Gartner Supply Chain Executive Conference
Summit 2018
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Gartner Supply Chain Executive Conference

Market Guide to 3D Printer Manufacturers

Pete Basiliere

Supply Chain Value Hidden in Plain Sight

Wheel Protection Jig		
	External Suppliers	Ultimaker 3D Printers
Cost	$835/part	$22/part
Time	56 days	10 days

Photo source: Ultimaker

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Supply Chain Value Hidden in Plain Sight

Volkswagen Autoeuropa:

- 100,000 vehicles produced annually
- 1,000 3D printed jigs and tools
- Seven Ultimaker desktop 3D printers
- $310,000 annual savings
- Two month ROI

Photo source: Ultimaker

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3D Printing Defined

An additive technique that uses a device to create physical objects from digital models

Photo source: Desktop Metal

3D Printing Defined

An Additive Technique That Uses a Device to Create Physical Objects From Digital Models

Technology	Definition	3D Printer Price Range
Material Extrusion	Material is selectively dispensed through a nozzle or orifice	$0.5k to $400k
Stereolithography	Liquid photopolymer is selectively cured by light-activated polymerization	$3.2k to $800k
Sheet Lamination	Sheets of material are bonded to form an object	$9.0k to 37.0k
Binder Jetting	A liquid bonding agent is selectively deposited to join powdered materials	$5.0k to $1.8m
Material Jetting	Droplets of build materials are selectively deposited	$20k to $600k
Directed Energy Deposition	Focused thermal energy fuses materials by melting them as they are being deposited	$200k to $5.0m
Powder Bed Fusion	Thermal energy selectively fuses regions of a powder bed	$20k to $2.0m

US dollars; k = Thousand; m = Million

Another 2D Technology Goes 3D

Selective Thermoplastic Electrophotographic Process (STEP)

From Evolve Additive

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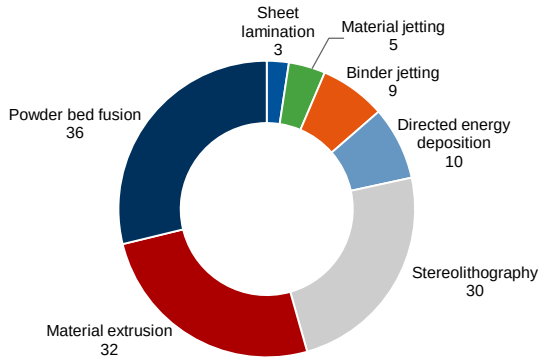
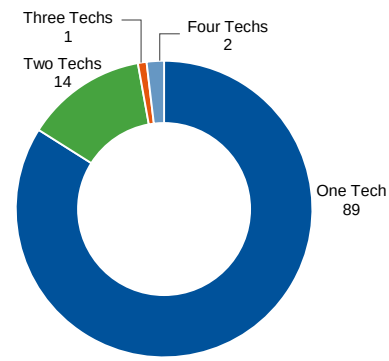
The 3D Printer Technology Landscape, Worldwide

Number of 3DP Manufacturers by Technology



Number of Manufacturers With Multiple Technologies



Note: 3DP = 3D printer; Graphs include only companies with 3D printers costing more that $2,500

See Gartner's *"Market Guide for 3D Printer Manufacturers," (G00319094)* for more details and a list of providers

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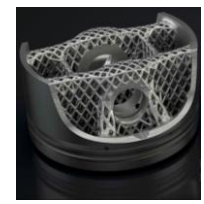
3D Printing at the Beginning, Middle and End

Rapid, Iterative Prototyping

- Prototype in plastic, produced in either plastic or metal
- Produce copies at multiple locations simultaneously

Tools, Jigs, Fixtures

- Increased productivity
- Greater flexibility
- Improved quality
- Fewer injuries



Finished Goods

- Low-volume end-use parts and spares
- Bridge manufacturing, startup, end-of-life
- Customized designs

Photo sources: Stratasys (Volvo engine pump), Markforged (grippers); Frustum (engine pistons)

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Balance the Supply Chain Opportunities and Risks

Opportunities

- Unique Product Performance
- On-Demand Product and Tools
- Reduced Product Complexity
- Response to Design Changes

of supply chain practitioners are using or will use 3D printing within two years

Risks

- Limited Supply Sources
- Lack of Certified Processes
- Specialized Skills Required
- Producing Product at Scale

of supply chain practitioners say 3D printing presents a significant supply chain challenge

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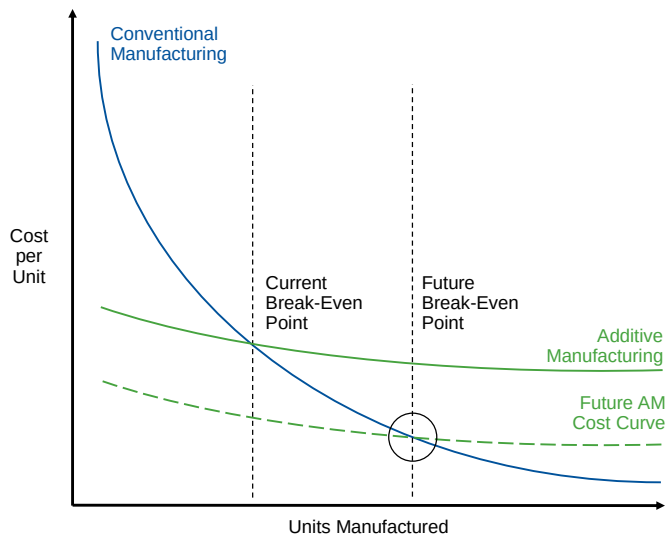
Volume Determines Whether to Use 3D Printing



Injection Molding Machine

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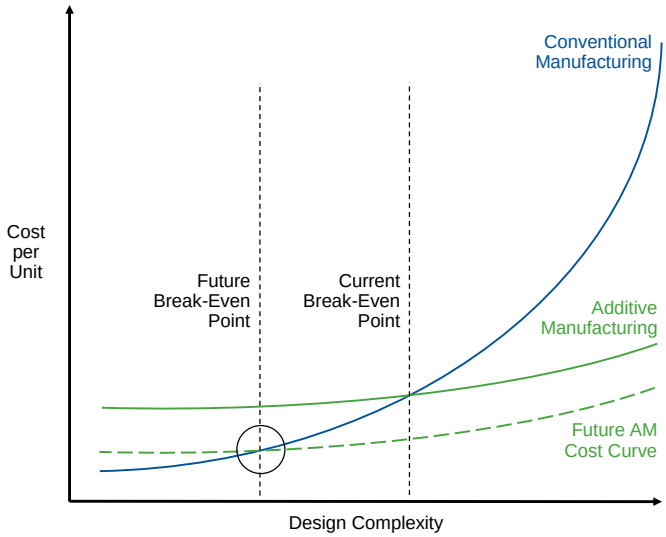
Complex Designs Favor Additive Manufacturing



Hydraulic Valve Block

Photo source: VTT Technical Research Centre of Finland

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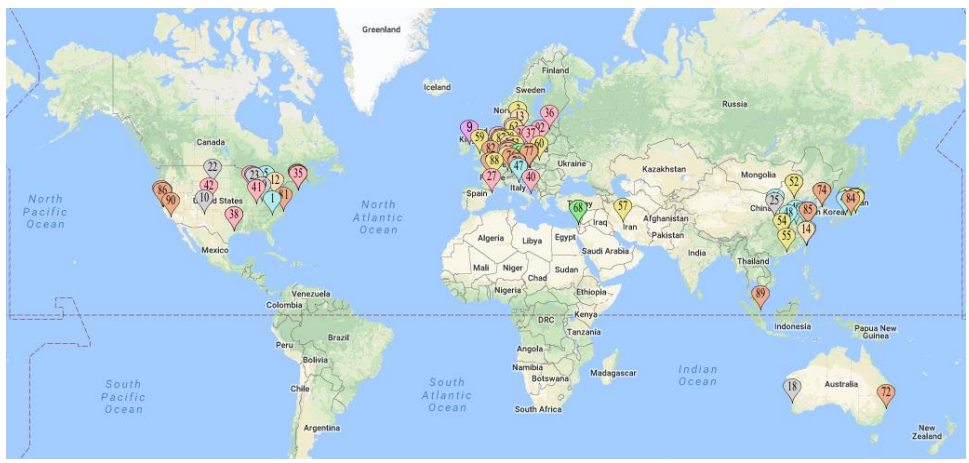
How Do You Pick the Right 3D Printer Manufacturer When There Are More Than 100 Enterprise-Class Suppliers?



100+ vendors are listed in the "Market Guide for 3D Printer Manufacturers," (G00319094)

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Begin With the End in Mind

1. What do you want to build?
2. What technology or technologies can produce the part?
3. Who manufactures the 3D printers that can build the part?
4. Which model 3D printer meets your requirements?
5. Which 3D print service bureau meets your needs?

3D Printed Gas Turbine Blades

Photo source: Siemens

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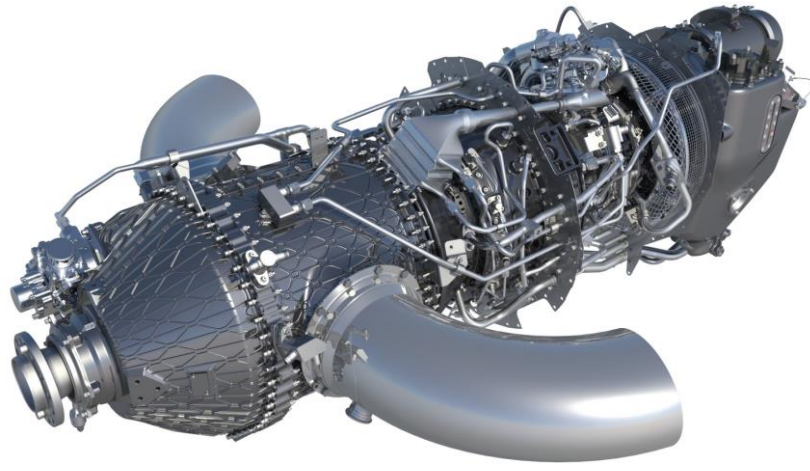
From Design for Ideal Manufacturing to Manufacturing the Ideal Design



Advanced Turboprop Engine (ATP) photo source: GE Aviation

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Recommended Gartner Research

- **Market Guide for 3D Printer Manufacturers**
  Pete Basiliere (G00319094)
- **Market Guide for 3D Print Service Bureaus**
  Pete Basiliere (G00326947)
- **Take a Strategic View of 3D Printing to Maximize Its Value Within Your Supply Chain**
  Michael Burkett and Pete Basiliere (G00332549)
- **Adopting 3D Printing for Industrial Parts Has Key Impacts on CAD and PLM Priorities**
  Marc Halpern (G00312880)
- **Predicts 2018: 3D Printing and Additive Manufacturing**
  Pete Basiliere, Michael Shanler, Stephen E. Smith and Others (G00342398)

For information, please contact your Gartner representative.

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