Designation: C1288 – 23

Standard Specification for Fiber-Cement Interior Substrate Sheets[1]

This standard is issued under the fixed designation C1288; 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 discrete fiber-cement sheets manufactured to be dimensionally stable and suitable for decoration as paint, wallpaper, natural stone, tile, or resilient flooring in internal wet and dry areas.

1.2 This specification is not applicable to fiber-cement flat sheets for exterior applications such as claddings, facades, curtain walls, and soffits (Specification C1186), gypsum backing board and coreboard (Specification C1396/C1396M), water-resistant gypsum backing board (Specification C1396/C1396M), glass mat gypsum backing board (Specification C1178/C1178M), glass mat gypsum panels (Specification C1658/C1658M), fiber-reinforced gypsum panels (Specification C1278/C1278M), particle boards (Definitions D1554), fiber mat cement boards (Specification C1325 and ANSI A118.9), or cement-bonded particleboards (Specification BS 5669: Part 4) and (ISO 8335).

1.3 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.

1.4 *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]

C1154 Terminology for Non-Asbestos Fiber-Reinforced Cement Products

C1178/C1178M Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel

C1185 Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards

C1186 Specification for Flat Fiber-Cement Sheets

C1278/C1278M Specification for Fiber-Reinforced Gypsum Panel

C1325 Specification for Fiber-Mat Reinforced Cementitious Backer Units

C1396/C1396M Specification for Gypsum Board

C1658/C1658M Specification for Glass Mat Gypsum Panels

D1037 Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials

D1554 Terminology Relating to Wood-Base Fiber and Particle Panel Materials

E84 Test Method for Surface Burning Characteristics of Building Materials

G21 Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

2.2 *ANSI Standards:*[3]

A118.1 Specification for Dry-Set Cement Mortar

A118.4 Specification for Modified Dry-Set Cement Mortar

A118.9 Test Methods and Specifications for Cementitious Backer Units

A136.1 Standard for Organic Adhesives for Installation of Ceramic Tile

2.3 *British Standards:*[3]

BS 5669: Part 4 Specification for cement bonded particleboard

2.4 *International Standards:*[3]

ISO 8335 Cement-bonded particleboards—Boards of Portland or equivalent cement reinforced with fibrous wood particles

3. Terminology

3.1 *Definitions*—Refer to Terminology C1154.

4. Classification

4.1 Flat sheets covered by this specification are intended for interior dry or wet area applications as a desired unfinished substrate or an unfinished substrate for decoration such as

[1] This specification is under the jurisdiction of ASTM Committee C17 on Fiber-Reinforced Cement Productsand is the direct responsibility of Subcommittee C17.02 on Fiber-Cement Products.

Current edition approved Dec. 1, 2023. Published December 2023. Originally approved in 1995. Last previous edition approved in 2017 as C1288–17ε1. DOI: 10.1520/C1288-23.

[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 American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

paint, wallpaper, natural stone, tile, or resilient flooring where dimensional stability is required.

4.2 They may be supplied coated or uncoated.

4.3 The sheets are further classified into four grades according to their flexural strengths. The manufacturer shall declare the grade of a given product in the literature for that product.

5. Composition and Manufacture

5.1 *Composition*—This specification is applicable to discrete fiber-cement flat sheets consisting essentially of an inorganic hydraulic binder or a calcium silicate binder formed by the chemical reaction of a siliceous material and a calcareous material reinforced by organic fibers, inorganic fibers, or both. Process aids, fillers, and pigments that are compatible with the fiber-cement may be added.

5.2 *Manufacture*—These products may be formed either with or without pressure and cured, under either natural or accelerated conditions, to meet the property requirements of this specification.

6. Mechanical and Physical Properties

6.1 Mechanical and physical properties shall be determined on uncoated product wherever practical. This material shall also be tested, with the results identified as applying to coated material, where the products are supplied coated.

6.1.1 Sampling and inspection for mechanical and physical properties shall be conducted in accordance with Test Methods C1185.

6.2 *Mechanical Properties:*

6.2.1 *Flexural Strength*—When tested in accordance with Test Methods C1185, flexural strength shall be not less than the corresponding value for the appropriate grade listed in Table 1. Where manufacturers state the minimum product strength, this shall be at the 4 % acceptable quality level (AQL) as are the values of Table 1.

6.2.2 Sheets shall be tested and specified in both the wet and equilibrium conditions, and they shall meet the minimum wet and minimum equilibrium flexural strength requirements for the appropriate grade specified in Table 1. In addition, the average wet flexural strength of the sample shall not be less than 50 % of the mean equilibrium strength of the sample.

NOTE 1—When sampling from continuous production, these tests may be conducted on dry, equilibrium, or saturated specimens, provided that a relationship can be established between this testing and the specified values.

6.3 *Physical Properties:*

TABLE 1 Flexural Strength Requirements

NOTE 1—The values of Table 1 are lower limit values based on an AQL of 4 %.

Grade	Minimum Wet Strength, psi (MPa)	Minimum Equilibrium Strength, psi (MPa)
I	580 (4)	580 (4)
II	1015 (7)	1450 (10)
III	1885 (13)	2320 (16)
IV	2610 (18)	3190 (22)

6.3.1 *Density*—Nominal values and tolerances for density shall be stated by the manufacturer for each product. When tested in accordance with the method specified in Test Methods C1185, the value for the density shall comply with the value stated by the manufacturer.

6.3.2 *Modulus of Elasticity*—Nominal values for modulus of elasticity shall be stated by the manufacturer for each product. When tested in accordance with the method specified in Test Methods C1185, the nominal value for the modulus of elasticity shall comply with the value stated by the manufacturer.

7. Dimensions and Permissible Variations

7.1 *Method of Measurement*—The method of measurement shall be in accordance with Test Methods C1185.

7.2 *Nominal Length and Width*—Fiber-cement sheets are typically supplied in nominal lengths of 96 in. (2438 mm) and 120 in. (3048 mm) and nominal widths of 48 in. (1219 mm). Greater or lesser nominal lengths and widths may be supplied.

7.3 *Nominal Thickness*—Fiber-cement sheets are normally available in thicknesses of ⅛ in. (3.5 mm) to 1 in. (25 mm), although thicknesses outside of this range may be supplied.

7.4 *Length and Width Tolerance*—The permissible variation from the nominal width shall be ±0.5 %, with a maximum variation of ± ¼ in. (6 mm). A maximum variation of ± ⅛ in. (3 mm) is acceptable for dimensions less than 24 in. (609 mm).

7.5 *Thickness Tolerance*—The maximum difference between extreme values of the thickness measurement within a sheet shall not exceed 15 % of the maximum measured value. The thickness variation from sheet to sheet shall not exceed the tolerances given in Table 2.

7.6 *Squareness Tolerance*—The length of the diagonals shall not vary by more than 1/32 in./ft. (2.6 mm/m) of the length of the sheet. Opposite sides of the sheet shall not vary in length by more than 1/32 in./ft. (2.6 mm/m).

7.7 *Edge Straightness Tolerance*—The sheet edges shall be straight within 1/32 in./ft. (2.6 mm/m) of length or width.

8. Workmanship, Finish, and Appearance

8.1 *Workmanship*—Sheets shall have a commercially uniformly smooth surface on one side, and they shall be free of major defects that will impair appearance, erection, use, or serviceability.

8.2 *Finish*—The surface of the sheet to be exposed shall be smooth, granular, or otherwise textured.

TABLE 2 Thickness Requirements

Nominal Thickness, in. (mm)	Tolerance, in. (mm)
⅛ to 3/16 (3.5–5)	±0.02 (0.5)
>3/16 to ⅜ (>5–10)	±0.04 (1.0)
>⅜ to ⅝ (>10 to 16)	±0.05 (1.3)
>⅝ to ¾ (>16 to 20)	±0.06 (1.5)
>¾ (>20)	±10 % thickness