

Micro 3D Printing builds parts by curing photopolymer resins with light. While the technology shares similarities with stereolithography (SLA) and Digital Light Projection (DLP), it also offers distinct advantages.

Micro 3D Printing at Prototype Projects is carried out using our microArch S240 printer, manufactured by Boston Micro Fabrication (BMF).



Why choose Micro 3D Printing?

This technology delivers extremely high accuracy, ultra-fine detail, and exceptionally smooth surfaces. It is ideal for parts that cannot be made using SLA, DLP, SLS, or PolyJet.

Micro 3D Printing is well suited to:

- ▶ Concept models
- ▶ Functional prototypes
- ▶ Low-volume end-use parts

It's particularly effective for small components where detail and dimensional accuracy are critical.

Typical applications

Micro 3D Printing is used in industries where miniaturisation and fine detail are essential.

Typical applications include:

- ▶ Medical devices
- ▶ Drug delivery systems
- ▶ Life sciences
- ▶ Biotechnology
- ▶ Microfluidics

Technical Overview

Thanks to its extremely high resolution and tight tolerances, Micro 3D Printing offers:

- ▶ Build envelope: 100 x 100 x 75 mm
- ▶ Resolution down to 10µm
- ▶ General tolerance of $\pm 25\mu\text{m}^*$
- ▶ X and Y optical resolution of $\pm 10\mu\text{m}^*$
- ▶ Print layer of 30-50µm

This enables ultra-fine features such as thin walls, sharp edges, and intricate geometries. Surface finishes are typically 0.4–0.8µm Ra on the top and 1.5–2.5µm Ra on the sides, reducing the need for hand finishing.

Parts also benefit from near-isotropic material properties, non-porosity, and good strength, stiffness, and dimensional stability.

*Subject to part geometry and build orientation.



Additional applications

Micro 3D Printing is also highly effective for:

- ▶ **Nano Devices:** Manufacturing functional components for nano-scale technologies with space and functionality constraints.
- ▶ **Microelectronics:** Precise housings, interconnects, and components for micro-electronic devices.
- ▶ **Photonics and Optics:** Intricate optical components such as waveguides and micro-lenses, delivering clarity and structural integrity.
- ▶ **Mini Medical Devices:** Parts for minimally invasive surgical tools, implantable devices, and diagnostic equipment.
- ▶ **Microfluidics:** Complex channels and reservoirs for fluid management in lab-on-chip devices and other fluidic systems.

Material options

We run three high-performance materials on the microArch S240:

HTL Resin

A high-temp, low-viscosity engineering resin offering excellent strength and rigidity. Finished parts withstand temperatures up to 114°C, ideal for demanding environments.

Bio Resin

A biocompatible resin suitable for non-implantable medical applications. Sterilisation-friendly and compliant with multiple ISO 10993 biocompatibility tests.

HTA300 Resin

An ultra-high temperature resistant rigid plastic, designed for the harshest thermal environments.

