

ALPHASENSE DLP/SLA/LCD Castable Dental Resin User Instructions

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Introduction

ALPHASENSE DLP/SLA/LCD castable resin is a photocurable polymer system containing monomers, photo-initiators, and additives. It cures under UV light (up to 420 nm) and is compatible with common resin-based 3D printers (DLP, SLA, LCD). Key features include fast curing, complete burnout, and minimal residue. It supports printing resolutions from 25 to 200 microns.

Usage

3D Printing

The exposure time is critical and depends on light intensity, layer thickness, and model cross-section. For **monochromatic LCD printers (e.g., Anycubic Photon Mono)**, use the following parameters:

- **Layer Thickness:** 0.05 mm
- **Bottom Layers:** 8
- **Base Layer Exposure:** 40 seconds
- **Normal Layer Exposure:** 4 seconds
- **Bottom Layer Light-Off Delay:** 4 seconds
- **Normal Layer Light-Off Delay:** 2 seconds

Notes:

- Ensure proper plate adhesion by using sufficient bottom layer exposure (40 seconds) and 8 bottom layers.
- Adjust normal layer exposure for intricate models.
- Use heavy supports for larger models in slicing software (e.g., Chitubox).

For **SLA printers (e.g., Formlabs)**, the resin is compatible with default settings (25-200 microns).

Post-Processing

1. **Rinse printed parts** to remove uncured resin using one of the following methods:
 - **Warm Water:** Rinse in warm water (40-50°C) for 1-2 minutes with agitation.
 - **Isopropyl Alcohol (IPA):** Rinse in 70% isopropyl alcohol for 1-2 minutes, ensuring thorough cleaning of all surfaces.
 2. **Post-Curing (Optional):**
 - If post-curing is desired, cure the rinsed/washed models under a 365nm, 40W UV lamp for 30 minutes. For best results, place the models in warm water (50°C) during post-curing.
 3. **Air-Dry:** Ensure parts are completely air-dried before casting.
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Casting

1. Use the traditional "lost-wax" method for jewelry and dental components.
 2. Attach the model to a wax tree with large sprues and buttons for smooth metal flow.
 3. Embed the model in **phosphate-bonded** (preferred) or **gypsum-bonded** investment material.
 - For gypsum-bonded material, add 1-1.5% boric acid for strength.
 - Apply vacuum during mixing and pouring to remove air bubbles.
 - Let the mold set for at least 3 hours before burnout.
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Burnout Schedule for Phosphate-Bonded Investment Powder

Users should follow the burnout instructions provided by the manufacturer of the **phosphate-bonded investment materials/casting powders**. Below is a general **temperature-time curve** for the burnout process, which ensures complete resin removal and minimizes stress on the investment material:

Temperature-Time Curve for Burnout

Below is the recommended burnout schedule for a 2" flask with small wax trees. For larger flasks, proportionally increase the duration of each step.

Step	Temperature (°F)	Time (Hours)	Notes
1	Room Temperature to 482°F (250°C)	1-2 hours	Slow heating to prevent cracking.
2	482°F (250°C)	1-2 hours	Hold to ensure complete wax or resin removal.
3	482°F to 1,472°F (250°C to 800°C)	2-3 hours	Gradual heating to prevent thermal shock.
4	1,472°F (800°C)	1-2 hours	Hold to ensure complete burnout of residues.
5	Cool to Casting Temperature	Gradual cooling	Allow the mold to cool to the desired casting temperature (e.g., 1,300°C for Co-Cr alloys).

Graph: Temperature-Time Curve for Burnout

