



Designation: C1530/C1530M – 23

Standard Specification for Fiber-Cement Roofing Shakes, Shingles, and Slates with Designed Varying Profiles and Thicknesses¹

This standard is issued under the fixed designation C1530/C1530M; 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 fiber-cement roofing shakes, shingles, and slates that are of designed varying profiles and thicknesses manufactured to provide the weather-exposed surfaces on roofs of buildings.

1.2 This specification does not include details of product installation or system performance. Refer to the manufacturer's installation literature for proper installation instructions, to Specification C1459 for roofing systems performance, and to Test Method E108 for levels of fire resistance.

1.3 This specification is not applicable to fiber-cement products as specified in Specification C1225.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.5 *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.*

1.6 *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.*

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

Current edition approved Dec. 1, 2023. Published December 2023. Originally approved in 2002. Last previous edition approved in 2019 as C1530 – 04 (2019) ^{ϵ 1}. DOI: 10.1520/C1530_C1530M-23.

2. Referenced Documents

2.1 ASTM Standards:²

C1154 Terminology for Non-Asbestos Fiber-Reinforced Cement Products

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

C1225 Specification for Fiber-Cement Roofing Shingles, Shakes, and Slates

C1459 Specification for Performance of Non-Asbestos Fiber-Reinforced Cement Shake, Shingle, and Slate Roofing Systems

D3359 Test Methods for Rating Adhesion by Tape Test

E108 Test Methods for Fire Tests of Roof Coverings

E284 Terminology of Appearance

G152 Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

G153 Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

G155 Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials

3. Terminology

3.1 *Definitions*—Refer to Terminology C1154.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *breaking load, n*—the value of perpendicular force expressed in newtons (pound-force), as calculated from the breaking load of a test specimen, loaded as a simple beam, with the load applied to the center.

4. Manufacture and Composition

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

4.2 *Composition*—This specification is applicable to fiber-cement roofing products, consisting of an inorganic binder (for example, Portland cement) reinforced by discrete fibers.

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.

NOTE 1—Process aids, fillers, mineral aggregates, and pigments are permitted.

5. Mechanical and Physical Properties

5.1 Mechanical and physical properties, as defined in Section 9, shall be determined on uncoated and unsealed specimens, unless the coating is an integral part of the product. Where products are tested coated or sealed, the results shall be identified as pertaining to coated material. Coating surface changes as a consequence of mechanical testing shall not constitute a mechanical failure as long as such materials have passed all the physical properties required.

6. Supplementary Shapes

6.1 Supplementary shapes such as starter pieces, hip and ridge finishing pieces, and ridge rolls shall have the same general characteristics as the products which they are designed to complement.

7. Inspection and Acceptance

7.1 Inspection of material shall be at the point of shipment at the manufacturing facility. The inspector, representing the purchaser, shall have authorized access to the carriers being loaded for shipment to the purchaser. The purchaser shall be afforded all reasonable and available facilities at the point of shipment for sampling and inspection of the material, which shall be conducted so as not to interfere unnecessarily with the loading of the carriers.

7.2 Third party certification, including inspections conducted either continuously or at regular intervals, shall be recognized as the alternative to lot inspection.

7.3 The manufacturer shall set up a quality control program to inspect the product throughout the manufacturing process. Each production lot shall be marked or coded to identify the date of manufacture. The Quality Control Program shall have provisions to identify and set aside any material or finished product that appears defective and does not meet this specification.

7.4 Third party inspection for Quality Control Program Certification shall be made at a minimum of once per quarter. These inspections shall occur without notice at anytime the plant is in operation. ISO 9000 Self Certification shall be permitted in lieu of a third party Quality Control Inspection Program and quarterly inspections.

7.5 Failure to conform with any of the requirements of this specification shall constitute grounds for non-acceptance.

8. Production Quality Control Requirements

8.1 Sampling:

8.1.1 *Breaking Load Test*—A minimum of one test specimen per 500 m² [5382 ft²] exposed area of merchantable material produced shall be randomly selected from a consistent stage in the manufacturing process and tested for breaking load as defined in 8.2.1.

8.1.2 *Water Absorption Test*—A minimum of one test specimen per lot of merchantable material produced shall be randomly selected from a consistent stage in the manufacturing process and tested for water absorption as defined in 8.3.

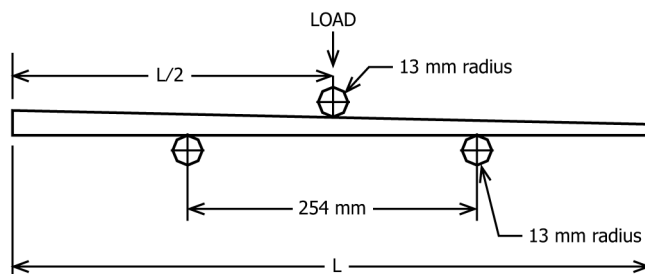


FIG. 1 Breaking Load Test Apparatus

8.2 Mechanical Requirements:

8.2.1 *Breaking Load Test Procedure*—Each test specimen shall be centered on two parallel metal supports, having a radius of 13 mm [$\frac{1}{2}$ in.], which shall be free to rotate (see Fig. 1). The center-to-center distance between the supports shall be 254 mm [10 in.]. A load shall be applied at the center of the span, with a metal bar of 13 mm [$\frac{1}{2}$ in.] radius, be parallel to the two parallel metal supports, and be in contact with the test specimen over its entire width. The load shall be applied at a uniform rate not exceeding 44.5 N [10 lb_f] per second until failure. The failing load for each test specimen shall be recorded to the nearest 9 N [2 lb_f]. Test results shall be recorded as N [lb_f].

8.2.2 Precision and Bias:

8.2.2.1 *Precision*—The precision of the procedure in this standard for breaking load test is being determined.

8.2.2.2 *Bias*—Since there is no applicable reference material to determine bias for the breaking load test, no statement of bias is being made.

8.2.3 *Condition of Acceptance*—The breaking load shall be a minimum of 312 N [70 lb_f] for a 305-mm [12-in.] wide specimen prior to shipping. If the manufacturer produces a product of widths other than 305 mm [12 in.], a force per unit width shall be calculated. The minimum force shall be 1.0 N/mm [5.8 lb/in.].

8.3 *Water Absorption*—Calculate the amount of water absorbed from the increase in weight of the dried specimen during submersion for a period of 48 h. Express water absorption as the percentage by weight when tested in accordance with Test Methods C1185 on a full-sized specimen. The values obtained are used for quality control purposes. The maximum water absorption shall be 25 %.

8.4 Dimensions and Tolerances:

8.4.1 *Nominal Length, Width, and Thickness*—The shape, size, and thickness shall be specified by the manufacturer. Dimensions shall be determined as specified in Test Methods C1185.

8.4.2 *Length and Width Tolerance*—The maximum variation from the manufacturer's specified lengths and widths shall be ± 12 mm [$\frac{1}{2}$ in.] and ± 6 mm [$\frac{1}{4}$ in.], respectively.

8.4.3 *Thickness Tolerance*—The maximum variation from the manufacturer's specified thickness shall be ± 25 % at the centerline when cut at the middle of the test specimen's length.

8.4.4 *Weight Tolerance*—The maximum variation from the manufacturer's specified weight, on samples taken at a consistent point in the manufacturing process which are either as received or oven dried, shall be ± 10 %.