FORMLABS USAGE GUIDE:

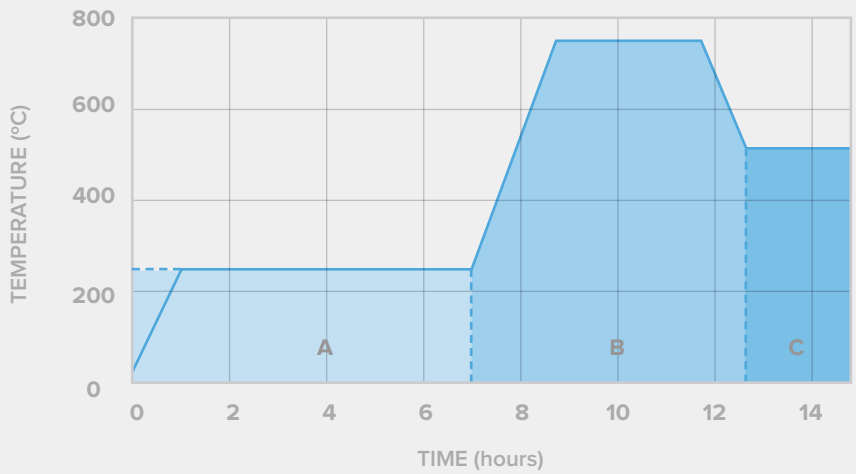
Castable Wax: Jewelry Pattern Burnout Process

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. Printed parts are strong enough to handle with no post-cure required, suitable for custom try-ons and direct investment casting.

formlabs

Standard Burnout Schedule (2019)

for use with Certus Prestige OPTIMA

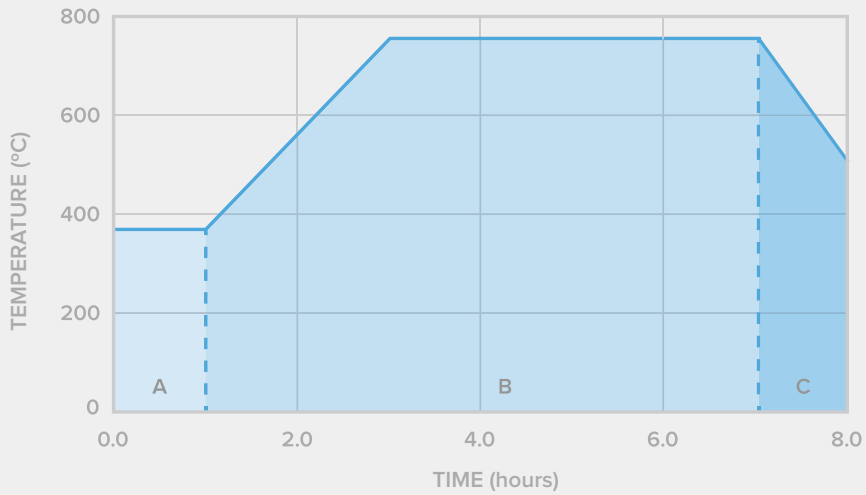


The Standard Burnout Schedule (2019) is designed to provide the maximum possible investment strength and complete burnout of the finest details using Certus Prestige OPTIMA or similar gypsum investment materials.

	DESCRIPTION	PHASE	TIME TO TEMP	SCHEDULE °C	SCHEDULE °F
	Place flasks into preheated oven.	Insert Flasks	0 min	250 °C	482 °F
A	**Diffusion Hold** Sprue melts out. Liquid wax diffuses out, increasing airflow to pattern.	Hold	480 min	250 °C	482 °F
B	**Final Burnout** Eliminates the remaining resin in the investment.	Ramp	100 min	5 °C/min	9 °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 °C/min	-7.2 °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.

Short Burnout Schedule



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.

	DESCRIPTION	PHASE	TIME TO TEMP	SCHEDULE °C	SCHEDULE °F
A	**Thermal Transition**	Insert Flasks into hot oven	0 min	371 °C	700 °F
		Hold	60 min	371 °C	700 °F
B	**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.

Technical Data for Castable Wax FLCWPU - Green[1]

	METRIC[2]	IMPERIAL[2]	METHOD
Tensile Properties			
Ultimate Tensile Strength	22.5 MPa	3270 psi	ASTM D 638-10
Young's Modulus	0.94 GPa	13 ksi	ASTM D 638-10
Elongation at Break	13%	13%	ASTM D 638-10
Burnout Properties			
Temp @ 5% Mass Loss	249 °C	480 °F	ASTM E 1131
Ash content (TGA)	0.0 - 0.1%	0.0 - 0.1%	ASTM E 1131

NOTES:

[1]Data was obtained from green parts, printed using Form 2, 50µm, Castable Wax settings without additional treatments.

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