



Designation: E1975 – 22

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

This standard is issued under the fixed designation E1975; 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 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 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 The following safety hazards caveat refers only to the test methods described 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, 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

- C273/C273M Test Method for Shear Properties of Sandwich Core Materials
- D1621 Test Method for Compressive Properties of Rigid Cellular Plastics
- D1622/D1622M Test Method for Apparent Density of Rigid Cellular Plastics
- D2842 Test Method for Water Absorption of Rigid Cellular Plastics

¹ This specification is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.53 on Materials and Processes for Durable Rigidwall Relocatable Structures.

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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.

E631 Terminology of Building Constructions

E864 Practice for Surface Preparation of Aluminum Alloys to Be Adhesively Bonded in Honeycomb Shelter Panels

E1730 Specification for Rigid Foam for Use in Structural Sandwich Panel Cores

E1749 Terminology Relating to Rigid Wall Relocatable Shelters

E1773 Practice for Sealing Rigid Wall Tactical Shelters with Polysulfide Based Sealants

E1794 Specification for Adhesive for Bonding Foam Cored Sandwich Panels (200 °F Elevated Humidity Service), Type II Panels

E1801 Practice for Adhesive Bonding of Aluminum Facings in Foam and Beam Type Shelters

E1851 Test Method for Electromagnetic Shielding Effectiveness of Durable Rigid Wall Relocatable Structures

E1925 Specification for Engineering and Design Criteria for Rigid Wall Relocatable Structures

2.2 AWS Standards:³

AWS D17.1/D17.1M Specification for Fusion Welding of Aerospace Applications

AWS D17.2/D17.2M Specification for Resistance Welding for Aerospace Applications

2.3 Federal Air Regulation (FAR):⁴

FAR 25.853 Compartment Interior

2.4 Military Standards:

MIL-DTL-14072 Finishes for Ground Electronic Equipment⁵

MIL-DTL-53039 Coating, Aliphatic Polyurethane, Single Component, Chemical Agent Resistant⁵

MIL-DTL-55507 Shelter, Electrical Equipment, (With or Without Equipment), Packaging of⁵

MIL-STD-202 Electronic and Electrical Component Parts⁵

MIL-STD-252 Wired Equipment, Classification of Visual and Mechanical Defects for Equipment, Electronic, Wired, and Other Devices⁵

³ Available from American Welding Society (AWS), 8669 NW 36 St., #130, Miami, FL 33166-6672, <http://www.aws.org>.

⁴ Available from Flight Standards Service, Federal Aviation Administration (FAA), 800 Independence Ave., SW, Washington, DC 20591, <http://www.faa.gov>.

⁵ Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

MIL-STD-810G Environmental Engineering Considerations and Laboratory Tests⁵

MIL-STD-1916 DOD Preferred Methods for Acceptance of Product⁶

MIL-STD-13231 Marking of Electronic Items⁵

2.5 Drawings:⁶

SC-D-36423 Hold Down Assembly

SC-D-36424 Cable Assembly

SC-C-200154 Keeper

SM-D-450462 Panel Assembly, Emergency Exit

SM-C-450466 Air Filter

SM-C-555515 Shock Mount

SM-B-563756 Sealer

SC-D-595509 Cover, Emergency Exit

SC-B-595564 Core Material-Urethane, Light

SC-B-595565 Core Material-Urethane, Heavy

SM-D-615264 Intake Louver Assembly

DL-SC-A-621051 Modification Kit, Radio Frequency Interference, MK-1079/G

SM-D-781242 Door Fixture (S-280) Construction Tightness Test

SM-D-781243 Drain Fixture (S-280) Construction Tightness Test

SM-D-781244 S-280 Construction Tightness Test

DL-SM-B-947080 Shelter, Electrical Equipment S-280C/G

SM-D-947080 Shelter, Electrical Equipment S-280C/G

SM-D-947081 Panel Assembly, Front

SM-D-947082 Panel Assembly, Rear

SM-D-947083 Panel Assembly, Roof

SM-D-947084 Panel Assembly, Floor

SM-D-947085 Panel Assembly, Side

SM-D-947141 Corner, Lifting Eye (Machining)

SM-D-947142 Corner, Towing Eye (Machining)

SM-D-947143 Casting, Lifting and Towing Eye

SM-D-947160 Door Jamb Assembly

SM-D-947166 Door Assembly

SM-B-947179 Bonding Procedure

SM-B-947180 Cleaning Procedure

SM-D-947181 Flatness and Squareness Measurements

SM-B-947184 Adhesive

SM-D-947186 Test Weight Installation

SM-C-947230 Shock Mount

SM-D-947235 Mounting Bracket, Skid

SM-C-947237 Shock Mount

SM-D-947238 Skid Assembly

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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 Terminologies E631 and E1749.

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 E1730 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 E1794 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 $-65^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($-54^{\circ}\text{C} \pm 3^{\circ}\text{C}$) (see 12.2.2 and Table 2).

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

⁶ Available from U.S. Army Natick Soldier Research, Development, and Engineering Center, ATTN: RDNS-SEE-T, 15 General Greene Avenue, Natick, MA 01760-5018, <https://www.army.mil/info/organization/natick>.