



Standard Test Method for Abrasion Resistance of Refractory Materials at Room Temperature¹

This standard is issued under the fixed designation C704/C704M; 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 relative abrasion resistance of refractory brick at room temperature. This test method can also be applied to castable refractories (see Metric Dimensions, Practice C861 and Practice C865) and plastic refractories (see Practice C1054).

1.2 *Units*—When values are stated in both SI and inch-pound units, the units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, use each system independently of the other. Combining values from the two systems may result in non-conformance with the standard. Several values are stated only in SI units as a matter of convention and to permit comparison of results. Included are the abrading media weight (grams), specimen weight (grams), specimen weight loss due to abrasion (grams), and the resultant volume loss (cubic centimeters).

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

- A681 Specification for Tool Steels Alloy
- C134 Test Methods for Size, Dimensional Measurements, and Bulk Density of Refractory Brick and Insulating Firebrick
- C179 Test Method for Drying and Firing Linear Change of Refractory Plastic and Ramming Mix Specimens
- C861 Practice for Determining Metric Dimensions of Standard Series Refractory Brick and Shapes

¹ This test method is under the jurisdiction of ASTM Committee C08 on Refractories and is the direct responsibility of Subcommittee C08.03 on Physical Properties.

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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.

C862 Practice for Preparing Refractory Concrete Specimens by Casting

C865 Practice for Firing Refractory Concrete Specimens

C1036 Specification for Flat Glass

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

D4285 Test Method for Indicating Oil or Water in Compressed Air

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

2.2 *American Society of Mechanical Engineers (ASME) Standard:*

B40.100 Pressure Gauges and Gauge Attachments

2.3 *ASTM Adjuncts:*

Abrasion Tester (1 dwg)³

3. Summary of Test Method

3.1 This test method measures the volume of material in cubic centimeters abraded from a flat surface at a right angle to a nozzle through which 1000 g of size-graded silicon carbide grain is blasted by air at a prescribed air pressure.

4. Significance and Use

4.1 This test method measures the relative abrasion resistance of various refractory samples under standard conditions at room temperature.

4.2 The abrasion resistance of a refractory material provides an indication of its suitability for service in abrasive environments.

4.3 The results obtained by this test method could be different than those obtained in service because of the different conditions encountered.

5. Interferences (Factors known to Affect Results)

5.1 During development, a ruggedness test was performed using 114 by 114 by 12.7 mm [$4\frac{1}{2}$ by $4\frac{1}{2}$ by $\frac{1}{2}$ in.] float glass

³ Detailed prints for the construction of the test chamber are available at a nominal cost from ASTM International Headquarters. Order Adjunct No. ADJC0704. An acceptable test chamber can be made from a weatherproof electrical switch box.