



Instructions for Printing

BIOMED CLEAR RESIN

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The following printing instructions are for Formlabs biocompatible photopolymer BioMed Clear Resin. Basic information about safety and environmental concerns are also included. For more detailed safety and environment information please refer to the Safety Data Sheet, available at [formlabs.com](https://www.formlabs.com). For further information regarding the use of the material, please contact Formlabs.

1. Introduction

APPLICATIONS

BioMed Clear Resin is a USP Class VI certified, light-curable polymer based material designed for the additive manufacturing of medical grade, biocompatible, clear, and rigid parts for long term Surface contact (more than 30 days). It can be used for manufacturing medical devices and 3D printing components that require water resistance, high impact strength, and sterilization compatibility.

Users should independently verify the suitability of the printed materials for their particular application and intended purpose.

BioMed Clear is a photopolymer resin made of a mixture of methacrylic esters and photoinitiators.

2. Specific Manufacturing Considerations

NOTIFICATION

The device specifications have been validated using the printer process parameters indicated below.

REQUIREMENTS

Use dedicated accessories for BioMed Clear Resin. For biocompatibility compliance, BioMed Clear requires a dedicated resin tank, build platform, Form Wash, and finishing kit, which should not be mixed with any other resins.

RECOMMENDED 3D PRINTER AND PRINTING PARAMETERS

- a. Hardware: Formlabs SLA 3D Printer
 - Laser wavelength : 405 nm
- b. Software: Formlabs PreForm
 - STL file import
 - Manual/Automatic rotation and placement
 - Manual/Automatic generation of supports
- c. Printing Parameters
 - Layer thickness: 100 µm
- d. Recommended Post-Processing Equipment:
 - Formlabs Form Wash
 - Isopropyl alcohol (IPA) ≥ 99%
 - Formlabs Form Cure

3. Hazards And Precautions

HAZARDS

BioMed Clear Resin (uncured) contains polymerizable monomers which may cause skin irritation (allergic contact dermatitis) or other allergic reactions in susceptible persons. If resin contacts skin, wash thoroughly with soap and water. If skin sensitization occurs, discontinue use. If dermatitis or other symptoms persist, seek medical assistance.

1. **Eye contact:** High vapor concentration may cause irritation.
2. **Skin contact:** May cause sensitization by skin contact. Irritating to skin. Repeated and/or prolonged contact may cause dermatitis.
3. **Inhalation:** Irritating to the respiratory system. Prolonged or repeated exposure may cause: headache, drowsiness, nausea, weakness (severity of effects depends on the extent of exposure).
4. **Ingestion:** Low oral toxicity, but ingestion may cause irritation of the gastrointestinal tract.
5. **Protection:** Protective glasses and nitrile gloves should be worn while handling BioMed Clear. Detailed information about the handling of BioMed Clear can be found in the Safety Data Sheets at formlabs.com.

PRECAUTIONS

1. When washing the printed part with solvent, it should be in a properly ventilated environment with proper protective masks and gloves.
2. Expired or unused BioMed Clear shall be disposed in accordance with local regulations.
3. IPA shall be disposed of in accordance with local regulations.

4. Manufacturing Procedure With BioMed Clear Resin

A. PRINTING AND POST-PROCESSING

1. **Shake cartridge:** Prior to use, shake cartridge well. Color deviations and print failures may occur if the cartridge is shaken insufficiently.
2. **Set up:** Insert resin cartridge into a compatible Formlabs 3D printer.

3. **Printing:**

- a. Prepare a print job using PreForm software. Import desired part STL file. Orient and generate supports. For recommendations on print orientation and support placement, visit support.formlabs.com.
- b. Send print job to printer. Begin print by selecting a print job from the print menu. Follow any prompts or dialogs shown on the printer screen. Printer will automatically complete print.

4. **Part removal:**

- a. Remove the build platform from the printer.
- b. Printed parts can be removed from the build platform before or after cleaning in a Form Wash. To remove, wedge the part removal tool under the printed part raft, and rotate the tool. For detailed techniques visit support.formlabs.com.

5. **Rinsing:** Required - Place the printed parts in a Form Wash filled with Isopropyl Alcohol (IPA, $\geq 99\%$) and wash for 15 minutes. Remove parts from Form Wash and soak in fresh Isopropyl Alcohol (IPA, $\geq 99\%$) for 5 minutes.

6. **Drying:**

- a. Remove parts from IPA and leave to air dry at room temperature for at least 30 minutes.
- b. Inspect printed parts to ensure that parts are clean and dry. No residual alcohol, excess liquid resin or residue particles must remain on surface before proceeding to subsequent steps.

7. **Post cure:** Required - Place the dried printed parts in a Form Cure and post cure at 60°C for 60 minutes.

8. **Support removal:**

- a. Remove supports using a cutting disk and handpiece, or with other part removal tools.
- b. Inspect the parts for any cracks. Discard if any damage or cracks are detected.

B. POLISHING

1. If any rough marks are left on the printed part surface after support removal, smooth down the support surfaces with a bur and handpiece to improve surface finish.
2. If needed, polish the printed parts using typical polishing methods. Make sure to verify the suitability of the polished printed material for the intended purpose.

C. CLEANING

1. Fully post processed parts can be cleaned using a dedicated soft brush with neutral soap and room temperature water.
2. Do not use any abrasive cleaning products on parts printed with BioMed Clear Resin. Such cleaning products may adversely affect surface finish.
3. After cleaning, always inspect parts for any cracks. Discard if any damage or cracks are detected.

D. DISINFECTION

Parts may be disinfected in 70% IPA for 5 minutes.

E. STORAGE

1. When not in use, place printed parts in closed, opaque or amber containers.
2. Store in a cool, dry place out of direct sunlight. Excess light exposure overtime may affect the color of printed parts.
3. Store the cartridges at 10°C - 25°C (50°F - 77°F).
4. Do not exceed 25°C (77°F) when in storage.
5. Keep away from ignition sources.

F. DISPOSAL

1. Any cured resin is non-hazardous and may be disposed of as regular waste.
2. Follow facility protocols for waste that may be considered biohazardous.
 - a. Liquid resin should be disposed of in accordance with government regulations (community, regional, national).
 - b. Contact a licensed professional waste disposal service to dispose of liquid resin.
 - c. Do not allow waste to enter storm or sewer drainage systems.
 - d. Avoid release into the environment.
 - e. Contaminated packaging: Dispose of as unused product.