



Standard Test Methods for Size, Dimensional Measurements, and Bulk Density of Refractory Brick and Insulating Firebrick¹

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1. Scope

1.1 These test methods cover procedures for measuring size, dimensional measurement, bulk density, warpage, and squareness of rectangular dense refractory brick and rectangular insulating firebrick. More precise determination of bulk density of refractory brick can be made by Test Methods C20. Stack height is generally determined only for dense refractories.

NOTE 1—Test Methods C830 and Test Method C914 are also used to determine bulk density of refractory brick, by different procedures.

1.2 The test methods appear in the following order:

	Sections
Size and Bulk Density	4 through 7
Warpage of Refractory Brick	8 through 10
Squareness of Refractory Brick	11 through 14

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 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

C20 Test Methods for Apparent Porosity, Water Absorption, Apparent Specific Gravity, and Bulk Density of Burned Refractory Brick and Shapes by Boiling Water

C830 Test Methods for Apparent Porosity, Liquid Absorption, Apparent Specific Gravity, and Bulk Density of Refractory Shapes by Vacuum Pressure

¹ These test methods are under the jurisdiction of ASTM Committee C08 on Refractories and are 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.

C914 Test Method for Bulk Density and Volume of Solid Refractories by Wax Immersion

3. Significance and Use

3.1 Refractory brick are used as modular units in furnace construction and should not deviate significantly from the intended configuration with respect to size, bulk density, flat surfaces, and right angles. These test methods are particularly suited for use under field conditions and provide a means to determine whether the brick meets the requirements considered necessary to assure a satisfactory refractory construction.

SIZE AND BULK DENSITY

4. Apparatus

4.1 *Rule*, steel, hook, 12 in. (305 mm) in length, graduated in 0.02-in. (0.5-mm) divisions, for use in measuring individual brick. The rule has a rigid hardened steel hook consisting of a right-angled piece on one end to fix the zero point of the scale against one face of the brick. The hook is about ¼ in. (6 mm) in width and extends about ¼ in. beyond the back face or, preferably, the edge of the rule.

4.2 *Rule*, stiff steel, hook, 36 in. (914 mm) in length, graduated from each end in 0.02-in. (0.5-mm) divisions, for use in measuring stack height and the larger individual brick. The 36-in. rule has the same design as the 12-in (305-mm) rule.

NOTE 2—Check the hook rules periodically to determine that they have not become worn or distorted in use. Other measuring equipment may be used, provided the results are at least as accurate as those obtained with the hook rule.

4.3 *Weighing Scale*, having a capacity of 20 lb (9 kg) or more and a sensitivity under load of at least 0.01 lb (4.5 g).

5. Sampling

5.1 A sample consists of ten brick selected at random.

5.2 *Preparation of Specimens*—Remove any blisters or fins from the specimens by lightly rubbing them together. Omit this step in the case of insulating firebrick.

6. Procedure

6.1 *Length and Width*—Measure the length and width of each of the ten specimens across the middle of each of the faces