



CASTING INSTRUCTIONS ON THE LIQUID CRYSTAL MAGNA

The method of removing the pattern when using 'Magna Draft' resin is different to conventional de-waxing, being a direct transformation from solid to gas with no melting. Our resin will exhibit negligible thermal expansion below its gas formation. The gas is released at above 250°C when the mass loss starts. The release of gas leads to burnout expansion, which must be controlled to avoid any cracking of the shell. The following tips and tricks will help you have successful casting with LC Magna and Magna Draft resin.

File preparation

It is extremely important to hollow your object to prevent any burnout expansion and instead allow the pattern to collapse into itself. When hollowing set a wall thickness to below 0.7mm. Depending on size of the objects, use infills to strengthen the pattern, setting the infill diameter to below 0.7 mm and the gap between knots (cell size) to be greater than 4mm. Ensure your object has enough drain holes, each with a 4mm in diameter. Alternatively, you can use the Tetrashell option in Materialise Magics.

Post processing

After washing your parts, you must take exceptional care to drain all the cleaning solvent from them. If any liquid resin or solvent remains inside the pattern, they may rapidly expand/evaporate during the burnout process leading to cracking the shell during the burnout process. Ensure that your parts are post cured fully by placing them in the Photocentric Cure L2 unit for 2hrs at 60°C. Allow them to cool down naturally by turning the Cure L2 off and leaving its door ajar.

Prior to pattern assembly and shelling

Make sure you have closed off all of the drain holes and potential cracks/holes in the patterns with red wax material or glue.

To check the pattern is completely sealed and watertight, you can inflate it with an air pump (using one of the drain holes) and check the pressure build up. Alternatively, but less desirably, immerse the pattern under water. If water is used for this check, it is very important to ensure that none of it remains inside the pattern to avoid cracking the shell during burnout process.

Ensure that you add enough vents (dewax tags) prior to making the shell. If the assembly is made of several prints, make sure that there is at least one tag on each separate print. They must be carefully positioned to avoid the gas being trapped and allow the free flow of necessary oxygen to the pattern for an effective burnout.

Post firing operations

Wash the ceramic shells to remove any ash or residual matter.

If possible, use a borescope to observe the moulds' internal cavity.

Make sure that all the vents (dewax tags) are blocked by refractory cement components before the final firing/casting process.

Recommended Burnout Cycle

This is a highly conservative burnout cycle. If you wish to use a faster burnout cycle, it is useful to know the burnout of this Photocentric resin peaks at 350°C and 440°C. There will be no remaining material left after 580°C.

Temperature (°C)	Ramp/Dwell	
Room Temperature	1	°C/min
250	2	hr
250-300	1	°C/min
300	2	hr
300-350	1	°C/min
350	2	hr
350-400	1	°C/min
400	2	hr
400-440	1	°C/min
440	2	hr
440-500	1	°C/min
500	2	hr
500-580	1	°C/min
580	2	hr

An alternative, faster, but slightly riskier burnout cycle is to rapidly ramp the temperature up to 600°C and hold it there for 6hrs.