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Standard Specification for Shelter, Electrical, Equipment S-280/G[1]

This standard is issued under the fixed designation E 1975; 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.

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 Constructions[2]

C 273 Test Method for Shear in Flatwise Plane of Flat Sandwich Constructions or Sandwich Cores[2]

D 1621 Test Method for Compressive Strength of Rigid Cellular Plastics[3]

D 1622 Test Method for Apparent Density of Rigid Cellular Plastics[3]

D 2842 Test Method for Water Absorption of Rigid Cellular Plastics[4]

E 864 Practice for Preparation of Aluminum Alloys to be Adhesively Bonded in Honeycomb Shelter Panels[5]

E 1730 Specification for Rigid Foam for Use in Shelter Sandwich Panel Cores[5]

E 1749 Terminology Relating to Rigid Wall Relocatable Shelters[5]

E 1773 Practice for Sealing Rigid Wall Tactical Shelters with Polysulfide Based Sealants[5]

E 1794 Specification for Adhesive for Bonding Foam Cored Sandwich Panels (200°F Elevated Humidity Service), Type II Panels[5]

E 1801 Practice for Adhesive Bonding of Aluminum Facings in Foam and Beam Type Shelters[5]

E 1851 Test Method for Electromagnetic Shielding Effectiveness of Durable Rigid Wall Relocatable Structures[5]

E 1925 Specification for Engineering and Design Criteria for Rigid Wall Relocatable Structures[5]

2.2 *Federal Air Regulation (FAR):*

FAR 25.853 Compartment Interior[6]

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 Seam[7]

MIL-M-13231 Marking of Electronic Items[7]

MIL-F-14072 Finishes for Ground Electronic Equipment[7]

MIL-DTL-55507 Shelter, Electrical Equipment, (With or Without Equipment), Packaging of[7]

MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes[7]

MIL-STD-202 Test Methods for Electronic and Electrical Component Parts[7]

MIL-STD-252 Classification of Visual and Mechanical Defects for Equipment, Electronic, Wired, and Other Devices[7]

MIL-STD-810 Environmental Test Methods[7]

MIL-STD-1235 Single and Multilevel Continuous Sampling Procedures and Tables for Inspection by Attributes[7]

MIL-STD-1595 Qualification of Aircraft, Missile and Aerospace Fusion Welders[7]

2.4 *Drawings:*

SC-D-36423 Hold Down Assembly[8]

SC-C-36424 Cable Assembly[8]

SC-C-200154 Keeper[8]

SM-D-450462 Panel Assembly, Emergency Exit[8]

SM-C-450466 Air Filter[8]

SM-C-555515 Shock Mount[8]

SM-B-563756 Sealer[8]

[1] This specification is under the jurisdiction of ASTM Committee E-16 on Performance of Buildings and is the direct responsibility of Subcommittee E06.53 on Materials and Processes for Durable Rigid Wall Relocatable Structures.

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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.

SC-D-595509 Cover, Emergency Exit[8]
SC-B-595564 Core Material-Urethane, Light[8]
SC-B-595565 Core Material-Urethane, Heavy[8]
SM-D-615264 Intake Louver Assembly[8]
DL-SC-A-621051 Modification Kit, Radio Frequency Interference, MK-1079/G[8]
SM-D-781242 Door Fixture (S-280) Construction Tightness Test[8]
SM-D-781243 Drain Fixture (S-280) Construction Tightness Test[8]
SM-D-781244 S-280 Construction Tightness Test[8]
DL-SM-D-947080 Shelter, Electrical Equipment S-280C/G[8]
SM-D-947080 Shelter, Electrical Equipment S-280C/G[8]
SM-D-947081 Panel Assembly, Front[8]
SM-D-947082 Panel Assembly, Rear[8]
SM-D-947083 Panel Assembly, Roof[8]
SM-D-947084 Panel Assembly, Floor[8]
SM-D-947085 Panel Assembly, Side[8]
SM-D-947141 Corner, Lifting Eye (Machining)[8]
SM-D-947142 Corner, Towing Eye (Machining)[8]
SM-D-947143 Casting, Lifting and Towing Eye[8]
SM-D-947160 Door Jamb Assembly[8]
SM-D-947166 Door Assembly[8]
SM-D-947235 Mounting Bracket, Skid[8]
SM-C-947237 Shock Mount[8]
SM-D-947238 Skid Assembly[8]
SM-B-947179 Bonding Procedure[8]
SM-B-947180 Cleaning Procedure[8]
SM-D-947181 Flatness and Squareness Measurements[8]
SM-B-947184 Adhesive[8]
SM-D-947186 Test Weight Installation[8]
SM-C-947230 Shock Mount[8]
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 ± 5°F (–54 ± 3°C) (see 12.2.2 and Table 2),

4.4.2 *Room Temperature*—200 psi (1.4 MPa) when tested at 80 ± 10°F (27 ± 6°C) (see 12.2.3 and Table 2),

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