



Designation: C 659 – 90 (Reapproved 1998)

Standard Specification for Asbestos-Cement Organic-Foam Core Insulating Panels¹

This standard is issued under the fixed designation C 659; 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 Department of Defense.

1. Scope

1.1 This specification covers asbestos-cement plastic-foam core panels consisting of a core of insulating cellular plastic sandwiched between and bonded to two sheets of asbestos-cement facing board. Asbestos-cement plastic-foam core panels are normally nonload-bearing panels designed for exterior and interior walls, partitions, curtain walls, and other insulation and decorative purposes.

1.2 All measurements and tests necessary for determining the conformity of asbestos-cement plastic-foam core panels with this specification are made in accordance with the methods covered in Sections 10 and 6.

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

1.4 *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. See 10.1.2 for a specific hazard warning.*

2. Referenced Documents

2.1 ASTM Standards:

C 220 Specification for Flat Asbestos-Cement Sheets²

C 236 Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box³

C 355 Test Methods for Water Vapor Transmission of Thick Materials⁴

D 2341 Specification for Rigid Urethane Foam⁴

E 96 Test Methods for Water Vapor Transmission of Materials³

2.2 Federal Standard:

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)⁵

¹ This specification is under the jurisdiction of ASTM Committee C-17 on Fiber-Cement Products and is the direct responsibility of C17.03 on Asbestos-Cement Products.

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² Annual Book of ASTM Standards, Vol 04.05.

³ Annual Book of ASTM Standards, Vol 04.06.

⁴ Discontinued—Replaced by E96, See Annual Book of ASTM Standards, Vol 08.02.

⁵ Available from Standardization Documents, Order Desk, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094. Attn: NPODS.

2.3 Military Standard:

MIL-STD-129 Marking for Shipment and Storage⁵

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *flexural strength*, n —the average breaking load in newtons (or lbf) of specimens conditioned seven days at $23 \pm 2^\circ\text{C}$ and $50 \pm 10\%$ relative humidity, loaded as simple beams with the load applied equally and simultaneously at both one-third points of the span.

3.1.2 *thermal resistance*, R —of a panel, the difference in temperature which will develop under a given steady state heat flow between two parallel unit area surfaces for a given material thickness.

4. Materials and Manufacture

4.1 Asbestos-cement plastic-foam core sandwich panels shall be composed of a plastic-foam core sandwiched between and bonded to two asbestos-cement facing sheets. The sheets may be supplied with a factory-applied finish, a factory prime coat, or uncoated. In order to provide a balanced panel and prevent field warpage, the two asbestos-cement facings should have essentially equal vapor transmission rates.

5. Physical Properties

5.1 *Facings*—Asbestos-cement facing sheets shall conform to the requirements for Type F of Specification C 220 for 3.2-mm ($\frac{1}{8}$ -in.) thickness.

5.2 *Core*—The plastic-foam core as well as pertinent grade or type classification shall be as agreed upon by the purchaser and seller. If Urethane is used, it shall conform to the requirements of Specification D 2341.

5.3 *Strength Properties*—The average breaking load for panel specimens conditioned for seven days at $23 \pm 2^\circ\text{C}$ (70 to 77°F) and $50 \pm 10\%$ relative humidity shall not be less than that shown in Table 1.

5.4 *Vapor Permeability*—The vapor permeance of the composite panel is dependent not only on the foam core, but on the adhesive, facing sheets, and the coating on such facings. The vapor permeabilities shown in Table 2 are typical values for the core materials and are not restrictive values for the composite panel.

5.5 *Thermal Resistance*, R —The average thermal resistance, R , = $5^\circ\text{F}\cdot\text{ft} = 2\cdot\text{h/Btu}$ ($\text{K}\cdot\text{m} = 2/\text{W}$) = 6 of the panel