

# How 3D Printing Impacts The Prosthetics Market



3D printing technology has influenced prosthetics since the beginning of the industry itself, and is widely regarded as the next-generation solution for manufacturing. Raise3D printers demonstrate how successful customization and small-batch production is in this sector. Both consumers and suppliers benefit from the nature of 3D printing technology when applied to prosthetics.

### 3D Printing Improves Quality

3D printing gives prosthetics unique manufacturing advantages such as customization and a higher-quality experience for the wearer. Prosthetics feature organic outlines and require a high degree of customization. The cutting tools in the traditional prosthetic manufacturing process aren't very suited for the required geometry and customization, and usually deliver rough shapes and structure inaccuracy.

In France, [Paolo Peirera Valerio's prosthetics project](#) demonstrates how 3D printing can deliver products that fulfil the precise individual requirements and better quality for appearance and wearing experience. The nature of additive manufacturing, an inherent feature of 3D printers, such as the Pro2 series and E2 by Raise3D, means that prosthetics can be made exactly as laid out in a CAD design. Thus, designers have full control over the specifications of the final product's geometry. 3D printing can produce a design with intricate geometry, which can include organic shapes, cavity structures, and lightweight construction.

So, in essence, 3D printing allows patients to receive fully optimized prosthetics products in both appearance and weight.



## 3D Printed Prosthetics Are More Affordable

Prosthetics products can be a very large expenditure for common consumers. With traditional manufacturing, the intricate geometry and identical dimensions of each prosthesis must rely on iterative handwork procedures. As a result, both the labor cost and lead time is high.

With the application of 3D printing technology, the small-batch production of prosthetics can be efficiently accomplished, resulting in lower costs and lead times. [e-NABLE](#) is a practitioner of such flexible manufacturing. In 2017, [e-NABLE](#) organized the small-batch production of 52 prosthetics, all within the space of two months. The cost per unit fell to \$50.



Each part of a prosthesis is 3D printed by large format Raise3D printers. These parts are designed with a CAD template with dimensions that can be adjusted to fit a patient's anatomical features, meaning each part's geometry is different as required. However, the production speed is not affected by each part's different geometry. In 3D printing, the processing time is only affected by the net volume of the printed parts, not by the complexity of the design. Additionally, changing the design specifications of each shape does not then call for any changes of hardware in the 3D printing process, such as a tool head or working platform.





3D printing helps e-NABLE eliminate two major cost factors in the prosthetics manufacturing process, namely labor and tooling costs. If e-NABLE were to resort to traditional prosthetics manufacturing processes, then e-NABLE would first need to purchase various machines and tools. In contrast, an FFF 3D printer is almost a one-stop solution that builds complete prosthetics from the ground up only using its layer-deposition process. Furthermore, traditional manufacturing methods require manual work to apply different tools to reach the blind area of machining. The automatic and one-stop process of a 3D printer does not require any manual intervention.

## How Raise3D Products Support Prosthetics Manufacturing

Raise3D has a unique and cutting-edge 3D printing ecosystem that integrates both hardware and software. Manufacturers can benefit from and receive support using Raise3D technology.

In terms of printer performance, Raise3D Pro2 dual extruder 3D printer and the Pro2 Plus large-format 3D printer have competitive build volumes. Their build area reaches 30cm in the X/Y direction and a building height that can reach either 30cm or 60cm. This is important for prosthetics which usually are large in size, to fit a person's limb or torso. Printing prosthetics in one-piece saves time and assembly labor, especially when compared to printing the prosthetic in smaller components.



Raise3D printers deliver consistent quality, whether they are printing a single large piece, or if they are manufacturing a small-batch. The industrial-grade components ensure precise performance even during a long period of continuous operation.

The seamless integration of Raise3D printers and a material database provides great support for high-performance thermoplastics. The high-temperature extrusion system and heating beds enable users to print [high-performance materials](#) such as [Nylon](#) and [PP](#). Such 3D printing materials provide excellent strength, durability, impact resistance, and reasonable flexibility. However, printing with these materials can require more fine-tuning to achieve the desired finish. From this perspective, Raise3D's ideaMaker Library provides well-tuned slicing templates for a vast range of materials. This helps users print these materials that perform well.



## Conclusion

Raise3D's 3D printing solution is aligned to demand from both the market and market suppliers in the prosthetics industry. Prosthetics benefit from better customization, precision, appearance aesthetics and lightweight structures from the additive manufacturing process. Concurrently, the process functions at a higher cost efficiency, which translates into a much lower cost for mass consumers. Furthermore, Raise3D's ecosystem provides manufacturers with several competitive advantages over other 3D printing solutions. These features allow business owners to have higher capacity and have a wider range of easily implementable functional options in the final product.

## Connect with Raise3D

Do you have a great 3D printing success story and think it would be cool to be featured on [www.raise3d.com](http://www.raise3d.com), we would love to learn more! Write to us at [inquiry@raise3d.com](mailto:inquiry@raise3d.com)

For more information about Raise3D printers and services, browse [our website](#), or [schedule a demo](#) with one of our 3D printing experts.