

**HH-I-578b**

May 17, 1966

**SUPERSEDING**

Fed. Spec. HH-I-578a

March 28, 1945

**FEDERAL SPECIFICATION****INSULATION, PIPE COVERING AND BLOCK,  
THERMAL, VERMICULITE**

*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 molded vermiculite block and pipe covering.

**1.2 Classification.** Vermiculite pipe insulation shall be furnished in one grade and the following types, as specified (see 6.2):

*Type:*

- I—Standard thickness.
- II—Double standard thickness.
- III—Solid thickness.
- IV—Block.

**2. APPLICABLE DOCUMENTS**

**2.1 Specifications and standards.** The following specifications and standards, of the issues in effect on date of invitation for bids, form a part of this specification to the extent specified herein:

*Federal Specification:*

PPP-B-636—Box, Fiberboard.

*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.

(Single copies of this 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, Washington, D. C., Atlanta, Chicago, Kansas City, Mo., Dallas, 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 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 contractors 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 shall apply.

*Official Classification Committee (OCC) Publication:*

Uniform Freight Classification Rules.

(Application for copies should be addressed to the Official Classification Committee, 1 Park Ave. at 33rd St., New York, N. Y., 10016.)

*American Trucking Association, Inc.*

*(ATA) Publication:*

National Motor Freight Classification Rules.

(Application for copies should be addressed to

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the American Trucking Association, Inc., 1616 P St., N.W., Washington, D. C., 20036.)

*American Society for Testing and Materials (ASTM) Standard:*

**E 171—Standard Atmospheres for Conditioning and Testing Materials.**

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

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

### 3. REQUIREMENTS

**3.1 Material.** The block and pipe covering shall be composed of vermiculite, long fiber asbestos, and a suitable binder. The mixture shall be homogeneous throughout.

**3.1.1 Asbestos content.** The asbestos fiber content of the mixture shall be not less than 7 percent by weight. The fiber shall be group 4.

**3.2 Weight.** The weight of the pipe covering, determined in accordance with 4.4.1.5, shall be not more than 26 pounds per cubic foot.

**3.3 Jacket.** Unless otherwise specified (see 6.2), the pipe covering shall have an attached cotton sheeting jacket weighing not less than 3.5 ounces per square yard.

**3.4 Bands.** When specified (see 6.2), steel bands, black japanned or lacquered, shall be furnished. All bands shall be at least 3/4 inch wide and not less than 0.005 inch thick. Bands shall be furnished at the rate of five for two sections of pipe coverings.

### 3.5 Dimensions.

**3.5.1 Type I.** Type I pipe covering shall be furnished in accordance with the dimensions shown in table I. For pipe sizes, 1/2 up to and including 10 inches, the covering shall be furnished in sections. For sizes larger than 10 inches, the covering shall be furnished in curved segments.

**TABLE I. Thickness of types I and II pipe covering**

Nominal size of pipe	Type I	Type II
	Inches	Inches
1 1/2 inches and smaller ...	7/8	1-3/4
3 to 3 1/2 inches .....	1-1/32	2-1/16
4 to 6 inches .....	1-1/8	2-1/4
7 to 10 inches .....	1-1/4	2-1/2
12 inches and larger .....	1-1/2	3

**3.5.2 Type II.** Type II pipe covering shall be furnished in accordance with the dimensions shown in table I, and as specified (see 6.2). The pipe covering shall be furnished in two layers of equal thickness, as follows: In sections for the inner layer of pipe sizes up to and including 10 inches, and for the outer layer of pipe sizes up to and including 8 inches; in curved segments for the inner layer of pipe sizes larger than 10 inches, and for the outer layer of pipe sizes larger than 8 inches. The total thickness shall not exceed the amount stated in table I.

**3.5.3 Type III.** Type III pipe covering shall be supplied in solid thicknesses of 2, 2-1/2, and 3 inches as specified (see 6.2), for all nominal pipe sizes.

**3.5.4 Type IV.** Type IV blocks shall be flat rectangular sections of 3, 6, and 12 inches wide, 1-1/2 or 3 feet long, and 1/2 to 6 inches in thickness as specified (see 6.2).

**3.5.5 Length.** Types I, II, and III sections shall be 3 feet long, split in half lengthwise. Curved segments shall be 3 feet long and of suitable width to fit properly the respective pipe size.

**3.5.6 Tolerances.** A tolerance in thickness for types I, II, and IV of minus zero or plus 1/8 inch shall be permitted.

**3.5.6.1** Sections for applications on Standard I.P.S. pipe of type III pipe covering shall fit the pipe snugly with closed longitudinal joints. The tolerance in thickness shall be plus or minus 1/16 inch with a tolerance of plus or minus 1/8 inch in length.

### 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 Sampling.

**4.2.1 Lot.** A lot shall consist of all insulation pieces of the same type and size offered for delivery at the same time.

**4.2.2 Sampling for visual examination of end item.** Sampling shall be in accordance with level S-3 of MIL-STD-105. The sample unit shall be sections or segments for one three-foot length of pipe covering or blocks, as applicable.

**4.2.3 Sampling for tests.** Sampling for tests shall be in accordance with level S-2 of MIL-STD-105. The sample unit shall be sections or segments for one three-foot length of pipe covering or blocks, as applicable.

**4.3 End item examination.** Samples of insulation selected in accordance with 4.2.2 shall be examined for the defects listed in table II. The acceptable quality level (AQL) shall be 2.5 percent defective for major defects and 4.0 percent defective for minor defects. Any sample having one or more of the defects listed shall be considered a defective unit.

TABLE II. *Classification of defects, end item*

Defects	Major	Minor
Type not as specified .....	X	
Jacket torn or frayed .....		X
Any component damaged, defective, or not as specified, except as otherwise classified as a defect .....	X	
Holes extending through thickness of insulation or exceeding 1/4" across by 1/4" deep .....	X	
Crushed, torn, or ragged ends or edges .....	X	
Not free from grease, oil, dirt, or other foreign matter .....		X
Steel bands missing or not as specified, (as applicable) .....	X	

#### 4.4 Tests.

**4.4.1 Acceptance.** Samples of insulation selected in accordance with 4.2.3 shall be tested as specified herein. The AQL shall be 6.5 percent defective. Any sample failing to pass a test should be considered a defective unit.

**4.4.1.1 Conditioning for tests.** Fourteen days after the date of manufacture, sample units for testing (see 4.2.3), shall be conditioned for 24 hours at 74°F. (23°C.) and 50 percent relative humidity, in accordance with ASTM E 171.

**4.4.1.2 Thickness.** Sample units shall be measured in at least three places with a dial-gage micrometer, or equivalent, and the thickness taken as the average of these three readings. The micrometer shall have a flat presser foot with an area of 1 square inch. The other flat bearing surface shall be not smaller than the presser foot. The presser foot shall exert a force of four ounces. The gage shall be graduated in 0.01 inch increments (see 3.5). If the average of the readings on the sample unit exceeds the permitted tolerance, the sample unit shall be rejected.

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**4.4.1.3 Linear dimensions.** A scale graduated to 0.1 inch shall be used for measuring the length of sample units. Each linear dimension of the test unit shall be measured at three equally spaced places, (see 3.10). If any one of the linear measurements is found to exceed the permitted tolerance, the sample unit shall be rejected. If alinement of mating edges of sections or segments as to width is found to exceed the permitted tolerance, the sample unit shall be rejected.

**4.4.1.4 Inside dimensions.** Measurement of clearances shall be made by means of feeler gages designed to suitably measure clearances between curved surfaces, and read to the nearest 0.10 inch (see 3.5). If inside dimensions exceed permitted tolerance the sample unit shall be rejected.

**4.4.1.5 Weight.** A sample unit shall be weighted on scales of sufficient capacity and sensitivity to determine its weight to an accuracy of plus or minus 0.5 percent.

**4.5 Examination of preparation for delivery.** An examination shall be made to determine that packing and marking requirements of the applicable contract or order are complied with. Defects shall be scored in accordance with the list below. The lot size shall be the number of shipping containers fully prepared for delivery with the exceptions that containers need not be sealed or closed. Examination shall be made in two phases: First an interior examination in process of packing, and second an examination of containers fully prepared for delivery. The sample unit for each of the two phases shall be one container prepared for delivery as set forth above. The inspection level shall be S-2 of MIL-STD-105 with an AQL of 4.0 percent defective.

TABLE III. Classification of preparation for delivery defects

Examine	Defects
Marking (exterior container)	Omitted, incorrect, illegible, improper size, location, sequence or method of application.
Workmanship (as applicable)	Inadequate or improper packing such as closure of container flaps, taping of seams, corners and manufacturer's joint, loose strapping or tape banding; inadequate stapling; bulging or distortion of containers.

## 5. PREPARATION FOR DELIVERY

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

**5.1.1 Level A.** Insulation shall be packed in boxes conforming to PPP-B-636, class weather-resistant.

**5.1.2 Level B.** Insulation shall be packed in boxes conforming to PPP-B-636, class domestic.

**5.1.3 Level C.** The complete equipment shall be packed in a manner which will insure arrival at destination in satisfactory condition and be acceptable to the carrier at lowest rates. Containers and packing shall comply with Uniform Freight Classification Rules, or National Motor Freight Classification Rules.

### 5.2 Marking.

**5.2.1 Civil agencies.** In addition to markings required by contract or order, shipping containers shall be marked in accordance with Fed. Std. No. 123.

**5.2.2 Military agencies.** In addition to marking required by contract or order, shipping containers shall be marked in accordance with MIL-STD-129.

## 6. NOTES

**6.1 Intended use.** Pipe covering covered by this specification is intended for use in localities where the temperature does not exceed 1800°F.

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**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) Type required (see 1.2).
- (c) Jacket, if different (see 3.3).
- (d) Type of bands required (see 3.4).
- (e) Thickness of pipe covering and size of pipe to be covered (see 3.5 and 3.5.3).
- (f) Size and thickness of type IV required (see 3.5.4).
- (g) Level of packing required (see 5.1).
- (h) Marking required (see 5.2).

#### **MILITARY CUSTODIANS:**

Army—MO  
Navy—YD  
Air Force—69

#### *Review activities:*

Army—MO, CE  
Navy—YD  
Air Force—69

#### *User activities:*

Navy—WP, SH

#### *Preparing activity:*

Navy—YD

#### **CIVIL AGENCIES, INTEREST:**

GSA

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Orders for this publication are to be placed with General Services Administration, acting as an agent for the Superintendent of Documents. See section 2 of this specification to obtain extra copies and other documents referenced herein. Price 5 cents each.

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## SPECIFICATION ANALYSIS SHEET

Form Approved  
Budget Bureau No. 119-R004INSTRUCTIONS

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).

## SPECIFICATION

**HH-I-578b: Insulation, Pipe Covering and Block, Thermal, Vermiculite**

ORGANIZATION (Of submitter)

CITY AND STATE

CONTRACT NO.

QUANTITY OF ITEMS PROCURED

DOLLAR AMOUNT

\$

MATERIAL PROCURED UNDER A

☐

DIRECT GOVERNMENT CONTRACT

☐

SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?

A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

☐

YES

☐

NO IF "YES", IN WHAT WAY?

4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)

SUBMITTED BY (Printed or typed name and activity)

DATE