Designation: C726 – 12

# Standard Specification for Mineral Wool Roof Insulation Board[1]

This standard is issued under the fixed designation C726; 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.

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

## 1. Scope

1.1 This specification covers the composition and physical properties of mineral wool insulation board used above structural roof decks in building construction. The mineral wool roof insulation acts as a base for systems such as single-ply, polymer-modified bitumen and built-up roof. This specification also covers mineral wool insulation boards that incorporate a fibrous high density upper layer on the top surface

1.2 It is possible that the use of thermal insulation materials covered by this specification will be regulated by building codes or other agencies that address fire performance, or both. The fire performance of the material needs to be addressed through standard fire test methods established by the appropriate governing documents.

1.3 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.

1.4 *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 the regulatory limitations prior to use.*

## 2. Referenced Documents

2.1 The following standards, of the issue in effect on the date of material purchase, form a part of this specification to the extent specified herein:

2.2 *ASTM Standards:*[2]

C165 Test Method for Measuring Compressive Properties of Thermal Insulations

C168 Terminology Relating to Thermal Insulation

C177 Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

C203 Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation

C209 Test Methods for Cellulosic Fiber Insulating Board

C303 Test Method for Dimensions and Density of Preformed Block and Board–Type Thermal Insulation

C390 Practice for Sampling and Acceptance of Thermal Insulation Lots

C518 Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

C665 Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing

C1363 Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus

D312 Specification for Asphalt Used in Roofing

D482 Test Method for Ash from Petroleum Products

D450 Specification for Coal-Tar Pitch Used in Roofing, Dampproofing, and Waterproofing

D2126 Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging

E84 Test Method for Surface Burning Characteristics of Building Materials

E2058 Test Methods for Measurement of Synthetic Polymer Material Flammability Using a Fire Propagation Apparatus (FPA)

2.3 *Other Referenced Documents:*

CAN/ULC-S102 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies[3]

EN 12430 :1998/A1 Thermal Insulating Product for Building Applications – Determination of Behaviour Under Point Load[4]

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[1] This specification is under the jurisdiction of ASTM Committee C16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.20 on Homogeneous Inorganic Thermal Insulations.

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[2] 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.

[3] Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, http://www.ul.com.

[4] Available from European Committee for Standardization (CEN), Avenue Marnix 17, B-1000, Brussels, Belgium, http://www.cen.eu.

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FM 4470 Approval Standard for Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Constructions[5]

ISO 1716 :2002, Reaction-to-Fire Tests for Building Products – Determination of the Heat of Combustion[6]

## 3. Terminology

3.1 *Definitions:*Terms used in this specification are defined in Terminology C168.

3.1.1 *noncombustible core*—a fibrous roof insulation product conforming to the ash content, visible flaming and heat of combustion requirements 12.11.

## 4. Classification

4.1 The thermal insulation shall be of the following types, classes and grades;

4.1.1 *Type I*—Roof insulation board comprised of a monolithic fibrous material having a fibrous high density upper surface layer and a lower density fibrous bottom layer.

4.1.1.1 *Class 1*—Minimum upper surface layer actual density of 11.2 lb/ft$^3$ (180 kg/m$^3$) and a minimum lower layer actual density of 7.5 lb/ft$^3$ (120 kg/m3).

4.1.1.2 *Class 2*—Upper surface layer and lower surface layer density less than Class 1.

*(1) Grade A* – Minimum point load of 146 lbf (650 N).

*(2) Grade B* – Point load < 146 lbf (650 N).

4.1.2 *Type II*—Roof insulation board of singular density.

4.1.2.1 *Class 1*—Minimum actual density of 9 lb/ft$^3$ (144 kg/m$^3$).

4.1.2.2 *Class 2*—Actual density less than Class 1.

## 5. Ordering Information

5.1 Orders for material purchased under this specification shall include:

5.1.1 Designation of this specification,

5.1.2 Product name,

5.1.3 Board dimensions,

5.1.4 Quantity of material, and

5.1.5 Special packaging or marking, (14.1 and 14.2) if required.

## 6. Materials and Manufacture

6.1 Mineral wool roof insulation board shall consist of mineral wool with an organic resin or other suitable binder.

6.2 For built-up roofing or polymer modified bitumen systems the board shall be faced during manufacture on one surface with a cover adequate for the application of Specification D312 asphalt or Specification D450 coal-tar pitch.

6.3 For single ply membrane systems the board shall be permitted to be faced or unfaced. For mechanically fastened single ply membrane systems the board shall be permitted to be faced or unfaced. For adhered single ply membrane systems the board shall be permitted to be faced during manufacture on one surface with a cover adequate for the application of the adhesive used to secure the single ply membrane.

## 7. Physical Properties

7.1 The average thermal resistance, *R*, of specimens sampled in accordance with Practice C390 shall be as specified by the manufacturer.

7.2 Nominal thickness required to obtain the specified resistance or conductance shall be as stated by the manufacturer.

7.3 Roof insulation boards shall have the limiting property values shown in Table 1.

## 8. Dimensions and Tolerances

8.1 The dimensions shall be as agreed upon between the purchaser and manufacturer. Tolerances shall be as follows:

**TABLE 1 Physical Properties**

| Property | Requirement |
|---|---|
| Type I: | |
| Class 1–Minimum Upper Density, lb/ft$^3$ (kg/m$^3$) | 11.2 (180) |
| Minimum Lower Density, lb/ft$^3$ (kg/m$^3$) | 7.5 (120) |
| Class 2–Upper Density, lb/ft$^3$ (kg/m$^3$) | <11.2 (180) |
| Lower Density, lb/ft$^3$ (kg/m$^3$) | <7.5 (120) |
| Type II: | |
| Class 1 Minimum Density, lb/ft$^3$ (kg/m3) | 9.0 (144) |
| Class 2 Density, lb/ft$^3$ (kg/m$^3$) | <9.0 (144) |
| Compressive resistance: | |
| at 25 % deformation, min, psi (kPa) | 12 (83) |
| at 10 % deformation min, psi (kPa) | 7 (48) |
| Tensile strength perpendicular to board surface, min, lbf/ft$^2$ (kPa) | 450 (22) |
| Breaking load, min, lbf (*N*): | |
| Type 1 | 60 (266) |
| Type 2 | 30 (133) |
| Water absorption, max, volume % | 5[A] |
| Dimensional Stability: | |
| % Linear Change, Thickness, Max | |
| +200 ± 4°F (93 ± 2°C) | <1 |
| -40 ± 6 °F (-40± 3°C) | <1 |
| +158 ±4 °F (70 ± 2°C) | <1 |
| % Linear Change, Length and Width, Max | |
| +200 ± 4°F (93± 2°C) | <1 |
| -40 ± 6 °F (-40 ± 3°C) | <1 |
| +158 ± 4°F (70 ± 2°C) | <1 |
| Point Load at 5mm compression, min, N: Type I | 650 |
| Noncombustible Core | |
| Ash content (%) | ≥90 |
| Visible Flaming | None |
| Heat of Combustion, max, BTU/lb (kJ/g) | 860 (2.0) |
| Corrosiveness | Shall meet requirements of Specification C665 for Steel |
| Surface Burning Characteristics | Flame Spread ≤25<br>Smoke ≤ 50 |

[A] There shall be no delamination during the water absorption test.

[5] FM Approvals, 1151 Boston-Providence Turnpike, P.O. Box 9102, Norwood, MA 02062.

[6] Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, http://www.iso.org.

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