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.

Designation: C865 – 22

Standard Practice for Firing Refractory Concrete Specimens[1]

This standard is issued under the fixed designation C865; 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 practice covers the firing of specimens made from refractory concretes (castable refractories) in accordance with Practice C862 for cast specimens. The procedure is also recommended for heating rates to be used for high-temperature test methods such as Test Methods C16, C583, etc., when these methods are used to test refractory concretes.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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]

C16 Test Method for Load Testing Refractory Shapes at High Temperatures

C583 Test Method for Modulus of Rupture of Refractory Materials at Elevated Temperatures

C862 Practice for Preparing Refractory Concrete Specimens by Casting

E230 Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples

3. Significance and Use

3.1 This practice is used to standardize the firing conditions of refractory concrete specimens prepared in accordance with Practice C862. The standards are set down to minimize laboratory-to-laboratory variation and do not attempt to duplicate any particular field applications.

4. Apparatus

4.1 *Kiln,* equipped with instruments capable of controlling the heating rate of the kiln at 100 °F to 700 °F (55 °C to 390 °C)/h (see 6.5) and holding the soak temperature to ±10 °F (5.5 °C) of the nominal soak temperature. For temperatures up to 2500 °F (1370 °C) an electrically heated kiln is preferred, but gas- or oil-fired kilns can be used for all temperatures, provided the heating rates specified can be maintained, the flame of the burners does not impinge directly on any specimen, and the furnace atmosphere contains a minimum of 0.5 % oxygen with 0 % combustibles.

5. Preparation of Samples

5.1 Samples are prepared by casting in accordance with Practice C862. If the sample size of the cast specimen is the same as that specified for the test, it can be used directly. However, cutting samples of the required size from larger cast blocks will often be necessary (Note 1). In this case, it is recommended that the samples be cut with a diamond saw. After cutting, the samples should be dried at 230 °F (110 °C) for a minimum of 18 h. All cut samples should have sharp edges and corners and should not show pull-out of grains on the cut surfaces. For some low-strength castables, drying prior to cutting may be needed to increase their strength and resistance to pull-outs.

NOTE 1—Specimens cut from the interior of large cement-bonded castables shapes may be stronger than specimens cut from small cast shapes because the interior of large cast shapes are exposed to high-pressure steam during dryout which causes more complete hydration of the cement.

5.2 Some types of castables, especially those containing aggregates of a relatively low hardness (such as lightweight castables), may be cut on a dry saw. This procedure is acceptable provided that specimens with sharp corners and edges, which show no signs of grain pull-out at the cut surfaces, are obtained.

[1] This practice is under the jurisdiction of ASTM Committee C08 on Refractories and is the direct responsibility of Subcommittee C08.09 on Monolithics.

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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.

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