



Designation: **C544 – 03 (Reapproved 2017) C544 – 18**

Standard Test Method for Hydration of Dead-Burned Magnesite or Periclase Grain¹

This standard is issued under the fixed designation C544; 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 test method covers the measurement of the relative resistance of magnesia grain to hydration.

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, health, and 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

C92 Test Methods for Sieve Analysis and Water Content of Refractory Materials

C357 Test Method for Bulk Density of Granular Refractory Materials

C456 Test Method for Hydration Resistance of Basic Bricks and Shapes

C493 Test Method for Bulk Density and Porosity of Granular Refractory Materials by Mercury Displacement (Discontinued 2002) (Withdrawn 2002)³

3. Significance and Use

3.1 This test method determines relative hydration resistance of magnesia grain.

3.2 This test method is used in industry to evaluate grain samples and is used for specification purposes in some cases.

3.3 Care must be taken in interpreting the data.

4. Apparatus

4.1 *Autoclave*, suitable for operation at 80 psi (552 kPa) at 324 °F (162 °C) and equipped with pressure and temperature measuring devices and safety equipment.

NOTE 1—A suitable apparatus is shown in Fig. 1 of Test Method **C456**.

4.2 *Standard Sieves*, ASTM No. 6 (3.35 mm), No. 12 (1.70 mm), No. 20 (850 μm), No. 40 (425 μm), and No. 50 (300 μm).

NOTE 2—The equivalent Tyler Standard Series sieves described in Test Methods **C92** may be substituted for the ASTM sieves.

5. Procedure

5.1 Remove the material retained on a No. 6 (3.35-mm) sieve, and crush it to pass the No. 6 sieve to obtain the maximum amount of coarse material. Recombine with the portion passing the No. 6 sieve, and screen the resultant sample to remove all material passing a No. 40 (425- μm) sieve. If necessary, dry at 220 to 230 °F (105 to 110 °C).

5.2 Separate this sample into the following three fractions:

¹ This test method is under the jurisdiction of ASTM Committee **C08** on Refractories and is the direct responsibility of Subcommittee **C08.04** on Chemical Behaviors. Current edition approved Nov. 1, 2017/ Feb. 1, 2018. Published November 2017/ February 2018. Originally approved in 1964. Last previous edition approved in 2013/2017 as C544 – 03 (2013) (2017). DOI: 10.1520/C0544-03R17.10.1520/C0544-18.

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.

³ The last approved version of this historical standard is referenced on www.astm.org.