FORMLABS USAGE GUIDE

Castable Wax and Castable Wax 40: Jewelry Pattern Burnout Process

Castable Wax resin is a 20% wax-filled material for reliable casting with zero ash content and clean burnout, Castable Wax accurately captures intricate features and offers the smooth surfaces stereolithography 3D printing is known for.

Castable Wax 40 resin offers high detail and surface smoothness, with handling characteristics similar to blue carving wax. With a 40% wax fill and low expansion, Castable Wax 40 Resin supports a wide range of lost wax casting conditions and is compatible with leading gypsum investments.

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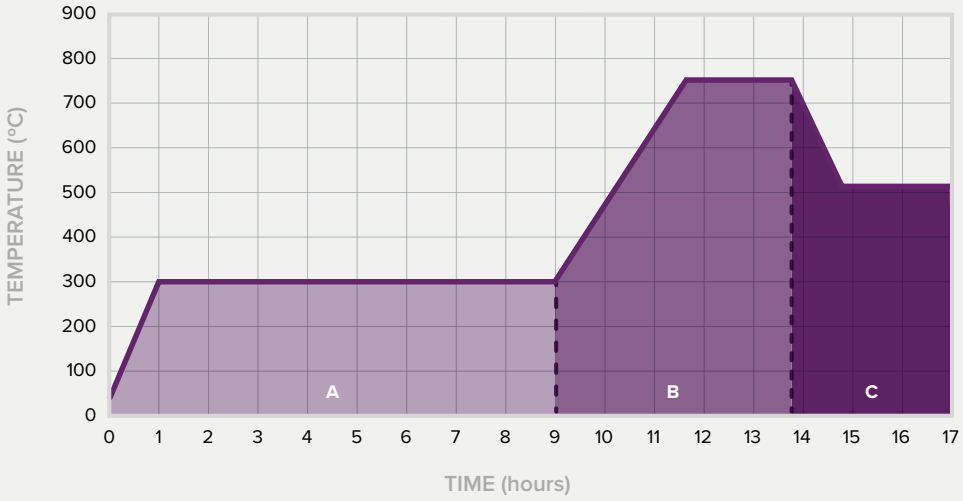
Castable Wax Standard Burnout Schedule

for use with gypsum investments



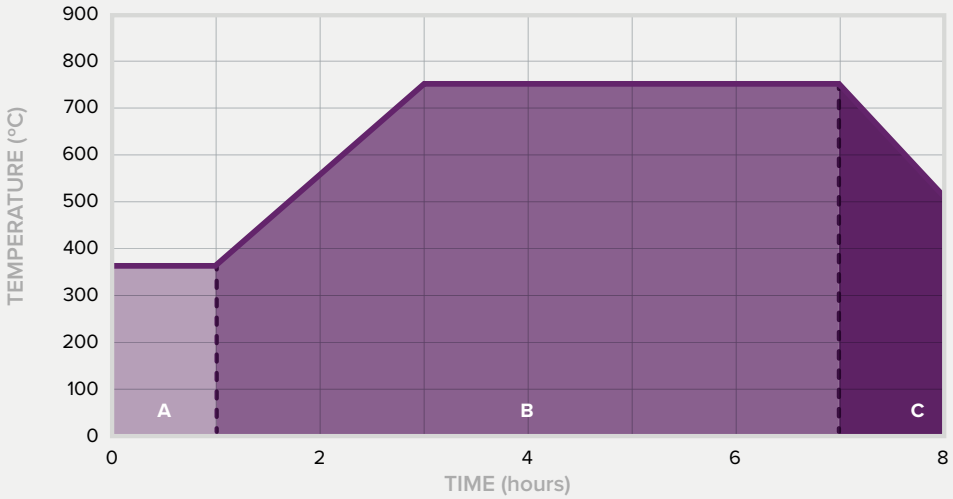
The Standard Burnout Schedule is designed to provide the maximum possible investment strength and complete burnout of the finest details using gypsum investment materials (Recommended investment is Prestige Optima and Ransom & Randolph investment..

		PHASE	TIME	SCHEDULE °C	SCHEDULE °F
A	Place flasks into oven at room temp.	Insert Flasks	0 min	21 °C	70 °F
	Diffusion Hold Sprue melts out. Liquid wax diffuses out, increasing airflow to pattern.	Ramp	60 min	4.7 °C/min	8.4 °F/min
		Hold	480 min	300 °C	572 °F
B	**Final Burnout** Eliminates the remaining resin in the investment.	Ramp	100 min	4.5 °C/min	8.1 °F/min
		Hold	180 min	750 °C	1382 °F
C	**Casting Temperature** Cools the flask to casting temperature of the selected metal.	Ramp	60 min	-4.0 °C/min	-7.1 °F/min
		Casting Window	Up to 2 hours	512 °C (or desired casting temp)	954 °F (or desired casting temp)

Before Casting: It is important to thoroughly clean prints before use. Wash Castable Wax prints in isopropyl alcohol (IPA) for 10 minutes. Rinse for 5 minutes in a second, cleaner IPA bath to eliminate any remaining uncured material. For best results, fully dry parts with compressed air. No post-curing is required for Castable Wax parts.

Castable Wax Short Burnout Schedule

for use with gypsum investments



It is possible to achieve faster cycle times with some geometries and investment materials. Higher end phosphate-bonded investments are stronger and can withstand fast heating.

Consider using a short burnout alongside a phosphate-bonded investment for rush-order projects. A short burnout works best with thinner designs (less than 1ml). Thick walled patterns may cause investment breakout.

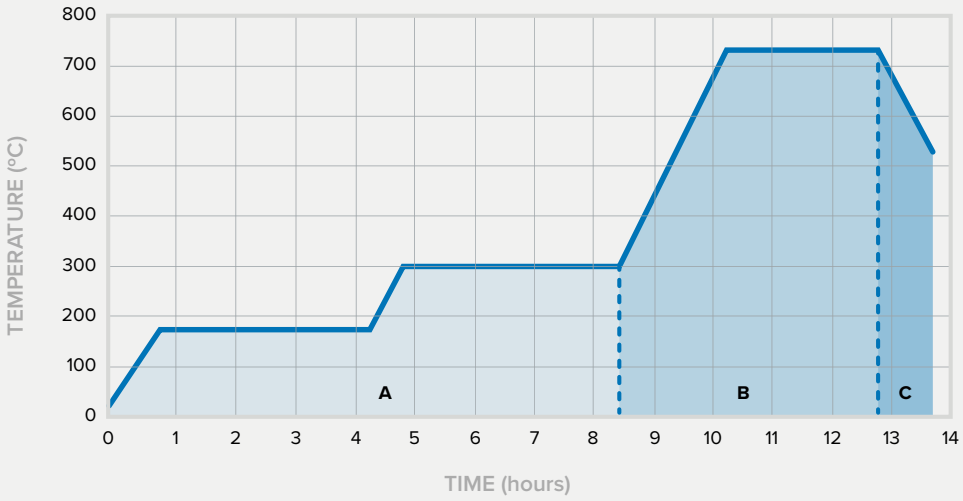
The cured flask is placed directly into a preheated furnace, and can be cast after 8 hours. Time at peak temperature may be reduced or extended depending on the volume of the parts.

		PHASE	TIME	SCHEDULE °C	SCHEDULE °F
A	**Thermal Transition**	Insert Flasks into hot oven	0 min	371 °C	700 °F
		Ramp	60 min	371 °C	700 °F
B	**Final Burnout**	Ramp	120 min	3.5 °C/min	6.3 °F/min
		Hold	240 min	788 °C	1450 °F
C	**Casting Temperature**	Ramp	60 min	-4.6 °C/min	-8.3 °F/min
		Casting Window	Up to 2 hours	512 °C (or casting temperature of alloy)	954 °F (or casting temperature of alloy)

Tip: Follow manufacturer's instructions for investment preparation and curing times.

Castable Wax 40 Standard Burnout Schedule

for use with gypsum investments



		PHASE	TIME	SCHEDULE °C	SCHEDULE °F
A	Place flasks into oven at room temp.	Heated Flask Drying	180 min	55 °C	131 °F
A	**Diffusion Hold** Sprue melts out. Liquid wax diffuses out, increasing airflow to pattern.	Ramp	48 min	2 °C / min	3.6 °F / min
A		Hold	180 min	150 °C	302 °F
A		Ramp	75 min	2.0 °C / min	3.6 °F / min
A		Hold	180 min	300 °C	572 °F
B	**Final Burnout** Eliminates the remaining resin in the investment.	Ramp	108 min	4.0 °C / min	7.2 °F / min
B		Hold	180 min	732 °C	1350 °F
C	**Casting Temperature** Cools the flask to casting temperature of the selected metal.	Ramp	44 min	- 5 °C / min	-9 °F / min
C		Casting Window	Up to 2 hours	Desired casting temp	Desired casting temp

Technical Data for Castable Wax Green

MATERIAL PROPERTIES DATA **Castable Wax Resin**

	METRIC [1]	IMPERIAL [1]	METHOD
	Green [2]	Green [2]	
Tensile Properties			
Ultimate Tensile Strength	12 MPa	1680 psi	ASTM D 638-10
Tensile Modulus	220 MPa	32 ksi	ASTM D 638-10
Elongation at Break	13%	13%	ASTM D 638-10
Burnout Properties			
Temp @ 5% Mass Loss	249 °C	480 °C	ASTM E 1131
Ash Content (TGA)	0.0 - 0.1%	0.0 - 0.1%	ASTM E 1131

[1] Material properties can vary with part geometry, print orientation, print settings, and temperature.

[2] Data was obtained from parts printed using Form 2, Castable 50 µm Fine Detail settings and washed without post-cure.

Technical Data for Castable Wax 40 Green

MATERIAL PROPERTIES DATA **Castable Wax 40 Resin**

	METRIC [1]	IMPERIAL [1]	METHOD
	Green [2]	Green [2]	
Burnout Properties			
Temperature @ 5% Mass Loss	249 °C	480 °C	ASTM E 1131
Ash content (TGA)	0.0 - 0.1%	0.0 - 0.1%	ASTM E 1131

[1] Material properties can vary with part geometry, print orientation, print settings, and temperature.

[2] Data was obtained from green parts, printed using Form 3, 50 µm, Castable Wax 40 Resin settings, without post-cure.