

I understand that cones measure heat work (a temperature-time relationship) rather than simply temperature alone. Yet when one compares the way small and large cones of the same numerical designation behave in the kiln, there is quite a difference. Can you explain this and show the relationship of small and large cones fired at the same temperature and rate?

The answer to your question is a complex one. To begin with, small and large cones of the same number are made from the same material composition, but that's where the similarity ends. "Though the viscosity of both large and small cones (standing inclined at 8 degrees from vertical) would decrease at nearly the same rate when heated side by side, the greater weight of the large cone will cause it to deform first" stated a representative of the Orton Ceramic Foundation staff. "What's more, there are other variables: a small cone used horizontally in a kiln sitter deforms earlier than the same cone standing 8 degrees from vertical primarily because of the added weight of the sitter sensing rod. The deformation is further influenced by factors including the position of the cone beneath the kiln sitter sensing rod, and the adjustment of the kiln sitter." (Orton Ceramics found three different weights on three kilns tested, the bars weighed 3.4, 3.8 and 3.6 grams respectively at the point of contact. Most kiln sitters are adjusted by moving the tripping mechanism on the outside end of the kiln sitter sensing rod.) "Contributing as much to the non-prescriptive nature of this cone comparison are the temperature variations found in each kiln" said an Orton Ceramics Foundation source.

With all these variables, it shouldn't be surprising that Orton has no charts which compare small and large cones fired at the same rate. The only useful comparison for the potter is to fire large and small cones side by side in the same manner in which you use them. Orton states, "This actual performance test is probably more helpful than temperature data."

Generally speaking though, small cones will deform at approximately 15 degrees Celsius higher than the corresponding large cones when fired in the recommended near-vertical position. When the small cone is fired horizontally in a kiln sitter, it generally shuts off electrical current from one to one and a half cones lower than the corresponding near vertical large cone.