Designation: C 892 – 00

Standard Specification for High-Temperature Fiber Blanket Thermal Insulation[1]

This standard is issued under the fixed designation C 892; 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 high-temperature fiber blanket thermal insulation for use at various temperatures from 1350°F (732°C) up to 3000°F (1649°C), except when used in high-temperature furnaces.

1.2 *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.*

1.3 When the installation or use of thermal insulation materials, accessories, and systems may pose safety or health problems, the manufacturers shall provide the user with appropriate current information regarding any known problems associated with the recommended use of the company's products, and shall also recommend protective measures to be employed in their safe utilization. The user shall establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.

1.4 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units which are provided for information only and are not considered standard.

2. Referenced Documents

2.1 *ASTM Standards:*

C 71 Terminology Relating to Refractories[2]

C 167 Test Methods for Thickness and Density of Blanket or Batt Thermal Insulation[3]

C 168 Terminology Relating to Thermal Insulating Materials[3]

C 177 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus[3]

C 201 Test Method for Thermal Conductivity of Refractories[2]

C 209 Test Methods for Cellulosic Fiber Insulating Board[3]

C 356 Test Method for Linear Shrinkage of Preformed High-Temperature Thermal Insulation Subjected to Soaking Heat[3]

C 390 Criteria for Sampling and Acceptance of Preformed Thermal Insulation Lots[3]

C 1058 Practice for Selecting Temperatures for Evaluating and Reporting Thermal Properties of Thermal Insulation[3]

C 1335 Test Method for Measuring Non-Fibrous Content of Man-Made Rock and Slag Mineral Fiber Insulation[3]

3. Terminology

3.1 *Definitions*—Terminology C 71 and Terminology C 168 shall be considered as applying to the terms used in this standard.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *fibers*—the fibers shall be refractory oxides, processed from a molten state into fibrous form.

3.2.2 *high-temperature fiber thermal insulation*— a thermal insulation, varying in flexibility, composed of refractory inorganic fibers, with or without binder added, and furnished in either flat sheets or rolls.

4. Classification

4.1 The general-type product governed by this specification is blanket or batt composed of inorganic refractory fibers.

4.2 *Types*—The product is separated into types based upon temperatures of use:

Type	Temperature of use, °F (°C), maximum
I	1350 (732)
II	1600 (871)
III	2400 (1316)
IV	2600 (1427)
V	3000 (1649)

4.3 *Grades*—The product is separated into grades based upon its density:

Grade	Density, lb/ft^3(kg/m^3), nominal
3	3 (48)
4	4 (64)
6	6 (96)
8	8 (128)
12	12 (192)

[1] This specification is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.23 on Blanket and Loose Fill Insulation.

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[2] *Annual Book of ASTM Standards*, Vol 15.01.

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

5. Ordering Information

5.1 High-temperature fiber blanket thermal insulation is normally purchased on the basis of brand name, grade, length, width, thickness, and total square footage as specified in the purchase order.

5.2 The type and grade for the intended service shall be as specified by the user with the assistance of the supplier where desirable.

5.3 Inspection and sampling of the material may be specified by the purchaser.

5.4 When a certification or test report, or both, is required, this shall be specified by the purchaser.

6. Physical and Mechanical Properties

6.1 *Apparent Thermal Conductivity* shall conform to the requirements of Table 1 when tested in accordance with 10.1.2.

6.2 *Density* shall conform to the requirements of 4.3 with a tolerance of +30, −15 % of nominal density when tested in accordance with 10.1.1.

6.3 *Temperature of Use* shall conform to the requirements of 4.2 when tested in accordance with 10.1.4.

6.4 Other physical and mechanical properties shall conform to the requirements of Table 2 when tested in accordance with Section 10.

7. Dimensions, Weights, and Permissible Variations

7.1 Rolls or flat sheets of blanket are normally furnished in standard dimensions as shown in Table 3, Table 4, and Table 5.

7.2 Sheets are normally furnished 4 by 8 ft (1219 by 2438 mm) at densities above 8 lb/ft^3 (128 kg/m^3).

7.3 The standard length, width, and thickness combinations available are a function of the type and grade. This information can be obtained by referring to the supplier's literature. Information for non-standard dimensions and combinations can be obtained by contacting the supplier.

TABLE 2 Physical and Mechanical Requirements

Properties	Requirements
Non-fibrous content (shot), maximum, % (by weight)	30
Linear shrinkage, maximum, % (at maximum use temperature)	5
Tensile strength, minimum, lb/in^2 (KPa)	
Grade 3	1.0 (6.9)
Grade 4	1.5 (10.3)
Grade 6	2.0 (13.8)
Grade 8	3.0 (20.7)
Grade 12	5.0 (34.5)

TABLE 3 Thickness Dimensions

Thickness, in. (mm)	Tolerance
1⁄16 (1.6)	+50, −25 %
1⁄8 (3.2)	+50, −25 %
3⁄16 (4.8)	+50, −25 %
1⁄4 (6.4)	+1⁄4 , −1⁄8 in. (+6.4, −3.2 mm)
3⁄8 (9.5)	+3⁄8 , −1⁄8 in. (+9.5, −3.2 mm)
1⁄2 (12.7)	+1⁄2 , −1⁄8 in. (+12.7, −3.2 mm)
3⁄4 (19.1)	+3⁄4 , −1⁄8 in. (+19.1, −3.2 mm)
1 (25.4)	+3⁄4 , −1⁄8 in. (+19.1, −3.2 mm)
1 1⁄2 (38.1)	+3⁄4 , −1⁄8 in. (+19.1, −3.2 mm)
2 (51.0)	+3⁄4 , −1⁄4 in. (+19.6, −6.4 mm)

TABLE 4 Width Dimensions

Width, in. (mm)	Tolerance,[A] %
12 (305)	−2, +10
18 (457)	−2, +10
24 (610)	−2, +10
36 (914)	−2, +10
39 (991)	−2, +10
42 (1067)	−2, +10
48 (1219)	−2, +10
72 (1829)	−2, +10

[A] Excess is permitted.

8. Workmanship, Finish, and Appearance

8.1 The insulation shall indicate good workmanship in fabrication by a uniform appearance, shall not have visible

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

For Test Method C 177

Grade	Mean Temperature, °F (°C) 400 (204)	800 (427)	1200 (649)	1600 (871)	2000 (1093)
3	0.66 (0.095)	1.13 (0.163)	1.79 (0.258)	2.76 (0.398)	4.20 (0.605)
4	0.62 (0.089)	1.03 (0.148)	1.66 (0.239)	2.58 (0.372)	3.83 (0.552)
6	0.54 (0.078)	0.94 (0.136)	1.47 (0.212)	2.28 (0.329)	3.33 (0.480)
8	0.53 (0.076)	0.92 (0.133)	1.41 (0.203)	2.02 (0.291)	2.72 (0.392)
12	0.53 (0.076)	0.91 (0.131)	1.38 (0.199)	1.80 (0.259)	2.17 (0.313)

For Test Method C 201, Modified[A]

Grade	Mean Temperature, °F (°C) 400 (204)	800 (427)	1200 (649)	1600 (871)	2000 (1093)	2500 (1371)
3	0.54 (0.078)	1.21 (0.175)	2.34 (0.338)	3.87 (0.558)	5.98 (0.862)	9.54 (1.375)
4	0.48 (0.069)	1.02 (0.147)	1.91 (0.275)	3.09 (0.446)	4.69 (0.676)	7.36 (1.061)
6	0.43 (0.062)	0.83 (0.120)	1.46 (0.211)	2.30 (0.332)	3.42 (0.493)	5.27 (0.759)
8	0.40 (0.058)	0.73 (0.105)	1.24 (0.179)	1.89 (0.273)	2.74 (0.395)	4.09 (0.589)
12	0.38 (0.055)	0.64 (0.092)	1.02 (0.147)	1.49 (0.215)	2.08 (0.300)	2.98 (0.429)

[A] Refer to Annex A1 of this specification.