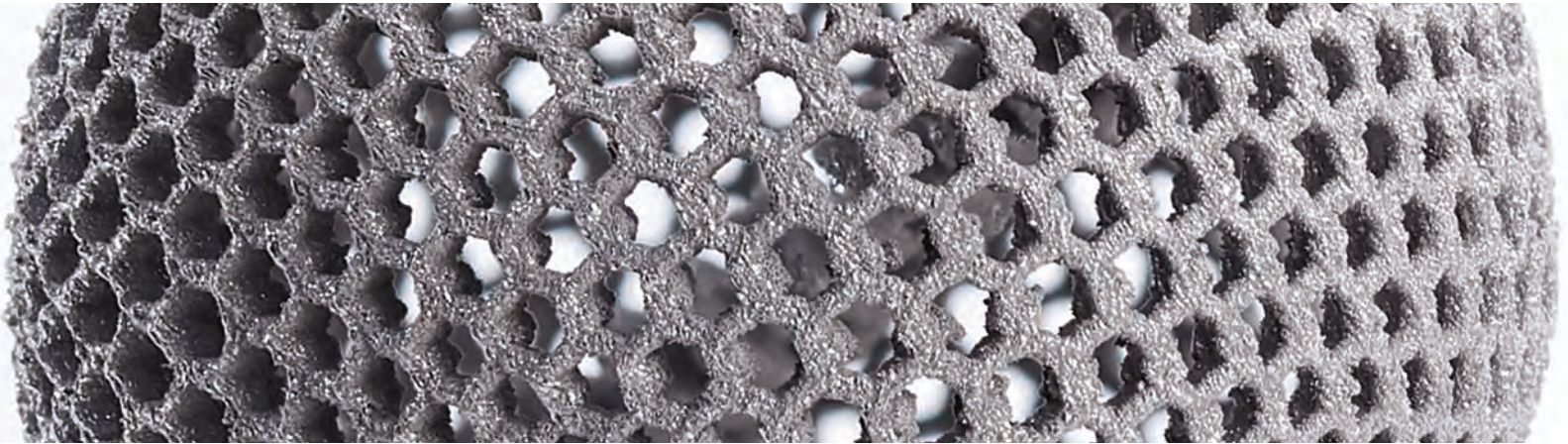


Direct Metal Printing

Remarkable 3D capabilities for even the most detailed precision parts



Implant printing—from prototype through production—with unprecedented speed



Building on our commitment to advanced technology, rms Company has invested in Direct Metal Printing (DMP) to support the development and manufacture of advanced orthopaedic implants for our medical device customers. As a first-in-the-world certified medical device manufacturing partner to 3D Systems, we have created a world-class U.S. service center for the manufacture of medical implants and components. Through advanced application support from 3D Systems and rms' ability to print parts, offer specific machine features and perform secondary operations in a single location, this new partnership provides our customers with an unparalleled speed-to-market advantage.

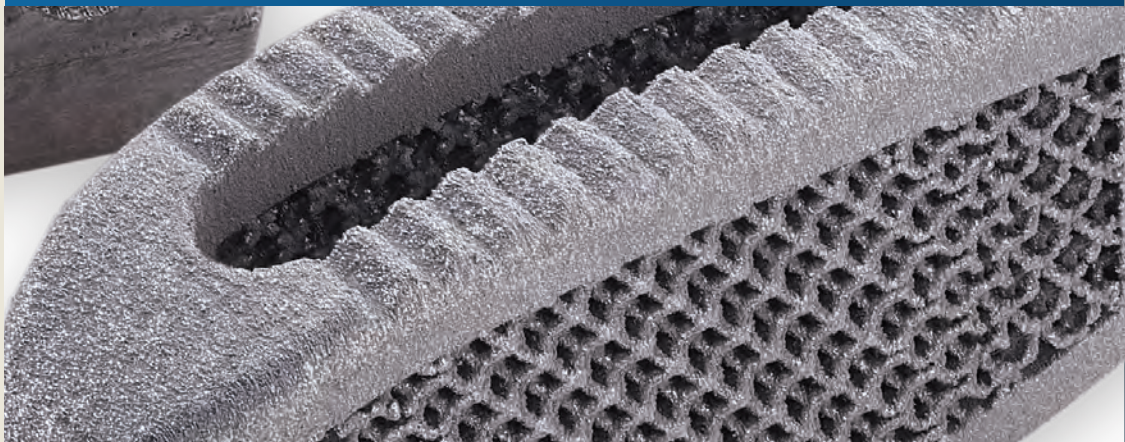


A revolution in the ability to create highly complex parts more quickly

Sometimes referred to as Additive Manufacturing, this process is proving invaluable in the manufacture of implantable medical devices because it offers several benefits that cannot be replicated through traditional machining. Foremost among these is the ability for DMP to “build” highly complex parts that incorporate printed trabecular surfaces and internal matrix structures that were not possible until now.

Accuracy and resolution to meet your most sophisticated demands

DMP uses a high-powered fiber laser to fuse metal powder into a solid structure. Because the parts are built up layer by layer, or additively, even highly complex internal and external geometries can be created simultaneously. The fact that there is no tooling involved in the printing process means that parts can be printed directly from a 3D model in a relatively short time. DMP is a net shape process, but the parts are produced with a high degree of accuracy and detailed resolution, providing outstanding surface quality and excellent mechanical properties.



Printed porous structure



Secondary machining of printed implants



Printed spinal fusion cage



Our DMP machine capabilities

- Powerful fiber laser: 500 watts
- Print volume: 10.8" x 10.8" x 16.5"
(275 mm x 275 mm x 420 mm)
- Typical build layers can be set for 30 microns, 60 microns or a combination of the two thicknesses
- Repeatability: x=20 microns, y=20 microns, z=20 microns
- Minimum feature size: 100 microns
- Typical print accuracy: $\pm 0.1-0.2\%$ with ± 50 micron minimum
- Argon atmosphere: Extremely low O_2 present in the chamber during build (25 ppm's) produces parts free of alpha case
- Can produce several different trabecular and porous surface structures
- Validated material: Ti 6AL4V ELI (Grade 23)
- Process conforms to ASTM F3001-14

Secondary processing

- Parts are removed from build plate manually or by wire EDM
- Blasting to remove support materials and loose parent matter "caviar"
- Hot Isostatic Pressing (HIP)
- Precision machining, turning and milling
- Ultrasonic cleaning
- Nitric passivation
- Laser marking
- Anodizing
- Assembly

Information required for quoting a DMP component

- File Types: SolidWorks, Creo, .STL, etc.
- Quantity requirements
- Critical dimensions and hole location call outs
- Preferred build orientation (if known)
- Post processing needs (HIP'ing, machining, blasting, anodizing, laser marking, etc.)

Customer experience and design support

- Advanced application support from 3D Systems
- Design for Manufacturability (DFM)
- World-class metrology laboratory
- Full IQ/OQ/PQ capability
- Systemic traceability from raw material components and final assembly

Quality and regulatory accreditation

- ISO 13485
- FDA registered as contract manufacturer

Photos top left and left courtesy of 3D Systems, Inc.

rms Company

Whether you are a major medical device manufacturer or a startup with a great new product, we can deliver what you need — from engineering and design for manufacture support through production and assembly. Contact us today to get an estimate for your next project, to arrange a tour of our facilities or just to learn more.

Call us at 763-786-1520.



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rms is part of the
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