, each weighing not less than 4 grams, after drying for 1 hour at 105° to 110°C. (221° to 230°F.) shall be placed in a desiccator for 1 hour, again weighed, and then placed in a furnace and heated for not less than 1 hour at 800° to 810°C. (1472° to 1490°F.). After removal from the furnace, the specimens shall be cooled for 1 hour in the desiccator containing anhydrous calcium chloride, and then again weighed. The weight of the residue shall be divided by 0.86 to determine the original weight of the asbestos content. (The factor 0.86 is based upon an average theoretical value of 14 percent chemically-combined water. Chemically-combined water subtracted from 100 should yield the proper factor for determination.) The weight of the asbestos content shall be divided by the weight of the dried specimen and the quotient multiplied by 100 to obtain the percentage of asbestos. The average of the determinations shall be taken as the asbestos content.

4.5.1.1.3 Chemically combined water. When specified, samples of asbestos fiber representative of the lot shall be used to make determinations of chemically combined water. Each sample of asbestos shall weigh approximately 5 grams. The hygroscopic moisture shall be removed as specified in 4.5.1.1.1, the weight recorded, and the dried material ignited in an electric furnace at 800° to 810°C. (1472° to 1490°F.) for 1 hour and the weight again recorded. The percentage of chemically-combined water shall be calculated as follows:

Percentage of chemically - combined

$$\text{water} = \frac{(A - B) \times 100}{A}$$

Where:

A = Weight of dried specimen.

B = Residual weight of ignited specimen.

4.5.1.2 Wire. The supplier shall keep on file affidavits to certify that the wire in the lot meets the requirements of specification QQ-W-321. These affidavits shall be made available to the procuring agency. A copy of this analysis shall be certified to and signed by a responsible agent of the contractor.

4.5.2 Test methods. Sample rolls of tape for test of weight and length shall be selected in accordance with 4.3.1. Sample yards of tape for all other tests shall be selected in accordance with 4.3.2. Tests shall be made in accordance with Fed. Test Method Std. No. 191/GEN and the method specified in table V.

4.6 Rejection and retest. Failure of any sample of asbestos tape to conform to any one of the requirements of this specification shall be cause for the rejection of the lot represented. Tape which has been rejected may be reworked or replaced to correct the defect and resubmitted for acceptance. Before resubmitting, full particulars concerning previous rejection and the action taken to correct the defects found in the original shall be furnished to the procuring agency.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A, B or C, as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Unit packaging. Unless otherwise specified, (see 6.2) in procurement documents, each roll of tape shall be wrapped in kraft paper, basis weight, not less than 30 pounds per ream, conforming to UU-P-268, and packaged in a snug-fitting folding paperboard box conforming to PPP-B-566, or a number of individual rolls, depending on the weight may be packaged in a fiberboard box conforming to PPP-B-636, class weather-resistant. Closure of the container shall be in accordance with the appendix of the respective specification.

5.1.1.2 Intermediate packaging. Unless otherwise specified, (see 6.2) asbestos tape, unit packaged as specified in 5.1.1.1, in quantities greater than 10 shall be intermediately packaged in containers conforming to PPP-B-636, class weather-resistant. The intermediate packages shall be closed with tape conforming to PPP-T-76. Unit containers conforming to PPP-B-636, class weather-resistant require no intermediate packaging.

5.1.2 Level B. Each roll of asbestos tape shall be packaged in a paperboard box conforming to ~~PPP-B-566~~, PPP-B-665 or PPP-B-676. The boxes shall be taped shut to prevent accidental spillage of contents.

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5.1.3 Level C. Each roll of asbestos tape shall be packaged to afford adequate protection against physical damage and deterioration, during shipment from supply source to the receiving activity.

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

5.2.1 Level A. The intermediate packages, in quantities as specified, (see 6.2) shall be packed in cleated plywood boxes conforming to PPP-B-601, overseas type; or nailed wooden boxes, conforming to PPP-B-621, class 2, style 4. When specified each exterior container shall be furnished with a sealed case liner fabricated from barrier material conforming to PPP-B-1055. All seams and closures shall be sealed with a continuous seam at least 3/4 inch wide of adhesive conforming to MMM-A-260.

5.2.2 Level B. Fifteen unit packages of asbestos tape, shall be packed in a fiberboard box conforming to PPP-B-636, class domestic. Closure shall be in accordance with Method I of the appendix to PPP-B-636. When specified, the packages of asbestos tape shall be packed in a fiberboard box conforming to PPP-B-636, class weather-resistance and closed method V.

5.2.3 Level C. The tape packaged as specified in 5.1 shall be packed to comply with the National Motor Freight Classification rules or the Uniform Freight Classification rules, as applicable.

5.3 Marking. In addition to any special marking required by procurement documents, the interior and shipping containers shall be marked in conformance to Fed. Std. No. 123 for civil agencies, or MIL-STD-129 for military agencies, as specified, (see 6.2).

6. NOTES

6.1 Intended use. The asbestos tape covered by this specification is intended for use in connection with insulation where the temperature encountered would exceed the temperature that normal textile fibers could withstand. Class 1 tape is suitable for insulation where a covering resistant to heat and chemicals is required, and class 2 where additional wear-resisting qualities are essential. As a rule, class 1 tape of the indicated grades will be applicable for service temperatures as follows:

Grade	Temperature °F.
AAAA	900
AAA	800
AA	600
U.G.	450
C.G.	350

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) Class, grade, and type of tape required (see 1.2).
- (c) Quantity in linear yards required.
- (d) Put-up if other than that specified (see 3.4).
- (e) Lot if otherwise specified (see 4.2).
- (f) Selection of applicable levels of packaging and packing (see 5.1 and 5.2).
- (g) When other method of unit and intermediate packaging is required for level A (see 5.1.1.1 and 5.1.1.2).
- (h) Quantity of intermediate packages to be packed for level A (see 5.2.1).
- (i) When a sealed case liner is required for level A packing (see 5.2.1).
- (j) Whether civil or military marking is required (see 5.3).

6.3 This specification includes the requirements of MIL-T-4117A dated February 12, 1960.

TABLE I. Asbestos tape

Properties	Type V class 1	Type VII class 2	Type VIII class 2	Type X class 2	Type XI class 2	Type XII class 2	Type XIII class 2
Weave.....	Plain	See fig. 1	See fig. 1	Plain	Plain	Plain	Plain
Width.....	1 1/2 + 1/16	3 + 1/8	2 + 1/8	1 1/2 + 1/16	2 + 1/16	1 1/2 + 1/16	5/8 + 1/16
Thickness (inch).....	.063 ± 0.010	.125 ± .063	.125 ± .063	.063 ± .010	.063 ± 0.016	.063 ± 0.016	.125 ± .032
Thread count:							
Total ground warp ends...	32 ± 1	91 ± 3	63 ± 1	30 ± 1	40 ± 2	32 ± 1	23 ± 1
Total binder warp ends...	...	21	15	...	...	...	5
Picks (inch).....	10 ± 1	11 ± 1	11 ± 1	8 ± 1	8 ± 1	10 ± 1	12 ± 1
Ply of asbestos yarns:							
Ground warp ends.....	2	2	2	2	2	2	2
Binder warp ends.....	...	2	2	1	1	2	2
Filling.....	2	2	2	22 ± 10%	17 ± 10%	19.6 ± 10%	20.0 ± 10%
Weight (feet per pound)...	28 ± 10%	3.5 ± 10%	5.8 ± 10%	22 ± 10%	17 ± 10%	19.6 ± 10%	20.0 ± 10%
Ply of wire insertion:							
Ground warp yarn.....	...	2	2	2	2	2	2 1/
Binder warp yarn.....	...	2	2	2	2	2	2
Filling yarn.....	...	2	2	1	1	2	2

1/ Or as specified.

TABLE I. Asbestos tape (con.)

Properties	Type XIV class 2	Type XV class 2	Type XVI class 2	Type XVII class 2	Type XIX class 2	Type XX class 2	Type XXI class 2
Weave.....	Plain	Plain	Plain	Plain	Plain	Plain	Plain
Width.....	1 1/2 1/16	2 + 1/16	3 + 1/16	5/8 + 1/16	1 1/2 + 1/16	2 + 1/16	3 + 1/16
Thickness (inch).....	.125 ± 0.032	.125 ± 0.032	.125 ± 0.032	.125 ± 0.031	.125 ± 0.031	.125 ± 0.031	.125 ± 0.031
Thread count:							
Total ground warp ends...	47 ± 2	61 ± 2	87 ± 2	23 ± 1	45 ± 2	61 ± 2	87 ± 2
Total binder warp ends...	11	14	21	5	10	14	21
Picks (inch).....	12 ± 1	12 ± 1	12 ± 1	12 ± 1	12 ± 1	12 ± 1	12 ± 1
Ply of asbestos yarns:							
Ground warp ends.....	2	2	2	3	3	3	3
Binder warp ends.....	2	2	2	3	3	3	3
Filling.....	2	2	2	3	3	3	3
Weight (feet per pound)...	9.4 ± 10%	7.2 ± 10%	4.95 ± 10%	19.6 ± 10%	9.6 ± 10%	7.0 ± 10%	4.88 ± 10%
Ply of wire insertion:							
Ground warp yarn.....	2	2	2	...	...	...	...
Binder warp yarn.....	2	2	2	...	...	...	...
Filling yarn.....	2	2	2	...	...	...	...

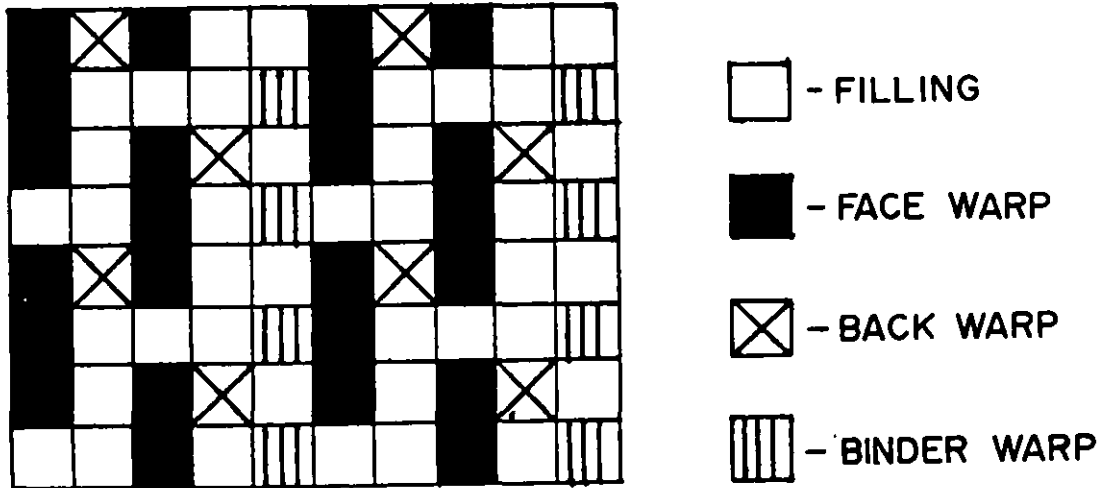


FIGURE 1. Weave diagram asbestos tape types VII and VIII.

TABLE II. Number of samples

Total yards in lot	Number of sample rolls
Up to 1300 1/.....	3
1300 to 3200.....	5
3201 to 8000.....	7
8001 to 22,000.....	10
22,001 to 110,000.....	15
110,001 to over.....	25

1/ If a lot contains fewer than 3 rolls, each roll shall be considered a sample.

TABLE III. Examination for construction

Requirement	Reference	Method
Wire diameter.....	3.2.2	micrometer
Weave.....	Table I	Visual
Thread count.....	Table I	Visual
Ground warp ends		
Binder warp ends		
Filling picks		
Number of yarn plies.....	Table I	Visual
Ground warp ends		
Binder warp ends		
Filling picks		
Ply of wire insert.....	Table I	Visual
Ground warp		
Binder warp		
Filling		

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TABLE IV. Classification of preparation for delivery defects

Examine	Defects
Marking (interior and exterior container)	Incorrect; incomplete; illegible; omitted; of improper size, location sequence or method of application.
Materials	Any nonconforming component; component missing, damaged or otherwise defective.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose or inadequate sealing, strapping or stapling when required.
Contents	Number of rolls per shipping container more or less than required.
Containers	Not as specified, not close-fitting for level A or B.

TABLE V. Test methods

Characteristic	Specification requirement	Test method
Width.....	Table I	5020
Thickness.....	Table I	5030
Weight.....	Table I	5040
Hygroscopic moisture.....	3.2.1.1	4.5.1.1.1
Asbestos content.....	3.2.1.2	4.5.1.1.2
Chemically combined water.....	3.2.1.3	4.5.1.1.3
Wire composition.....	3.2.2	See 4.5.1.2
Length.....	3.4	5010

MILITARY INTEREST:Preparing activity:Custodian:

GSA-FSS

Army - ME

Civil Agency Coordinating Activities:User interest:DOT-ACO
GSA-FSS
NASA-JFK
TVA-TVA

Navy - YD

Military Coordinating Activity:

Army - ME

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