



Designation: C179 – 09

Standard Test Method for Drying and Firing Linear Change of Refractory Plastic and Ramming Mix Specimens¹

This standard is issued under the fixed designation C179; 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 test method covers the determination of the drying shrinkage and of the combined drying and linear change of ramming and plastic refractories.

1.2 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.

1.3 *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:*²

C113 Test Method for Reheat Change of Refractory Brick

C134 Test Methods for Size, Dimensional Measurements, and Bulk Density of Refractory Brick and Insulating Firebrick

C181 Test Method for Workability Index of Fireclay and High-Alumina Plastic Refractories

C1054 Practice for Pressing and Drying Refractory Plastic and Ramming Mix Specimens

3. Significance and Use

3.1 This test method is useful in quantitatively rating or ranking both ramming and plastic refractories by their linear stability after heating.

3.2 This test method is also useful for determining whether a ramming or plastic refractory can be used in a specified application based on linear change criteria.

¹ This test method is under the jurisdiction of ASTM Committee C08 on Refractories and is the direct responsibility of Subcommittee C08.09 on Monolithics.

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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.

3.3 This test method excludes basic and carbon bearing materials.

3.4 This test method can produce data for the engineering and design of refractory installations. The linear change data can be used to determine the number of joints necessary to maintain integrity of ramming or plastic refractory in a large installation.

4. Apparatus

4.1 *Kiln*, electric or gas type, of such design that the flame, as coming directly from the burner, cannot impinge upon the test specimens.

4.2 *Measuring Device*, capable of being read to 0.02-in. (0.5-mm). A hooked rule, 12 in. (305 mm), is convenient to use and a suitable type is described in Test Methods C134. Other measuring devices, such as calipers or dial gages, of the same or better precision may also be used.

5. Test Specimens

5.1 *Number of Specimens*—A minimum of six specimens molded from the sample (see Note 1) of plastic refractory will be required. Half of the specimens shall be used for the test and the other half used as supporting pieces during the kiln heat treatment.

NOTE 1—For pressing and drying the specimens see Practice C1054.

5.2 *Measurement of Specimens*—Using the measuring device, measure the bar for all dimensions to the nearest 0.02-in. (0.5-mm). Label and make reference marks to indicate the exact length measurement points. Caution should be taken as deformation of the specimens may be caused by handling.

5.3 *Drying of Specimens*—Dry specimens should be dried as stated in Practice C1054, 6.6.

5.4 *Measuring Dried Specimens*—Measure specimens as stated in 5.2.

6. Procedure

6.1 *Placing Specimens in Kiln*—Place the dried specimens in the kiln in accordance with Test Method C113, with the exception that the supporting brick shall consist of the three plastic refractory brick prepared for that purpose.

6.2 *Temperature Measurements*—Conduct temperature measurements in accordance with Test Method C113.