

## HOW TILE IS MANUFACTURED *(courtesy of Interceramic)*

Have you ever wondered how wall tile can begin basically as dirt and end up as your beautiful kitchen countertops and backsplashes, virtually impervious to damage? Well, we took a look at Interceramic's Garland, Texas wall tile factory to get the dirt on tile.

Interceramic begins the production process by procuring the finest raw materials available. The body is a combination of the earth's natural resources and elements including silica, talc and calcium carbonate. Each of these ingredients is inspected for quality prior to entering the production process. The bulk clay is then broken down into a more manageable state in the crushers. Then the various clays are loaded onto large conveyors where they are delivered to storage silos where each raw material has its own silo.

Water and clay, in precise proportions, are then loaded into ball mills. These mills contain high-density alumina balls, which grind the clay into a fine homogeneous mixture. The result is a product called body slip. Its viscosity is similar to that of a milkshake. The product then mills for several hours and is tested for viscosity, density and residue to see if further milling is required.

From the ball mill the material, which is now more commonly called the body slip, is stored in holding tanks, which contain large paddles that keep the slip in a suspended state. These holding tanks can hold four ball mills worth of material.

From the storage tanks, the body slip is then pumped into the spray dryer. The burner in the dryer generates rapidly moving hot air, which evaporates the moisture from the body slip. This creates fine particles of clay with a hole in the center. These particles are of various sizes and are controlled as they are formed in the evaporation process and travel through the burner. The granulation size is such that if a bucket were poured, it would flow like water. At this point, it is commonly called the powder.

The powder is then transferred into large silos for storage. From the silos, the powder is then taken to various presses by means of a conveyor system. The moisture content of the powder is approximately 5% at the time of press. There the powder is loaded into molds and compressed under approximately 690 tons of pressure to form the bisque. Bisque is what the tile is called prior to being glazed and fired.

The bisque is then run through a horizontal dryer to further reduce the moisture content and to heat the tile prior to applying the glaze. The moisture content is reduced from 5% to less than 1% and exits the dryer at approximately 280(F)

While the body is being prepared, the glaze is also in production at a designated area of the factory called glaze prep. Glaze is made primarily of frit, which is a man-made substance that contains silica, feldspar, nepalean, titanium and other compounds that are found naturally and has some of the characteristics of ceramic and some characteristics of glass. All ingredients are milled with alumina balls and additives are added to control viscosity. From the silo, the glaze is filtered and put into transportable storage for the next step- the glaze line. Interestingly, all the glazes start with the same basic make-up and then pigments are added to create the wide array of wall tile colors available in the Interceramic line.

It is worth noting that throughout the manufacturing process, goods are kept on hand as "goods in process". This is critical to quality control and is necessary to run the kilns at capacity 24 hours per day, seven days a week.

From the horizontal dryer, the bisque travels down the glaze lines where various types of glazes are applied, including waterfall applications, dry glaze and silk-screens. These applications will determine the style, color, design and surface texture. After the glaze application is complete, the tile, now called green ware, is temporarily stored in cars, which hold over 1,000 square feet of tile. Now the tile will await its turn to go through the roller hearth kiln.

At the hearth kiln, the glazed green ware travels through the kiln on rollers. The controlled firing curve causes two chemical reactions to take place, one in the body and one in the glaze, whereby the glaze is fused to the body. During the firing process, the wall tile body shrinks by less than one percent. Inside the kiln, temperatures reach 1100(C) or close to 2000(F). Amazingly, the kilns are designed to withstand these intense temperatures while operating 24 hours a day and seven days a week.

When the tile exits the kiln, it is loaded onto cars, transferred to storage racks and transported to a selection area. There the tile is unloaded onto the selection line where by human eye; the tiles are sorted by tones and class (firsts and seconds). Via electronic photocells, they are measured for squareness, caliber, wedging and warpage and identified with an electronic marker. Tiles not meeting Interceramic's standards are discarded and the rest are scanned by machinery designed to read the electronic marker and then sort and pack according to quality. Finally, the tile is packaged, labeled and bar coded by classification.

Basically, from start to finish the product is never touched with the exception of the ultraviolet marker in the selection process.