



Designation: C 416 – 97

Standard Classification of Silica Refractory Brick¹

This standard is issued under the fixed designation C 416; 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 classification is limited to silica brick meeting the following requirements:

Alumina (Al_2O_3) content of less than 1.50 %.

Titania (TiO_2) content of less than 0.20 %.

Iron oxide (FeO_3) content of less than 2.50 %.

Calcium oxide (CaO) content of less than 4.00 %.

Average modulus of rupture of not less than 500 psi (3.45 MPa).

1.2 *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 133 Test Methods for Cold Crushing Strength and Modulus of Rupture of Refractories²

NOTE 1—Chemical analysis of refractory products is determined by a combination of x-ray fluorescence (XRF) and inductively coupled plasma (ICP) using standard reference materials (SRM), including various types of minerals and refractory materials that are available from the National Institute of Standards and Technology³ and other appropriate sources.

3. Significance and Use

3.1 The presence of certain impurities in silica brick tends to lower their refractoriness and service limits. This classification

permits those familiar with refractories to predict the refractoriness of silica brick from their alkali and alumina contents.

4. Basis of Classification

4.1 *Flux Factor*—Silica brick are classified on the basis of impurities by the use of a “flux factor,” which is equal to the percent of alumina plus twice the percent of total alkalis.

4.2 *Types:*

4.2.1 *Type A*—Silica brick having a flux factor of 0.50 or less.

4.2.2 *Type B*—All other silica brick falling within the scope of this classification.

5. Test Methods

5.1 The properties listed in this classification shall be determined in accordance with the following ASTM methods:

5.1.1 *Modulus of Rupture*—Test Method C 133.

5.1.2 *Chemical Analysis*—XRF and ICP.

6. Retests

6.1 Because of variables resulting from sampling and the lack of satisfactory reproducibility in tests conducted by different laboratories, the material may be resampled and retested when requested by either the manufacturer or the purchaser. This may apply in instances when the first test results do not conform to the requirements prescribed in this classification. The final results to be used shall be the average of at least two sets of results, each of which has been obtained by following in detail the specified testing procedures.

7. Keywords

7.1 brick; refractories; silica

¹ This classification is under the jurisdiction of ASTM Committee C08 on Refractories and is the direct responsibility of Subcommittee C08.07 on Alumina, Silica, and Special Refractories.

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

³ Available from the National Institute for Science and Technology (NIST), Gaithersburg, MD 20899.