

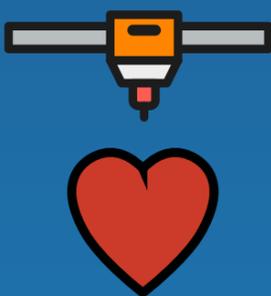
3D PRINTED PLASTICS FOR MEDICAL DEVICE PROTOTYPING

3D printed parts are often used in medical devices for prototyping, jigs and fixtures, and end-use parts. But which printing processes and plastics are safe, functional, and high-precision enough for medical applications? Read about industrial plastic specifications, features, and medical applications below.

HOW ARE 3D PRINTED PARTS USED IN THE MEDICAL INDUSTRY?

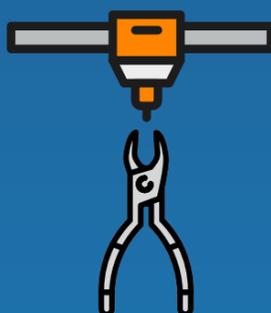
Surgical Models and Guides

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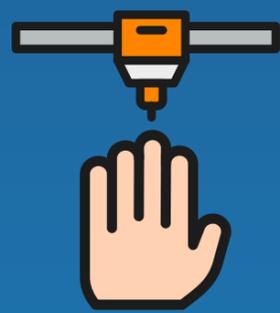
3D printed replicas and models of human organs aid complicated surgeries

Surgical Devices and Tools



Clamps, scalpels, forceps, and components of larger machines

Prosthetics



3D printed prosthetics for children and adults for any body part

WHICH 3D PRINTED PLASTICS CAN BE STERILIZED?

Nylon 12 (SLS and HP MJF)



Methods of Sterilization:

Steam Autoclave, Ethylene Oxide (EtO), Gamma Irradiation, Gas Plasma (HO), Chemical

ABS-M30i (FDM)



Methods of Sterilization:

Steam Autoclave, Ethylene Oxide (EtO), Gamma Irradiation, Gas Plasma (HO), Chemical

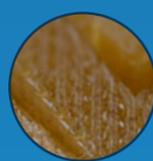
PC-ISO (FDM)



Methods of Sterilization:

Ethylene Oxide (EtO), Gamma Irradiation, Gas Plasma (HO)

Ultem 1010 (FDM)



Methods of Sterilization:

Ethylene Oxide (EtO), Gamma Irradiation

EPU (Carbon DLS)



Methods of Sterilization:

Ethylene Oxide (EtO), Gamma Irradiation, Electron Beam

CE (Carbon DLS)



Methods of Sterilization:

Steam Autoclave**, Ethylene Oxide (EtO), Gamma Irradiation, Electron Beam

EPX (Carbon DLS)



Methods of Sterilization:

Steam Autoclave, Ethylene Oxide (EtO), Gamma Irradiation, Electron Beam

RPU (Carbon DLS)



Methods of Sterilization:

Steam Autoclave, Ethylene Oxide (EtO), Gamma Irradiation, Electron Beam

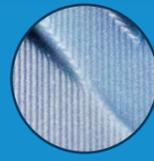
FPU (Carbon DLS)



Methods of Sterilization:

Ethylene Oxide (EtO), Gamma Irradiation, Electron Beam

SIL (Carbon DLS)



Methods of Sterilization:

Ethylene Oxide (EtO), Gamma Irradiation*, Electron Beam*

If a material can be sterilized, does that make it food safe or medical grade?

The material alone cannot determine whether a device is food safe or medical grade. Rather, the combination of the raw materials, design, surface finish, and handling of the part determines whether the application is biocompatible. Using the above materials in a clean, sterile medical device is a good foundation

for preventing irritation, cytotoxicity, and sensitivity.

Can you reuse 3D printed medical devices made from plastic?

Oftentimes, no. Parts printed in certain processes may contain small gaps or pores within the part which are difficult to sterilize. Nylon 12 parts, printed through SLS and HP MJF, can absorb moisture when they do not have extra surface treatments. ABS-M30i,

PC-ISO, and Ultem 1010 parts, printed through FDM, may not be air-tight and the gaps may be difficult to clean. These devices should be disposed of after their purpose-designed use. Carbon DLS materials have a smoother surface finish and little to no porosity, but they must be evaluated and qualified on a case-by-case basis.