A 20% wax-filled photopolymer for reliable casting with zero ash content and clean burnout, highly accurate Castable Wax Resin 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, allowing for a faster, simpler workflow.

- **For jewelry:** Printed parts are suitable for both custom try-ons and final production through direct investment casting. Download the Usage Guide for detailed instructions. Print at 50 or 25 microns.
- **For dental:** Printed patterns are suitable for casting and pressing copings and substructures, full contour crowns, and removable partial denture frameworks with accurate, sealed margins. Download the Application Guide for detailed instructions. Print at 50 microns to reduce print times while ensuring clinically acceptable accuracy.

Supports print resolutions: 50 and 25 microns.
No post-curing required.
Resin Tank LT recommended.
Using Castable Wax Resin

Use FormLabs Castable Wax Resin to produce highly detailed jewelry by casting parts through direct investment casting with minimal part finishing (no post-cure required). Castable Wax prints are strong enough to use for prototyping and fitting before production.

A 20% wax-filled material, Castable Wax Resin prints both delicate and bulky models with ease. Parts printed in Castable Wax are ready to cast after washing without post-curing for fast, clean burnout and a streamlined casting process.

Understand the step-by-step workflow, recommendations, burnout schedules, and special considerations for designing models, printing, preparing investments, and casting successfully with Castable Wax Resin.

RECOMMENDED FOR:

- Direct investment casting:
  - all jewelry models
  - jewelry with delicate features such as filigree, pavé geometries, thin walls, and fine surface details
  - large castable parts
- Prototyping and fitting for jewelry

NOT RECOMMENDED FOR:

- Final or functional parts

Several silver casted rings and their complementary printed versions on a marble surface. Castable Wax prints both delicate and bulky models.
Material properties

Castable Wax Resin is an acrylate photopolymer formulated with liquid wax to enable a burnout process similar to a traditional wax schedule.

Castable Wax Resin prints parts with high mechanical strength in their green state when compared to parts printed in Castable, which requires post-curing. As a result of the high strength, Castable Wax is particularly suitable for large patterns and for patterns with delicate features and high surface detail requirements.

See the table below for relevant material properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Castable Wax Resin V1</strong></td>
<td></td>
</tr>
<tr>
<td>(FLCWP001)</td>
<td></td>
</tr>
<tr>
<td><strong>Green</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Purple</td>
</tr>
<tr>
<td><strong>Tensile Strength at Break</strong></td>
<td>22.5 MPa</td>
</tr>
<tr>
<td><strong>Young’s Modulus</strong></td>
<td>0.94 GPa</td>
</tr>
<tr>
<td><strong>Elongation at Break</strong></td>
<td>13%</td>
</tr>
<tr>
<td><strong>Temp. at 5% Mass Loss</strong></td>
<td>249 °C</td>
</tr>
<tr>
<td><strong>Ash Content (TGA)</strong></td>
<td>0.0-0.1%</td>
</tr>
</tbody>
</table>

Data was obtained from green parts, printed using Form 2, 50 micron Castable Wax settings, without additional treatments.
To learn more about the performance properties of each FormLabs resin, refer to the library of material properties datasheets.

Required resources

MADE BY FORMLABS:

- Form 2 or Form 3 3D printer with up-to-date firmware
- PreForm software
- Build platform
- Resin TankLT
- Castable WaxResin
- Form Wash or Finish Kit
- Form Cure

MADE BY THIRD PARTIES:

- Jewelry-specific CAD software, such as JewelCAD or RhinoGold
- Recommended investment:
  - For Standard Burnout Schedule: Certus Prestige Optima
  - For Short Burnout Schedule: Nobilium Microfire
- Burnout oven capable of 750 °C
- Casting equipment (vacuum chamber and casting system, such as Indutherm MC-series or the Neutec J2R)
- Compressed air
- Sandpaper (400 grit or above)

Workflow overview

NOTICE:

This is an abbreviated version of the complete instructions in Introduction to Casting for 3D Printed Jewelry Patterns[en]. Read the application guide for detailed instructions about design, settings, and part orientation for Castable Wax Resin.

An abridged guide to casting with Castable Wax Resin is available in Castable Wax: Jewelry Pattern Burnout Process[en].
Casting is both a skill and an art form. The design of the piece to be cast is as important as the material properties for successful results. Learn more in our white paper, Jewelry 3D Printing: Basic Design Parameters, Supports, and Orientation (English only).

Pay attention to the design of individual features, the flow of material in the investment, and the printing configuration. Learn more about the best design parameters for common jewelry features, such as prongs, filigree, engraving, surfaces, raised text, and milgrain, in the Designing for 3D printed jewelry white paper (English only) from FormLabs.

Design airflow vents in thick or large geometries to allow sufficient ventilation during burnout.
Prepare and print parts

Prepare prints in PreForm

Follow FormLabs print setup instructions to open the model in PreForm, orient it, generate supports, and select print settings.

The PreForm print settings for Castable Wax Resin are optimized for printing jewelry and quality cast parts, with a focus on achieving the features and detail that matter to jewelers.

Open Mode must be toggled off to print with Castable Wax Resin.

Shake the resin cartridge and mix resin in the resin tank to agitate Castable Wax Resin before printing. Mix the resin regularly to maintain or restore expected resin performance.

Finish parts for casting

Wash Castable Wax prints in isopropyl alcohol (IPA) for 10 minutes. Rinse for five minutes in a second, cleaner IPA bath to eliminate any remaining uncured material. The Form Wash agitates the alcohol bath and removes parts from the bath after a set time.

Do not leave parts in IPA longer than necessary. If the pattern is hollow, ensure liquid resin is flushed out thoroughly from internal channels and hollows.

Ensure all IPA on washed parts evaporates completely prior to casting because the IPA can interact with the investment and cause pitting. For best results, wash parts in clean IPA and use compressed air to dry parts, especially parts with internal channels and hollows.

Post-curing

No post-curing is required for Castable Wax parts. While post-curing Castable Wax parts should not affect castability, post-curing may shrink parts slightly (by less than 1%), which can cause distortion.
Casting with Castable Wax Resin

For detailed steps about casting with FormLabs resins, read Introduction to casting with Formlabs resins (PDF) and other FormLabs resources.

NOTICE:

Follow the investment manufacturer’s safety recommendations.