

MIL-A-17472(NAVY)

12 February 1953

~~SUPERSEDING~~

HH-P-0046(NAVY SHIPS)

1 May 1952

## MILITARY SPECIFICATION

### ASBESTOS SHEET COMPRESSED (PACKING MATERIAL)

(All interested bureaus of the Navy Department have concurred in the use of this specification for purchase.)

#### 1. SCOPE

1.1 This specification covers symbol 2150 compressed asbestos sheet packing material used as a gasket joint sealing material for steam, hot and cold water or brine, air and gases, and oils.

#### 2. APPLICABLE SPECIFICATIONS, STANDARDS, DRAWINGS, AND PUBLICATIONS

2.1 The following specifications and standards, of the issue in effect on date of invitation for bids, form a part of this specification:

#### SPECIFICATIONS

##### FEDERAL

NN-B-591 - Boxes; Fiberboard, Wood-Cleated (for Domestic Shipment).

NN-B-601 - Boxes; Wood-Cleated-Plywood, for Domestic Shipment.

NN-B-621 - Boxes; Wood, Nailed and Lock-Corner.

ZZ-R-601 - Rubber Goods; General Specification (Methods of Physical Tests and Chemical Analyses).

LLL-B-631 - Boxes; Fiber, Corrugated (for Domestic Shipment).

LLL-B-636 - Boxes; Fiber, Solid, (for Domestic Shipment).

##### MILITARY

JAN-P-105 - Packaging and Packing for Overseas Shipment - Boxes, Wood, Cleated-Plywood.

JAN-P-106 - Packaging and Packing for Overseas Shipment - Boxes, Wood, Nailed.

JAN-P-125 - Packaging and Packing for Overseas Shipment - Barrier-Materials, Waterproof, Flexible.

JAN-P-132 - Packaging and Packing for Overseas Shipment - Crates; Unsheathed, Wood Nailed (for Maximum Net Load of 2,500 Pounds).

MIL-A-140 - Adhesive, Water-Resistant, Waterproof Barrier-Material.

MIL-L-10547 - Liners, Case, Waterproof.

##### NAVY DEPARTMENT

General Specifications for Inspection of Material.

#### STANDARDS

##### MILITARY

MIL-STD-129 - Marking of Shipments

(Copies of specifications, standards, and drawings required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

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2.2. Other publications. - The following publications of the date of invitation for bids, unless otherwise stated, form a part of this specification.

**CONSOLIDATED FREIGHT CLASSIFICATION COMMITTEE**

Consolidated Freight Classification - Ratings, Rules and Regulations.

(Application for copies should be addressed to the Consolidated Freight Classification Committee, 202 Chicago Union Station, Chicago 6, Ill.)

**AMERICAN TRUCKING ASSOCIATION, INC.**

Motor Freight Classification Rules.

(Application for copies should be addressed to the Issuing Officer, American Trucking Association, Inc. 1424 16th St., N. W., Washington 6, D. C.)

**3. REQUIREMENTS**

3.1 Qualification. - Compressed asbestos sheet furnished under this specification shall be a product which has been tested and has passed the qualification tests specified in section 4 (see 6.2).

3.2 Material. - The compressed asbestos sheet shall be made of asbestos fiber, natural or synthetic rubber, or a mixture of the two, sulphur, and suitable mineral fillers.

3.2.1 Asbestos fiber. - The asbestos fiber shall be chrysotile and shall contain not less than 12 percent water of crystallization.

3.2.2 Rubber compound. - The rubber compound shall be free from substances which may injuriously affect the quality.

3.3 Construction. - The asbestos sheet shall be thoroughly and evenly mixed to the required consistency and compressed into a sheet of compact and uniform texture either cross-laminated or single-ply.

3.4 Asbestos fiber and rubber content. - The compressed asbestos sheet shall contain not less than 70 percent by weight, of asbestos fiber, and not less than 10 percent by weight, of rubber.

3.5 Thickness and weight. - The thickness and weight of the finished compressed asbestos sheet shall be as shown in table I as specified (see 6.1).

Table I - Thickness and weight

Thickness	Weight, minimum
Inch	Pounds per square yard
1/64	0.8
1/32	2.0
1/16	4.0
3/32	6.0
1/8	8.0
3/16	12.0
1/4	16.0

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3.5.1 Thickness tolerances. - The permissible tolerances in thickness shall be as shown in table II.

Table II - Thickness tolerances.

Thickness	Tolerance
Inch	
1/64	+0.005 inch; -0.002 inch
1/32	+0.005 inch
1/16 and over	+10 percent

3.6 Tensile strength. - The average tensile strength of sheets 1/32 inch and thicker shall not be less than 3500 pounds per square inch (p.s.i.). Single ply sheets 1/64 inch thick shall have a minimum average tensile strength of 1200 p.s.i. in the weakest direction and an average tensile strength of both the longitudinal and transverse directions of not less than 2,000 p.s.i. (see 4.5.1).

3.7 Solvents. - The finished sheet shall be free of gasoline or other solvents used in the process of manufacture.

3.8 Graphite. - Unless otherwise specified (see 6.1), the finished sheets shall not be lubricated or graphited.

3.9 Simulated performance. - The compressed asbestos sheet shall pass the simulated performance test specified in 4.5.3. The compressed asbestos sheet upon completion of the test shall be in satisfactory condition.

3.10 Branding. - Every square foot, or less, of the asbestos sheet shall be plainly marked with the manufacturer's brand name.

3.11 Workmanship. - Workmanship shall be first class in every respect. The asbestos sheet shall have smooth surfaces and shall be free from imperfections.

#### 4. SAMPLING, INSPECTION, AND TEST PROCEDURES

4.1 Inspection procedures. - For Naval purchases, the general inspection procedures shall be in accordance with General Specifications for Inspection of Material.

4.2 Qualification tests at a Government laboratory. - Qualification tests shall be conducted at a Government laboratory designated by the Bureau of Ships. These tests shall consist of the tests specified in 4.5.

4.3 Sampling. - Three pieces of finished compressed asbestos sheet, 12 inches square, shall be taken at random from each lot of 2,000 pounds or less of each thickness offered for delivery for inspection and tests as specified in 4.4 and 4.5.1 to 4.5.2.5.

4.4 Inspection. - Compressed asbestos sheet shall be inspected with respect to workmanship, construction, dimensions, branding, packing, and marking.

4.5 Tests. - Unless otherwise specified hereinafter, tests shall be in accordance with the applicable methods specified in Specification ZZ-R-601.

4.5.1 Tensile strength. - Specimens 1/2 inch wide by 6 inches long shall be used, with a 3-inch gage length of specimen between the jaws. The testing machine shall be operated at a rate of separation of the grips of 12  $\pm$  1 inches per minute. Three specimens shall be cut lengthwise of the sheet (longitudinal) and three specimens at right angles thereto (transverse). All specimens shall be conditioned at 212°F. for

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1 hour and cooled to room temperature in a desiccator before testing. The average of the results of six specimens shall be used to determine the average tensile strength. The average of the results of three specimens from one direction of the asbestos sheet shall be the average tensile strength of the asbestos sheet in that direction.

4.5.2 Chemical analysis. -

4.5.2.1 Preparation of sample for analysis. - Small strips or cross-sections shall be cut from various parts of the sample so as to be representative of the sample. The specimen shall be split with the aid of a knife to produce relatively thin layers of material in order to increase the surface area.

4.5.2.2 Lubricant (graphite) when specified. -

4.5.2.2.1 A 1 to 3 gram specimen shall be weighed accurately and placed in a siphon cup without a filter thimble. If graphite is present, 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 into the extraction flask. This is done to prevent the siphon cup from becoming plugged. Two or three treatments are usually sufficient to remove most of the graphite which shall be collected in the extraction flask along with the chloroform soluble material. The siphon cup shall then be assembled in the extraction flask, sufficient chloroform added to bring the volume up to about 50 milliliters, and the extraction shall be continued in the usual manner for a period of 2 hours.

4.5.2.2.2 The extracted material shall then be transferred to a watch glass and permitted to air dry. When dry, the fibers shall be carefully separated, and the remaining graphite carefully brushed off and collected on the watch glass, then added to the extraction flask. The residue shall be reserved for subsequent determinations.

4.5.2.2.3 The chloroform shall be distilled from the extraction flask on a steam bath, using a gentle stream of filtered air to prevent boiling. The flask shall then be dried for 1 hour at 105° Centigrade (C.), cooled in a desiccator and weighed.

4.5.2.2.4 Calculation. -

$$\text{Lubricant, percent} = \frac{L}{S} \times 100$$

Where L = weight of graphite and soluble material  
S = weight of specimen

4.5.2.3 Rubber. -

4.5.2.3.1 After removal of the lubricant, the specimen shall be placed in a 125 milliliter (ml.) lipped assay flask or a 250 ml. Erlenmeyer flask fitted with a standard taper and an air condenser. Ten grams of paranitrotoluene and 25 ml. of orthodichlorobenzene shall be added, and the mixture heated to 180 to 190°C. on a hot plate under a hood with occasional stirring until the rubber dissolves. From 4 to 10 hours are usually sufficient to effect solution.

4.5.2.3.2 The flask and contents shall be cooled, 10 ml. of chloroform added, and the mixture decanted through a 100 mesh screen. The residue shall be washed with chloroform until the insoluble fillers are removed as indicated by a clear filtrate. If undissolved rubber remains, the fibers shall be returned to the digestion flask and the treatment with paranitrotoluene and orthodichlorobenzene repeated.

4.5.2.3.3 The filtrates and wash solutions shall be combined and poured through a portion of the sieve that is free of fibers in order to collect any fibers that may have passed through previously. The fibers shall then be transferred to a siphon cup and extracted for 1 hour with chloroform, dried at 105°C. for 1 hour, cooled and weighed.

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4.5.2.3.4 Calculation. -

$$\text{Asbestos fibers, percent} = \frac{F}{S} \times 100$$

$$\text{Rubber content, percent} = 100 - A - B$$

Where F = weight of fibers

S = weight of specimen

A = percent fibers

B = percent lubricant

4.5.2.4 Chemically combined water. - A specimen of approximately 1 gram shall be taken from the fibrous material which has been treated as required in 4.5.2.3.3. It shall be dried for 1 hour in a platinum crucible at a temperature of 105 to 110°C., cooled in a desiccator and again weighed. The specimen and crucible shall be ignited in an electric furnace at a temperature of 800 to 825°C., or over a blast lamp, to a constant weight.

4.5.2.4.1 Calculation. -

$$\text{Chemically combined water, percent} = \frac{S-R}{S} \times 100$$

Where R = weight of specimen after ignition

S = weight of specimen before ignition

4.5.2.4.2 Two specimens shall be tested. The average of the results obtained from the two specimens shall be the chemically combined water of the sample.

4.5.2.5 Cotton, asbestos and chemically combined water. - If the fibrous material contains cotton or other organic materials as indicated by nonconformance to 3.2.1, it may be determined as follows: The asbestos content of the fibrous material which has been treated as specified in 4.5.2.3 shall be determined by the combustion procedure for cotton and asbestos. If graphite, carbon black, or other material insoluble in the paranitrotoluene - orthodichlorobenzene mixture remains on the fibers, the combustion method will not give reliable results, and in such cases the results obtained shall be considered to be approximations.

4.5.2.5.1 A specimen weighing approximately 1 gram shall be taken from the fibrous material (see 4.5.2.3). It shall be placed in a porcelain or platinum combustion boat, dried for 1 hour at a temperature of 105° to 110°C., cooled in a desiccator and weighed. The dried specimen in the boat shall be inserted in the combustion tube of an electric organic combustion furnace. The specimen shall be maintained at a temperature of 900 ± 50°C. for approximately 30 minutes or until combustion of the cotton is complete. During the combustion period a current of oxygen (carbon dioxide free) shall be passed through the combustion tube at a rate of approximately 200 milliliters per minute. The combustion gases shall be passed through either two U-tubes containing calcium chloride or through a drying tube containing anhydrous magnesium perchlorate or calcium sulphate to remove the moisture; and finally the gases shall be passed into either a weighed Vanier or similar absorption bulb containing a strong solution of caustic potash, or in a weighed carbon dioxide absorption bulb containing a sodium hydroxide impregnated base (the absorbent having the trade name "ascarite" is of this type) to absorb the carbon dioxide. Three-elevenths of the increase in weight of the Vanier or other carbon dioxide absorption bulb shall represent the weight of the carbon in the asbestos. This shall be 44.40 percent of the cotton. These factors may be combined to give a constant of 0.614. When the combustion has been completed, the absorption tube shall be weighed, and the combustion boat containing the ignited residue shall be removed from the furnace, cooled in a desiccator and weighed.

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4.5.2 5.2 Calculation. -

$$\text{Cotton, percent} = \frac{61.4}{E} \times C$$

$$\text{Asbestos in fiber, percent} = 100 - \text{percent cotton}$$

$$\text{Ignited asbestos, percent} = \frac{R}{E} \times 100$$

$$\text{Chemically combined water of asbestos, percent} = \frac{D-B}{D} \times 100$$

$$\text{Asbestos in sample, percent} = \frac{F \times D}{S} \times 100$$

Where E = weight of specimen of fiber

C = weight of carbon dioxide absorbed

R = weight of residue after ignition

B = ignited asbestos, percent

D = asbestos in fiber, percent

F = weight of fiber in specimen (see 4.5.2.3.3).

S = weight of specimen

4.5.2.5.3 Two specimens shall be tested. The average of the results obtained from the two specimens shall be the asbestos content of the sample.

4.5.3 Simulated performance. - The test shall be conducted in a pipe flange gasket test apparatus consisting of 6 inch piping made up of 30 inch lengths, fitted with raised face flanges in such a manner to provide seven joints. A small steam line extending through the center of the entire length of the apparatus affords a means of obtaining the desired temperatures within the apparatus. Calibrated mercury glass thermometers are placed in thermometer wells and pressure gages connected to the apparatus to measure the temperature and pressure within the apparatus. Readings of the thermometers and pressure gages shall be recorded three times a day. Gaskets shall be cut from the packing sheet to fit the flanges. In order to prevent adherence of the packing to the flange faces, the gaskets shall be coated with powdered graphite prior to their installation for the test. Any leakage of steam, oil or water occurring from any joint during the test shall be noted and, if possible, checked and stopped. The gaskets shall be subjected to the following conditions:

- (a) Saturated steam, 300 p.s.i. gage pressure for 2 weeks.
- (b) Fuel, oil, 300 p.s.i. gage, hydrostatic pressure, 150°F. temperature for 2 weeks.
- (c) Salt water, 300 p.s.i. gage, hydrostatic pressure, 150°F. temperature for 2 weeks.
- (d) Open all vents and allow air to circulate through the apparatus at 110° to 120°F. for 3 days.
- (e) The above steps shall be repeated until four cycles of each condition have been completed.

## 5. PREPARATION FOR DELIVERY

5.1 Packing. -

5.1.1 For domestic shipment - immediate known use. - When specified in the contract or order, compressed asbestos sheet shall be packed in accordance with the Consolidated Freight Classification Ratings, Rules and Regulations or Motor Freight Classification Rules, whichever may be applicable. When fiberboard is used for container construction, the Mullen test shall be no less than 275 pounds.

5.1.2 For domestic shipment and storage. - Unless otherwise specified, (see 6.1), compressed asbestos sheet shall be packed as follows:

5.1.2.1 Compressed asbestos sheet, in thicknesses up to and including 1/16 inch thick, shall be furnished in rolls and packed in wood-cleated-fiberboard, wood-cleated plywood, nailed wood, corrugated or solid fiberboard boxes conforming to Specification NN-B-591, NN-B-601, NN-B-621, LLL-B-631 or LLL-B-636, respectively. The gross weight of wood boxes shall not exceed 200 pounds, of fiberboard boxes 70 pounds.



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5.1.2.2 Compressed asbestos sheet in thicknesses exceeding 1/16 inch shall be furnished in flat sheets and packed in unsheathed crates conforming to Specification JAN-P-132, and shrouded in accordance with the appendix thereto. The gross weight shall not exceed 500 pounds.

5.1.3 For overseas shipment. - When specified (see 6.1), compressed asbestos sheet shall be packed as follows:

5.1.3.1 Compressed asbestos sheet, in thicknesses up to and including 1/16 inch thick, shall be furnished in rolls and packed in wood cleated plywood or nailed wood boxes conforming to style A or B of Specification JAN-P-105, or style 2 or 4 of Specification JAN-P-106, respectively. Each box shall be lined with a liner conforming to Specification MIL-L-10547 and sealed in accordance with the appendix thereto. The gross weight shall not exceed 150 pounds.

5.1.3.2 Compressed asbestos sheet, in thicknesses exceeding 1/16 inch shall be furnished in flat sheets and packed in unsheathed crates conforming to Specification JAN-P-132. Contents shall be wrapped within a waterproof bag made of material conforming to Specification JAN-P-125. Seams and closure shall be sealed with an adhesive conforming to Specification MIL-A-140, and shall have water-resistance equal to that of the body material. The gross weight shall not exceed 500 pounds.

5.2 Marking. - In addition to any special marking required by the contract or order, shipments shall be marked in accordance with Standard MIL-STD-129.

## 6. NOTES

6.1 Ordering data. - Procurement documents should specify the following:

- (a) Title, number, and date of the specification.
- (b) Thickness required (see 3.5).
- (c) Whether finished sheet should be lubricated or graphited (see 3.8).
- (d) Whether domestic or overseas shipment is required; if domestic type required (5.1).

6.2 In the procurement of products requiring qualification, the right is reserved to reject bids on products that have not been subjected to the required tests and found satisfactory for inclusion on the Military Qualified Products List. The attention of suppliers is called to this requirement, and manufacturers are urged to communicate with the Bureau of Ships, Navy Department, Washington 25, D. C., and arrange to have the products that they propose to offer to the Army, the Navy, or the Air Force, tested for qualification in order that they may be eligible to be awarded contracts or orders, for the products covered by this specification. Information pertaining to qualification of products covered by this specification may be obtained from the Chief of the Bureau of Ships, Navy Department, Washington 25, D. C.

6.3 By using a number of rings of 1/16-inch asbestos sheet sufficient to fill the packing space in boiler blow-off valves, the individual rings will vulcanize into one solid ring and serve the same purpose as special-molded rings.

6.4 Superseding data. - This specification supersedes Specification HH-P-0046. The latter superseded Navy Specification 33PI3c.

Notice. - When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Custodian:

Bureau of Ships

Other interest:

NAVY - ShAOsY

1. The purpose of this document is to provide a comprehensive overview of the project's objectives, scope, and deliverables. It is intended to serve as a reference for all project participants and to ensure that everyone is aligned on the project's goals and expectations.

2. The project is a complex endeavor that requires the coordination of multiple teams and resources. The primary objective is to deliver a high-quality product that meets the needs of the customer and the organization.

3. The project's scope is defined by the following key areas: product development, marketing, sales, and customer support. Each of these areas has specific deliverables and timelines that must be met in order for the project to be successful.

4. The project's deliverables are the tangible outputs that will be produced as a result of the project. These include the final product, marketing materials, sales collateral, and customer support documentation.

5. The project's timeline is a critical factor in determining the success of the project. It is essential that all project participants understand the project's schedule and their respective roles in meeting the deadlines.

6. The project's budget is a key consideration in the planning and execution of the project. It is important to ensure that the project is completed within the allocated budget and that all resources are used efficiently.

7. The project's risk management plan is designed to identify and mitigate potential risks that could impact the project's success. This includes identifying risks related to the project's scope, timeline, budget, and resources.

8. The project's communication plan is a critical component of the project's success. It ensures that all project participants are kept informed of the project's progress and that any issues are addressed in a timely manner.

9. The project's quality management plan is designed to ensure that the final product meets the highest standards of quality. This includes implementing a rigorous testing and review process to identify and correct any defects or errors.

10. The project's closure plan is a final step in the project's lifecycle. It involves reviewing the project's performance, identifying lessons learned, and ensuring that all project deliverables are properly archived and distributed.

11. The project's success is ultimately measured by the customer's satisfaction and the organization's ability to meet its business objectives. It is essential that all project participants remain focused on these goals throughout the project's duration.

12. The project's documentation is a critical asset that provides a record of the project's progress, decisions, and outcomes. It is important to maintain accurate and up-to-date documentation throughout the project's lifecycle.

13. The project's team is a key factor in the project's success. It is essential that all team members are clearly defined, have the necessary skills and resources, and are committed to the project's goals.

14. The project's sponsor is a critical stakeholder who provides the necessary support and resources for the project. It is important to maintain a strong relationship with the sponsor throughout the project's duration.

15. The project's steering committee is a group of senior leaders who provide strategic guidance and oversight for the project. It is important to ensure that the steering committee is well-informed and actively engaged in the project's progress.

16. The project's communication plan is a critical component of the project's success. It ensures that all project participants are kept informed of the project's progress and that any issues are addressed in a timely manner.

17. The project's quality management plan is designed to ensure that the final product meets the highest standards of quality. This includes implementing a rigorous testing and review process to identify and correct any defects or errors.

18. The project's closure plan is a final step in the project's lifecycle. It involves reviewing the project's performance, identifying lessons learned, and ensuring that all project deliverables are properly archived and distributed.

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