



Standard Practice for Location of Test Specimens from Magnesia-Carbon and Impregnated Burned Basic Brick¹

This standard is issued under the fixed designation C 1190; 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 practice covers a procedure for preparing test specimens from magnesia-carbon and impregnated burned basic brick. This practice generally concerns preparation of test specimens from brick greater than 13 in. (33 cm) in length. These brick are mainly manufactured for use in electric arc furnaces and basic oxygen furnaces.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI units given in parentheses are for information only.

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:

C 607 Test Method for Coking Large Shapes of Carbon-Bearing Materials²

C 830 Test Methods for Apparent Porosity, Liquid Absorption, Apparent Specific Gravity, and Bulk Density of Refractory Shapes by Vacuum Pressure²

C 831 Test Methods for Residual Carbon, Apparent Residual Carbon, and Apparent Carbon Yield in Coked Carbon-Containing Brick and Shapes²

C 1099 Test Method for Modulus of Rupture of Carbon-Containing Refractory Materials at Elevated Temperatures²

3. Summary of Practice

3.1 This practice defines a procedure for obtaining samples from carbon-containing basic brick. These samples can be used to characterize the product for the following physical properties: hot modulus of rupture (MOR), as-received porosity,

coked porosity, ignited porosity, carbon properties, coked modulus of rupture, and thermal expansion.

3.2 This practice does not specify specific sample sizes. For specific sample sizes, the particular ASTM test of interest should be consulted.

4. Significance and Use

4.1 This practice defines a procedure that ensures reasonably consistent preparation of specimens for product testing and evaluation.

4.2 This practice can be used in the laboratories of producers, users, and general interest parties for research and development or quality control work. It is particularly useful for interlaboratory comparisons on products, for repetitive evaluations or comparisons of products or product quality, and in specifying a uniform preparation practice for specimens for acceptance testing.

4.3 If pitch impregnated samples are prepared by wet cutting or drilling, care should be taken in drying them. If the samples are heated to facilitate drying, the temperature to which they are heated should not be so high that it causes drainage of pitch from the samples.

4.4 Porosities of metal-containing brick must be measured using kerosene or mineral spirits because using water will result in an artificially low result.

5. Apparatus

5.1 *Saw or Drill*, appropriate for cutting dense refractory shapes.

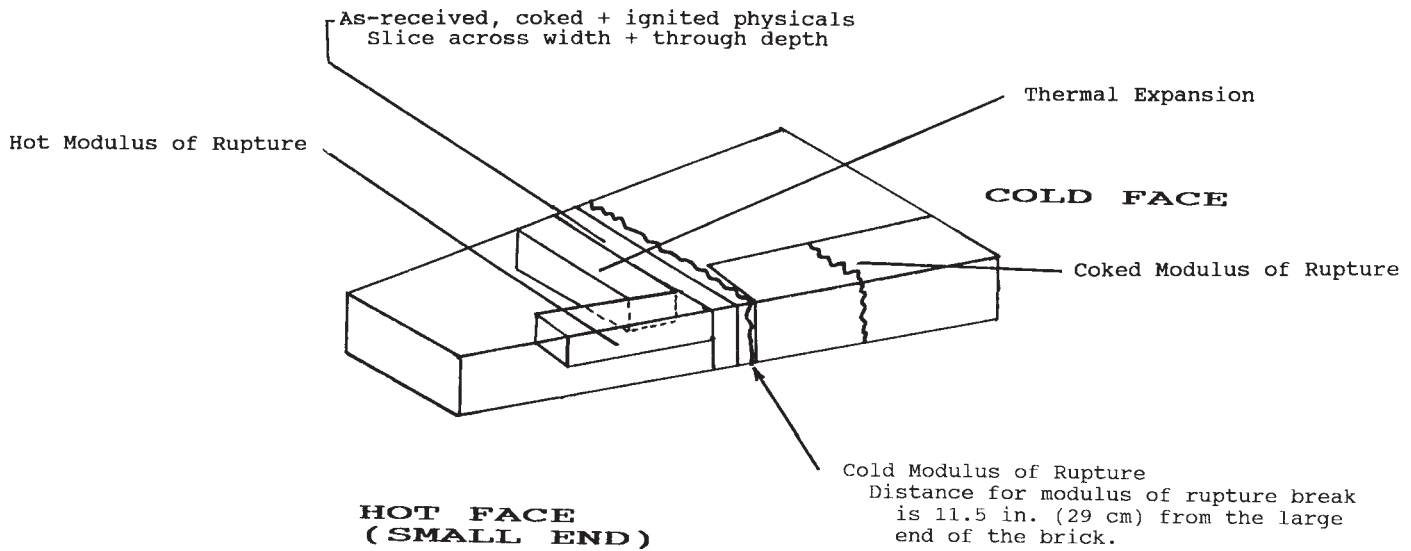
6. Procedure

6.1 First break the as-received brick across its width in a three-point modulus of rupture test as indicated in Fig. 1. Note that for a 30-in. (76-cm) long brick, the cold modulus of rupture break is at a distance of 11.5 in. (29 cm) from the large end of the brick. All other brick sizes should be at the same relative distance or 38.3 % of the distance from the large end of the key; for example, for an 18-in. (46-cm) long brick the distance should be 18 in. (46 cm) $\times$ 0.383 = 6.89 in. (17 cm) from the large end of the brick. All other samples shall be taken out of the influence of the cold modulus of rupture break.

¹ This practice is under the jurisdiction of ASTM Committee C08 on Refractories and is the direct responsibility of Subcommittee C08.92 on The Joseph E. Kopanda Subcommittee for Editorial, Terminology and Classification.

Current edition approved Oct. 10, 1995. Published December 1995.

² *Annual Book of ASTM Standards*, Vol 15.01.



NOTE 1—For a 30-in. (76-cm) long brick the cold MOR is at 11½ in. (29 cm). All other brick sizes should be at the same relative distance or 38.3 % of the distance from the cold face, for example, for 18-in. (46-cm) long brick: 18 in. (46 cm) × 0.383 = 6.89 in. (17 cm) from the cold face. Physical sample must be taken out of the influence of the cold MOR break.

FIG. 1 Location of Test Specimens from Magnesita-Carbon, Impregnated Burned Brick

6.2 Then cut or drill samples for running the following tests from the brick: hot modulus of rupture, as-received porosity, coked porosity, ignited porosity, carbon properties, coked modulus of rupture, and thermal expansion. Fig. 1 indicates the locations from which the samples are to be cut or drilled.

6.3 If wet cut, dry the samples at 150 to 250°F (66 to 121°C).

6.4 Use Test Method C 1099 for measuring the hot modulus of rupture.

6.5 Use Practice C 607 for coking the coked modulus of rupture sample.

6.6 Use procedures outlined in Test Methods C 831, in coking and igniting the porosity samples, and in determining carbon properties.

6.7 Use Test Method C 830 in the porosity measurements.

6.8 A standard test method for measuring the thermal expansion of carbon-containing refractories is currently under development by ASTM Subcommittee C 08.01.

6.9 No standard ASTM test method exists for measuring the cold modulus of rupture of large shapes such as those described in this practice.

7. Keywords

7.1 impregnated burned brick; magnesita-carbon; pitch-bearing brick; refractories; resin-bonded brick; specimen operation

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