



Standard Practice for Adhesive Bonding of Aluminum Facings in Foam and Beam Type Shelters¹

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1. Scope

1.1 This practice covers the materials, processes, and quality controls to be used in the manufacture of adhesive-bonded, aluminum-faced, foam core sandwich panels for tactical shelters.

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

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:

- B 209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate²
- E 1730 Specification for Rigid Foam for Use in Shelter Sandwich Panel Cores³
- E 1749 Terminology of Rigid Wall Relocatable Shelters³
- E 1793 Practice for the Preparation of Aluminum Alloy for Bonding in Foam and Beam Type Transportable Shelters³
- E 1794 Specification for Adhesive for Bonding Foam Cored Sandwich Panels (200°F Elevated Humidity Service), Type II Panels³
- E 1800 Specification for Adhesive for Bonding Foam Cored Sandwich Panels (160°F Elevated Humidity Service), Type I Panels³

3. Significance and Use

3.1 The formation of reproducible, durable adhesive bonds in structural units requires great care in the performance of the steps in the bonding process. Experience has shown that adhesive bonding carried out in accordance with this practice produces reproducible adhesive bonds. This practice is appli-

cable to both the Type 1, 71°C (160°F), and Type 2, 93°C (200°F), elevated humidity service type of foam and beam shelter.

4. Facilities

4.1 *Panel Assembly Layup Area*—The panel assembly layup area shall be a ventilated area maintained at a minimum temperature of 20°C (68°F). The area shall be free of oils, grease, silicone, lint, or other contaminants detrimental to the production of adhesive bonds.

4.2 *Post-Curing Rooms*—The post-curing rooms shall provide a uniform temperature distribution over all panels and over all portions of the panels exposed for post-curing. The total temperature range shall be no more than 14°C (25°F).

5. Apparatus

5.1 *Pressure Equipment*—Pressure equipment for bonding of shelter panels shall be large enough to permit the bonding of a complete panel in one step. The manufacturer shall provide calibration and test data demonstrating that the temperature on the two facings of the press platens during bonding will be equal and uniform within $\pm 3^\circ\text{C}$ ($\pm 5^\circ\text{F}$) of the indicated temperature. The platens shall be flat to within 0.08 mm/305 mm (0.003 in./ft) and shall be smooth having a maximum surface roughness of 125 rms. The pressure equipment shall be equipped with temperature and pressure recorders and controls that accurately control heat-up, pressure applied, and dwell time.

5.2 *Calibrations, Temperature and Pressure Requirements, and Controls*—Gages shall be calibrated every 6 months by an accredited independent laboratory or by the panel manufacturer if approved by the purchaser. All calibrations shall be traceable to the National Institute of Standards and Technology. The latest calibration certificate shall be attached to the equipment near each gage. Thermocouples placed at each corner and at the center of each facing shall be used to demonstrate the uniformity of the temperature. A permanent record of the pressure, time, and temperature during bonding shall be maintained.

5.3 *Calibration of Testing Equipment*—Calibration of the required testing equipment shall be done in accordance with the equipment manufacturer's instructions. All calibrations of test equipment required by this practice shall be traceable to the National Institute of Standards and Technology.

¹ This practice 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 *Annual Book of ASTM Standards*, Vol 02.02.

³ *Annual Book of ASTM Standards*, Vol 04.11.