

AMERICAN SOCIETY FOR TESTING MATERIALS
1916 RACE ST., PHILADELPHIA 3, PA.

Reprinted from Copyrighted Book of ASTM Standards, Part 3.

APPROVED AS
AMERICAN STANDARD
BY THE AMERICAN STANDARDS ASSOCIATION
ASA NO.: A111.24-1955
UDC 666.76: 666.93: 621.1

Standard Specifications for
AIR-SETTING REFRACTORY MORTAR (WET TYPE) FOR
BOILER AND INCINERATOR SERVICES¹



Reproduced By GLOBAL
ENGINEERING DOCUMENTS
With The Permission Of ASTM
Under Royalty Agreement



ASTM Designation: C 178 - 47

ADOPTED, 1947.²

Reapproved in 1953 Without Change.

This Standard of the American Society for Testing Materials is issued under the fixed designation C 178; the final number indicates the year of original adoption as standard or, in the case of revision, the year of last revision.

Scope

1. These specifications cover the wet type of air-setting refractory mortar for use in laying up fireclay refractories in boiler furnaces and incinerators. Requirements are specified for three classes of mortar. The mortar used should be of sufficient refractoriness for the type of service encountered. Unless otherwise specified, high duty mortar shall be supplied.

Classes

2. High-temperature refractory mortars are classified according to the service and grade of fireclay refractories with which they are to be used. The several classes of mortar are distinguished by their refractoriness test temperatures (Section 4 (d)), as follows:

Class	Refractoriness Test Temperature
Super duty.....	2910 F. (1600 C.)
High duty.....	2730 F. (1500 C.)
Intermediate duty.....	2550 F. (1400 C.)

¹ Under the standardization procedure of the Society, these specifications are under the jurisdiction of the A.S.T.M. Committee C-8 on Refractories.

² Prior to adoption as standard, these specifications were published as tentative from 1943 to 1947, being revised in 1944 and 1945.

Quality

3. The mortar shall be sufficiently free from grit and of such quality and workability that it will spread satisfactorily with a trowel, either as it comes from the container or after a moderate amount of tempering with water. The mortar shall have properties that will enable it to be converted readily to dipping consistency by the addition of water. At any time within a 6-month period after purchase, the mortar in a newly opened container shall not have stiffened or hardened to such an extent as to prevent its easy removal and mixing.

Test Requirements

4. (a) *Particle Size*.—The particle size of the mortar shall be such that 95 per cent shall pass a No. 40 (420-micron) A.S.T.M. sieve (equivalent to mesh No. 35 of the Tyler standard series), and not more than 0.5 per cent shall be retained on a No. 20 (840-micron) A.S.T.M. sieve (equivalent to mesh No. 20 of the Tyler standard series).

(b) *Water Content*.—The total water content of the mortar shall be not more than 25 per cent, calculated on the wet basis.

(c) *Bonding Strength*.—The mortar when made into a joint shall after drying have a modulus of rupture of not less than 200 psi.

(d) *Refractoriness*.—The mortar shall not flow out of the joint when it is subjected to the refractoriness test at the following temperature:

Class	Refractoriness Test Temperature
Super duty.....	2910 F. (1600 C.)
High duty.....	2730 F. (1500 C.)
Intermediate duty.....	2550 F. (1400 C.)

Sampling

5. (a) When the shipment consists of 100 containers or fraction thereof, the contents of one container, selected at random, shall be removed and mixed thoroughly. A representative 10-lb. test sample (approximately $\frac{1}{2}$ gal.) shall be taken and sealed in a clean metal or glass container.

(b) When the shipment consists of more than 100 containers, the number to be sampled shall be as follows:

Number of Containers in Shipment	Number of Containers to be Selected for Sampling
Over 100 but less than 300.....	2
300 but less than 600.....	3
600 but less than 1000.....	4

In these cases, the several 10-lb. samples from the selected containers shall be combined and mixed thoroughly, after which the final 10-lb. test sample shall be taken and sealed in a clean metal or glass container.

Retests

6. Because of variables resulting from sampling and the lack of satisfactory reproducibility in tests conducted by different laboratories, the material may be resampled and retested when requested by either the manufacturer or the purchaser. This may apply in instances when the first test results do not conform to the requirements prescribed in these specifications. The final results to be used shall be the average of at least two sets of results, each of which has been obtained by following in detail the specified testing procedures.

Methods of Testing

7. The properties enumerated in these specifications shall be determined in accordance with the following methods of test of the American Society for Testing Materials:

(a) *Particle Size*.—Methods of Test for Sieve Analysis and Water Content of Refractory Materials (A.S.T.M. Designation: C 92),³ using the procedure for wet sieve analysis described in Section 5 (b) of those methods.

(b) *Water Content*.—Methods C 92, using the procedure for water content described in Section 4 (a).

(c) *Bonding Strength*.—Method of Test for Bonding Strength of Air-Setting Refractory Mortar (Wet Type) (A.S.T.M. Designation: C 198).³

(d) *Refractoriness*.—Method of Test for Refractoriness of Air-Setting Refractory Mortar (Wet Type) (A.S.T.M. Designation: C 199).³

³ Appears in this publication, see Contents in Numeric Sequence of ASTM Designations at front of book.