



ADAPTABILITY:

Design-Freedom and Flexibility with 3D printing



OVERVIEW

Daniel Robert Orthopedics' mission is to find a personalized solution for those who require their services regarding the person, their specific needs, their desires, and their means, in collaboration with a medical professional and with a multidisciplinary approach. When manufacturing orthoses and prostheses for their patients, Daniel Robert Orthopedics needs to create a unique and custom device that allows for comfort, flexibility, and is lightweight.

With 3D printing, Daniel Robert Orthopedics can provide this type of mass-customization in orthopedics while still maintaining flexibility in manufacturing and the design process.

The Challenges:

1. Designs and manufacture a completely individualized and fitted device for each patient's unique needs.
2. Consistent and repeatable production quality



Established in Switzerland, Daniel Robert Orthopedics offers comprehensive services in technical orthopedics, orthotics, prostheses, rehabilitation positioning, and special footwear. The company has professionals specializing in ortho-prosthetists, podo-orthopedists, and rehabilitation positioning.

The company is expanding to provide more 3D solutions for Orthoses and Prostheses via [OrthoVoxel®](https://www.orthovoxel.com). Daniel Robert, orthoses and prosthetist practitioner in Switzerland is also launching a new service to offer 3D printing global solutions to his peers, professionals who want to be more involved in the 3D printing of O & P. www.orthovoxel.com

[Daniel Robert Orthopedics](https://www.orthovoxel.com)

“Sculpteo has become a very important partner in our development of 3D printing. The various technologies offered by Sculpteo help us choose the right processes for various applications. The offer of chemical treatments for finishes is a plus. The platform is very responsive and allows us to order quickly and we immediately know the price and delivery dates.”

- Daniel Robert, CEO and Artisan Orthopedist

Freedom of Design

Daniel Robert Orthopedic used the freedom of design offered by 3D printing, which allows for the creation of unique custom devices that are lighter and more breathable. Using a 3D model of the patient's limb the ortho specialist designs an entirely individualized and fitted splint or cast based on a patient's specific positioning and unique needs. With Sculpteo's online 3D printing platform, the 3D file of the AFO device is then custom fabricated for the patient from a 100 percent biomass material, Ultrasint® PA11. This 3D printing material is biocompatible and registered ISO 10993 & USP biocompatibility which is favorable in the manufacturing of auxiliary means in orthopedics and prosthesis.

Using the powder-bed fusion, SLS or MJF 3D printing technology, Daniel Robert Orthopedics found an economical and timely way to produce their custom devices. The main benefits of powder based technologies over traditional manufacturing are the surface quality, breathability, lightweightness and accuracy.

During the design stage, Daniel Robert Orthopedics was also able to take advantage of integrated assembly. By integrating brackets, clips, and holes for threaded fasteners directly into the design, they were able to reduce the number of components, simplify their supply chain, and optimize the overall cost to produce their custom AFO devices or prostheses.

Repeatability of high-quality devices

A further advantage of 3D printing is that parts are easy to reproduce. Once developed, the orthosis can be produced again at any time. 3D printing enables Daniel Robert Orthopedics to scale their devices easily in term of produced units as well as the production of other types of orthoses. For example with children's orthoses, which have to be replaced in a different size but with the same functionality and structure.



Scoliosis brace made with PA11



Forearm orthosis made with PA12

Material Spotlight: PA11

PA11 is 100% bio-based polymer made from castor oil with exceptional high toughness. As a powder based technology, the surface finish is uniform and smooth to the touch without visible layers. Available in unfinished form in both white (SLS technology) and grey (Multi Jet Fusion technology), PA11 is a versatile polymer with excellent mechanical properties.

Both SLS and Multi Jet Fusion PA11 technologies offer a variety of finishing options from dyeing to chemical smoothing, giving the quality and aesthetics of injection molded plastics.

[Learn more about PA11.](#)
