

# KILNS

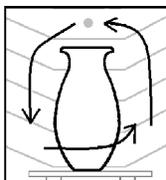
## HOW YOUR KILN WORKS

### Time PLUS Temperature

Heatwork, or getting the heat's full effect on the clay, is not just a matter of reaching the optimum temperature -- even with computerized kilns. Heatwork is a combination of time and temperature. It takes a certain amount of time at peak temperature for clay to achieve complete maturity. Compare it baking a cake in your oven: just because the temperature reaches 350° does not mean the cake is done. It takes time for the heat to do its work on the batter. Heatwork is also cumulative for clay.

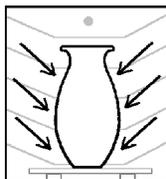
### Convection

Convection is the first step in the heating process. Air is heated as it passes across the warming kiln elements. As the hot air rises and the cool air falls, air currents are created which circulate hot air to cooler places in the kiln. This heat is transferred to everything in the kiln: ware, posts, cones and shelves alike.



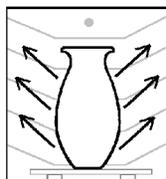
### Conduction

Conduction occurs when heat moves through a solid material, moving from the inside to the outside of the kiln and from the outside to the inside of the ware (and shelves and posts and...). Conduction is the main way to spread uniform heat through the kiln. It is a slow process.



### Radiation

At the beginning of the firing, the elements are the hottest part of the kiln. Heat radiates out from them, like the sun warming the ground on a cool day. Eventually, the firebrick and the ware itself will get hot enough to radiate heat as well. As the temperature increases, more and more heat is transferred by radiation from the elements instead of convection or conduction.



## FIRING SUPPLIES

### Orton Cones

The Greek letter Delta, or 'Δ', is the commonly used symbol for the word "cone." During firing, cones soften and melt as they are heated, and gravity causes them to bend. This bending indicates that the cone and the ware on that shelf have received a specific amount of heat. It usually takes 15 to 22 minutes for cones to bend fully once they begin melting. Regularly using witness cones gives you the true measure of how accurately your kiln fire to the desired temperature.

### Cone Prices

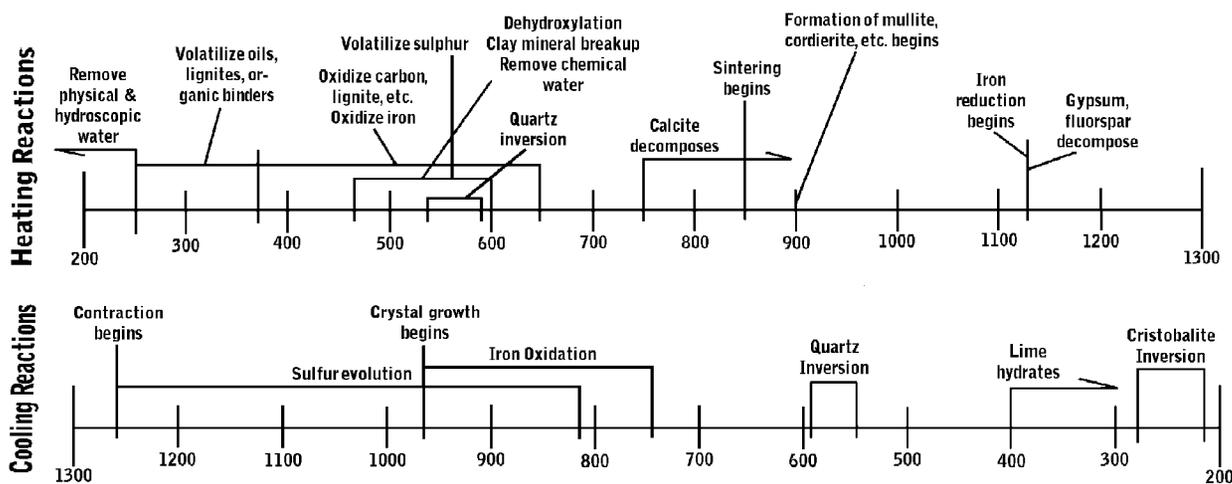
All cone prices are net: no discounts apply.

<b>SRB</b> .....	Junior Cones, in boxes of 50 .....	\$8.10
<b>BRB</b> .....	Mini Bars, in boxes of 50 .....	\$8.10
<b>LRB</b> .....	Large Cones, in boxes of 50 .....	\$10.70
<b>SSB</b> .....	Self-Supporting Cones, in boxes of 25 .....	\$7.70
<b>CHS</b> .....	Wire Cone Holders, in bags of 5 .....	\$3.59
<b>MS517</b> ...	LRB 3-Hole Cone Plaque .....	\$0.65

### Common Firing Temperatures

<u>Cone</u>	<u>°F</u>	<u>Firing Type</u>
019	1265	Mother-of-Pearl
018	1337	Gold, Lusters, China Paints, Decals, Enamel
014	1528	Glass Fusing
08	1751	Soft Bisque for Raku Work
05	1915	Hobby Ceramic Glazes
04	1940	Hobby Ceramic Bisque Pottery Bisque for Δ6-10 Work
1	2109	Sanitary Ware Glaze Firing
2	2124	Sanitary Ware Glaze Firing
5	2185	Stoneware Glazes (beginning of range)
6	2232	Porcelain Doll Full Bisque Maturity
7	2264	(Upper end of Stoneware Glaze range)
9	2336	Pottery Glaze Firing (in fossil-fueled kilns and reduction atmospheres)
10	2381	

Temperatures are in degrees Fahrenheit, based on 270° per hour rate of increase.



We found these charts on ceramic heating and cooling in Ceramic Industry magazine. Read through them and see ALL that happens on the scale from 200 to 1300°F. Clay is very busy in that range, so slow and steady wins the firing race every time!

