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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material)[1]

This standard is issued under the fixed designation C 1071; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers fibrous glass insulation used as a thermal and sound absorbing liner for interior surfaces of ducts, plenums, and other air handling equipment that handle air up to 250°F (121°C).

1.2 The values stated in inch-pound units are the stand-ard. The SI values in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

C 167 Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations[2]

C 168 Terminology Relating to Thermal Insulating Materials[2]

C 177 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus[2]

C 390 Criteria for Sampling and Acceptance of Preformed Thermal Insulation Lots[2]

C 411 Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation[2]

C 423 Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method[2]

C 518 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus[2]

C 665 Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing[2]

C 1104/C 1104M Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation[2]

C 1114 Test Method for Steady-State Thermal Transmission Properties by Means of the Thin-Heater Apparatus[2]

C 1304 Test Method for Assessing the Odor Emission of Thermal Insulation Materials[2]

C 1338 Test Method for Determining Fungi Resistance of Insulation Materials and Facings[2]

E 84 Test Method for Surface Burning Characteristics of Building Materials[3]

E 795 Practices for Mounting Test Specimens During Sound Absorption Tests[2]

2.2 *Other Standards:*

NAIMA Fibrous Glass Duct Liner Standard[4]

SMACNA HVAC Duct Construction Standards[5]

3. Terminology

3.1 For definitions of terms used in this specification, see Terminology C 168.

4. Classification

4.1 The insulation covered by this specification shall be of the following types:

4.1.1 *Type I*—Blanket in roll form up to 200 ft (61 m) in length, 36 to 72 in. (914 to 1829 mm) in width, and thicknesses of ½ to 3 in. (13 to 76 mm), in ½-in. (13-mm) increments.

4.1.2 *Type II*—Board in sheet form, up to 120 in. (3048 mm) in length, up to 48 in. (1219 mm) in width, and thicknesses of ½ to 3 in. (13 to 76 mm) in ½-in. (13-mm) increments.

5. Ordering Information

5.1 Purchasers should select the preferred options permitted herein and include the following information in procurement documents:

5.1.1 Title, designation, and year of this specification.

5.1.2 Type of insulation (see 4.1).

5.1.3 Length, width, and thickness required (see 4.1).

5.1.4 Packaging required (see 16.1).

5.1.5 Marking required (see 16.2 and 16.3).

5.1.6 Material weight should be obtained from supplier.

6. Materials and Manufacture

6.1 *Basic Material*—The basic material shall be made from

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[2] *Annual Book of ASTM Standards*, Vol 04.06.

[3] *Annual Book of ASTM Standards*, Vol 04.07.

[4] Available from North American Insulation Manufacturers Association, 44 Canal Center Plaza, Suite 310, Alexandria, VA 22314.

[5] Available from Sheet Metal and Air Conditioning Contractors National Association, Inc., 4201 Lafayette Center Drive, Chantilly, VA 22021-1209.

glass processed from the molten state into fibrous form with a binder added to form dimensionally stable insulation. Asbestos shall not be used as an ingredient or component part of the product.

6.2 *Air Stream Surface*—Depending on the insulation surface characteristics and service air velocity, the air stream surface may be plain or coated with a temperature resistant coating or faced with a plain or coated fibrous mat or fabric.

7. Physical Requirements

7.1 *Corrosiveness*—When tested in accordance with 12.3, the metal plate in contact with the back side (non-air surface side) of the insulation shall show no corrosion greater than the comparative plates in contact with sterile cotton which has been tested in the same manner.

7.2 *Water Vapor Sorption*—When tested in accordance with 12.4, the water vapor sorption of the insulation shall not be more than 3 % by weight.

7.3 *Fungi Resistance*—When tested in accordance with 12.5, the insulation shall be observed as having no fungal growth.

7.4 *Temperature Resistance*—When tested in accordance with 12.6, the air stream surface shall have no evidence of flaming, glowing, smoldering, smoking, or delamination.

7.5 *Erosion Resistance*—When tested in accordance with 12.7, the insulation shall not break away, flake off, or show evidence of delamination or continued erosion when air is passed through typical duct sections at a velocity specified in 12.7.

7.6 *Odor Emission*—When tested in accordance with 12.8, a detectable odor of objectionable nature recorded by more than two of the five panel members shall constitute failure of the material.

7.7 *Surface Burning Characteristics*—When tested in accordance with 12.9, the air stream surface of the insulation shall have a maximum flame spread rating of 25 and a maximum smoke developed rating of 50.

7.8 *Apparent Thermal Conductivity*—When tested in accordance with 12.10, the apparent thermal conductivity (k) of the insulation, expressed as Btu·in/h·ft^2·°F or W/m·K for the specified thickness shall not exceed the values shown in Table 1.

7.9 *Sound Absorption Coefficients*—When tested in accordance with 12.11, the insulation shall have sound absorption coefficients not less than that in Table 2 at the specified frequencies.

8. Dimensional Tolerances

8.1 After conditioning for a minimum of 24 h at 70± 3°F (21 ± 1.6°C) and 50 ± 5 % relative humidity, the insulation shall conform to the dimensional tolerances listed in Table 3.

9. Workmanship, Finish, and Appearance

9.1 The insulation units shall indicate good workmanship in fabrication and shall not have visible defects which adversely affect their service qualities.

TABLE 1 Apparent Thermal Conductivity (maximum), Btu·in/h·ft^2·°F (W/m·K)

Mean Temperature, °F (°C)	Type I	Type II
75 (24)	0.31 (0.045)	0.27 (0.039)

TABLE 2 Sound Absorption Coefficients (min) Using a Type "A" Mounting

NOTE 1—This data is based on round-robin tests. Data on Type "A" mounting is for comparison only and is not meant to indicate characteristics in duct service.

	Thickness, in. (mm)	Frequency, Hz						NRC[A]
		125	250	500	1000	2000	4000	
Type I	½ (13)	0.02	0.07	0.18	0.37	0.52	0.67	0.30
	1 (25)	0.04	0.19	0.35	0.55	0.69	0.72	0.45
	1½ (38)	0.08	0.31	0.58	0.75	0.82	0.81	0.60
	2 (51)	0.16	0.42	0.76	0.85	0.85	0.83	0.70
Type II	1 (25)	0.02	0.20	0.52	0.73	0.82	0.84	0.55
	1½ (38)	0.05	0.40	0.77	0.88	0.88	0.86	0.75
	2 (51)	0.12	0.67	0.99	0.97	0.91	0.87	0.90

[A]Noise Reduction Coefficient.

TABLE 3 Dimensional Tolerance, in. (mm)

	Length	Width	Thickness
Type I	−0, + 2 % of length	−0, + ¼ (−0, +6)	±⅛ (±3)
Type II	−⅛, + ⅜ (−3, +10)	±⅛ (±3)	±⅛ (±3)

10. Sampling

10.1 The insulation shall be sampled in accordance with Criteria C 390. Specific provisions for sampling shall be agreed upon between the purchaser and supplier as part of the purchase contract.

11. Qualification Requirements

11.1 The following requirements shall be employed for the purpose of initial material or product qualification:

11.1.1 Corrosiveness,
11.1.2 Water vapor sorption,
11.1.3 Fungi resistance,
11.1.4 Temperature resistance,
11.1.5 Erosion resistance,
11.1.6 Odor emission,
11.1.7 Surface burning characteristics,
11.1.8 Apparent thermal conductivity, and
11.1.9 Sound absorption coefficients.

11.2 The manufacturer shall furnish a certificate of compliance for qualification requirements upon request (see Criteria C 390).

12. Test Methods

12.1 Conduct tests for temperature resistance, erosion resistance, surface burning characteristics, and sound absorption on the air stream surface side.

12.2 *Dimensions*—The thickness shall be measured in accordance with Test Methods C 167. Length and width shall be measured with a steel tape or ruler to ±1⁄16 in. (±2 mm).

12.3 *Corrosiveness*—The corrosiveness shall be tested in accordance with the method for testing the corrosiveness of mineral fiber batt and blanket insulation in Specification C 665.

12.4 *Water Vapor Sorption*—The water vapor sorption shall