



Designation: C764 – 11

Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation¹

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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 nodulated mineral fiber thermal insulation for use in attics or enclosed spaces in housing and other framed buildings.

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 *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:*²

B152/B152M Specification for Copper Sheet, Strip, Plate, and Rolled Bar

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

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

C687 Practice for Determination of Thermal Resistance of Loose-Fill Building Insulation

C870 Practice for Conditioning of Thermal Insulating Materials

C1104/C1104M Test Method for Determining the Water

Vapor Sorption of Unfaced Mineral Fiber Insulation

C1304 Test Method for Assessing the Odor Emission of Thermal Insulation Materials

C1338 Test Method for Determining Fungi Resistance of Insulation Materials and Facings

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

C1374 Test Method for Determination of Installed Thickness of Pneumatically Applied Loose-Fill Building Insulation

C1574 Guide for Determining Blown Density of Pneumatically Applied Loose-Fill Mineral Fiber Thermal Insulation

C1630 Guide for Development of Coverage Charts for Loose-Fill Thermal Building Insulations

E136 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

E970 Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source

G1 Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, refer to Terminology **C168**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *settled density*—The mass per unit volume of a loose-fill insulation after which time or forces, or both, have exerted their effect upon thickness.

3.2.1.1 *Discussion*—The settled density is determined using long term aging studies in attics.

4. Classification

4.1 The nodulated mineral fiber thermal insulation shall be of the following types and classes:

4.1.1 *Type I*—Pneumatic application.

4.1.2 *Type II*—Poured application.

5. Ordering Information

5.1 Both types of nodulated mineral fiber thermal insulation are intended for use as thermal insulation in open spaces, such as attics and enclosed spaces, such as walls, in housing and

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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.

buildings at ambient temperatures. Type I is used for pneumatic application (blown or conveyed by an air stream through a hose and discharged over the area to be insulated). Type II is used for application by pouring in place.

6. Materials and Manufacture

6.1 *Basic Material*—The basic material shall be fibers made from mineral substances such as rock, slag, or glass processed from the molten state into an incombustible fibrous form.

6.2 *Manufacture*—The fibers shall be mechanically processed into nodules, and are permitted to be treated to provide improved processing and handling characteristics suitable for installation by pouring or pneumatic applications.

7. Physical Properties

7.1 *Thermal Characteristics*—The standard thermal resistance values normally recommended for open application are expressed in °F·h·ft²/Btu (K·m²/W). Typical values are shown in **Table 1**. *R* values others than those listed in **Table 1** shall be as agreed upon between the supplier and the purchaser. The thermal resistance *R* for the average of any (four) randomly selected samples shall not be more than 5 % below the mutually agreed upon *R* value when tested in accordance with **12.2**, nor shall any single specimen be more than 10 % below the mutually agreed upon *R* value.

7.2 *Critical Radiant Flux*—Mineral fiber loose fill when tested in accordance with **12.3** shall have a critical radiant flux-flame propagation resistance ≥0.12 W/cm² (.11 Btu/ft² · s).

7.3 *Combustion Characteristics*—Mineral fiber loose fill when tested in accordance with **12.4** shall not have a recorded temperature rise of more than 54°F (30°C); shall have no flaming after the first 30 s; and, if the specimen weight loss exceeds 50 % during the test, the recorded temperature of the specimen during the test shall not rise above the furnace air

temperature at the beginning of the test, and there shall be no flaming of the specimen.

7.4 *Water Vapor Sorption*—The water vapor sorption of the insulation shall not be more than 5 % by weight when tested in accordance with **12.5**.

7.5 *Odor Emission*—A detectable odor of a strong objectionable nature recorded by more than two of the five panel members shall constitute rejection of the material when tested in accordance with **12.6**.

7.6 *Corrosiveness*—When tested in accordance with **12.7**, the metal plates that are in contact with the insulation shall show no corrosion greater than the comparative plates that are in contact with sterile cotton that has been tested in the same manner.

7.7 *Fungi Resistance*—When tested in accordance with **12.8**, the insulation shall have growth no greater than that observed on the white birch tongue depressor comparative material.

8. Other Requirements

8.1 *Qualification Requirements*—The following requirements are generally emphasized for purposes of initial material product requirements:

- 8.1.1 Thermal resistance,
- 8.1.2 Critical radiant flux,
- 8.1.3 Combustion characteristics,
- 8.1.4 Water vapor sorption,
- 8.1.5 Odor emission,
- 8.1.6 Corrosiveness, and
- 8.1.7 Fungi Resistance.

8.2 *Inspection Requirements*—The following requirements are generally emphasized for purposes of acceptance sampling of lots of qualified thermal insulation:

TABLE 1 Coverage Chart

NOTE 1—Chart is occasionally given in metric units.

<i>R</i> Value at 75°F Mean Temperature	Maximum Net Coverage		Minimum Thickness	Minimum Weight per ft ²
To obtain an insulation resistance (<i>R</i>) of: $\frac{h \cdot ft^2 \cdot ^\circ F}{Btu}$	Minimum bags per 1000 ft ² of net area (bags/MSF)	Maximum ft ² coverage per bag (ft ²)	Installed insulation to be not less than: (in.)	Settled thickness not to be less than: (in.) The weight per ft ² of installed insulation to be not less than: (lbs/ft ²)
Attic:				
11				
13				
15				
19				
22				
26				
30				
33				
38				
44				
49				
60				
Sidewalls ^A : <i>R</i> —				

^A Optional information for products intended for sidewall application.