



Designation: E 1975 – 01

Standard Specification for Shelter, Electrical, Equipment S-280/G¹

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1. Scope

1.1 This specification covers one type of lightweight field and mobile shelter designed for transport by cargo truck, fixed or rotary winged aircraft, by rail, and ship, as Shelter, Electrical Equipment S-280/G (see 15.5).

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 The following safety hazards caveat refers only to the test methods described in this specification. *This standard does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of the user of the 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:

- C 272 Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions²
- C 273 Test Method for Shear in Flatwise Plane of Flat Sandwich Constructions or Sandwich Cores²
- D 1621 Test Method for Compressive Strength of Rigid Cellular Plastics³
- D 1622 Test Method for Apparent Density of Rigid Cellular Plastics³
- D 2842 Test Method for Water Absorption of Rigid Cellular Plastics⁴
- E 864 Practice for Preparation of Aluminum Alloys to be Adhesively Bonded in Honeycomb Shelter Panels⁵
- E 1730 Specification for Rigid Foam for Use in Shelter Sandwich Panel Cores⁵
- E 1749 Terminology Relating to Rigid Wall Relocatable Shelters⁵
- E 1773 Practice for Sealing Rigid Wall Tactical Shelters with Polysulfide Based Sealants⁵
- E 1794 Specification for Adhesive for Bonding Foam Cored

Sandwich Panels (200°F Elevated Humidity Service), Type II Panels⁵

E 1801 Practice for Adhesive Bonding of Aluminum Facings in Foam and Beam Type Shelters⁵

E 1851 Test Method for Electromagnetic Shielding Effectiveness of Durable Rigid Wall Relocatable Structures⁵

E 1925 Specification for Engineering and Design Criteria for Rigid Wall Relocatable Structures⁵

2.2 Federal Air Regulation (FAR):

FAR 25.853 Compartment Interior⁶

2.3 Military Standards:

MIL-W-6858 Welding Resistance: Aluminum, Magnesium, Non-Hardening Steels or Alloys, Nickel Alloys, Nickel Alloys, Heat-Resisting Alloys and Titanium Alloys; Spot and Seam⁷

MIL-M-13231 Marking of Electronic Items⁷

MIL-F-14072 Finishes for Ground Electronic Equipment⁷

MIL-DTL-55507 Shelter, Electrical Equipment, (With or Without Equipment), Packaging of⁷

MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes⁷

MIL-STD-202 Test Methods for Electronic and Electrical Component Parts⁷

MIL-STD-252 Classification of Visual and Mechanical Defects for Equipment, Electronic, Wired, and Other Devices⁷

MIL-STD-810 Environmental Engineering Considerations and Laboratory Tests⁷

MIL-STD-1235 Single and Multilevel Continuous Sampling Procedures and Tables for Inspection by Attributes⁷

MIL-STD-1595 Qualification of Aircraft, Missile and Aerospace Fusion Welders⁷

2.4 Drawings:

SC-D-36423 Hold Down Assembly⁸

SC-C-36424 Cable Assembly⁸

SC-C-200154 Keeper⁸

SM-D-450462 Panel Assembly, Emergency Exit⁸

SM-C-450466 Air Filter⁸

SM-C-555515 Shock Mount⁸

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² Annual Book of ASTM Standards, Vol 15.03.

³ Annual Book of ASTM Standards, Vol 08.01.

⁴ Annual Book of ASTM Standards, Vol 08.02.

⁵ Annual Book of ASTM Standards, Vol 04.11.

⁶ Available from Flight Standards Service, Federal Aviation Administration, 800 Independence Ave., SW, Washington, DC 20591.

⁷ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁸ Available from U.S. Army Natick Research, Development, and Engineering Center, Attn: SSCNC-WST, Natick, MA 01760-5018.

SM-B-563756 Sealer⁸
 SC-D-595509 Cover, Emergency Exit⁸
 SC-B-595564 Core Material-Urethane, Light⁸
 SC-B-595565 Core Material-Urethane, Heavy⁸
 SM-D-615264 Intake Louver Assembly⁸
 DL-SC-A-621051 Modification Kit, Radio Frequency Interference, MK-1079/G⁸
 SM-D-781242 Door Fixture (S-280) Construction Tightness Test⁸
 SM-D-781243 Drain Fixture (S-280) Construction Tightness Test⁸
 SM-D-781244 S-280 Construction Tightness Test⁸
 DL-SM-D-947080 Shelter, Electrical Equipment S-280C/G⁸
 SM-D-947080 Shelter, Electrical Equipment S-280C/G⁸
 SM-D-947081 Panel Assembly, Front⁸
 SM-D-947082 Panel Assembly, Rear⁸
 SM-D-947083 Panel Assembly, Roof⁸
 SM-D-947084 Panel Assembly, Floor⁸
 SM-D-947085 Panel Assembly, Side⁸
 SM-D-947141 Corner, Lifting Eye (Machining)⁸
 SM-D-947142 Corner, Towing Eye (Machining)⁸
 SM-D-947143 Casting, Lifting and Towing Eye⁸
 SM-D-947160 Door Jamb Assembly⁸
 SM-D-947166 Door Assembly⁸
 SM-D-947235 Mounting Bracket, Skid⁸
 SM-C-947237 Shock Mount⁸
 SM-D-947238 Skid Assembly⁸
 SM-B-947179 Bonding Procedure⁸
 SM-B-947180 Cleaning Procedure⁸
 SM-D-947181 Flatness and Squareness Measurements⁸
 SM-B-947184 Adhesive⁸
 SM-D-947186 Test Weight Installation⁸
 SM-C-947230 Shock Mount⁸
 17-1-3274 Shelter, Electrical Equipment, S-280C/G (Shielded)⁸

3. Terminology

3.1 Definitions:

3.1.1 delaminations—for the purpose of this specification, a delamination is defined as the condition that exists within a shelter section or panel when two surfaces that once were bonded together are no longer bonded together. Delaminations may occur between any two bonded surfaces, examples include: separations between thermal barriers and members, between thermal barriers and skins, between members and core, or between skins and core. They may be the result of a poor quality bond or they could occur due to misuse or severe handling of the panels or the shelter after bonding. Test requirements of this specification shall not be construed as misuse or severe handling as these terms apply to the definition of delaminations (see 5.4).

3.1.2 examination—examination consists of simple, generally nondestructive determinations of compliance, without the use of special testing equipment.

3.1.3 inspection—inspection is the examination or testing, or both, of supplies to determine compliance with the applicable requirements. Sampling is an element of inspection.

3.1.4 testing—testing consists of determinations of compliance, using technical means.

3.1.5 voids—for the purpose of this specification, a void is defined as any unauthorized separation or space within a shelter panel or section, that is, any separation or space that is in conflict with the drawings or other contractual requirements. Voids range from gaps as wide as the space created by a missing piece of core material to as thin as a break in the continuity of material. Voids may be located solely within one type of material, such as a core material separation; they may exist between adjacent materials, such as unbonded core material; or they may be located between other parts within a panel, such as where a piece of material is missing, damaged, or undersized. Voids may have been created at the time of construction, such as where a part was omitted; or may be created at a later time, such as a core separation or delaminated skin (see 5.4).

NOTE 1—All other terminology related to this specification is defined in Terminology E 1749.

4. Material Requirements

4.1 General—Materials used in the construction of this item shall be in accordance with the following requirements:

4.2 Core Material—Core material density, compressive strength, shear strength, flammability, and water absorption properties shall be in accordance with Specification E 1730 and Drawings SC-B-595564 and SC-B-595565, as applicable (see 12.2.1, 10.1, Table 1, and Table 2).

4.3 Adhesive—The shear strength of the cured adhesive and its bond to aluminum shall be in accordance with requirements of Specification E 1794 and the Drawing SM-B-947184. This requirement shall apply to the low temperature, room temperature, and high temperature conditions and after the humidity exposure and salt spray exposure conditions required by SM-B-947184 (see 12.2.2, 12.2.3, 10.2, 10.2.2, Table 1, and Table 2).

4.4 Sealer—The shear strength of the cured sealer and its bond to aluminum shall be in accordance with the following (see 10.2, 10.2.2, Table 1, and Table 2):

4.4.1 Low Temperature—200 psi (1.4 MPa) when tested at $-65 \pm 5^\circ\text{F}$ ($-54 \pm 3^\circ\text{C}$) (see 12.2.2 and Table 2),

4.4.2 Room Temperature—200 psi (1.4 MPa) when tested at

TABLE 1 First Article Specimens

Inspection	Quantity	Requirements Subsection	Test Subsection
Core material:		4.2	10.1
Density	5 for every grade or type	4.2	10.1.1
Compressive strength	5 for every grade or type	4.2	10.1.2
Shear strength	5 for every grade or type	4.2	10.1.3
Flammability	5 for every grade or type	4.2	10.1.4
Water absorption	3 for every grade or type of urethane	4.2	10.1.5
Adhesive	50 coupons	4.3	10.2
Sealer	50 coupons	4.4	10.2
Shock mounts	SM-C-555515: 3 per –3 SM-C-947237: 3 each SM-C-947230: 3 each	4.5	10.3.1
Impact panel	1 from wall, 1 from floor	5.4.1	10.7
Hold down assembly	1 complete	9.2	10.32
Eye casting hardness	1 casting per SM-D-947143	7.5.2	10.24.2