



# Standard Specification for Perlite Thermal Insulation Board<sup>1</sup>

This standard is issued under the fixed designation C 728; 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 ( $\epsilon$ ) 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 for perlite thermal insulation board used principally above structural roof decks and as a base for built-up, modified, and elastomeric membrane roofing in building construction.

1.2 The use of thermal insulation materials covered by this specification may be regulated by building codes or other agencies that address fire performance, or both. The fire performance of the material should 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 the standard. The values given in parentheses are for information only.

1.4 The following safety hazards caveat pertains only to the test methods, Section 11, in this specification: *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 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*:<sup>2</sup>

**C 165** Test Method for Measuring Compressive Properties of Thermal Insulations

**C 168** Terminology Relating to Thermal Insulation

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

**C 203** Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation

**C 209** Test Methods for Cellulosic Fiber Insulating Board

**C 390** Practice for Sampling and Acceptance of Preformed Thermal Insulation Lots

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

**C 1289** Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

**E 84** Test Method for Surface Burning Characteristics of Building Materials

## 3. Terminology

3.1 For complete descriptions of terms used in this specification, refer to Terminology **C 168**.

## 4. Classification

4.1 Perlite thermal insulation board is classified as follows:

4.1.1 *Type 1, Roof Insulation Board*—The ½ in. (13 mm) thick version of this product is available only to manufacturers of laminated rigid foam products as specified in Specification **C 1289**.

4.1.2 *Type 2, Roof Cover/Recover Board*—This is used primarily as a field-applied cover board over other roof insulations or in reroofing applications.

## 5. Ordering Information

5.1 Orders shall at least include the following information:

5.1.1 Title and designation Specification C 728.

5.1.2 Product name, nominal thickness and dimensions.

5.1.3 Quantity of material ordered.

5.1.4 Manufacturer's name, address, and telephone number.

## 6. Materials and Manufacture

6.1 *Composition*—The basic material of the insulation board shall be perlite expanded by the application of heat to form glassy, cellular aggregates. The insulation board shall be composed of expanded perlite and fibers formed into rigid, flat, rectangular units with a suitable sizing material incorporated in

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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.

the product. It may have on one or both surfaces a facing or coating to prevent excessive hot bitumen strike-in during roofing installation.

6.2 *Lamination*—The finished board may be either single-ply or multiple-ply. When multiple-ply boards are supplied, a suitable adhesive shall be used to join the plies.

## 7. Physical Properties

7.1 *Thermal Resistance*—Perlite thermal insulation boards shall conform to the following thermal resistances:

Nominal Thickness in. (mm)	Thermal Resistance, F-h-ft <sup>2</sup> /btu (Km <sup>2</sup> /W)	
	Type 1	Type 2
1/2 (13)	1.4 (0.25)	1.3 (0.23)
3/4 (19)	2.0 (0.35)	...
1 (25)	2.7 (0.48)	...
1 1/2 (38)	4.1 (0.72)	...
2 (51)	5.4 (0.95)	...
2 1/2 (64)	6.5 (1.1)	...
3 (76)	8.1 (1.4)	...

7.1.1 Nominal thickness is the thickness of insulation required to obtain the desired resistance value and may be more or less than the thicknesses shown in 7.1. See 8.1 for tolerances.

7.1.2 Insulation boards having thermal resistances other than those values listed may be supplied as agreed upon by purchaser and seller.

7.2 The insulation board shall further conform to the physical requirements shown in Table 1.

## 8. Standard Dimensions and Tolerances

8.1 The dimensions and tolerances shall conform to those listed below. Other dimensions may be supplied as agreed upon by purchaser and seller.

Dimensions, in. (mm)	Tolerance, in. (mm)
Length, 36 (915), 48 (1220) 72 (1830), 96 (2440)	+ 1/4 (6) - 1/8 (3)
Width, 24 (610), 48 (1220)	+ 1/4 (6) - 1/8 (3)
Thickness, 1/2 to 3, (13 to 76), incl	± 1/16 (1.6)

8.1.1 Board squareness shall be within required tolerance if the two diagonal measurements of the board differ by no more than 1/4 in. (6 mm).

8.2 The fabrication of tapered perlite roof insulation board products shall be acceptable if dimension and installation specifications are agreed upon between buyer and seller.

**TABLE 1 Physical Requirements**

Property	Units	Type 1	Type 2
Density	lb/ft <sup>3</sup> (kg/m <sup>3</sup> )	8 (128) min	10 (160) min
Compressive strength at 5 % consolidation	psi (kPa)	20(138) min	20 (138) min
Tensile strength, perpendicular	lb/ft <sup>2</sup> (kPa)	575 (27.5) min	800 (38.3) min
Flexural strength	psi (kPa)	40 (276) min	60 (414) min
Water absorption	volume %	1.5 max	3.5 max

## 9. Workmanship, Finish, and Appearance

9.1 The surface of the board shall be clean, dry, and free of visual defects that will adversely affect the service quality. Edges shall be square.

## 10. Sampling

10.1 Unless otherwise specified, sampling for qualification and inspection tests, if required, shall be in accordance with Practice C 390.

## 11. Test Methods

11.1 *Thermal Resistance*—Test Method C 177 or C 518 at a mean temperature of 75 ± 2°F (24 ± 1°C) and a minimum temperature difference of 40°F (22°C). In the event of challenge, Test Method C 177 shall be the referee method.

11.2 *Compressive Strength*—Test Method C 165, Procedure A, at a crosshead speed of 0.05 in./min for all thicknesses.

11.3 *Tensile Strength Perpendicular to the Surface*—Section 12 on Tensile Strength Perpendicular to Surface of Test Methods C 209.

11.4 *Flexural Strength*—Test Methods C 203, Method I, Procedure D, except test at a strain rate of 2 in./min using 3 in. (76 mm) wide specimens on a 10 in. (254 mm) span.

11.5 *Flame Spread Classification*—Test Method E 84 in the event that surface burning characteristics are required.

11.6 *Water Absorption*—Water Absorption section of Test Methods C 209.

11.7 *Thickness*—Thickness section of Test Methods C 209.

## 12. Qualification and Inspection

12.1 Qualification tests shall be run on the physical requirements given in 7.1 and 7.2.

12.2 Inspection requirements are given in 8.1.

## 13. Rejection

13.1 Failure to conform to any of the requirements of this specification shall constitute grounds for rejection. In case of rejection, the seller shall have the right to reinspect the rejected shipment and resubmit the lot after removal of that portion not conforming to the specified requirements.

## 14. Packaging and Package Marking

14.1 *Packaging*—Unless otherwise specified, boards shall be packaged in the manufacturer's standard commercial containers. Special packaging shall be provided when agreed to in writing between purchaser and seller.

14.2 *Marking*—Unless otherwise specified, each container shall be plainly marked with the supplier's name, address, telephone number, board dimensions, quantity, and the coverage area per container. Additional marking shall be provided when agreed to in writing between purchaser and seller.

## 15. Keywords

15.1 cover/recover board; laminated rigid foam board; perlite; perlite thermal insulation board; roof insulation; thermal insulation

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