

FlashFire Dewax Method

The FlashFire dewax method is used to dewax and burnout the ceramic shell. When completed properly, this process puts less stress on the ceramic shell than the autoclave dewax process and allows the recovery of a significant portion of spent wax. A brief review of general process recommendations, using Pacific Kiln FlashFire Dewax equipment, follows.

1. Use a sprue/gate wax that melts 10°F (5°C) lower than the part wax. This allows sprues to melt out first, creating a passageway for the pattern wax to flow through. It also reduces pressure against the shell during the wax expansion of the melting process. This is true for any dewax method.
2. Pour cups should not be placed on the oven floor during dewax. Shells should be elevated over drainage ports in the bed of the FlashFire dewax system, which allows for appropriate oxygen flow, encouraging efficient dewax and directing wax away from the hot oven bed. Wax contact with the hot bed or over the sides of the bed can result in fire hazards.
3. Molten wax presents a flame hazard, if not managed properly during dewax. Molten wax should exit the oven through drainage ports in the bed of the FlashFire dewax system. Pacific Kiln & Insulations Co. Inc. (PKI) has a patented wax recovery chamber that uses inert gas to extinguish flames during this dewax process.
4. The maximum recommended temperature for a FlashFire dewax system depends on furnace limitations, process demands and shell composition. FlashFire dewax systems are rated for continuous operation at a given temperature, with occasional increases in temperature to an operating maximum. PKI Standard FlashFire dewax systems are rated for continuous operation at 1800°F (982°C) with an intermittent rating of 2000°F (1093°C). PKI New Generation FlashFire dewax systems are rated for continuous operation at 2100°F (1148°C) and intermittent rating of 2200°F (1204°C). Using equipment outside of its recommended operating parameters may damage the equipment.

If the foundry process includes pouring metal immediately upon shell removal from the FlashFire dewax system, temperature requirements are guided by the metal that is being poured. If the foundry process allows the shell to cool and requires a preheat before metal pour, shell composition must be taken into consideration during FlashFire dewax process. Shells with large portions of fused silica (i.e., stucco) should not be heated above 1750°F-1800°F (950°C-980°C) during the FlashFire dewax cycle or shell material will convert to cristobalite, weakening the shell.

5. Avoid direct burner flame contact with the shell. This contact, or flame impingement, will cause hot spots in the shell. Hot spots in the shell can lead to weak shells and leakers. Burners should always be above the load zone for maximum oxygen efficiency in burnout.
6. During the FlashFire dewax process, it is important to maintain an oxygen rich atmosphere in the oven. Approximately 10% excess oxygen is required to burn off wax completely. Excess oxygen provides cleaner burnout and reduces the potential for carbon formation in the shell. If carbon is left in the shell, it can produce COx in the mold when metal is introduced. This gas can lead to casting defects.

TECHNICAL TIP



RANSOM & RANDOLPH

Maumee, OH 43537 USA

Toll Free: 800.800.7496

Phone: 419.865.9497

Fax: 419.865.9997

www.ransom-randolph.com

Issue Date: 021317 / Replaces: 081716

Investing with Innovation™

FlashFire Dewax Method

7. Fire the shells long enough that all organic materials in the shell, and from the pattern materials, are completely burned out. This will vary from shell to shell, but a general rule of thumb for stereolithography (SLA) materials is 45-60 minutes and 20-30 minutes for wax, depending on filler content. The time and temperature used can vary depending on the geometry of the cast part. For example, thin sections may require higher mold temperatures at casting.
8. Every FlashFire dewax oven is created to handle a customer-specified wax load. If the oven is loaded with more wax than intended in the original design, performance is compromised. Smoke can indicate that more wax is being processed than the original design anticipated.

TECHNICAL TIP



RANSOM & RANDOLPH

Maumee, OH 43537 USA

Toll Free: 800.800.7496

Phone: 419.865.9497

Fax: 419.865.9997

www.ransom-randolph.com

Issue Date: 021317 / Replaces: 081716

Investing with Innovation™