HP Jet Fusion 3D Printing Solutions

Reinvent making

Data courtesy of Invent Medical

1 Creating limitless potential

Welcome to a new era of 3D printing.

Leap beyond the limits of previous technologies and enter a world where 3D printing allows you to move rapidly from thoughts to things, from radical prototyping to final parts manufacturing.

A world where you can think and create without limits and propel your business forward by unlocking the full potential of 3D printing.

Because now, HP is bringing decades of expertise in printing and materials science—with more than 5,000 HP patents—to the unique performance of HP Multi Jet Fusion technology.

Fast form, fit, and function

HP Multi Jet Fusion technology enables the fastest production of functional parts[1]—including color parts[2]—at a low cost, and with no trade-offs in the process.

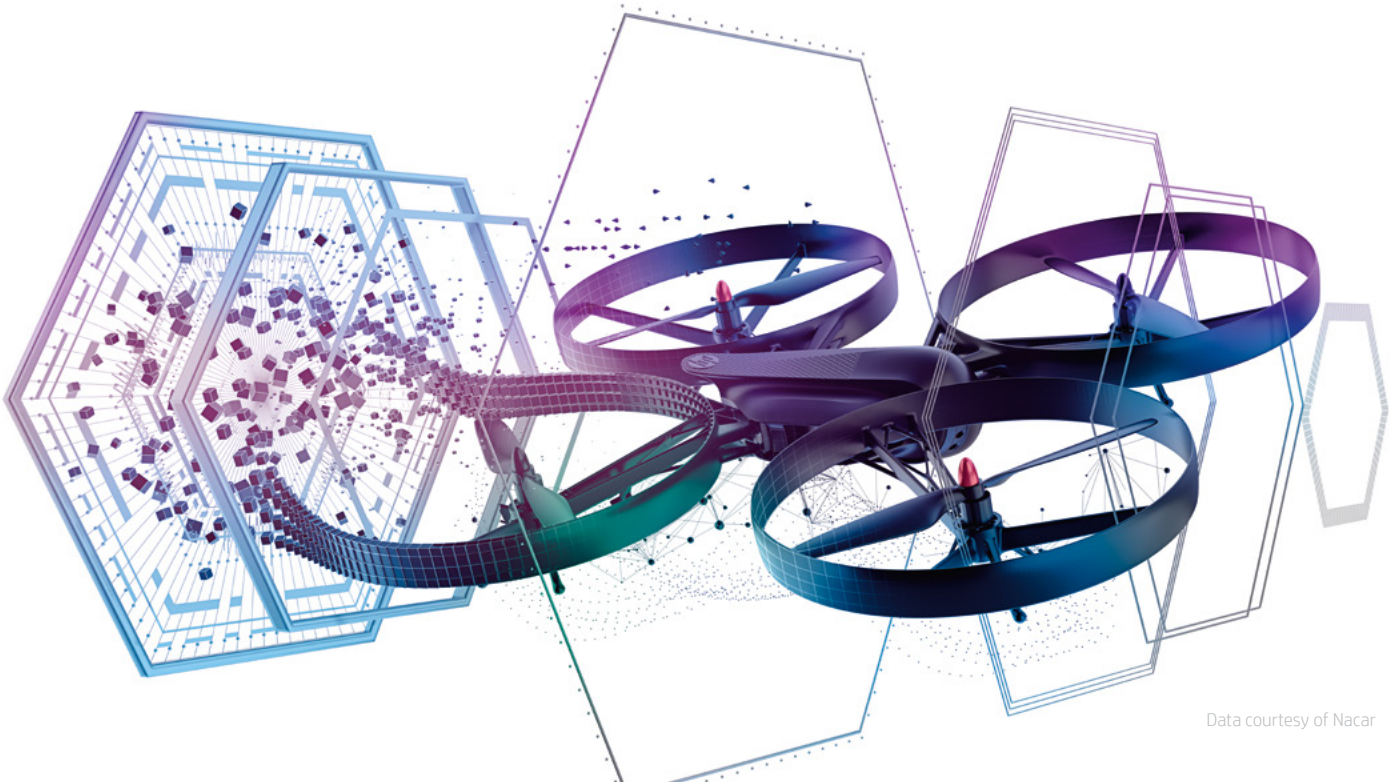
That's because HP's technology can transform part properties voxel by voxel—enabling a future of limitless applications, materials, and colors. Imagine a future where we can produce 'Smart Parts' with embedded electronics and integrated traceability and intelligence.

HP is here to help your business get ready for a future era of digital manufacturing.

Collaboration to advance the state of the art

HP's Multi Jet Fusion Open Platform will bring down the barriers to widespread 3D printing adoption across industries, in order to:

- Facilitate the development of never-before-seen 3D printing materials and new software to expand applications.
- Enable new 3D printing materials that combine lower costs with enhanced properties.
- Support the transformation from traditional manufacturing to a future of digital manufacturing.
- Drive software innovation and standards such as 3MF, an improved 3D printing file format, through collaboration with partners.



Data courtesy of Nacar

2 Reinventing prototyping and manufacturing:

HP Jet Fusion 3D 4210 Printing Solution

Accelerate your business' transformation to industrial-scale 3D manufacturing

Unlock 3D manufacturing-scale economics with the HP Jet Fusion 3D 4210 Printing Solution. Start producing engineering-grade parts—now at up to 65% lower cost[3] and up to 10 times faster.[1]

Breakthrough economics for production runs[3]

- Achieve up to 65% lower cost per part[3]—high-volume 3D production is now truly economically viable.
- Discover a world of new high-volume applications, made possible with HP Multi Jet Fusion technology.
- Best balance between economics and part quality, with industry-leading surplus powder reusability.[4]

Superior,[5] consistent part quality

- Get excellent dimensional accuracy and fine detail,[5] enabled by HP's unique multi-agent printing process.
- Produce truly functional parts with optimal mechanical properties[6]—up to 10 times faster.[1]
- Predictable and reliable final printed parts that match your design.[5]
- Access new future materials and applications with the HP Multi Jet Fusion Open Platform.

Breakthrough productivity for manufacturing environments

- Produce more parts per day with continuous printing, fast cooling[7]—add parts while printing for urgent jobs.
- Experience enhanced performance thanks to a higher disk capacity and additional memory.
- Cleaner experience with an enclosed processing station and materials not classified as hazardous.[8]
- Plan production times more accurately and predictably to help increase your overall operational efficiency.

HP Jet Fusion 3D 4210 Printing Solution

Ideal for manufacturing environments producing 600-1000 parts per week*

HP Jet Fusion 3D 4210/4200 Printer

Image shows the HP Jet Fusion 3D 4200 Printing Solution

* Assuming 220 working days of 30 cm^3 parts at 10% packing density on Balanced print mode using HP 3D High Reusability PA 12 material, and 20% powder reusability ratio.

For more information, please visit:
hp.com/go/JetFusion3Dsolutions

HP Jet Fusion 3D 4200 Printing Solution

Reinvent how you prototype and produce functional parts

Deliver quality output, up to 10 times faster[1] at half the cost.[9]

Superior,[5] consistent part quality

- Gain control with advanced/custom print modes for mechanical/functional/aesthetic properties, accuracy, speed.
- Get truly functional parts with optimal mechanical properties[6] and monitor part quality during printing.
- Obtain predictable, reliable final printed parts that match your design.[10]
- Access new future materials and uncover new applications thanks to the HP Multi Jet Fusion Open Platform.

Breakthrough productivity

- Produce more parts per day with continuous printing and fast cooling.[7]
- Streamline your workflow with HP's automated materials mixing and processing station.
- Cleaner experience with enclosed processing station and materials not classified as hazardous.[8]
- Rely on HP's world-class HP Jet Fusion 3D Solution Services to maximize uptime and productivity.

Lower cost per part[9]

- Achieve half the cost per part[9] and reduce operational costs, opening your doors to short-run manufacturing.
- Benefit from a competitively priced 3D printing solution.[9]
- Optimize cost and part quality, with cost-efficient materials that offer industry-leading reusability.[4]
- Plan production times more accurately and predictably, to help increase your overall operational efficiency.
- Choose your ideal end-to-end solution from a range of printing and processing options.

HP Jet Fusion 3D 4210/4200 Processing Station with Fast Cooling[7]

HP Jet Fusion 3D 4200 Printing Solution

Ideal for industrial prototyping and final part production environments producing 130-599 parts per week*

Image shows the HP Jet Fusion 3D 4200 Printing Solution

*Assuming 220 working days of 30 cm^3 parts at 10% packing density on Balanced print mode using HP 3D High Reusability PA 12 material, and 20% the powder reusability ratio.

Reinventing prototyping and manufacturing:

HP Jet Fusion 500 Series 3D Printers

HP Jet Fusion 580 Color 3D Printer:
Produce functional parts in full color—with voxel control—in a fraction of the time[2]

Full spectrum color parts with voxel control

- Produce brilliant, full-color functional parts while maintaining optimal mechanical properties.
- Stay ahead with a future-ready technology.

Accurate, functional parts with intricate detail

- Produce engineering-grade thermoplastic parts with optimal mechanical properties.
- Achieve fine detail and high dimensional accuracy for small features.
- Access a wide range of future materials and applications with the HP Multi Jet Fusion Open Platform.
- Get accurate and repeatable results.

Accelerate design—create, test, iterate in hours

- Produce multiple prototype iterations in the same time it takes to print a single part.[2]
- Access convenient in-house automated 3D printing with the most compact HP Jet Fusion 3D device.
- Get the parts you want when you need them, easily, reliably, and predictably with immediate access to support.
- Move smoothly from prototyping to final part production with the same HP Multi Jet Fusion technology.

HP Jet Fusion 500 Series 3D Printers

Ideal for small/medium-sized product development teams, design firms, and universities producing up to 100 parts per week*

This image shows an HP Jet Fusion 580 Color 3D Printer

*Assuming 220 working days of 30 cm^3 parts at a 10% packing density using HP 3D High Reusability CB PA 12 material and a 20% powder reusability ratio.

For more information, please visit:
hp.com/go/3DPrinter580

HP Jet Fusion 540 3D Printer:
Accelerate your creation workflow—produce functional parts in a fraction of the time[2]

Accurate, functional parts with intricate detail

- Produce engineering-grade thermoplastic parts with optimal mechanical properties.
- Achieve fine detail and high dimensional accuracy for small features.
- Get accurate and repeatable results.

Streamline design—create, test, iterate in hours

- Produce multiple prototype iterations in the same time it takes to print a single part.[2]
- Access convenient in-house automated 3D printing with the most compact HP Jet Fusion 3D device.
- Get the parts you want when you need them, easily, reliably, and predictably.
- Get immediate access to support and comprehensive training with affordable HP Jet Fusion 3D Solution Services.

Print consistent white parts with voxel control

- Produce clean, white models.
- Access a wide range of future materials and applications with the HP Multi Jet Fusion Open Platform.
- Stay ahead with a future-ready technology.
- Move smoothly from prototyping to final part production with the same HP Multi Jet Fusion technology.

For more information, please visit:
hp.com/go/3DPrinter540


Data courtesy of NACAR

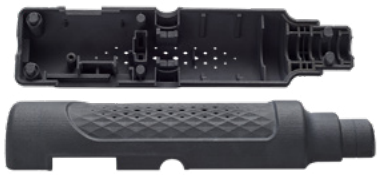
3 Engineering-grade thermoplastics

HP 3D Printing materials provide optimal output quality and high reusability at a low cost per part. Engineered for HP Multi Jet Fusion technology, these materials test the limits of functional part creation, optimizing cost and part quality, while also delivering high[11] and in many cases, industry-leading reusability[4] at the lowest cost per part.[3]

HP 3D High Reusability PA 12

Picture taken after graphite post-processing

HP 3D High Reusability PA 12 Glass Beads



3D data courtesy of NACAR

HP 3D High Reusability CB PA 12

HP 3D High Reusability PA 11

3D data courtesy of NACAR

Materials Certified for HP Jet Fusion 3D Printing

VESTOSINT® is a modified polyamide-based powder that is produced at Evonik's Marl site in Germany using the company's own special process. The powders are certified for HP Jet Fusion 3D printers.*

Certified for HP Jet Fusion 3D printers

EVONIK INDUSTRIES

HP Multi Jet Fusion Open Platform material partners:

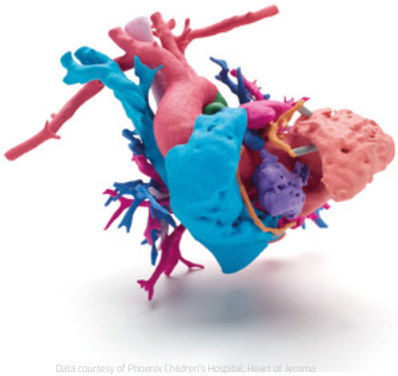
ARKEMA · BASF We create chemistry · dressler group · Henkel · Lehmann&Voss&Co. · Lubrizol · SIGMADESIGN

* The only terms and conditions governing the sale of HP 3D printer solutions are those set forth in a written sales agreement. The only warranties for HP products and services are set forth in the express warranty statements for such products and services. Nothing herein should be construed as constituting an additional warranty or additional binding terms and conditions. HP shall not be liable for technical or editorial errors or omissions contained herein and the information herein is subject to change without notice. The Materials Certified for HP Jet Fusion 3D Printing have not been designed, manufactured, or tested by HP for compliance with legal requirements and recipients are responsible for making their own determination as to the suitability of VESTOSINT® 3D Z2773 for their purposes, including but not limited as regards direct or indirect food contact applications.

...and beyond

HP plans to continue expanding our materials offering even further—delivering a wider family of thermoplastics, including those with flame-retardant properties. And we're exploring new materials, such as elastomers, polyamides, commodity plastics, and high-performance materials.

Thanks to the HP Multi Jet Fusion Open Platform and a network of materials innovation partners, we will continue expanding the palette of materials offerings even further. Accelerated materials innovation via the HP Multi Jet Fusion Open Platform is key so that even applications not yet imagined will become possible.



Data courtesy of Phoenix Children's Hospital; Heart of Jemma

Accelerating materials innovation

HP is bringing down the barriers of 3D printing adoption across industries through materials innovation.

Materials cost, quality, performance, and diversity are real pain points for 3D printing customers today. So HP is addressing this with our unique HP Open Platform approach based on:

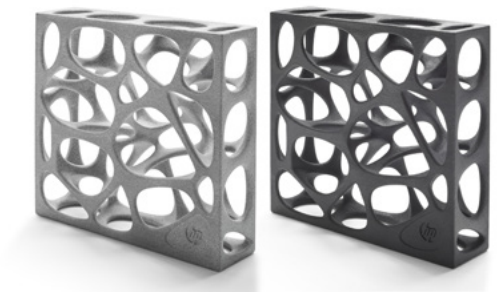
- Expanding 3D printing materials to address a broader set of applications.
- Driving down materials costs—resulting in a consistently lower cost-per-part[3]—so that 3D printing becomes a viable alternative to traditional production methods.
- Driving performance improvements and new possibilities for part properties that address specific industry needs—thanks to unique combinations of materials and HP agents.

For more information, please visit:
hp.com/go/3Dmaterials

4 HP recommended accessories HP Jet Fusion 3D 4210/4200 Printing Solutions

Girbau DY130 Dyeing Solution*

With 50 years of experience designing industrial equipment and in the dyeing equipment industry, Girbau offers a post-processing solution for dye finishing made for HP Jet Fusion 3D 4210/4200 Printing Solutions.*



For more information, visit the website:
www.coloringsystem.girbau.com

* This product will be available in Europe in August 2018, and in the Americas in September 2018. HP does not design, manufacture or sell the Girbau product or provide any warranty for the Girbau products. HP believes that the information herein is correct based on the current state of scientific knowledge and as the date of its publication, however, to the maximum extent permitted by law HP EXPRESSLY DISCLAIMS ANY REPRESENTATIONS AND WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, NON-INFRINGEMENT, MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE (EVEN IF HP IS AWARE OF SUCH PURPOSE) WITH RESPECT TO ANY INFORMATION PROVIDED. Except to the extent that exclusion is prevented by law, HP shall not be liable for technical or editorial errors or omissions, and damages or losses of any kind or nature that result from the use of or reliance upon this information, which is subject to change without notice. Recipients of the Girbau product are responsible for determining the suitability of Girbau products with HP Jet Fusion 3D products, ensuring compliance with applicable laws and regulations, and being aware that other safety or performance considerations may arise when using, handling or storing the product.

5 HP 3D Printing software: maximum efficiency end-to-end

Discover a complete and easy-to-use 3D printing software solution

Best-in-class algorithms help you achieve superior, consistent part quality with dimensional accuracy and fine detail.[5,6] Embedded quality checks help minimize errors, automated packing increases the number of parts per build, and accurate build time estimations let you plan production more efficiently.

Job preparation and monitoring

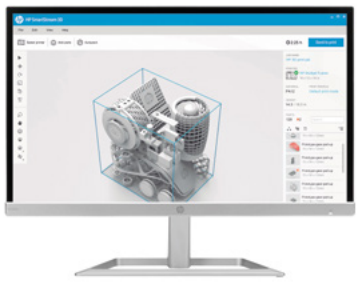
HP SmartStream 3D Build Manager
The intuitive and powerful HP SmartStream 3D Build Manager helps you prepare your jobs for printing and contains the essential features you need to prepare and send to print, including:

- Import 3MF and STL files.
- 3D model error detection and correction.
- 3D autopacking.
- Send to print.

Additional HP SmartStream 3D Build Manager features available with the HP Jet Fusion 500 Series 3D Printers include:

- Import OBJ and VRML version two files.
- Global color addition, subtraction, and correction.*

HP SmartStream 3D Command Center
The HP SmartStream 3D Command Center allows you to fully monitor your HP Jet Fusion 3D printers from your desktop. Keep track of build status, check consumables, and get real-time alerts.



HP SmartStream 3D Build Manager

Intuitive, powerful software to prepare and send your parts to print.

HP SmartStream 3D Command Center

Keep track of build status, check consumables, and get real-time alerts.

Integration with industry-leading software solutions:**

AUTODESK NETFABB

Autodesk® Netfabb® Engine for HP provides advanced software for the additive manufacturing of production-quality parts. Quality control functions prevent machine errors and enhance your overall process reliability and efficiency.

materialise
innovators you can count on

Connect with Materialise Magics with Materialise Build Processor for HP Multi Jet Fusion technology, the industry-standard software for professional 3D printing, to unlock the full potential of your HP 3D printer and manage every step in your production process.

SIEMENS

The new Siemens NX AM for HP Multi Jet Fusion module will enable NX customers to combine design, optimization, simulation, preparation of print jobs, and inspection processes for HP Multi Jet Fusion 3D printed parts, all in a single managed environment and with a minimum of steps.

Founding member of 3MF Consortium

3MF CONSORTIUM

HP is a founding member of the 3MF Consortium—an industry consortium working to define a new 3D printing format that will allow design applications to send full-fidelity 3D models to a mix of other applications, platforms, services, and printers.

For more information, please visit:
hp.com/go/3Dsoftware

* Color capabilities are available with the HP Jet Fusion 580 Color 3D Printer only.
** HP Jet Fusion 500 Series 3D Printers do not have integration with this software.

6 Boost your competitive advantage with HP Jet Fusion 3D Solution Services

HP Jet Fusion 3D 4210/4200 Printing Solutions

Rely on HP Jet Fusion 3D Solution Services to stand behind your business, maximizing your uptime and productivity, and driving your business growth.

With exclusive HP installation, training, support services, and market-leading applications expertise, you can optimize your 3D printer performance, throughput, part quality, and yield.

- Next-business-day onsite support.[12]
- Next-business-day spare parts availability,[12] thanks to HP's global reach.
- 3D printing productivity and professional services to accelerate your business growth.

We help you do more as well as get more return on your investment. Not just from day one, but every day as your needs evolve. So you can grow your business with real peace of mind.

HP Jet Fusion 580 Color and 540 3D Printers

Bring your ideas to life and boost your time-to-part with immediate access to support, affordable solution services, and comprehensive training to help you leverage HP's 3D color expertise.* We're standing by with predictable support coverage designed to help you get the most out of your investment.

Boost your time-to-part—our 3D Solution Services Engineers are dedicated to accelerating your design cycle:

- Enjoy immediate access to remote and onsite consulting from HP.
- Accelerate your time-to-part.
- Help achieve the best part quality possible.

Rely on affordable solution services—predictable support coverage is designed to help you maximize your investment:

- Help get the most out of your investment, improving time-to-part.
- Gain access to HP's predictable support coverage.

Take advantage of our comprehensive training—we're here to help you acquire new knowledge by leveraging HP's expertise with color:*

- Participate in training designed to help you achieve the best results.
- Gain access to HP's color expertise.
- Build your expertise and bring your ideas to life.

* Color capabilities are available with the HP Jet Fusion 580 Color 3D Printer only.

For more information, please visit:
hp.com/go/3Dsupport

7 Accelerate your move to HP 3D Printing with HP Financial Services

HP can help make it easier for you to acquire an HP Jet Fusion 3D Printing Solution. Whether you are looking to ease into your transition, or prefer to have more flexibility to refresh to the latest technology, we can help you design the right financial solution that meets your business objectives best.

Choose an investment solution that helps you avoid making a large, up-front cash outlay and provides a monthly payment plan that aligns with both your technology and financial requirements.

- Make monthly payments on your new hardware over the chosen term, typically 3 to 5 years, with the flexibility to ease into your deployment through a payment deferral or step structure.
- Bundle hardware and services into a simple and straightforward agreement that gives you more flexibility to refresh sooner.
- Accelerate your migration by converting your existing owned technology to a monthly payment so you can free up cash to fund your investment in new HP 3D Printing Solutions.
- We can even design an asset recovery solution to help you securely navigate through the removal and recycling of your HP Jet Fusion 3D Printing equipment when you are done with it.

You have the flexibility to add-on or expand as your business grows, and at the end of your chosen term, we make it simple for you to refresh and renew to the latest generation. You can cost effectively keep your business in a position to grow and improve with the most advanced HP technology.

For more information, please visit the Programs and Promotions section on
hp.com/go/hpfinancialservices

Financing and service offerings available through HP Financial Services Company and its subsidiaries and affiliates (collectively HPFSC) in certain countries and is subject to credit approval and execution of standard HPFSC documentation. Rates and terms are based on customer's credit rating, offering types, services, and/or equipment type and options. Not all customers may qualify. Not all services or offers are available in all countries. Other restrictions may apply. HPFSC reserves the right to change or cancel this program at any time without notice.

8 Designed for sustainable 3D printing

HP Multi Jet Fusion technology and HP 3D Printing materials and agents are designed to help drive a more sustainable digital transformation.

Safety first

- Enjoy a cleaner, more comfortable workplace[13]
  - enclosed printing system
  - automatic powder management
- Leading air emissions testing and exposure assessment to minimize risks[14]
- Agents and materials not classified as hazardous;[13] for agents:
  - no Hazardous Air Pollutants (HPAs)[15]
  - non-flammable and non-combustible[16]
- Biocompatibility certification for medical devices[17]
- Agents and materials can be used for toys[18]

Reduced environmental impact always

- Low energy consumption per printed part[19]
- Industry-leading surplus powder reusability[20]
- Meets HP's Design for Environment goals
  - over 90% of hardware can be recycled or reused
  - over 50% of hardware plastic parts can be printed with HP Multi Jet technology
- Free printhead recycling[21]
- Up to 80% of the weight of used agent/powder container is locally recyclable cardboard[22]
- Renewable raw material: HP 3D High Reusability PA 11[23]

1. Based on internal testing and simulation, HP Jet Fusion 3D average printing time is up to 10 times faster than average printing time of comparable fused deposition modeling (FDM) and selective laser sintering (SLS) printer solutions from $100,000 USD to $300,000 USD on market as of April, 2016. Testing variables for the HP Jet Fusion 4210/4200 Printing Solutions: Part quantity: 1 full build chamber of parts from HP Jet Fusion 3D at 20% of packing density versus same number of parts on above-mentioned competitive devices; Part size: 30 cm^3; Layer thickness: 0.08 mm/0.003 inches.
2. Based on internal and third-party testing for HP Jet Fusion 580 Color and 540 3D Printers, printing and cooling time is a fraction of the time of the printing times of comparable plastic fused deposition modeling (FDM), stereolithography (SLA), and material jetting solutions from $20,000 USD to $120,000 USD on market as of June, 2017. Testing variables for the HP Jet Fusion 580 Color and 540 3D Printers: Part quantity: 1 full build chamber of parts from HP Jet Fusion 3D at 10% of packing density versus same number of parts on above-mentioned competitive devices; Part size: 30 cm^3; Layer thickness: 0.08 mm/0.003 inches. Competitor testing variables are comparable.
3. Based on internal testing and public data, HP Jet Fusion 3D 4210 Printing Solution average printing cost per part is 65% lower versus the average cost of comparable fused deposition modeling (FDM) and selective laser sintering (SLS) printer solutions from $100,000 USD to $300,000 USD on market as of April, 2016 and is 50% lower versus the average cost of comparable SLS printer solutions for $300,000 USD to $450,000 USD. Cost analysis based on: standard solution configuration price, supplies price, and maintenance costs recommended by manufacturer. Cost criteria: printing 1.4 full build chambers of parts per day/5 days per week over 1 year of 30 cm^3 parts at 10% packing density on fast print mode using HP 3D High Reusability PA 12 material, and the powder reusability ratio recommended by manufacturer.
4. Industry-leading surplus powder reusability based on using HP 3D High Reusability PA 12 at recommended packing densities and compared to selective laser sintering (SLS) technology, offers excellent reusability without sacrificing mechanical performance. Tested according to ASTM D638, ASTM D256, ASTM D790, and ASTM D648 and using a 3D scanner for dimensional accuracy. Testing monitored using statistical process controls.
5. Based on HP's unique multi-agent printing process. Excellent dimensional accuracy and fine detail within allowable margin of error. Based on dimensional accuracy of ±0.2 mm/0.008 inches on XY for hollow parts below 100 mm/3.94 inches and ±0.2% for hollow parts over 100 mm/3.94 inches, using HP 3D High Reusability PA 12 material, measured after sandblasting. See hp.com/go/3Dmaterials for more information on materials specifications.
6. Based on the following mechanical properties: Tensile strength at 48 MPa (XYZ), Modulus at 1700 -1800 MPa (XYZ). ASTM standard tests with HP 3D High Reusability PA 12 material. See hp.com/go/3Dmaterials for more information on materials specifications.
7. Fast cooling is enabled by HP Jet Fusion 3D Processing Station with Fast Cooling and is recommended only for HP 3D High Reusability PA 12 and HP 3D High Reusability PA 12 Glass Beads. HP Jet Fusion 3D Processing Station with Fast Cooling accelerates parts cooling time versus recommended manufacturer time of selective laser sintering (SLS) printer solutions from $100,000 USD to $450,000 USD, as tested in April, 2016. Fused deposition modeling (FDM) not applicable. Continuous printing requires an additional HP Jet Fusion 3D Build Unit (standard printer configuration includes one HP Jet Fusion 3D Build Unit).
8. Compared to manual print retrieval process used by other powder-based technologies. The term "cleaner" does not refer to any indoor air quality requirements and/or consider related air quality regulations or testing that may be applicable. The HP powder and agents do not meet the criteria for classification as hazardous according to Regulation (EC) 1272/2008 as amended.
9. Based on internal testing and public data, HP Jet Fusion 3D 4200 Printing Solutions average printing cost per part is half the average cost of comparable fused deposition modeling (FDM) and selective laser sintering (SLS) printer solutions from $100,000 USD to $300,000 USD on market as of April, 2016. Cost analysis based on: standard solution configuration price, supplies price, and maintenance costs recommended by manufacturer. Cost criteria: printing 1 build chamber per day/5 days per week over 1 year of 30 cm^3 parts at 10% packing density using HP 3D High Reusability PA 12 material, and the powder reusability ratio recommended by manufacturer.
10. Within allowable margin of error. Based on dimensional accuracy of ±0.2 mm/0.008 inches on XY for hollow parts below 100 mm/3.94 inches and ±0.2% for hollow parts over 100 mm/3.94 inches, using HP 3D High Reusability PA 12 material, measured after sandblasting. See hp.com/go/3Dmaterials for more information on materials specifications.
11. Based on using recommended packing densities, offers high reusability of surplus powder. Liters refers to the materials container size and not the actual materials volume. Materials are measured in kilograms.
12. Available in most countries, subject to Terms & Conditions of HP Limited Warranty and/or Service Agreement. Please consult your local sales representatives for further details.
13. For HP Jet Fusion 3D Printing Solutions compared to manual print retrieval process used by other powder-based technologies. The term "cleaner" does not refer to any indoor air quality requirements and/or consider related air quality regulations or testing that may be applicable. The HP powder and agents do not meet the criteria for classification as hazardous according to Regulation (EC) 1272/2008 as amended.
14. Readily acceptable indoor and outdoor air quality is routinely assured for HP printing system emissions. Powder safety assurance (health protection) is a fundamental aspect of material selection. Airborne emissions from the HP Jet Fusion printing operation are extensively controlled with fine particle emissions levels in the workspace well below recognized Occupational Exposure Limits applicable to respirable dust. For more information, contact your local sales representative.
15. HP 3D agents were tested for Hazardous Air Pollutants, as defined in the Clean Air Act, per U.S. Environmental Protection Agency Method 311 (testing conducted in 2016) and none were detected.
16. HP 3D agents are not classified as flammable or combustible liquids under the USDOT or international transportation regulations. Testing per the Pensky-Martins Closed Cup method demonstrated flash point greater than 110° C.
17. Based on HP internal testing, June 2017, HP 3D600 Fusing and Detailing Agents and HP 3D High Reusability PA 12 powder meet USP Class I-VI and US FDA's guidance for Intact Skin Surface Devices. Tested according to USP Class I-VI including irritation, acute systemic toxicity, and implantation; cytotoxicity per ISO 10993-5, Biological evaluation of medical devices–part 5: Tests for in vitro cytotoxicity; and sensitization per ISO 10993-10, Biological evaluation of medical devices–Part 10: Tests for irritation and skin sensitization. It is the responsibility of the customer to determine that its use of the fusing and detailing agents and powder is safe and technically suitable to the intended applications and consistent with the relevant regulatory requirements (including FDA requirements) applicable to the customer's final product. For more information, see hp.com/go/biocompatibilitycertificate/PA12.
18. Parts made with HP 3D600 Fusing and Detailing Agents and HP 3D High Reusability PA 12 have undergone the following tests: 1) Heavy Metal: No metals were detected in the study with a limit of detection of 2.5 ppm. The submitted samples comply with the soluble heavy metals requirements according to section 4.3.5.2 2(b) of ASTM F963-11. 2) Phthalates: No phthalates were detected down to 0.005% in the study. The submitted sample passed the applicable requirements for phthalates as recommended by the Consumer Product Safety Improvement Act of 2008, Section 108. 3) Bisphenol A (BPA): No Bisphenol A was detected in the sample down to 0.1 ppm. 4) Migration study: The migration study with synthetic saliva and gastric fluid revealed no verifiable components leaching from the investigated material under room temperature conditions.
19. The energy consumption is calculated for the entire end-to-end, self-contained process; max energy divided by max build capacity.
20. HP Jet Fusion 3D Printing Solutions using HP 3D High Reusability PA 12 and HP 3D High Reusability PA 11 provide 80% post-production surplus powder reusability, producing functional parts batch after batch. For testing, material is aged in real printing conditions and powder is tracked by generations (worst case for recyclability). Parts are then made from each generation and tested for mechanical properties and accuracy.
21. Applicable to HP Jet Fusion 3D 4210/4200 Printing Solutions. Printing supplies eligible for recycling vary by printer. Visit hp.com/recycle to see how to participate and for HP Planet Partners program availability; program may not be available in your area. Where this program is not available, and for other consumables not included in the program, consult your local waste authorities on appropriate disposal.
22. HP 3D agents and powders for HP Jet Fusion 4210/4200 Printing Solutions are supplied in containers of which approximately 70% (agents) and 80% (powder) of the weight of the used container is a locally recyclable cardboard. Visit hp.com/recycle to see how to disassemble and recycle the powder container.
23. HP 3D High Reusability PA 11 powder is made with 100% renewable carbon content derived from castor plants grown without GMOs in arid areas that do not compete with food crops. HP 3D High Reusability PA 11 is made using renewable sources, and may be made together with certain non-renewable sources. A renewable resource is a natural organic resource that can be renewed at the same speed in which it is consumed. Renewable stands for the number of carbon atoms in the chain coming from renewable sources.

4AA6-4894ENA, November 2018

This is an HP Indigo digital print.