

SUBJECT: Fire Brick, Refractory Mortar and Castable Refractories

The purpose of this digest is to explain which mortar is appropriate for use with firebrick for building fireplace liners, pizza ovens, and other masonry exposed to fire. Acme Brick Company manufactures Everset refractory mortar. It has been used successfully for many years to build brick kilns and other high temperature refractory structures. Fire brick with Everset refractory mortar can be used successfully to build fire-exposed masonry, but only if the mortar joints can be kept very thin. Joint thickness should not exceed 0.125 inch (3 mm). Everset refractory mortar will not dry properly if it is used to fill thicker joints. To build refractory domes in pizza ovens and similar curved surfaces, either fire brick must be cut to precise shapes to maintain thin joints throughout the dome, or castable refractory cement can be used to fill gaps where fire brick do not match perfectly. Everset is not a castable refractory.

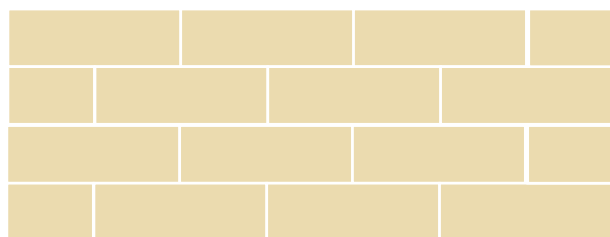
Everset Refractory Mortar Testing

Acme Brick has used Everset refractory mortar successfully for more than twenty years to build brick kilns, which are fired at up to 2400°F, Everset seals the fire brick joints, and we have never had a joint breached by flame. Everset mortar was recently tested for “Medium Duty criteria in ASTM C1655 Specification for Refractory Mortars. The testing was done and the National Brick Research Center at Clemson University in accordance with ASTM C199 - Standard Pier Test for Refractory Mortars. That test report is posted on the Acme Brick Company website.

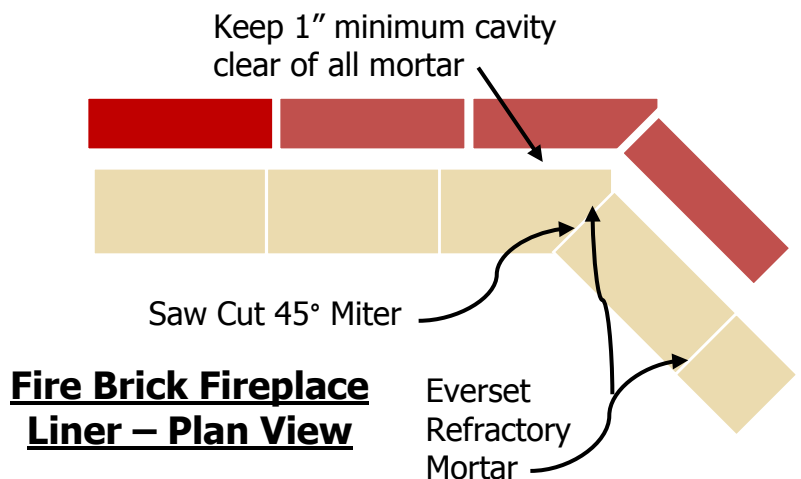
In this document we show several methods of building refractory masonry with firebrick, refractory mortar, and castable refractories. We do not certify the performance or suitability to the task of any of the materials mentioned in this document. Any performance warranties for those materials shall be only as expressly stated in warranties provided by their respective manufacturers.

Fireplace Liners:

Fireplace liners are often built with fire brick set in refractory mortar. Refractory mortars should be mixed with water to a creamy consistency and applied to one surface of adjoining units with a 1/4-inch notched trowel before placing. This results in a 1/8-inch joint that will quickly dry as the fire brick absorb moisture from the mortar. **NEVER USE REFRACTORY MORTAR TO FILL LARGE MORTAR JOINTS.** Corners and curves that are not multiples of 90 degrees (orthogonal) require the fire bricks to be cut with diamond saws to keep joint thickness to 1/8-inch.



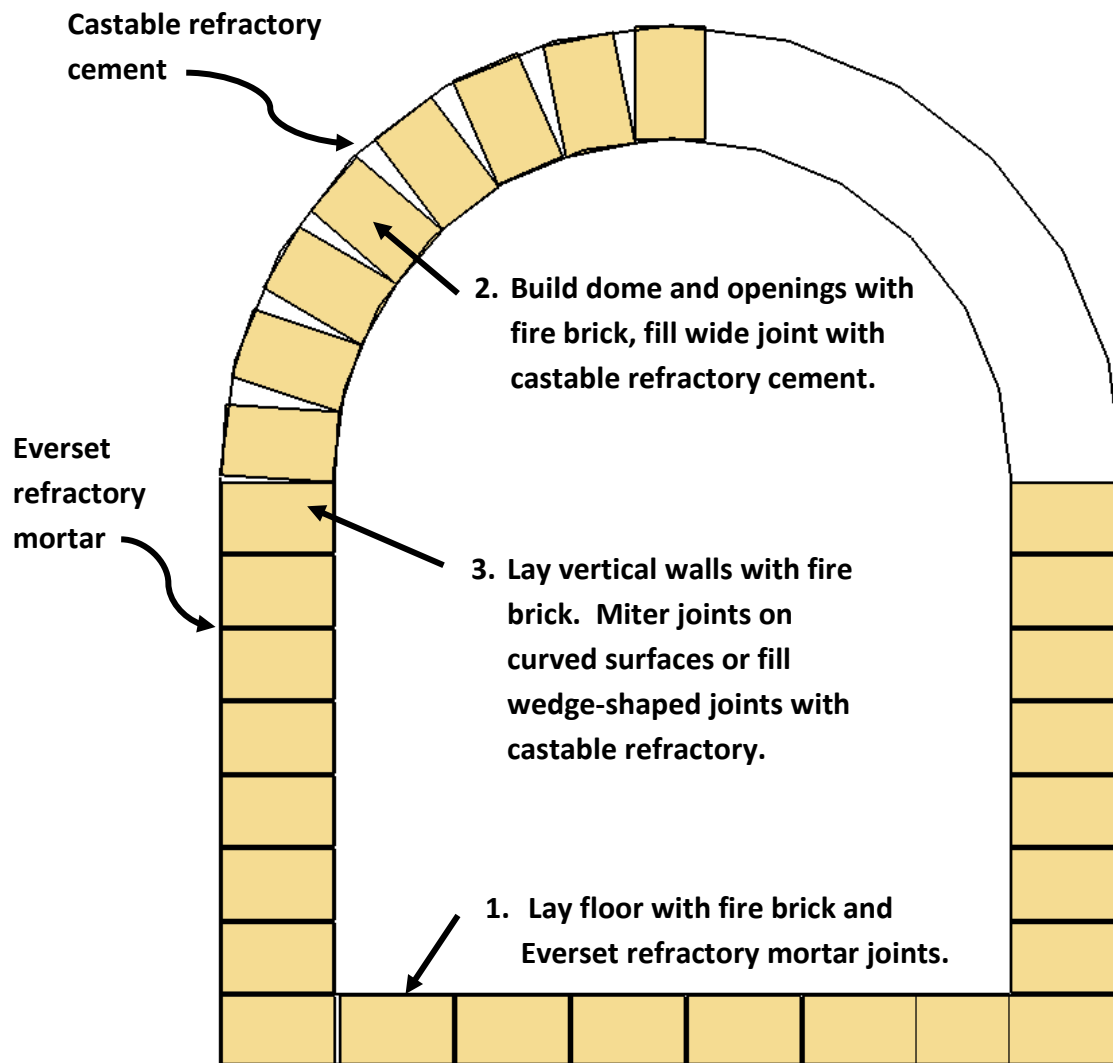
Fire Brick Elevation



Fire Brick Fireplace Liner – Plan View

Pizza Ovens:

Pizza ovens and similar refractory structures with curved surfaces could theoretically be built with carefully cut fire bricks set in Everset refractory mortar. But making so many cuts with necessary accuracy requires a lot of highly skilled labor to calculate and cut all of the pieces to fit. A much more practical approach is to use fire brick, but fill the large joints with castable refractory. NEVER USE Everset REFRACTORY MORTAR TO FILL LARGE MORTAR JOINTS. If fire bricks are used on surfaces with a tight curvature, they can be cut into smaller pieces of one-half brick or less to better fit those curves.



Pizza Oven Construction