3D Printer Technology
Choosing a Printer to Fit Your Needs

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Manufacturing Specialist
• 3D printing is becoming a viable, low-cost option for people in every industry.

• Each industry demands different qualities from printed parts – Stratasys offers complimentary technologies (FDM and Polyjet) to meet a wide range of needs.
Best Fit – FDM or Polyjet?

Additive Manufacturing

FDM or Polyjet Technology

Specific System/Printer

Local Reseller
Additive Manufacturing

Idea Applications

- Accelerate Time to Market
- Facilitate Communication
- Reduce Costs
- Nearly-unlimited Design Freedom
- Increase Design Iterations
- No/Low Penalty Design Changes

Design Applications

Production Applications
FDM or Polyjet Technology

Common / Shared....
- Market Leading Technology
- Pioneering & Innovative Manufacturer
- Facility Friendly
- Ease of Use

FDM Technology
Performance....
- Variety of real thermoplastics
- Wide application scope: idea - production
- Strong, tough & durable parts
- Part stability & accuracy over time
- Variable part density control
- Low total cost of ownership

Polyjet Technology
Precision.....
- Range of simulated plastics & elastomers
- Design prototyping versatility
- Fine detail accuracy
- Smooth surface finish
- Multi-Material Jetting
- High volume efficiency
## Application Best Fit

<table>
<thead>
<tr>
<th>IDEA (Concept Modeling)</th>
<th>DESIGN (Design Verification)</th>
<th>PRODUCTION (Manufacturing Tools)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small parts</td>
<td>Small/Mid parts</td>
<td>Mid/Large parts</td>
</tr>
<tr>
<td>Quick iterations</td>
<td>High precision</td>
<td>Durability</td>
</tr>
<tr>
<td>Desktop prototyping</td>
<td>Design group prototyping</td>
<td>Durability, repeatability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jigs and fixtures, Low Volume end-use parts</td>
</tr>
</tbody>
</table>

- **Fortus**
- **Dimension**
- **uPrint/Mojo**
- **Connex**
- **Eden**
- **Desktop**

*Graph depicts best fits… In some instances any system can perform any application*
### Top Applications

#### FDM Best Fit
- Inexpensive concept models
- High-requirements prototyping
- Jigs and Fixtures
- Sand Casting
- Soluble Cores - Composites
- Low-Volume EUP *(select)*
- Paper-pulp molds

#### Polyjet Best Fit
- Aesthetic concept models
- Visual models
- Clear/transparent models
- Rubber-like prototypes
- Over molding
- Injection Molding inserts
- Dental

#### BOTH
- ≤ Moderate duty prototyping
- RTV molding masters
- Thermoforming patterns

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FDM Technology *(performance)*

Polyjet Technology *(precision)*
Both technologies have strengths

So how do you decide between FDM and Polyjet?
## High Level Solution Selection

<table>
<thead>
<tr>
<th>System Attribute</th>
<th>Production &amp; High-End Design</th>
<th>IDEA &amp; Low-End Design</th>
<th>Part Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTION &amp; high-end DESIGN</td>
<td>Connex350/500, Objet1000</td>
<td>Objet24; Objet30 / 30 Pro</td>
<td>Polyjet</td>
</tr>
<tr>
<td>DESIGN &amp; low-end PRODUCTION</td>
<td>O30 Pro, Eden 260/350/500, Connex260/350/500</td>
<td>Mojo, uPrint, Dimension</td>
<td>FDM</td>
</tr>
<tr>
<td>IDEA &amp; low-end DESIGN</td>
<td>Dimension, Fortus250/360/400</td>
<td></td>
<td></td>
</tr>
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</table>
FDM and Polyjet: Common Apps

Both FDM and Polyjet are proven technologies that enable wide Applications:

- **Testing**: Form, Fit & Assembly, Function, Ergonomics, Wind Tunnel Testing

- **Marketing**: Focus Group, Exhibitions, Sales & Marketing Models, Graphic Design & Packaging, Communication Tools

- **Finishing**: Bonding, Painting, Polishing, Metal Coating, Chrome Plating, Mass Finishing

There’s no one clear cut answer.....
FDM and Polyjet: Common Apps

More common applications also exist in:

- **Tooling**: Silicone Molding, Vacuum Forming, Injection Molding, Rapid Tooling, Sand Casting, Blow Molding, Fiber Lay-Up, Spin Casting

- **Manufacturing**: Jigs & Fixtures, Molding Validation, Production Line Testing, Equipment Calibration, Measuring Equipment Guides, End-Use Parts
Some solutions are more suitable for Polyjet:

- **Clear and Translucent models:**
  - Polyjet technology enables the user to print VeroClear/FullCure720 models
  - These materials allow for clear/translucent properties
  - FDM models can be translucent – but not transparent

- **Rubber like flexible materials**
Unique Polyjet Apps

- **Connex Capabilities**: Over Molding, Soft Touch Coating, Dynamic Friction, Gaskets, Plugs & Seals, Impact Resistance, Shock Absorption, Labeling & Texturing, Living Hinges

- Tango family of materials and Connex abilities makes Polyjet unique

- These include seals, gaskets, shock absorbance and dynamic friction
Some solutions are more suitable on FDM:

- **Soluble Cores:**
  - FDM Technology offers SR20, SR30, & SR100 (Soluble release)
  - Enables user to form composite materials on soluble structures easily and efficiently
Unique FDM Apps

• **Unique FDM Applications include:** Soluble Core Molding, Paper Pulp Molding, Sheet Metal Forming, Inserts (Threaded, Metal Reinforcement, etc.)

• **Strong FDM Applications:** End-Use Parts, Jigs & Fixtures

• **Unique FDM finishing applications:** Mass Finishing, Finishing Touch Smoothing Station
  
  • Thermoplastics used in FDM process provide a wide range of mechanical properties

  • This offers mechanical and chemical resistance superior to other technologies
Both Technologies have some inherent strengths to consider...

<table>
<thead>
<tr>
<th>FDM Technology</th>
<th>Polyjet Technology</th>
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<tbody>
<tr>
<td>Production-Grade Thermoplastics</td>
<td>Excellent Surface Finish</td>
</tr>
<tr>
<td>Accuracy &amp; Repeatability</td>
<td>Fine Feature Detail</td>
</tr>
<tr>
<td>Durable Materials</td>
<td>Variety of Material Options</td>
</tr>
<tr>
<td>Material Stability over Time</td>
<td>Multi-Material Build Capability</td>
</tr>
<tr>
<td>Sparse Internal Fill Capability</td>
<td>Rubber-Like Materials</td>
</tr>
<tr>
<td>Soluble Materials</td>
<td>Transparent Materials</td>
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