

E-49-CL
HH-P-0034c (GSA-FSS)
October 2, 1968
INTERIM REVISION OF
Fed. Spec. HH-P-34b
April 21, 1948

INTERIM FEDERAL SPECIFICATION
PACKING MATERIAL, (ASBESTOS, ROD, BRAIDED)

This Interim Federal Specification was developed by the General Services Administration, Federal Supply Service, Washington, D. C. 20405, based upon currently available technical information. It is recommended that Federal agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

1. SCOPE AND CLASSIFICATION

1.1 Scope. This specification covers braided rod asbestos packing material.

1.2 Classification. The packing material covered by this specification shall be of the following types and sizes, as specified (see 6.2):

Type I - Plain, no wire.
Type II - With wire insertion.

Nominal sizes - inches

1/8
3/16
1/4
5/16
3/8
7/16
1/2
9/16
5/8
3/4
7/8
1

2. APPLICABLE DOCUMENTS

2.1 Specifications and standards. The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein:

Federal Specifications:

PPP-B-546 - Boxes, Folding, Paperboard.
PPP-B-636 - Boxes, Fiberboard.
PPP-B-665 - Boxes, Paperboard, Metal Stayed (Including Stayed Material).
PPP-B-676 - Boxes, Setup.

Federal Standard:

Fed. Std. No. 123 - Marking for Domestic Shipment (Civilian Agencies).

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards and Handbooks as outlined under General Information in the Index of Federal Specifications and Standards and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402)

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PLAINTIFF'S
EXHIBIT
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(Single copies of the specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Wash, D. C., Atlanta, Chicago, Kansas City, Mo., Fort Worth, Denver, San Francisco, Los Angeles, and Seattle, Wash.

(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 Specifications:

MIL-C-121 - Barrier Material, Greaseproofed, Water-Proofed, Flexible.

Military Standards:

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

MIL-STD-129 - Marking for Shipment and Storage.

(Copies of specifications, standards, drawings and publications required by supplies 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 otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

Uniform Classification Committee:

Uniform Freight Classification Rules.

(Application for copies should be addressed to the Uniform Classification Committee, 202 Union Station, 516 West Jackson Boulevard, Chicago, Illinois 60606.)

National Classification Board, Inc.:

National Motor Freight Classification Rules.

(Application for copies should be addressed to the National Classification Board, Inc., 1616 P St., N. W., Washington, D. C. 20036.)

American Society for Testing and Materials (ASTM) Standard:

D 1918 - Asbestos Content of Asbestos Textile Materials

(Application for copies should be addressed to the American Society For Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103.)

3. REQUIREMENTS

3.1 Preproduction sample. When specified (see 6.2), before production is commenced, a sample item covered by this specification shall be submitted or made available to the contracting officer or his authorized representative for approval in accordance with 4.2. The approval of the preproduction sample authorizes the commencement of production but does not relieve the supplier of responsibility for compliance with all applicable provisions of this specification. The preproduction sample shall be manufactured in the same facilities to be used for the manufacture of the production items.

3.2 Standard product. The packing material delivered under this specification shall be the manufacturer's standard commercially current product, except for any changes necessary to comply with specification requirements.

3.3 Materials

3.3.1 Asbestos. The asbestos shall be chrysotile, of not less than 12 percent, by weight, water of crystallization. (see 4.4.4).

3.3.2 Lubrication. Each asbestos yarn or strand shall be treated with a high temperature lubricating compound. The finished packing shall be coated with lubricating graphite and shall contain not more than 30 percent, by weight, of lubrication, which shall include the lubricating compound and the graphite. (see 4.4.2.1)

3.4 Type I Packing, plain, no wire.

3.4.1 Asbestos yarn. The yarn shall contain not less than 85 percent, by weight, of asbestos fiber (see 4.4.3.2). Other fibers shall be organic.

3.4.2 Construction. Packing 1/8 and 3/16 inch shall be either "Round Braided" or Square Braided". All other sizes shall be "Square Braided." A core will be permitted in all sizes. When "Square Braided" a warp (or corner ends) shall not be included in sizes below 5/8 inch, but it will be permitted in sizes 5/8 inch and over. The finished packing shall be approximately square in cross section.

3.4.3 Weight. The weight per linear yard of type I packing shall conform to the requirements in table 1.

TABLE 1. Weight per linear yard, type I packing

Nominal size	Weight per linear yard	
	Minimum	Maximum
Inch	Pounds	Pounds
1/8	0.015	0.12
3/16	.034	.30
1/4	.10	.34
5/16	.16	.36
3/8	.23	.44
7/16	.30	.55
1/2	.43	.66
9/16	.54	.80
5/8	.66	.92
3/4	.94	1.36
7/8	1.30	1.84
1	1.70	2.10

3.5 Type II Packing, with wire insertion.

3.5.1 Asbestos yarn. The fibrous material in the yarn shall contain not less than 85 percent, by weight, of asbestos fiber (see 4.4.3.2). Other fibers shall be organic.

3.5.2 Wire inserted yarn. The yarn shall be composed of asbestos yarn and brass, copper or nickel-copper wires. Each strand shall contain two (2) asbestos yarns and not more than four (4) brass, copper or nickel-copper wires twisted together. The wire shall be not more than 0.01 inch in diameter.

3.5.3 Construction. Packing 1/8 and 3/16 inch shall be either "round braided" or "square braided". All other sizes shall be "square braided". A core will be permitted in all sizes. A warp (or corner ends) shall not be included in sizes below 5/8 inch, but will be permitted in sizes 5/8 inch and over. The finished packing shall be approximately square in cross section.

3.5.4 Weight. The weight per linear yard of type II packing shall conform to the requirements in table II.

TABLE II. Weight per linear yard, type II packing

Nominal size	Weight per linear yard	
	Minimum	Maximum
Inch	Pounds	Pounds
1/8	0.025	0.18
3/16	.06	.24
1/4	.12	.30
5/16	.20	.40
3/8	.28	.50
7/16	.39	.64
1/2	.50	.78
9/16	.65	.95
5/8	.80	1.12
3/4	1.15	1.54
7/8	1.60	2.02
1	2.10	2.60

3.6 Marking. The packing material, spool or coil, as applicable, shall be permanently marked with the manufacturer's name, trade name or trademark for the purpose of identification of the manufacturer.

3.7 Workmanship. The workmanship shall be first class in every respect.

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 in the contract or order, the supplier 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 suppliers and services conform to prescribed requirements.

4.2 Preproduction sample inspection. When a preproduction sample is required it shall be examined for visual defects in table III and for dimensions specified herein, and tested as specified in 4.4.1 through 4.4.4 inclusive.

4.3 Sampling for inspection. Sampling for inspection shall be performed in accordance with the provisions set forth in MIL-STD-105, except where otherwise indicated.

4.3.1 End product inspection. The inspection lot shall consist of all packing material of one type and size offered for inspection at the same time. The sample unit shall be one spool or coil of packing material.

4.3.1.1 Visual examination. Examination shall be made of the packing material for the defects in table III. The inspection level shall be with an acceptable quality level (AQL) of 2.5 for major defects and 6.5 for total defects, expressed in terms of defects per hundred units.

TABLE III. Classification of defects

Defect	Classification	
	Major	Minor
Not treated with lubricating compound	X	
Not coated with lubricating graphite	X	
Sizes above 3/16 inch not square braided	X	
Not approximately square in cross section		X

TABLE III. Classification of defects (con't)

Defect	Classification	
	Major	Minor
Wire missing for Type II	X	
Wire for Type II not as specified	X	
1/8" and 3/16" not round or square braided	X	
All other sizes not square braided	X	
Sizes below 5/8" have a warp (corner ends)	X	
Permanent marking illegible or missing on packing material, spool or coil		X

4.3.1.2 Dimensional examination. An examination shall be made of the packing material for dimensional defects. Any dimension not within specified requirements shall be classified as a defect. The inspection level shall be S-2 with an AQL of 4.0 expressed in terms of defects per hundred units.

4.3.1.3 End product testing. Packing material shall be tested as specified in 4.4.1 through 4.4.4 inclusive. The inspection level shall be S-2 with an AQL of 4.0 expressed in terms of defects per hundred units.

4.3.2 Examination of preparation for delivery. An examination shall be made to determine that packaging and packing as required by section 5 are complied with. Defects shall be scored as specified in table IV. The sample unit shall be one shipping container fully prepared for delivery. The lot shall be the number of containers offered for delivery at one time. The inspection level shall be S-2 with an AQL of 4.0 expressed in terms of defects per hundred units.

TABLE IV. Examination of preparation for delivery

Examination	Defect
Marking (exterior and interior container)	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application.
Materials	Component missing, damaged, or otherwise defective.
Workmanship	Inadequate application of components such as incomplete closure of container flaps; loose strapping or tape banding; inadequate stapling; bulging or distortion of containers.
Contents	Content per container is more or less than required.

4.4 Tests.

4.4.1 Preparation of samples for analysis. Small strips or cross-sections shall be cut from all samples so as to be representative of the entire lot.

4.4.2 Lubricant. A 5- to 8-gram specimen shall be weighed accurately and placed in a siphon cup without a filter thimble. A few milliliters of chloroform shall be added to the cup, and agitated gently to dislodge the bulk of the graphite, which shall be removed by decanting the solvent into an extraction flask. This is done so as to prevent the siphon tube from becoming plugged. Two or three such treatments are usually sufficient to remove most of the graphite, which shall be collected in the extraction flask. The siphon cup is then assembled in the extraction flask; sufficient chloroform shall be added to bring the volume of solvent up to almost 50 milliliters. The extraction shall be continued in the usual manner for a period of 2 hours. The extracted material shall then be removed, and permitted to air-dry on a watch glass. When dry, the yarns shall be carefully separated and the remaining graphite carefully shaken or brushed off and collected on the watch glass, after which it shall be added to the extraction flask. The chloroform shall be removed from the extraction flask with a gentle stream of air, and the extract shall be dried at 105°C. for 1 hour, cooled, and weighed.

4.4.2.1 Calculation. Lubricant, percent = $\frac{\text{Increase in weight of flask}}{\text{Weight of specimen}} \times 100$ (see 3.3.2)

4.4.3 Asbestos.

4.4.3.1 Removal of foreign material. After removal of the lubricant, the specimen shall be placed in a 125-milliliter lipped assay flask, and approximately 20 milliliters of chloroform added. The flask and contents shall be agitated by shaking sufficiently to loosen the fibers so as to permit the separation of nonfibrous material. The contents of the flask shall be poured through an 80-mesh screen, which will retain the fibers and metal, and washed well with chloroform. The treatment with chloroform shall be repeated until all of the nonfibrous material (except the metal) has been removed. The filtrate and washings shall be poured through a portion of the sieve not occupied by fibers in order to recover any long fibrous material that may have slipped through the sieve. The wire shall be carefully removed from the fiber with the aid of forceps and the fibrous material permitted to dry.

4.4.3.2 Asbestos content. Specimens shall be taken from the fibrous material which has been treated as required in 4.4.2 and 4.4.3.1. The asbestos content shall be determined in accordance with the method specified in ASTM D 1918. (see 3.4.1 and 3.5.1)

4.4.4 Water of crystallization. Specimens of approximately 5 grams shall be taken from the fibrous material which has been treated as required in 4.4.2 and 4.4.3.1. They shall be dried for one hour at 105° to 110°C. (220° to 230°F.), in an electric oven, cooled for one hour in a desiccator containing anhydrous calcium chloride and weighed. The dried material shall be ignited in an electric furnace at 800° to 810° C. (1472° to 1490°F.) for one hour and the weight recorded.

$$\text{Percent of water of crystallization} = \frac{(A-B)}{A} \times 100 \text{ (see 3.3.1)}$$

where A = Weight of dried specimen

B = Residual weight of ignited specimen

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. Asbestos rod packing shall be furnished on spools or in coils as follows:

Size of asbestos rod packing	Quantity per unit	Unit
1/8 and 3/16	1 pound	Spool
1/4 and 5/16	5 pounds	Spool
3/8, 7/16, and 1/2	10 pounds	coil or spool
9/16, 5/8, and 3/4	15 pounds	coil
7/8 and 1	25 pounds	coil

Coils shall be wrapped in a greaseproof barrier material conforming to MIL-B-121, grade A, class 2. Spools and wrapped coils shall be packaged in a snug-fitting folding, setup or metal stayed paper-board box conforming to PPP-B-566, PPP-B-576 or PPP-B-565 as determined by the weight limit of the respective box. Closure shall be made in accordance with the requirements of the appendix to the appropriate box specification.

5.1.2 Level B. Asbestos rod packing shall be furnished and packaged as specified in 5.1.1 except coils may be wrapped in any suitable greaseproof barrier.

5.1.3 Level C. Each spool or coil shall be packaged to assure adequate protection against damage during shipment from the supplier to the initial destination.

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

5.2.1 Level A. The asbestos rod packing packaged as specified in 5.1 shall be packed in a snug-fitting fiberboard box conforming to PPP-B-636, class weather-resistant, grade V3c. Closure shall be in accordance with Method II of the appendix to PPP-B-636.

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