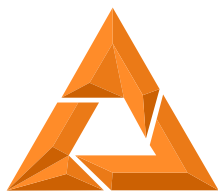


IMPLEMENTING 3D PRINTING IN A MEDICAL ENVIROMNET



B9Creations

Digital Manufacturing Technology

Introduction

Customization is key in medical environments – making 3D printing the perfect solution. Additive manufacturing enables engineers, product designers, and surgical solution providers to create an array of medical devices, including ones that require complex features or are patient customized.



3D printers can also accelerate design development, rapidly creating different design iterations of the same device, taken from customer, marketing, or clinical input. Using 3D printing, healthcare professionals and medical device manufacturers can now move from virtual model to print and prototyping to production runs of thousands of parts seamlessly.

B9Creations has established itself as the industry leader in production, speed, and value, serving brands ranging from Johnson & Johnson and Procter & Gamble to 3M, B. Braun Medical Inc., The National Institutes of Health, and Medtronic with a track record of rapid innovation in the healthcare sector.

In Good Company

P&G

3M

B | BRAUN

Johnson & Johnson



Medtronic

Topics

- 1 Key reasons to leverage digital manufacturing for medical & applications best suited to 3D printing
- 2 The top regulatory, technical, & business considerations for implementing 3D printing in a medical environment
- 3 How to build a business case for adopting, adding, or upgrading your 3D printing capabilities
- 4 How medical manufacturers are utilizing B9Creations 3D printing technology
- 5 How to cost-effectively build a digital prototyping and production medical workflow with B9Creations technology
- 6 Leverage Distributive Additive Manufacturing to Run Your Business: A Customer Case
- 7 How to leverage and scale 3D printing to run your business with a disrupted supply chain, a remote workforce, or increasing part demand



Key Reasons to Leverage Digital Manufacturing for Medical & Applications Best Suited for 3D Printing

Why Digital Manufacturing for Medical?

Design Freedom & Interactive Design Analysis

Known for design freedom, additive manufacturing enables users to design without the constraints of traditional manufacturing – this production method allows engineers, product designers, and surgical solution providers to create patient-customized medical devices that require even the most complex features. This technology also empowers users to take feedback from clinical or marketing/sales professionals and use it to make critical design adjustments in real time, saving on development time and cost.

Accelerate Design Cycles with Rapid Prototyping

With additive technology, users can move from prototype to production of medical devices with ease. Healthcare professionals and engineers can create prototypes in production-grade materials for functional and regulatory testing, and with high-speed 3D printing, users can get parts in an hour and print 10+ different design iterations daily.

Bridge Tooling Before Production

Additive manufacturing allows users to leverage cost-effective bridge tooling for design and market validation before capital investment in tools. This method of bridging the gap between prototyping and final production of your parts is the perfect solution for volumes which would otherwise be costly and time consuming to create using 3D printing.

Low-Volume Production

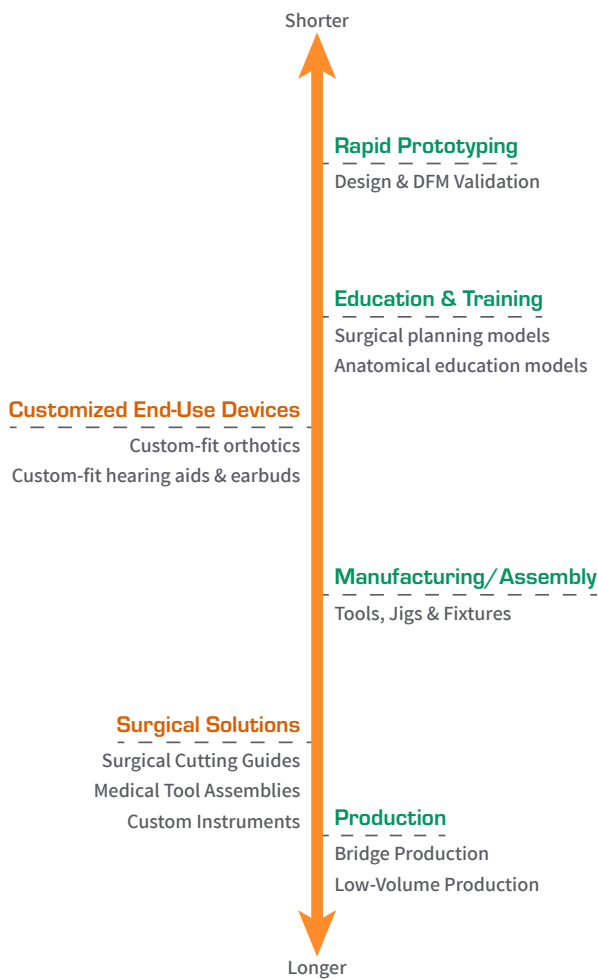
Add flexibility and resilience into your supply chain. With additive manufacturing technology, users will avoid the expense of tooling by 3D printing runs of thousands of parts. And with our IEC 60601-1 and 60601-1-2 medical equipment compliant 3D printer and engineering-grade or biocompatible materials, clinical professionals can quickly and cost-effectively create functional end-use parts.

Implementation Timeline

Key Decision-Makers



Time to Market



When considering implementing 3D printing in a medical environment, it's important to understand which applications are well suited to additive manufacturing. B9Creations serves key subsets of the medical industry, from medical devices to anatomical models and audiology applications through orthopedics and surgical solutions.

But no matter what healthcare specialty your company represents, one of the main considerations when implementing 3D printing centers on implementation. How soon additive manufacturing can be brought into that process? Will implementation take a long time, or can it be quick? Which key decision-makers are part of that process?



Medical Devices



Audiology



Orthopedics



Anatomical Models



Surgical Solutions

The Top Regulatory, Technical, & Business Considerations for Implementing 3D Printing in a Medical Environment



Business

What is the total cost of ownership?

Initial investment, operating costs, consumables

What are the maintenance requirements?

Calibrations required? Does the resin vat degrade?

What business results can be expected?

Is it fast enough to accelerate design cycles? Repeatably accurate?

What does the learning curve look like?

What does training and support look like?

Is it field deployable?

Can it be operated outside a factory setting? Additional ventilation or electrical supply required?



Technical

What is missing from your current additive manufacturing capabilities?

What type of technology do you need?

What type of materials?

How is the resolution, precision & accuracy?

How easy is it to use? How fast? How reliable?



Regulatory

Is the 3D printer medical equipment compliant?

Are the materials biocompatible? Sterilizable?

Is the post-processing workflow clearly defined to maintain biocompatibility?

Do you need to get buy-in from your Environmental Health & Safety team?

How to Build a Business Case for Adopting, Adding, or Upgrading Your 3D Printing Capabilities

Comparing costs is an important step in building a business case for adopting, adding, or upgrading your additive technology. A cost comparison guide like the one below will help you decide which 3D printer or method of production will best suit your business.

Production Inputs

| | |
|---|-----------------|
| Is your part small, medium, or large? | Size |
| How many do you produce in a week? | Qty |
| Which B9 Core Series printer are you interested in? | B9 Core Med 500 |
| Which resin are you interested in? | HD Slate |

Business Case Outputs

| | |
|--|---------------------------|
| How many hours/week do you lose waiting on your current printer? | 8 hours |
| What could you do with → | An extra full working day |
| How many products are being missed? | 15 |
| How much does not switching cost you? | \$ |
| How much are you losing per year? | \$\$\$ |

Total Cost of Ownership

| | B9 Core Med 500 or B9 Core 5 Series Med XL | 3D Printer, Outsourcing, Injection Molding, or Milling |
|---------------------------------------|--|--|
| Machines needed at current production | | |
| Upfront Cost | | |
| Operating Cost - 1 st Year | | |
| Operating Cost - 2 nd Year | | |
| Operating Cost - 3 rd Year | | |
| Total 3 Years Cost of Ownership | | |
| Prep time per month in hours | | |
| Prep time per month in hours | | |
| Total production capacity per month | | |
| Hours saved per month | | |
| Cost savings per month | | |



**Request your own
personalized cost
comparison here**

How Medical Manufacturers are Utilizing B9Creations 3D Printing Technology



MAJOR MEDICAL DEVICE MANUFACTURER

Head of \$1M Additive Manufacturing Lab

Challenge:

Needed to produce high-resolution parts with incredibly fine detail that no other 3D printer in their lab could produce.

Solution:

Using our high-detail resin, the high-precision B9 Core Series 3D printer is not only capable of incredible detail, like 80-micron threads, but prints so fast, the lab has increased their throughput, production, capacity, turnaround time, and number of design iterations.



MEDICAL & PHARMACEUTICAL DEVICE COMPANY

Medical Device Engineer

Challenge:

Looking for an upgraded 3D printing solution that offers precision, surface finish and speed - with dyeable materials.

Solution:

The B9 Core Med 500 3D printer delivered parts 5 times faster than their SLA 3D printer, without any software or post-processing failures. Using our biocompatible white resin, the parts were not only dyeable, but boasted sharper resolution and better quality than injection-molded parts.



MEDICAL DEVICE MANUFACTURER

Entire Product Design Team

Challenge:

Battling painfully slow print times, the product design team needed to find a faster method of production to stay on their original development timeline.

Solution:

They decided to upgrade to the B9 Core Series 3D printer, and in doing so, cut their average print time from four hours to just one hour, which means more design iterations and faster time to market.

How to Cost-Effectively Build a Digital Prototyping & Production Medical Workflow with B9Creations Technology

DEVELOP

Create custom settings engineered for your application with our material development toolkit, B9Captive.



DESIGN

Use your preferred CAD software to bring your ideas to life.



PREPARE

Set up your print's layout, orientation, and supports in B9Create 2.0 for successful 3D printing with FAST™ technology.



3D PRINT

Designed and engineered to be a class of one in the healthcare industry, B9Creations' medical-grade 3D printing solution integrates additive manufacturing into the design, production, and use of medical devices, anatomical models, surgical tools, and more.



MATERIALS

Ideal for medical manufacturing, clinical, and consumer tech environments, leverage our engineering-grade or ISO 10993 biocompatible resins.



CLEAN

Automate your post-processing with the B9Clean's thorough, no-mess cleaning.



FINISH

With high-speed 3D printing, you can print prototypes in under an hour or move seamlessly to production runs of thousands of parts.



CURE

Cure your models in minutes in a post-curing unit, such as the B9 Model Cure.

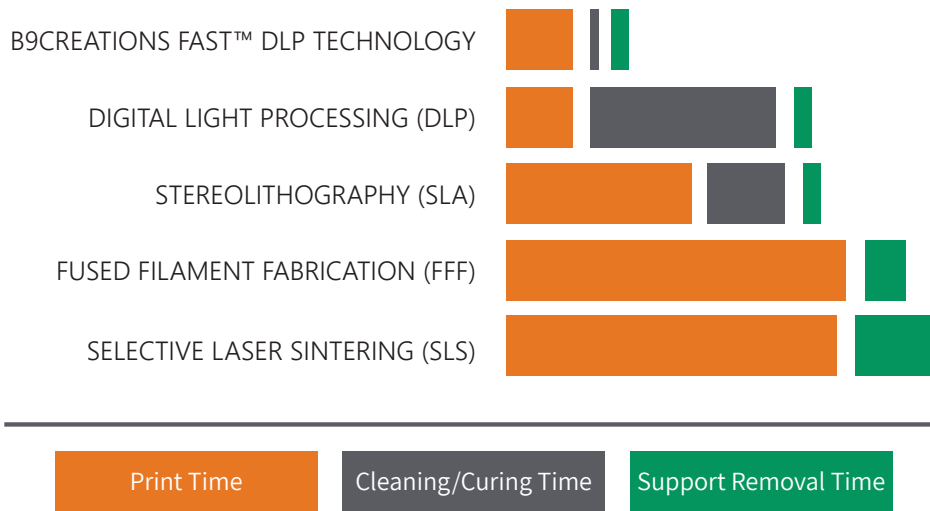


Making Additive Manufacturing Solutions Work for You

If you're looking to accelerate design cycles, lower production costs, create a more resilient supply chain, or gain flexibility throughout your product's life cycle, DLP technology offers rapid, reliable, high-resolution 3D printing.

Unlike low-resolution FFF or costly SLS printers, DLP technology offers high fidelity to your CAD files with a quick return on investment – and better resolution, higher accuracy, and faster speeds than SLA printers. B9Creations DLP technology is differentiated even within its own field. Unlike other DLP platforms that offer fast printing times but painfully slow post-processing, B9Creations' workflow includes automated post-processing that cleans and cures models in minutes. Powered by FAST™ technology, users gain production-grade parts, pinpoint accuracy and precision, and a flawless finish on all B9Creations 3D printers.

3D PRINTING PRINT PROCESSING TIME COMPARISON



When implementing additive manufacturing into your business, it's important to find a 3D printer, like the B9 Core Series, that delivers quick and easy setup, precision, speed, and profitability.



Quick Setup



Precise



High-Speed



Profitable

Leverage Distributive Additive Manufacturing to Run Your Business: A Customer Case

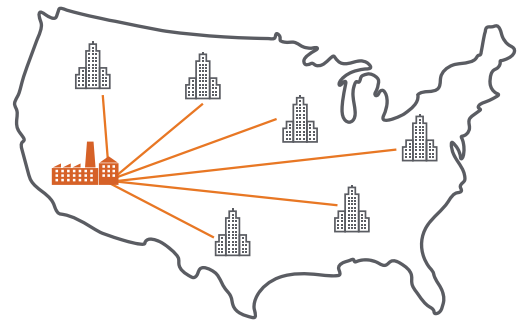
A B9Creations customer, with roughly 900 store locations throughout the US, was being pitched to build a multi-million-dollar centralized additive manufacturing facility. But doing so would require reliance on a delivery service, like FedEx, to distribute their products – and additionally carried significant risk if that geographic site closed because of weather or other unforeseen events.

Bringing production in house, and leveraging strong locations from a workforce standpoint, for things like design, quality control, etc., will enable their business to drastically reduce turnaround time while implementing lean manufacturing, a production methodology that focuses on minimizing waste in the manufacturing process without sacrificing productivity.

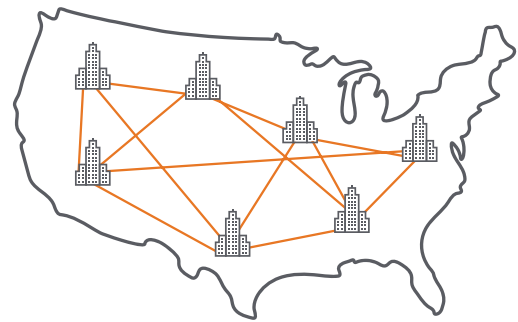
Additionally, the price of the B9 Core Series allows them to invest in extra capacity on-site to mitigate risk caused by closures at any one location, allowing other sites to absorb workload as needed – treating the nationwide sprawl of stores as a self-healing mesh.

Not only is customer turnaround time no longer dependent upon FedEx, but time zones now carry an advantage. If their design team is based in New York, team members in California can request a file in the morning, receive one before the East Coast team leaves for the day, print it and still achieve same-day customer delivery.

CENTRALIZED MANUFACTURING



SELF-HEALING MESH OF DESIGN & PRODUCTION



How to Leverage & Scale 3D Printing to Run Your Business With a Disrupted Supply Chain, a Remote Workforce, or Increasing Part Demand

Additive manufacturing can help your business overcome unprecedented challenges that disrupt your supply chain, labor force, and revenue. Here's how:



Diversify & Adapt Your Supply Chain

Leverage B9Creations field deployable 3D printing solution.

Utilize our service bureau at B9Creations headquarters.

Explore 3D printing as an alternative for supply chain disruption of injection-molded parts.



Empower Remote Employees

Take our standalone, desktop unit home. It requires no additional ventilation or electrical supply.

Prep your files at home and send them to on-site technicians. With 0 calibrations and only 5 button pushes to print, even those who've never run a 3D printer before are successful from day one.



Inventory On-Demand

Can't access inventory because of supply chain disruption or other restrictions?

Want to avoid ordering more inventory with high minimum order quantities and long lead times?

3D print critical components or entire parts on demand.



Agility Throughout Your Product's Life Cycle

Use 3D printing for prototyping and design verification, bridge manufacturing, spare parts, and end-of-life production.

Leverage 3D printing for tools, jigs and fixtures during production.

About B9Creations

As a global provider of digital manufacturing technology, B9Creations has become the industry leader in production, speed, and value across its 3D printing hardware, software, materials, and services platforms.

It now stands as the additive manufacturing market leader in high-precision applications such as medical, prototyping and manufacturing, aerospace, research, jewelry, and model making.

Our industrial and medical-grade 3D printers and suite of biocompatible and engineering materials are used by brands like Johnson & Johnson, Medtronic, B. Braun Medical, Inc., 3M, Procter & Gamble, and more.

B9Creations serves customers, certified dealers and OEM partners in nearly 70 countries around the globe. Find us online at b9c.com.



Download

B9Creations Product Guide

Discover our Product Guide for an in-depth look at B9Creations' patented technology, materials, software, and unrivaled customer support.



Request

A Sample with B9Creations

To help you explore the integration of additive technology into your business, we'll ship a sample directly to you!



Book Time

With a Medical Solutions Expert

Have questions or want to learn more? Speak with one of our medical solutions experts!



Watch

Our Medical Product Demo

See the latest innovations in our medical manufacturing workflow.