

What are High-Fire Glazes?



The description “high-fire glazes” determines a firing range of glazes, or to be more precise, it determines a type of ceramics. We cannot talk about a type of glaze without talking about the type of ceramics it relates to, because for a glaze to be fired at a certain temperature, it needs to be on a clay body that will support that temperature. Ceramics that fall in the high-fire range are stoneware and porcelain. These ceramics are fired to a temperature range between cone 5 (2,205 degrees Fahrenheit) and cone 10 (2,381 F) or even higher, compared to what are called low-fired ceramics or earthenware and raku, which are generally fired at temperatures between cone 012 (1,620 F) and cone 04 (1,971 F).

Stoneware and porcelain bodies are formulated using refractory materials with, generally, feldspar as the flux. These ceramics will mature at the higher temperatures into a very dense and vitreous body. These bodies can have a level of absorption from 0 percent to no greater than 5 percent, making them completely non-porous, unlike earthenware and raku, which are very porous. Therefore, stoneware and porcelain are very hard, which makes them well-suited for making utilitarian ware. They will hold up very well under a lot of use and abuse and the extreme cycles of the dishwasher.

Because of the density of stoneware and porcelain, it is a pre-set material to use for sculpture or other items for outdoors. Pieces of stoneware and porcelain can be left outside for the winter where temperatures fall below freezing. The problem with outdoor ceramics is when the temperature falls to freezing, that moisture will expand as it freezes and shatter the piece into tiny fragments. Likewise, when a piece of utilitarian earthenware is used, you will see crazing develop over time. That is due to the porosity of the earthenware body – moisture penetrates through the dry food. Even if the piece is glazed all over, moisture can penetrate through a pinhole. When it does that, the body will expand and cause the glaze surface to crackle. The more times the piece goes through the dishwasher cycle, the more it will expand and contract, and the more crazing will develop.

Ceramic artists have generally chosen to work with low-fire (earthenware) ceramics because of the wide range of colour glazes and underglazes that are available for the lower temperature ceramics. Art pieces can be created this way to achieve very bright and shiny surfaces with as much controlled detail as the artist likes.

Now we go back to the original question, “What are high-fire glazes?” High-fire glazes have a variety of different characteristics. Utilitarian-ware potters usually use flow-type glazes that are fired to cone 10 (2,381 F) in a reduction atmosphere. These glazes are high in colour and texture, with amazing floats of rich crystalline patterns and/or contrasting shades of colours. When fired, they move a little, creating wonderful effects. Because of their slight movement during the firing, potters often superimpose them, one on top of the other. This technique

increases and varies the effects produced compared to using them individually. Many formulas for glazes like these originated in the orient and have become very popular throughout the world.

Another type of high-fire glaze uses wood or volcanic ash as a flux. These glazes produce a special “wiggly” effect when fired and are produced in a number of colours. Ash glazes are elegant and usually used on utilitarian ware, although many artists and potters also use them in combination with other glazes for their special effect. Traditionally, these glazes are fired in a reduction atmosphere to cone 10 (2,381 F).

A third type of high-fire glaze is very stable with bright colours, including yellows, reds, purples, and greens, and has a smooth or delicately textured surface. These glazes have been used to produce colourful utilitarian ware, however they are also used to create very controlled designs in beautiful bright colours, as the artist knows that the colours will come out of the kiln exactly as he or she planned for in the design. These glazes are very dependable.

There are beautiful transparent celadons, opaque copper-turquoise mattes, iron-saturated glazes of all kinds, and unlike the old copper-reduction reds, cadmium reds can be produced to work at high temperatures. With current technology, we can also use underglaze or overglaze decoration to fire in a single firing with the base glaze. Zinc-free clear glaze is available to apply over underglazes so that the colours will fire true and bright. We probably cannot stop talking about high-fire glazes at any one point, because there are as many varieties as there are glazes.

