FIRED UP KILNS
and pottery supplies

KILN FIRING CHART

Firing transforms fragile greenware into a strong, durable, permanent form. As the kiln temperature increases, various changes occur at different stages. Understanding these changes can help you avoid clay and glaze issues related to firing.

TEMPERATURE °C	CONE (approx)	INCADANDESCENCE	EVENT
1400	14 13 12	Brilliant white	End of porcelain range
	11 10	White	End of stoneware range
1300	9 8 7 6	Yellow-white	End of midfire range
1200	5 4 3 2 01 02	Yellow	End of earthenware (red clay) range
1100	03 04 05	Yellow-orange	1100-1200 °C : Mullite and cristobalite (Two types of silica) form as clay begins to convert to glass. Particles start melting together to form crystals, and materials shrink as they become more dense. Soaking (holding the end temperature) increases the amount of fused material and the amount of chemical action between the fluxes and the more refractory materials.
	06 07	Orange	
1000	08 09 10	Red-orange	
900	011 012 013 014 015	Cherry red	800-900°C : The beginning of sintering, the stage where clay particles begin to cement themselves together to create a hard material called bisque.
800	016 017 018	Dull red	300-800°C : Carbonaceous materials (impurities in the clay along with paper, wax, etc.) burn out. The kiln requires ample air during this stage since after 800°C sintering begins and the clay surface begins to seal off, trapping unburned materials and sulfides, which can cause bloating and black coring.
700	019 020	Dark red	
600	021 022		
500		Dull red glow	573°C Quartz inversion occurs where the quartz crystal change form an alpha (a) structure to a beta (B) structure. The inversion is reversed on cooling. This conversion creates stresses in the clay so temperature changes must be slow to avoid cracking the work.
		Black	
400 **300**			Between 480-700°C chemcial water (“water smoke”) is driven off.
200			Upon cooling, cristobalite, a crystalline form of silica found in all clay bodies, shrinks suddenly at 220°C. Fast cooling at this temperature will cause ware to crack.
100		dark	Water boils and converts to steam at 100°C. Trapped water causes clay to explode so keep the kiln below 100°C until all water has evaporated.