Direct Metal Solutions

Precision production metal printing with the ProX® DMP printer series, 3DXpert™ software and LaserForm® materials
Go further with Direct Metal Printing

**UNLOCK YOUR PRODUCT’S POTENTIAL**
With complete design freedom, direct metal 3D printed parts can be stronger, lighter, longer lasting and higher performing than machined or cast assemblies. Manufacture superior performing products faster and at a lower cost than with traditional fabrication methods.

**ACCELERATE TIME-TO-MARKET**
Conduct R&D, prototyping and production all in the same system. DMP users around the world are designing faster and compressing production times. Transform complex assemblies that take hundreds of hours to machine and assemble into a single high value part printed in hours or days.

**STREAMLINE SUPPLY CHAINS**
With DMP, you have complete control over your production, without relying on specialty components from suppliers. Print entire assemblies on demand, with fewer components, as needed.

**INCREASE MANUFACTURING AGILITY**
Metal additive manufacturing requires no tooling, reducing overhead and increasing economies of scale. You are able to update designs and change your production mix to meet changing market demands.

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**CONFORMAL COOLING**
Direct integration of conformal cooling channels into this blow mold increases efficiency by 30%.

**SIMPLIFIED ASSEMBLIES**
Replacing a complex assembly, this single burner component contains nine under-cuttings and six internal cavities.

**REDUCED WEIGHT**
Complex lattice structures allow significant weight reduction for this combustion chamber.

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**ENHANCED FLUID FLOW**
For this turbine inlet guide vane, computed fluid dynamics simulation predicts a 70% reduction in shock intensity.

**TOPOLOGY OPTIMIZATION**
Topology optimized aerospace bracket reduces weight by 35%.

**MASS CUSTOMIZATION**
Designed to perfectly fit the obstructed zone, this reconstruction corrects the patient’s facial asymmetry.
Automated production, exceptional quality

ProX® DMP 100, 200 & 300

The ProX DMP 100, 200, and 300 share a common architecture to print exceptionally detailed, high quality parts in an automated and repeatable process that is ideal for R&D and serial part manufacturing at the tightest tolerances in direct metal printing.

INDUSTRY’S BEST SURFACE FINISH
Reduce machining or polishing of final parts.

CLEAN AND SAFE
Sealed powder loading and recycling prevents material contamination and increases operator safety.

EXCEPTIONAL MECHANICAL PROPERTIES
Roller compaction yields higher density and uniform mechanicals.

UNMATCHED PRECISION
Print the finest features with exceptional accuracy.

INTEGRATED METAL PRINTING
ProX DMP printers, 3DXpert™ software and LaserForm® materials are fine-tuned for process reliability and repeatability.

PRINT IN CERTIFIED ALLOYS
Count on your results with certified LaserForm materials and extensively tested print parameters.

3DXPERT FOR FASTER DATA PREPARATION AND EXCEPTIONAL BUILD OPTIMIZATION
3DXpert software, 3D Systems’ precision metal printing solution, is delivered with every ProX DMP printer. Benefit from intelligent design tools and fast build preparation, relying on the extensively tested build parameter database for your material of choice. No other software lets you localize print strategies for increased precision of metal parts.
High precision, high throughput

ProX® DMP 320

The ProX DMP 320, developed from the outcome of nearly half-a-million prints, offers fast build turnaround times in demanding 24/7 production environments.

PRODUCTION READY
Designed for productivity with quick-swap build modules and fast powder recycling.

INTEGRATED METAL PRINTING
ProX DMP printers, 3DXpert™ software and LaserForm® materials are fine-tuned for process reliability and repeatability.

STRONGER MECHANICAL PROPERTIES
The lowest O\textsuperscript{2} during builds (25 ppm) for exceptionally strong parts of high chemical purity.

EXTENSIVELY TESTED MATERIALS
Thousands of hours of parameter optimization ensure predictable and repeatable print quality with a broad range of LaserForm materials.

LOW OPERATING COSTS
Efficient consumables management and shared ancillary equipment lower the total cost of ownership.

DMP VISION: REAL-TIME PART BED MONITORING
DMP Vision allows ProX DMP 320 users to further increase precision in their metal printing workflow by analyzing images and video of the part bed, captured in real time during the build process. A benefit to highly regulated industries, the images and video provided can serve as a permanent record of the build.
Metal Alloys for the ProX DMP Series

3D Systems’ broad range of ready-to-run LaserForm® materials is formulated and fine-tuned specifically for 3D Systems DMP 3D printers to deliver high part quality and consistent part properties. The print parameter database that 3D Systems provides together with the material has been extensively developed, tested and optimized in 3D Systems’ part production facilities that hold the unique expertise of printing 500,000 challenging metal production parts in various materials year over year. And for your 24/7 production 3D Systems’ thorough Supplier Quality Management System guarantees consistent, monitored material quality for reliable results.

Heat exchanger with complex cooling channels in LaserForm AlSi10Mg (A)

Gas burner with integrated cooling channels in LaserForm Ni718 (A)

High corrosion resistant impeller in LaserForm 316L (A)

Minireactor for scale testing built in LaserForm 17-4PH (A)

Partials, copings and bridges production in LaserForm CoCr (B)

Blow mold with conforming holes in LaserForm Maraging Steel (B)

Extra High Productivity Upgrade for LaserForm Ti Gr5 (A) and Ti Gr23 (A)

Count on up to 34% speed increases and decisive per part cost reductions while maintaining the high level of consistent, repeatable part quality as published in our LaserForm data sheets.

* Availability varies by printer model (see details on the last page).

YOUR SCALABLE DMP FACTORY NETWORK

The ProX® DMP 320 is easily scalable for high volume part production. A central server manages print jobs, materials, settings and maintenance for 24/7 productivity. Shared resources, including cooling and powder recycling systems, increase efficiency.
<table>
<thead>
<tr>
<th>Build envelope capacity (W x D x H)¹</th>
<th>ProX DMP 100</th>
<th>ProX DMP 200</th>
<th>ProX DMP 300</th>
<th>ProX DMP 320</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.94 x 3.94 x 3.94 in (100 x 100 x 100 mm)</td>
<td>5.51 x 5.51 x 4.92 in (140 x 140 x 125 mm)</td>
<td>9.84 x 9.84 x 12.99 in (250 x 250 x 330 mm)</td>
<td>10.82 x 10.82 x 16.53 in (275 x 275 x 420 mm)</td>
</tr>
<tr>
<td>Metal alloy choices with developed print parameters</td>
<td>LaserForm CoCr (B)</td>
<td>LaserForm CoCr (B)</td>
<td>LaserForm CoCr (B)</td>
<td>LaserForm Ti Gr1 (A)²</td>
</tr>
<tr>
<td></td>
<td>LaserForm 17-4PH (B)</td>
<td>LaserForm 17-4PH (B)</td>
<td>LaserForm 17-4PH (B)</td>
<td>LaserForm Ti Gr5 (A)²</td>
</tr>
<tr>
<td></td>
<td>LaserForm Maraging Steel (B)</td>
<td>LaserForm Maraging Steel (B)</td>
<td>LaserForm Ni625 (A)³</td>
<td>LaserForm Ti Gr23 (A)²</td>
</tr>
<tr>
<td></td>
<td>LaserForm AlSi12 (B)</td>
<td>LaserForm AlSi12 (B)</td>
<td>LaserForm AlSi10Mg (A)²</td>
<td>LaserForm AlSi12 (B)</td>
</tr>
<tr>
<td></td>
<td>LaserForm Maraging Steel (A)²</td>
<td>LaserForm Maraging Steel (A)²</td>
<td>LaserForm Ni718 (A)³</td>
<td>LaserForm Maraging Steel (A)³</td>
</tr>
<tr>
<td></td>
<td>LaserForm Ti Gr1 (A)²</td>
<td>LaserForm Ti Gr5 (A)²</td>
<td>LaserForm Ti Gr23 (A)²</td>
<td>LaserForm Maraging Steel (A)³</td>
</tr>
<tr>
<td></td>
<td>LaserForm AlSi10Mg (A)²</td>
<td>LaserForm Ni625 (A)³</td>
<td>LaserForm Ni718 (A)³</td>
<td>LaserForm 17-4PH (A)³</td>
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<tr>
<td></td>
<td>LaserForm CoCrF75 (A)³</td>
<td>LaserForm 316L (A)³</td>
<td>LaserForm CoCrF75 (A)³</td>
<td>LaserForm Ti Gr23 (A)²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Layer thickness</th>
<th>10 μm - 100 μm</th>
<th>10 μm - 100 μm</th>
<th>10 μm - 100 μm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeatability</td>
<td>x=20 μm, y=20 μm, z=20 μm</td>
<td>x=20 μm, y=20 μm, z=20 μm</td>
<td>x=20 μm, y=20 μm, z=20 μm</td>
</tr>
<tr>
<td>Min. feature size</td>
<td>x=100 μm, y=100 μm, z=20 μm</td>
<td>100 μm</td>
<td>100 μm</td>
</tr>
<tr>
<td>Min. wall thickness</td>
<td>150 μm, 150 μm, 150 μm</td>
<td>150 μm</td>
<td>150 μm</td>
</tr>
<tr>
<td>Typical accuracy</td>
<td>± 0.1-0.2% with ± 50 μm minimum</td>
<td>± 0.1-0.2% with ± 50 μm minimum</td>
<td>± 0.1-0.2% with ± 50 μm minimum</td>
</tr>
<tr>
<td>Recycling system</td>
<td>Optional external system</td>
<td>Optional external system</td>
<td>Automatic</td>
</tr>
<tr>
<td>Interchangeable build modules</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Powder bed monitoring</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

¹Including build plate ²Set up A ³Set up B

Complete specifications available at www.3dsystems.com

**DMP for in-space communication satellite engines – European Space Agency**

1. Expansion nozzle: reduced stress, minimized overhang mass
2. Combustion chamber: significant weight savings with a 12% volumetric density mesh
3. Engine injector: optimized propellant flow simplified assembly from 5 parts to 1

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Warranty/Disclaimer: The performance characteristics of these products may vary according to product application, operating conditions, material combined with, or with end use. 3D Systems makes no warranties of any type, express or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use.