

Firebricks

Tools of the Trade by Jim Wunch

Buying Firebricks

REFRACTORIES

Refractory materials (materials that can withstand high temperatures) are used in the construction and maintenance of ceramic studio kilns. Firebrick, ceramic fiber and castable refractories are the three forms of refractories used in kilns, but firebrick is the most significant.

A Brick With Many Faces

Firebrick is a generic term that encompasses any brick that can withstand repeated heating and cooling at various temperature ranges. Additionally, firebricks must be able to withstand different atmospheres, provide various structural or insulating qualities, and due to the difficulty in cutting them, must be available in a variety of shapes to add flexibility to kiln design and construction.

Hard and Soft

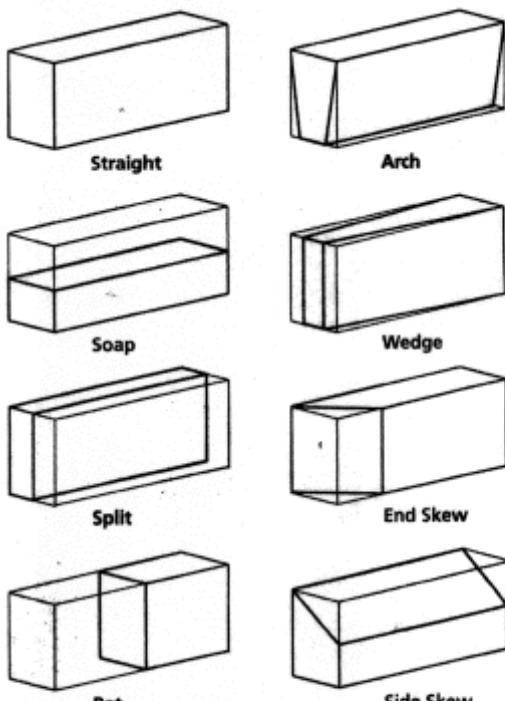
There are two types of firebrick: hardbrick and softbrick. Hardbricks are very dense and durable and used for their structural qualities. They can be found most often as the main building component of large kilns, chimneys, fireboxes and burner ports—anywhere around direct flame. Softbricks are lightweight and made from a refractory clay body containing combustible materials. When fired, the materials burn out leaving a sponge-like matrix of air pockets, which serve to provide insulating qualities to the brick. Also known as insulating firebricks (IFBs), these bricks absorb about half the energy as hardbricks during a firing. Softbrick range from 2000°F to 3300°F and are used as the brick of choice for constructing electric kilns or as insulating liners in reduction kilns.

Grades Are Important

The main ingredient in firebricks is fireclay, which contains mostly alumina and silica, elements capable of withstanding high temperatures. Hardbricks are available in several *grades*, depending on their composition and properties, which determine the most efficient use of them in construction. High alumina compositions start at 50% alumina and increase in alumina content to 98% for the highest purity and most expensive. It's extremely rare that a potter would require an alumina content exceeding 70%.

Low-duty: Typically rated to 1750°F maximum service temperature. Primarily used for fireplace chimneys, and contains 24–26% alumina.

Medium duty: Temperature rating to 2700°F



A sample of some of the many brick shapes available.

maximum service temperature. Uses include backup linings, lower-temperature ceramic kilns and chimneys, and contains 34–38% alumina.

High Duty (first-quality firebrick): Temperature rating to 2850°F maximum in purely heat service. Certain atmospheres can reduce this temperature rating by several hundred degrees, and contains 36–40% alumina. Uses include boilers, ceramic kilns, chimneys and back-up linings.

Super Duty: Temperature rating to 2900°F in pure heat service. Certain atmospheres can reduce this temperature rating by several hundred degrees. Same uses as high duty where higher temperatures are involved. Contains 40–44% alumina.

High-Fired Super Duty: Temperature rating between 3000°F–3150°F. A higher burned version of super duty firebrick designed to lower the porosity, increase physical strength and improve resistance to alkali attack and carbon monoxide disintegration. Contains 40–44% alumina.