



Liquid Crystal  
**MAGNA**

## CASTING INSTRUCTIONS FOR THE LIQUID CRYSTAL MAGNA

The method of removing the pattern when using 'Photocentric High Tensile Translucent' 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 before 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 Translucent resin.

### File preparation

It is extremely important to hollow your object to minimise any burnout expansion and instead allow the pattern to collapse into itself. When hollowing, set a wall thickness to between 0.5mm and 0.7mm. Depending on the size of the objects, use infills to strengthen the pattern, setting the infill diameter to between 0.5mm and 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 diameter. Alternatively, you can use the Tetrashell option in Materialise Magics.

### Post processing

After washing your parts, it is critical to drain all the cleaning solvent from them. If any liquid resin or solvent remains inside the pattern, it may rapidly expand/evaporate during the burnout process leading to cracking of the shell during the burnout process.

Ensure that your parts are post cured fully by placing them in the Photocentric Cure L unit for 2hrs at 60°C. Allow them to cool down naturally by turning the Cure L off and leaving its door ajar.

### Prior to pattern assembly and shelling

Make sure you have closed off all 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 and look out for air bubbles coming out of the fully sealed pattern. 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 check 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, but the safest. If you wish to use a faster burnout cycle, note that 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