Designation: E 990 – 04

An American National Standard

Standard Specification for Core-Splice Adhesive for Honeycomb Sandwich Structural Panels[1]

This standard is issued under the fixed designation E 990; 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 core-splice adhesive for use with nonmetallic honeycomb cores in the fabrication of honeycomb sandwich panels used in relocatable structures. The adhesive shall be used for new production or depot repair. The adhesive shall be suitable for forming bonds that can withstand long combinations of stress, temperature, and relative humidity expected to be encountered in service. The adhesive shall be used for bonding core segments and for bonding core segments to edge members and to integral members in a honeycomb sandwich panel. The adhesive shall not allow the transfer of water from one part of the panel to another either through or along the line of the adhesive.

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 The following precautionary caveat pertains only to the test method portion, Section 5, of 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:* [2]

B 209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate

C 393 Test Method for Flexural Properties of Sandwich Constructions

D 792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

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

E 865 Specification for Structural Film Adhesives for Honeycomb Sandwich Panels

E 874 Practice for Adhesive Bonding of Aluminum Facings to Nonmetallic Honeycomb Core for Shelter Panels

E 1091 Specification for Nonmetallic Honeycomb Core for Use in Shelter Panels

2.2 *Federal Standards:*

QQ-A-250/4 Aluminum Alloy 2024, Plate and Sheet[3]

QQ-A-250/8d Aluminum Alloy 5052H34, Plate and Sheet[3]

QQ-A-250/11d Aluminum Alloy 6061T6, Plate and Sheet[3]

2.3 *Military Standards:*

MIL-S-8802 Sealing Compound, Temperature-Resistant, Integral Fuel Tanks, and Fuel Cell Cavities, High-Adhesion[3]

3. Materials and Manufacture

3.1 The adhesive shall be free of foreign materials, be noncorrosive to the metal parts, and have the structural integrity equal to or better than that of an unspliced panel section as specified in Table 1, Flexural Sheer.

4. Requirements

4.1 *Material*—The adhesive shall be thermosetting and when tested in accordance with Section 5, shall meet the requirements of Table 1. The adhesive shall not have a deleterious effect on the panel nor on its component parts over the range of temperature at which the adhesive will be used. This adhesive shall be compatible and capable of co-curing with the structural film adhesive (Specification E 865) used to fabricate the panel.

4.2 *Form*—The adhesive shall be of film form either 1.27 mm (0.051 in.) or 2.54 mm (0.100 in.) thick and shall be capable of expanding to at least 1.75 times its original thickness.

4.3 *Working Characteristics*:

4.3.1 *Application*—The adhesive shall be suitable for application to core material, edge members, and integral parts in accordance with the manufacturer's instructions at temperatures from 18 to 30°C (65 to 85°F) and at relative humidities of up to 50 %.

[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 Rigid Wall 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.

[3] Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098

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