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Standard Classification of Mullite Refractories[1]

This standard is issued under the fixed designation C 467; 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 covers refractory products consisting predominantly of mullite ($3\ Al_2O_3 \cdot 2\ SiO_2$) crystals that are formed by either converting any of the sillimanite group of minerals, or synthesizing from appropriate materials in a melt or sinter process.

2. Referenced Documents

2.1 *ASTM Standards:*

C 16 Test Method for Load Testing Refractory Brick at High Temperatures[2]

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

C 832 Test Method of Measuring the Thermal Expansion and Creep of Refractories Under Load[2]

3. Significance and Use

3.1 The mullite content of an alumina-silica refractory material has an important influence on volume stability, load bearing properties, and its satisfactory use in refractory applications. This classification is considered useful for purchase specifications and quality control.

4. Properties

4.1 The refractory products falling within the scope of this classification are classified by chemical and physical tests to meet the following requirements:

Alumina content, %	56 to 79
Impurities,[A] max, %	5
Deformation,[B] max, %	5

[A] Impurities refer to metal oxides other than those of aluminum and silicon.

[B] When tested in accordance with 6.1.2.

5. Test Specimens

5.1 Testing for compliance with this classification shall be performed on 9 by 4½ by 2½ -in. (228 by 114 by 64-mm) rectangular brick as made, or on specimens of this size cut from larger shapes, utilizing existing plane surfaces as much as possible.

6. Test Methods

6.1 The properties enumerated in this classification shall be determined in accordance with the following ASTM methods:

6.1.1 *Alumina Content*—XRF and ICP.

6.1.2 *Load Test*—Schedule 6 of Table 1 in Test Method C 16.

6.1.3 *Thermal Expansion and Creep*—Method C 832.

7. Retests

7.1 Because of possible variables that may result from sampling or an unsatisfactory reproducibility of tests by different laboratories, the material may be resampled and retested at the request of either the manufacturer or the purchaser. This could apply where the first test results may not conform to the requirements prescribed in this classification. Therefore, the final results to be used shall be the average of at least two series of tests, each of which has been obtained by following the specified testing procedures in detail.

8. Keywords

8.1 alumino-silicate; classification; mullite; refractories

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[1] This classification is under the jurisdiction of the 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.

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

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