Designation: C 865 – 02

Standard Practice for Firing Refractory Concrete Specimens[1]

This standard is issued under the fixed designation C 865; 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 Department of Defense.

1. Scope

1.1 This practice covers the firing of specimens made from refractory concretes (castable refractories) in accordance with Practice C 862 for cast specimens. The procedure is also recommended for heating rates to be used for high-temperature test methods such as Methods C 16, C 583, 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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

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

C 20 Test Methods for Apparent Porosity, Water Absorption, Apparent Specific Gravity, and Bulk Density of Burned Refractory Brick and Shapes by Boiling Water[2]

C 113 Test Method for Reheat Change of Refractory Brick[2]

C 133 Test Methods for Cold Crushing Strength and Modulus of Rupture of Refractories[2]

C 210 Test Method for Reheat Change of Insulating Firebrick[2]

C 288 Test Method for Disintegration of Refractories in an Atmosphere of Carbon Monoxide[2]

C 401 Classification of Alumina and Alumina-Silicate Castable Refractories[2]

C 546 Method of Load Testing Refractory Brick at High Temperatures, Long-Time[3]

C 583 Test Method for Modulus of Rupture of Refractory Materials at Elevated Temperatures[2]

C 704 Test Method for Abrasion Resistance of Refractory Materials at Room Temperature[2]

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

C 862 Practice for Preparing Refractory Concrete Specimens by Casting[2]

E 220 Method for Calibration of Thermocouples by Comparison Techniques[4]

3. Significance and Use

3.1 This practice is used to standardize the firing conditions of refractory concrete specimens prepared in accordance with Practice C 862. 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 to 700°F (55 to 380°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.

4.2 *Balances*—For 9 by 4½ by 2 or 3-in. (228 by 114 by 51 or 76-mm) samples, a balance with a capacity of 15 lb (6.8 kg) and a sensitivity of 0.01 lb (4.5 g) is recommended; for smaller specimens (for example, 6 by 1 by 1-in. (152 by 25 by 25-mm) bars), a 2-kg balance with a sensitivity of 0.1 g is recommended.

4.3 *Caliper or Steel Rule*, to measure the dimensions of the specimens. For large specimens, a 12-in. (305-mm) steel rule with 0.01-in. (0.3-mm) divisions is recommended. For smaller

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

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

[3] Discontinued. See 1985 *Annual Book of ASTM Standards*, Vol 15.01.

[4] Discontinued. See 1994 *Annual Book of ASTM Standards*, Vol 14.03.