

Frame Fabrication Method - Lab Process

Information Provided By Kevin Orthopedic Institute

3D Printed Frame

Additive manufacturing

Option not on the order form and is available as a special request

FOOT IMPRESSION METHODS ACCEPTED

Plaster Slipper Cast, Foam Impression, STS Slipper Sock, 3D Scanner

FRAME MATERIAL OPTIONS

Nylon

ADVANTAGES

- Precise resolution in microns
- Very accurate to digital design
- No environmental waste

DISADVANTAGES

- Limited to nylon material
- CAD technician design time limitations

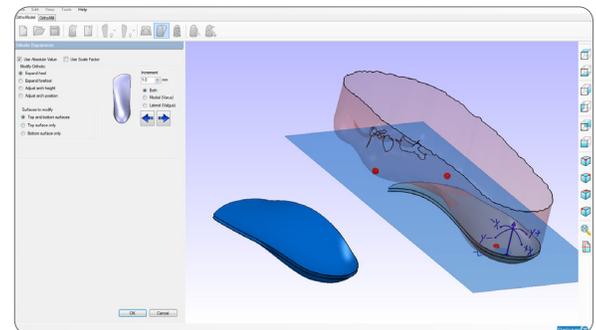
Kevin Orthopedic offers the option for clients to use 3D printing through additive manufacturing for a patient's devices. After a patient's foot model is digitally scanned, technicians use a software CAD program to design a positive model and custom frame before the Selective Laser Sintering (SLS) process, which then produces the physical frame of the device. The benefits of using the SLS process are that it is incredibly accurate in producing a precise physical match to the CAD or STL digital frame design and makes reordering easy, as the lab stores the digital frame specifications indefinitely. The compromises of using this method include very limited frame material options and frame congruency limitations. Orthotic lab CAD technicians are limited in the time they have to design orthotic frames that are perfectly congruent with patient foot impressions. CAD software shortcuts are used to reduce the time needed to design the digital frame, resulting in an increased variation between the shape and contour of the orthotic frame and the patient's impression model.



Close up of a SLS 3D printed orthotic. Layer thicknesses from Selective Laser Sintering (SLS) range from 0.060mm to 0.150mm. The lower the layer thickness, the higher the resolution and the longer it takes to make a 3D printed object of a given height.



**7% FRAME TO
MODEL VARIATION
TOLERANCE**



CAD file of an orthotic frame used for 3D printing or CAM. Thickness of frame, tapering, smoothing and all contours are designed on a computer screen in this environment. The superimposed positive model of the foot is used to help the orthotic technician create the orthotic frame shape and contour.



The 3D printers. 3D Printed SLS (selective laser sintering), is based on the melting of a plastic powder using a laser.