Designation: ~~C401 – 12~~ C401 – 12 (Reapproved 2018)

Standard Classification of Alumina and Alumina-Silicate Castable Refractories[1]

This standard is issued under the fixed designation C401; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This classification covers alumina and alumina-silicate castable refractories that, when tempered with water, will develop structural strength by chemical action.

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~~ safety, health, and ~~health~~environmental practices and determine the applicability of regulatory limitations prior to use.*

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C113 Test Method for Reheat Change of Refractory Brick
C133 Test Methods for Cold Crushing Strength and Modulus of Rupture of Refractories
C134 Test Methods for Size, Dimensional Measurements, and Bulk Density of Refractory Brick and Insulating Firebrick
C862 Practice for Preparing Refractory Concrete Specimens by Casting
C865 Practice for Firing Refractory Concrete Specimens

3. Significance and Use

3.1 Alumina and alumina-silicate castable refractories are produced to yield property characteristics commensurate with different ~~end use~~ end-use properties. Volume stability, modulus of rupture, bulk density, and lime content have become useful measures to distinguish various alumina and alumina-silicate castable formulations for initial fitness for service. This classification is considered useful for purchase specifications and for quality control.

4. Basis of Classification

4.1 Alumina and alumina silicate castable refractories that contain a hydraulic setting cement and have a density of greater than 105 lb/ft^3 (1.68 g/cm^3) may be classified by the lime (CaO) content as contributed by the cement. The classifications are shown in Table 1. While this standard only uses the lime content as contributed by cement, other sources of lime may be present in the mix and may affect the performance of a material.

4.2 Refractory castables classified as conventional castable refractories having a modulus of rupture after drying of at least 300 psi (2.07 MPa) are ~~normal-strength,~~ normal strength, and those having at least 600 psi (4.14 MPa) modulus of rupture are high-strength types. They are further classified on the basis of volume stability of cast test brick when fired at the temperatures prescribed in Table 2.

4.3 *Insulating Refractory Castables*—This~~Insulating Refractory Castables —This~~ class includes insulating castable refractories which are classified on the basis of bulk density of dried cast test brick and volume stability of such test brick when fired at the temperatures prescribed in Table 3.

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

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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.