Jewelry Manufacturing Solutions

Maximize Creativity, Quality, and Reliability with Digital Design and Manufacturing Workflows, Including Leading Solutions in 100% Wax 3D Printing
With over 20 years of jewelry manufacturing experience and the number one solution in 100% wax 3D printing, 3D Systems offers a competitive advantage in high-throughput and mass-custom jewelry production. Our 3D printing solutions ensure perfect quality and reduce time to market and cost, allowing innovative jewelry design and streamlining manufacturing workflows.

Address Every Jewelry Design Challenge with 3D Printing

3D Systems manufacturing solutions provide quality, accuracy, and reliability for all jewelry styles and production challenges.

Middle Eastern / Arabic
Deliver high-resolution for sharp, fine details in ornate designs with our 3D printing solutions for prototyping, casting, and rubber molding.

Fusion
Direct casting from 3D printed castable plastic or 100% wax patterns enables the production of hollow, lightweight filigree and thin wire mesh shapes of complex designs.

Pavé and Stone Setting
Accuracy and smooth surface finish allow for prototyping and stone setting validation, patterns for direct casting and rubber molding of single, multiple, and pavé stone designs, including micro-prongs.

Western
Achieve a smooth surface finish to create prototypes and patterns for casting and rubber molding for large surface areas and heavier-weight designs.
Bring Digital Agility into Your Jewelry Manufacturing Workflows

Unlimited Design Freedom
Elevate design complexity with dissolvable and meltable supports enabling limitless geometries with no impact to surface finish for reliability and creativity.

Consistent Quality
Quality printed parts ensure fine details, accuracy, high fidelity, smooth surfaces, and repeatability for consistent results through your manufacturing workflow.

Superior Materials Performance
We offer 100% wax and castable plastics for lost wax casting, heat-resistant rigid plastic for master patterns, and high-contrast material for prototyping.

Increased Manufacturing Scalability
From fast turnaround prototypes and mass custom manufacturing, to high-throughput production, gain unprecedented levels of agility with ease-of-use and quality at any scale.

Proven System Reliability
Our reliable, industrial, end-to-end 3D printing solutions provide consistent uptime, low operating costs, and improved efficiency.
Patterns for Lost Wax Casting

Uncompromised Castability and Design Freedom at High Throughput

Achieve high productivity and quality, and unleash creativity with 3D Systems’ jewelry solutions. Our 3D printed casting patterns fit standard processes for reliable output while enabling maximum design freedom for high-volume and mass custom jewelry manufacturing.

- **Design Freedom**
- **100% Wax Castability**
- **Efficiency of Ease-of-Use**

### MJP Wax 3D Printing

- **9,000+ rings per month/printer**
- 100% wax for uncompromised castability with standard casting processes
- Quick turnaround and high throughput at factory scale
- Superior resolution and dissolvable/meltable supports allow reduced finishing labor and polishing of costly precious metals, and ultimate design freedom

### Figure 4 Jewelry 3D Printing

- **15 rings in 2 hr 03 min**
- Figure 4 JCAST-GRN 20 and JCAST-GRN 10 castable plastic were specifically developed for easy jewelry casting with minimal ash and residue after burnout
- Ultra-fast turnaround – 15 mm/hr vertical build speed
- MicroPoint™ ultra-fine tip supports enable smooth surface finish, reduced post-processing labor, and accelerated production by minimizing polishing
Master Patterns for Mold Making

Reduce Labor, Increase Speed and Design Freedom

3D Systems provides compatibility with jewelry mold-making processes for high-volume manufacturing with ultra-high-detail, heat-resistant, high-quality, complex master patterns to create your rubber mold in a matter of hours.

Our Figure 4 3D printing technology, material, and software solution for jewelry is a fast alternative to labor-intensive, design-limiting, multi-step processes.

- Fast pattern production enables design-to-rubber-mold in hours
- Reduce labor with accurate master patterns and superior surface finish
- Increase design freedom with thin, delicate geometries, fine mesh, and more

Figure 4 Jewelry 3D Printing Solution for Master Patterns

30 master patterns in 2 hr 02 min

- Ultra-high detail resolution with our proprietary build style
- 15 mm/hr build speed at 30 µm layer thickness
- Easy to remove MicroPoint™ ultra-fine tip support structures limit contacts for a smooth surface finish with minimized post-processing
- High heat deflection temperature (over 300°C) of Figure 4 JEWEL MASTER GRY material is compatible with various silicone types and vulcanization temperatures without inhibition
- High material rigidity for prevention of pattern distortion
Models and Prototypes

Quick-Turnaround Jewelry Prototypes Bring Designs to Life Faster

Reveal your creativity with accurate, finely detailed, high-fidelity prototypes. 3D Systems’ Figure 4 Jewelry solution provides a quick turnaround from designs to 3D printed models, for design iteration, validation, stone settings, and try-ons.

Explore more creations by producing fast, high quality 3D-printed prototypes.

- Faster design iteration and validation
- Increased customer confidence with quality models for try-ons
- Accurate reproductions with unlimited design freedom

Figure 4 Jewelry 3D Printing Solution for Models and Prototypes

30 prototypes in 39 minutes

- Detailed, accurate, high-fidelity representations of digital creations with our proprietary build style, which can be painted or plated
- 3D print prototypes in minutes with 45 mm/hr build speed at 50 µm layer thickness
- Easy to remove MicroPoint™ ultra-fine tip support structures limit contacts for a smooth surface finish with minimized post-processing
- Snap-fit capability enables stone settings testing, including micro-pavé
- Safe for extended try-on testing and user fittings with biocompatibility for cytotoxicity
# Key Solution Specifications

## Wax Multijet Printing for Jewelry Casting Patterns

<table>
<thead>
<tr>
<th>Product</th>
<th>Build volume:</th>
<th>Resolution:</th>
<th>Layer thickness:</th>
<th>Typical accuracy:</th>
<th>Supports type:</th>
<th>Printer weight/size:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProJet MJP 2500W Plus</td>
<td>294 x 211 x 144 mm</td>
<td>1200 x 1200 x 1600 DPI (XHD mode)  1200 x 1200 x 3200 DPI (ZHD mode)</td>
<td>8 or 16 μm</td>
<td>±0.0508 mm/25.4 mm of part dimension</td>
<td>Dissolvable/Meltable</td>
<td>211 kg, 1120 x 740 x 1070 mm</td>
</tr>
<tr>
<td>MJP 300W Plus</td>
<td>294 x 211 x 144 mm</td>
<td>1200 x 1200 x 1000 DPI (UHD mode)  1200 x 1200 x 1600 DPI (XHD mode)  1200 x 1200 x 3200 DPI (ZHD mode)  2000 x 1800 x 2900 DPI (QHD mode)</td>
<td>8 to 25 μm</td>
<td>±0.0508 mm/25.4 mm of part dimension</td>
<td>Dissolvable/Meltable</td>
<td>211 kg, 1120 x 740 x 1070 mm</td>
</tr>
</tbody>
</table>

**VisiJet M2 CAST / WAX JEWEL RED / WAX JEWEL RUBY**

<table>
<thead>
<tr>
<th>Build volume:</th>
<th>Resolution:</th>
<th>Pixel pitch:</th>
<th>Layer thickness:</th>
<th>Supports type:</th>
<th>Printer weight/size:</th>
</tr>
</thead>
<tbody>
<tr>
<td>124.8 x 70.2 x 196 mm</td>
<td>1920 x 1080 pixel</td>
<td>65 microns (390.8 effective PPI)</td>
<td>10 μm - 50 μm</td>
<td>Fine tips MicroPoint™ support structures</td>
<td>34.5 kg (76 lbs), 426 x 489 x 971 mm</td>
</tr>
</tbody>
</table>

**Figure 4** for Jewelry Casting Patterns, Master Patterns for Mold Making, and Prototyping

- **Description:** 100% wax
- **Color:** Deep purple / Brilliant red / Dark red
- **Melting point:** 61-66°C / 62-63°C / 61-63°C
- **Softening point:** 40-48°C / 43-47°C / 45-47°C
- **Volumetric shrinkage:** 1.6% / 1.7% / 1.5% (from 40°C to 23°C)
- **Linear shrinkage:** 0.52% / 0.58% / 0.50% (from 40°C to 23°C)
- **Needle penetration hardness:** 12 / 14 / 12 (ASTM D1321)
- **Ash content:** 0.05% / 0.00% / 0.00% (ASTM D5630-13A)

## JEWEL CAST-GRN 10 / JCAST-GRN 20

<table>
<thead>
<tr>
<th>Build volume:</th>
<th>Resolution:</th>
<th>Tensile strength:</th>
<th>Tensile modulus:</th>
<th>Elongation at break:</th>
<th>Coefficient of thermal expansion:</th>
<th>Water absorption:</th>
</tr>
</thead>
<tbody>
<tr>
<td>67 MPa (ASTM D638)</td>
<td>13.7 MPa / 9 MPa (ASTM D638)</td>
<td>262 MPa / 300 MPa (ASTM D638)</td>
<td>12% / 15% (ASTM D638)</td>
<td>143 ppm/°C (&gt; Tg) / 122 ppm/°C (-20 to 70°C)</td>
<td>&gt;300°C at 0.455 MPa (ASTM D648)</td>
<td>1.3% / 1.06% (ASTM D570)</td>
</tr>
</tbody>
</table>

**Description:** Castable plastic

**Vertical print speed:** 15 mm/hr at 30 μm

**Elongation at break:** 12% / 15% (ASTM D638)

**Coefficient of thermal expansion:** 143 ppm/°C (> Tg) / 122 ppm/°C (-20 to 70°C)

**Water absorption:** 1.3% / 1.06% (ASTM D570)

## JEWEL MASTER GRY JCAST-GRN 10

<table>
<thead>
<tr>
<th>Build volume:</th>
<th>Resolution:</th>
<th>Tensile strength:</th>
<th>Tensile modulus:</th>
<th>Elongation at break:</th>
<th>Coefficient of thermal expansion:</th>
<th>Heat deflection temperature:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3500 MPa (ASTM D638)</td>
<td>67 MPa (ASTM D638)</td>
<td>262 MPa / 300 MPa (ASTM D638)</td>
<td>12% / 15% (ASTM D638)</td>
<td>143 ppm/°C (&gt; Tg) / 122 ppm/°C (-20 to 70°C)</td>
<td>&gt;300°C at 0.455 MPa (ASTM D648)</td>
<td>&gt;300°C</td>
</tr>
</tbody>
</table>

**Description:** Resin for prototypes and master patterns

**Vertical print speed:** 15 mm/hr (Master Pattern Mode); 45 mm/hr (Prototype Mode)

**Elongation at break:** 2.5% (ASTM D638)

**Coefficient of thermal expansion:** 80 ppm/°C (0-30°C); 146 ppm/°C (45-130°C)

**Biocompatible capable**

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Note: Not all products and materials are available in all countries – please consult your local sales representative for availability.
Bring Digital Agility into Your Standard Jewelry Manufacturing Workflows

Learn more: https://www.3dsystems.com/jewelry

For questions/contact: