



Designation: **C208 – 12 (Reapproved 2017)<sup>ε2</sup> C208 – 12 (Reapproved 2017)<sup>ε2</sup>**

## Standard Specification for Cellulosic Fiber Insulating Board<sup>1</sup>

This standard is issued under the fixed designation C208; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

<sup>ε1</sup> NOTE—Editorially added missing SI conversions in September 2017.

<sup>ε2</sup> NOTE—Editorially corrected [Table 1](#) in November 2019.

### 1. Scope

1.1 This specification covers the principal cellulosic fiber insulating board types, grades, and sizes. Requirements are specified for composition, construction, physical properties, tolerances, sampling procedures, and test methods.

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

1.3 When the installation or use of thermal insulation materials, accessories, and systems may pose safety or health problems, the manufacturer shall provide the user 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 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

### 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[C165 Test Method for Measuring Compressive Properties of Thermal Insulations](#)

[C168 Terminology Relating to Thermal Insulation](#)

[C209 Test Methods for Cellulosic Fiber Insulating Board](#)

[C390 Practice for Sampling and Acceptance of Thermal Insulation Lots](#)

[C846 Practice for Application of Cellulosic Fiber Insulating Board for Wall Sheathing](#)

[D1037 Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials](#)

[D1554 Terminology Relating to Wood-Base Fiber and Particle Panel Materials](#)

[D2164 Methods of Testing Structural Insulating Roof Deck \(Withdrawn 2005\)](#)<sup>3</sup>

[E72 Test Methods of Conducting Strength Tests of Panels for Building Construction](#)

2.2 *Federal Standard:*

[4900.1 Rev-1 U.S. Dept. of Housing and Urban Development Minimum Property Standards, One and Two Family Dwellings](#)<sup>4</sup>

### 3. Terminology

3.1 For definitions of terms used in this specification, see Terminology [C168](#) and Definitions [D1554](#).

3.2 *Definitions of Terms Specific to This Standard:*

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee [C16](#) on Thermal Insulation and is the direct responsibility of Subcommittee [C16.22](#) on Organic and Nonhomogeneous Inorganic Thermal Insulations.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](#), or contact ASTM Customer Service at [service@astm.org](#). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> The last approved version of this historical standard is referenced on [www.astm.org](#).

<sup>4</sup> Available from the U.S. Department of Housing and Urban Development, Construction Standards Division, HUD Building, Washington, DC 20410.

**TABLE 1 Physical Property Requirements for Cellulosic Fiber Insulating Board**

Physical Requirements	Sound Deadening Board ½ in. (13 mm) thick	Roof Insulation Board						
		Grade 1				Grade 2		
		⅞ in. (11 mm) thick	½ in. (13 mm) thick	1 in. (25 mm) thick	2 in. (51 mm) thick	½ in. (13 mm) thick	1 in. (25 mm) thick	2 in. (51 mm) thick
Thermal conductivity (k), max, Btu·in./h·ft <sup>2</sup> ·°F (W/m·K) at mean temperature of 75± 5°F (24 ± 3°C)	0.38 (0.055)	0.38 (0.055)	0.38 (0.055)	0.38 (0.055)	0.38 (0.055)	0.50 (0.072)	0.40 (0.058)	0.40 (0.058)
Transverse strength either direction, min, lbf (N)	12 (53.4)	7 (31.1)	7 (31.1)	14 (62.3)	28 (124.6)	12 (53.4)	24 (107)	36 (160)
Tensile strength parallel to surface, min, lbf/in. <sup>2</sup> (kPa) <sup>B</sup>	150 (1034)	50 (345)	50 (345)	50 (345)	...	150 (1034)	150 (1034)	...
Tensile strength perpendicular to surface, min, lbf/ft <sup>2</sup> (kPa)	600 (28.7)	500 (23.9)	500 (23.9)	500 (23.9)	500 (23.9)	600 (28.7)	600 (28.7)	600 (28.7)
Water absorption by volume, max, %	7	10	10	10	10	7	7	7
Linear expansion, 50–90 % RH, max, %	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Flame Spread Index, finish surface, max	...	...	...	...	...	...	...	...
Vapor permeance, grains/h·ft <sup>2</sup> ·in. Hg pressure differential, (mg/s·m <sup>2</sup> ·kPa) min	5 (0.287)	...	...	...	...	...	...	...
Modulus of rupture, min, lbf/in. <sup>2</sup> (kPa)	240 (1655)	140 (965)	140 (965)	80 (552)	40 (276)	275 (1896)	140 (965)	70 (483)
Deflection at specified min load, max, in. (mm)	0.85 (22)	1.25 (32)	1.25 (32)	0.62 (16)	0.31 (8)	0.75 (19)	0.42 (11)	0.21 (5)
Modulus of Elasticity, min, lbf/in. <sup>2</sup> × 10 <sup>3</sup> (mPa) <sup>F</sup>	...	...	...	...	...	...	...	...
Deflection Span Ratio, max <sup>F</sup>	...	...	...	...	...	...	...	...
Moisture content by weight, max, %	10	10	10	10	10	10	10	10
Racking Load <sup>G</sup> , min plf (N/m)	...	...	...	...	...	...	...	...
Compressive Strength <sup>H</sup> , min, lbf/in. <sup>2</sup> (kPa)	...	14.5 (100)	14.5 (100)	14.5 (100)	14.5 (100)	15 (105)	15 (105)	15 (105)

3.2.1 *cellulosic fiber insulating board*—a fibrous-felted, homogeneous panel made from ligno-cellulosic fibers (usually wood) and having a density of less than 31 lb/ft<sup>3</sup> (497 kg/m<sup>3</sup>) but more than 10 lb/ft<sup>3</sup> (160 kg/m<sup>3</sup>).

#### 3.2.1.1 Discussion—

Cellulosic fiber insulating board is characterized by an integral bond which is produced by interfelting of the fibers, but which has not been consolidated under heat and pressure as a separate stage in manufacture. Other materials may be added during manufacture to improve certain properties.

### 4. Classification

4.1 Insulating board covered by this specification consists of six types:

4.1.1 *Type I*—Sound deadening board, for use in wall assemblies to control sound transmissions.

4.1.2 *Type II*—Roof insulation board, for use in various roofing systems.

4.1.2.1 *Grade 1*—Primarily for use under built-up, and modified bitumen roof systems.

4.1.2.2 *Grade 2*—Primarily for use under single-ply, built-up, and modified bitumen roofing systems.

4.1.3 *Type III*—Ceiling tiles and panels.

4.1.3.1 *Grade 1*—Nonacoustical, for use as decorative wall and ceiling coverings.

4.1.3.2 *Grade 2*—Acoustical, for use as decorative, sound absorbing wall and ceiling coverings.

4.1.4 *Type IV*—Wall Sheathing.

4.1.4.1 *Grade 1*—Regular, for use as wall sheathing in frame construction.

4.1.4.2 *Grade 2*—Structural, for use as wall sheathing in frame construction. When installed in accordance with Practice C846, structural wall sheathing provides adequate racking resistance for use as exterior wall bracing.

4.1.5 *Type V*—Backer board, for use behind exterior finish in wall assemblies where there are no structural requirements.

4.1.6 *Type VI*—Roof deck, for use as roof decking for flat, pitched, or shed-type, open-beamed, ceiling-roof construction.

4.2 On occasion these products are used for other applications. The manufacturer and the purchaser shall agree upon any special requirements for such end uses.

### 5. Materials and Manufacture

5.1 Cellulosic fiber insulating board shall be manufactured from refined or partially refined ligno-cellulosic (usually wood) fibers, by a felting or molding process, into homogeneous panels. Other ingredients may be added to provide or improve certain