



Designation: **C800—14 C800 – 19**

Standard Specification for Fibrous Glass Blanket Insulation (Aircraft Type)¹

This standard is issued under the fixed designation C800; 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 U.S. Department of Defense.

1. Scope

1.1 This specification covers the composition, size, dimensions, and physical properties of glass fiber blanket thermal and acoustical insulation for use up to 700°F (370°C) in aircraft applications. For specific applications, the maximum temperature shall be agreed upon between the supplier and the purchaser.

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, health, and environmental practices and determine the applicability of regulatory limitations 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:²

C167 Test Methods for Thickness and Density of Blanket or Batt 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

C390 Practice for Sampling and Acceptance of Thermal Insulation Lots

C411 Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation

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

~~C552~~C522 Specification for Cellular Glass Thermal Insulation Test Method for Airflow Resistance of Acoustical Materials

C1045 Practice for Calculating Thermal Transmission Properties Under Steady-State Conditions

C1058 Practice for Selecting Temperatures for Evaluating and Reporting Thermal Properties of Thermal Insulation

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

C1511 Test Method for Determining the Water Retention (Repellency) Characteristics of Fibrous Glass Insulation (Aircraft Type)

C1559 Test Method for Determining Wicking of Fibrous Glass Blanket Insulation (Aircraft Type)

D5034 Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

F1110 Test Method for Sandwich Corrosion Test

2.2 Other Standards

14 CFR FAR (Federal Aviation Regulations) 25.853 Appendix F, Part I³

14 CFR FAR (Federal Aviation Regulations) 25.856(a) Appendix F, Part IV³

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.

Current edition approved Feb. 1, 2014; Sept. 1, 2019. Published July 2014; September 2019. Originally approved in 1975. Last previous edition approved in 2008 as C800 – 08; C800 – 14. DOI: 10.1520/C0800-14; 10.1520/C0800-19.

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, National Archives and Records Administration 8601 Adelphi Road College Park, MD 20740-6001.

3. Terminology

3.1 *Definitions*—Terminology **C168** shall be considered as applying to the terms used in this specification. Definitions in Test Method **E552C522** shall be considered as applying to the acoustical terms used in this standard.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *Wetting*—A condition where the water has penetrated into the insulation and fills the spaces between the fibers.

4. Classification

4.1 Fibrous glass blanket insulation covered by this specification shall be classified into Types based on temperature limits, Classes based on acoustical properties, Grades based on nominal density and Groups based upon thickness as shown in **Table 1**.

4.2 The insulation shall be either water repellent or non-water repellent.

5. Ordering Information

5.1 The type, class, grade, and group suited to the conditions of intended service shall be specified by the purchaser after consultation with the supplier. Type refers to service temperature, class refers to thermal/acoustical properties, grade refers to nominal density and group refers to thickness of insulation.

5.2 It shall also be specified whether the insulation is to be water repellent or non-water repellent.

6. Materials and Manufacture

6.1 *Composition:*

6.1.1 Fiber shall be glass processed from a molten state into fibrous form.

6.1.2 Binder shall be of a type and quantity to provide the properties and performance listed in this specification. Additives can be included to provide a degree of water repellency.

6.1.3 This product is typically supplied unfaced.

6.1.4 The basic product can also be obtained in uncured form for molding into special shapes other than blanket. However, not all requirements in this specification apply. The purchaser shall consult the supplier and agree on the portions of this specification and conditions that are applicable.

6.2 For sizes and densities other than those listed, the purchaser shall consult the material supplier.

7. Physical Requirements

7.1 The insulation shall conform to the requirements described in **7.2 – 7.11** and **Tables 1-5**.

7.2 *Density*—The insulation shall conform to the requirements shown in **Table 1**. The insulation shall have a maximum density tolerance when tested in accordance with 11.6 of + 15%, with no minimum limit.

TABLE 1 Types, Classes, Grades and Groups

Type I— For Use to 450°F (232°C) ClassAA							
Nominal Density		Maximum Density			Color	Nominal Thickness	
Grade	lb/ft ³	kg/m ³	lb/ft ³ (kg/m ³)		(unless otherwise specified)	Group	in. (mm)
A	0.34	(5.5)	0.39 (6.33)	Medium gray		1	0.38 (9.5)
B	0.42	(6.7)	0.48 (7.71)	Amber		2	0.50 (13)
C	0.50	(8.0)	0.58 (9.2)	Medium gray		3	1.00 (25)
D	0.60	(9.6)	0.69 (11.0)	Green		4	1.50 (38)
E	1.20	(19)	1.38 (21.9)	Medium gray		5	2.00 (51)
F	1.50	(24)	1.73 (27.6)	Amber			
G	1.00	(16)	1.15 (18.4)	Orange			
Class B							
Nominal Density		Maximum Density				Nominal Thickness	
Grade	lb/ft ³	kg/m ³	lb/ft ³ (kg/m ³)			Group	in. (mm)
A	0.50	(8.0)	0.58 (9.2)	Amber		1	0.38 (9.5)
B	0.60	(9.6)	0.69 (11.0)	Amber		2	0.50 (13)
C	1.00	(16)	1.15 (18.4)	Amber		3	1.00 (25)
						4	2.00 (50)
Type II—For Use to 700°F (370°C)							
Class AA							
Nominal Density		Maximum density		Color	Nominal Thickness		
Grade	lb/ft ³	kg/m ³	lb/ft ³ (kg/m ³)		Group	in.	(mm)
A	0.60	(9.6)	0.69 (11.0)	White to light tan	1	0.38	(9.5)
B	1.00	(16)	1.15 (18.4)	White to light tan	2	0.50	(13)
C	3.00	(48)	3.45 (55.2)	White to light tan	3	1.00	(25)

TABLE 2 Other Properties

Property	Requirement, max
<i>Wicking:</i>	
Before Aging and Before Leaching, in. (mm)	¼ (6.4)
After Aging, in. (mm)	¼ (6.4)
After Leaching, in. (mm)	¼ (6.4)
<i>Water Repellency, lb. (kg):</i> ^A	0.044 (0.020)

^A Average of three test specimens.

7.3 *Handleability*—Each piece of insulation shall be sufficiently coherent to permit transportation and installation as a unit.

7.4 *Burning Characteristics*—The insulation shall conform to the requirements in FAR 25.853, Appendix F, Part I and the encapsulated insulation blanket shall conform to the requirements in FAR 25.856(a) in accordance with 11.1. If required, unfaced blankets are tested with alternative methods or requirements recognized by airframe manufacturers to demonstrate and maintain product consistency.

7.5 *Wicking (water-repellent insulation only)*—The insulation shall conform to the requirements in Table 2, when test in accordance with 11.2.

7.6 *Odor Emission*—A detectable odor of objectionable nature recorded by more than two of the five panel members shall constitute failure of the material, when tested in accordance with 11.3.

7.7 *Service Temperature*—The insulation shall conform to the requirements in Table 1, when tested in accordance with 11.7.

7.7.1 Insulation shall be serviceable up to the maximum temperature limitations as long as limited mechanical properties are required. At maximum or near-maximum service temperatures, some deterioration of the binder is possible over extended periods of time.

7.8 *Apparent Thermal Conductivity*—Values shall not exceed those in Table 3, when tested in accordance with 11.9.

7.9 *Specific Transverse Airflow Resistance*—The insulation shall conform to the requirements in Table 4, when tested in accordance with 11.4.

7.10 *Breaking Strength*—The insulation shall conform to the requirements in Table 5, when tested in accordance with 11.5.

7.11 *Water Repellency (water-repellent insulation only)*—The insulation shall conform to the requirements of Table 2, when tested in accordance with 11.8.

7.12 The insulation shall be rated 0 (no visible corrosion) when tested per the requirements of Test Method F1110 on non-clad aluminum (2024T3).

8. Dimensions and Permissible Variations

8.1 *Length and Width*—The average measured length and width shall not differ from the manufacturer’s standard dimensions by more than the following:

- Length—6 in. (152 mm), with excess permitted;
- Width ±0.5 in. (13 mm).

8.2 *Thickness*—Insulation shall recover to within the following values of the nominal thickness:
Less than 1-in. (25.1-mm) thick ± 20 %

- when tested per the requirements within C167.
- 1 in. (25.4 mm) or greater in thickness ± 0.25 in. (6.4 mm)

8.3 *Dimensions*, shall be tested in accordance with 11.6.

8.4 *Standard Sizes*—As agreed upon between customer and manufacturer.

9. Workmanship, Finish, and Appearance

9.1 The insulation units shall indicate good workmanship in fabrication and shall not have visible defects that adversely affect their service qualities.

10. Sampling

10.1 The insulation shall be sampled in accordance with Practice C390. Specific provision for sampling shall be as agreed upon between the purchaser and the supplier as part of the purchase contract.

11. Test Methods

11.1 *Burning Characteristics*: Testing shall be conducted according to and burning characteristics shall meet the appropriate section of FAR (Federal Aviation Regulation) 25.853, Appendix F Part I and the encapsulated insulation blanket shall conform to the requirements in FAR 25.856(a) flame propagation test in Appendix F, Part IV.