



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)	INCANDESCENCE	EVENT	
1400	14	Brilliant white	End of porcelain range	
	13			
	12			
	11			
	10			
1300	9	White	End of stoneware range	
	8			
	7			
	6			
	5			
1200	4	Yellow	End of earthenware (red clay) range	
	3			
	2			
	01			
	02			
	03			
1100	04	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.	
	05	Orange		
	06			
	07			
1000	08	Red-orange		
	09			
	010			
900	011	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.
	012			
	013			
	014			
	015			
800	016	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.	
	017			
	018			
700	019	Dark red		
	020			
600	021			
	022			
500		Dull red glow	573°C Quartz inversion occurs where the quartz crystal change from 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.	