

FIREPLACE BULLETIN

REFRACTORY MORTAR STANDARDS & SPECIFICATIONS

Alsey Refractories Company has been manufacturing the United States' premier fireplace brick and refractory mortar since 1906. We believe strongly in the importance of advising the proper use of our products and fostering a greater understanding of terminology as it pertains to building codes; we particularly want to clear up any confusion about mortar and fireclay.

Refractory mortar is a high temperature resistant material that does not expand or disintegrate when heat is applied. As a result, we have developed **ALSEY Air-Set Refractory Fireplace Mortar** and **FLUE-SET Non-Water Soluble Refractory Mortar** to meet these requirements. These medium duty refractory fireplace mortars conform to all applicable building codes (The International Code Council, The International Residential Building Code and The National Fire Protection Association) and are tested to ASTM C199 Medium Duty.

Available in an easy to use pre-mixed form **ALSEY Air-Set**, an air-setting mortar, is intended for indoor use. Applications, such as outdoor fireplaces, fire pits, pizza ovens, bread ovens, etc., exposed to weather require **ALSEY Flue-Set**, a hydraulically setting mortar, in order to resist these outdoor elements. This dry mortar must be mixed with water and can be used for firebrick and clay flue tile installation. Product information sheets are available upon request to help determine which **ALSEY** mortar is best suited to your application.

ALSEY Dry Milled Fireclay must have temperatures above 2400°F to develop a ceramic bond. Temperatures required to form this ceramic bond are NEVER achieved in residential fireplaces. **Alsey Dry Milled Fireclay** is a heat resistant material; however, it is not a refractory mortar. No amount of additives will make it an acceptable substitute! The specific addition of Portland cement reduces the service temperature of this product well below temperatures achieved in fireplaces. Portland cement will not be able to resist the high temperatures and the temperature cycling in this application, nor will it possess the necessary acid resistance for this service. These critical failures will not satisfy any national or state building code requirements.

The following are the most common ASTM standards and building codes for Fireplace & Chimney Construction:

ASTM C27 Standard Classification of Fireclay and High-Alumina Refractory Brick

Fireclay brick are classified based on the following physical properties: PCE (C24), Load test Schedule No. 2 (C16), MOR (C133), and Bulk Density (C134).

ASTM C199 Standard Test Method for Pier Test for Refractory Mortars

Medium Duty mortars are classified based on the following physical properties: PCE must be 29 or above with minimum Heat Schedule B (C113)

ASTM C1261 Standard Specification for Firebox Brick for Residential Fireplaces

Firebox brick shall be 100% solid and tested in accordance with C67 for MOR (500psi minimum), size, warpage and C24 for PCE (minimum of 13).

ASTM C1283 Standard Practice for Installing Clay Flue Lining

Flue liners shall be installed using refractory mortar Refractory Mortar Test Method C24 and Test Method C199 (medium duty)

International Building Code (Chapter 21 Masonry) & International Residential Code (Chapter 10 Chimneys and Fireplaces)

1. Flue liners shall be installed in accordance with ASTM C1283 and shall be laid in medium-duty refractory mortar conforming to ASTM C199.
2. Firebox & smoke chamber walls require firebrick conforming to ASTM C27 or C1261 and shall be laid with medium-duty refractory mortar conforming to ASTM C199.

NFPA 211 codes, standards, recommended practices and guides for Fireplace & Chimney Construction:

1. Fireclay Flue Liners shall be bedded with medium duty, non-water-soluble calcium aluminate refractory cement mixture. Portland cement-bonded mixtures shall not be used.
2. Masonry Fireplaces shall be constructed from (a minimum) of low-duty fireclay brick (C27 & C1261) laid in medium-duty refractory mortar (C199). All joints and intersections between the hearth extension/fireplace facing and the fire chamber (firebox) shall be fully sealed with medium-duty refractory mortar (C199). Smoke chamber walls shall be lined with (a minimum) of low-duty fireclay brick (C27 & C1261) and laid in medium-duty refractory mortar (C199).

Alsey Refractories Company is committed to providing quality products that will meet and exceed all applicable building codes.

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