

# HP Metal Jet S100 Printing Solution



Reinvent business opportunities with digitally driven metal  
3D Printing for mass production





## Accelerate innovative designs and products, and efficiently produce high-quality 3D metal parts at scale



Data courtesy of Schneider Electric, Legor, and GKN.

## Accelerate innovative designs and products

- Embrace design freedom and achieve:
  - Efficient flow of various mediums (gasses, fluids, heat, etc.) through optimized design profiles that help minimize loss—such as pressure drops and resistance.
  - Improved strength-to-weight ratio for lightweight parts.
  - Simplified manufacturing processes with part consolidation.
  - Innovative, high-quality products—such as industrial filters—with HP’s density control.
- Differentiate your products with mass customization—of consumer goods, auto parts, and medical instruments.
- Accelerate time to market with fast design iterations and digital simulation capability—e.g., sinter simulation; easily and rapidly iterate and adjust part design to help avoid deformation during the sintering process.



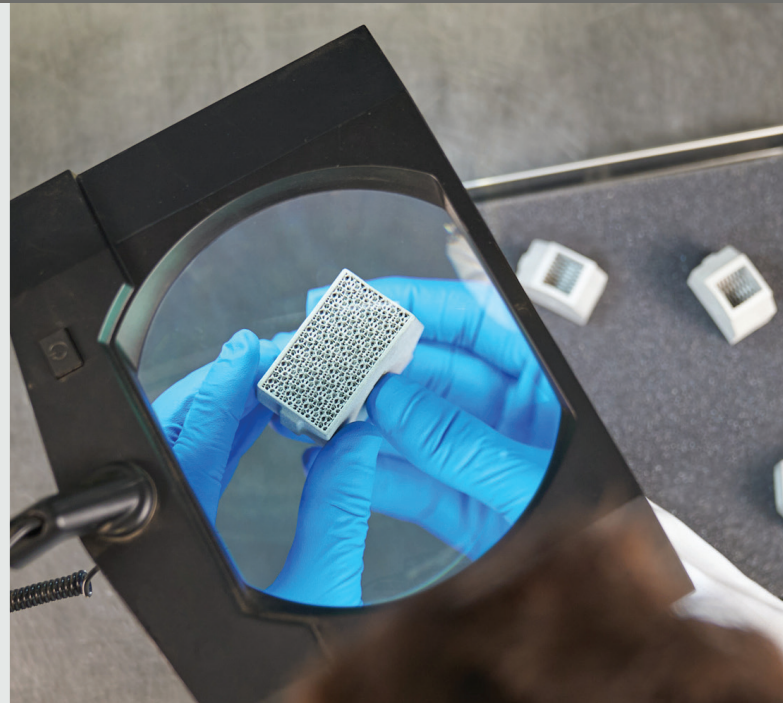
# Efficiently 3D print metal parts at scale



- Achieve industrial Overall Equipment Effectiveness (OEE) with a digital end-to-end solution that delivers:
  - Efficient operation enabled by digital insight monitoring for system maintenance with HP Metal Jet Software Solutions.
  - Maximum system uptime with an industrial-grade printing system designed for 24/7 manufacturing conditions.
  - Comprehensive set of proactive, preventive, and responsive maintenance HP Metal Jet Solution Services.
- Reduce manual labor and improve operational efficiency with automated features:
  - HP Metal Jet Powder Removal Station automates removal and recovery of loose powder which is 100% reusable<sup>1</sup> while simultaneously performing build unit cleaning.
  - Speed up production and minimize the potential for human error in powder management processes with the HP Metal Jet Powder Management Station, which automatically mixes, sieves, and loads powder to the build unit.
  - HP Metal Jet API enables digital orchestration of the production workflow for automated scheduling, routing, and monitoring of jobs.
- Help lower costs and reduce time to production from months to days vs. analog methods by eliminating time-consuming tooling and manufacturing processes.

## Deliver top quality from a trusted global industry leader

- Rely on 30 years of HP Thermal Inkjet expertise in 2D and 3D printing for industrial production-grade quality.
- Meet demanding industry standards<sup>2</sup>:
  - Enable repeatable parts and reliable process control at speed with up to 4 times nozzle redundancy<sup>3</sup> from 2 print bars and HP voxel-level 1200 x 1200 dpi 3D printing resolution.
  - Achieve consistent layer quality with a re-coating system that delivers precise tolerances.



# Scale growth with HP's flexible offering

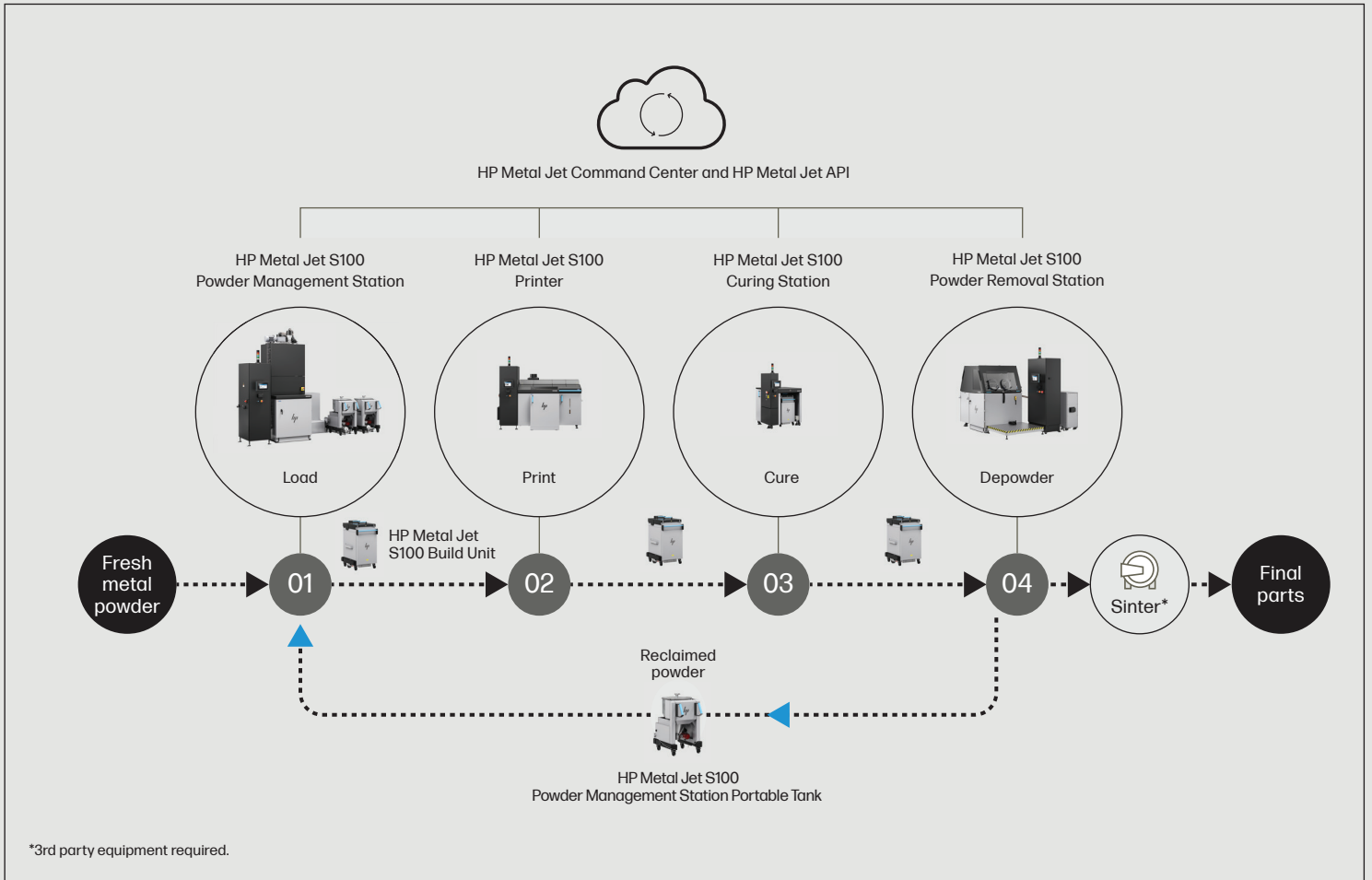
Explore the different ways you can adopt and scale 3D metal printing with the HP Metal Jet S100 Printing Solution.

- Access HP's metal printing technology outright for repeatable results, clean workflows, and industrial production-grade part quality.
- Order the HP Metal Jet printed parts you need via the HP Metal Jet Production Service.<sup>4</sup>
- HP is with you at every step of the metal printing journey, providing technical support—and so much more—when and where needed. Choose a subscription plan that best fits your business needs and benefit from a predictable, affordable, and convenient payment model with fixed monthly costs and less upfront investment.



# Streamline your process workflow—from design to final part—with the HP Metal Jet S100 Printing Solution

Produce metal parts at scale that achieve industrial OEE and reduce manual labor with automated systems and features.



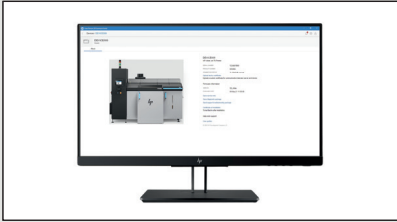
① Before printing, the HP Metal Jet S100 Powder Management Station (Load) automatically blends, sieves, and loads metal powder into the HP Metal Jet S100 Build Unit according to the user-defined print job and customized parameters.

② Once printing (Print) and ③ curing (Cure) are complete, the HP Metal Jet S100 Build Unit is manually inserted into ④ the HP Metal Jet S100 Powder Removal Station (Depowder), which automates the removal and recovery of loose powder for 100% reusability,<sup>1</sup> while simultaneously performing build unit cleaning. For any fine powder remaining on printed parts, the HP Metal Jet S100 Powder Removal Station includes separate vacuum attachments that enable manual removal of the remaining fine powder. All reclaimed powder is pneumatically recovered into the HP Metal Jet S100 Powder Management Station Portable Tank for storage and reintroduced into ① the HP Metal Jet S100 Powder Management Station.



# Accelerate process development and scale production with HP Metal Jet Software Solutions

HP is pioneering software-defined additive manufacturing to transform mass production. HP Metal Jet Software Solutions provide control to connected factory system solutions, focus on data flow across touchpoints, and prioritize operational uptime.

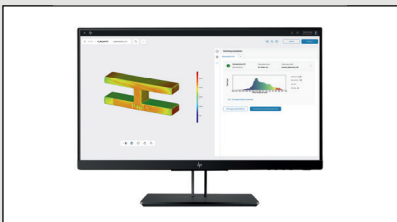


## HP Metal Jet Command Center

Client/server application for system setup, registration, device monitoring, and connectivity management.

## HP Metal Jet API

Application Programming Interface (API) for streamlined access to device data and device orchestration for process development and production workflow management.



## HP Metal Jet Process Development Suite

Integrated build management, process parameter editing, sintering simulation, and process monitoring reduce time and effort in process development.

# Explore new application designs with HP Metal Jet stainless steel materials

Today, the HP Metal Jet S100 Printing Solution utilizes two stainless steel powders with process parameters that achieve MPIF 35 properties. Additionally, other materials have been evaluated and can be developed for specific applications and properties.<sup>5</sup>



## HP Metal Jet SS 316L—extreme resistance to corrosion and high temperatures

This material is a non-magnetic austenite stainless steel used in applications requiring extremely high corrosion resistance, excellent elongation, ductility, and strength at elevated temperatures. The high alloy and low carbon content makes it a great fit for automotive, aerospace, medical, jewelry, and oil/chemical industries.

## HP Metal Jet SS 17-4PH—high strength and wear resistance

This material is a martensite precipitation hardening stainless steel used in applications that require a combination of high strength and mechanical properties with good corrosion and wear resistance. Properties can be tailored through heat treatment, making this versatile material valuable for a wide use of applications in the medical, aerospace, marine, food processing, and automotive industries.



# Enhance your customer journey to scale production with HP Metal Jet Solution Services

HP Metal Jet Solution Services provide your business with a comprehensive suite of onboarding, maintenance, and professional services to help you achieve the most value with HP Metal Jet technology.



## HP Metal Jet Onboarding Services

Launch and scale your HP Metal Jet S100 Printing Solution with installation and training onboarding services designed to quickly and efficiently get your team, equipment, and site up and running.

## HP Metal Jet Maintenance Services

Maximize your Overall Equipment Effectiveness (OEE) with proactive, preventive, and responsive HP Metal Jet Maintenance Services tailored to your operational needs.



## HP Metal Jet Professional Services

Optimize and accelerate your application designs as well as process and new material development efforts with HP Metal Jet Professional Services customized to help you achieve your desired part quality and production outcomes.

# Achieve final part properties with post-processing: sintering and finishing

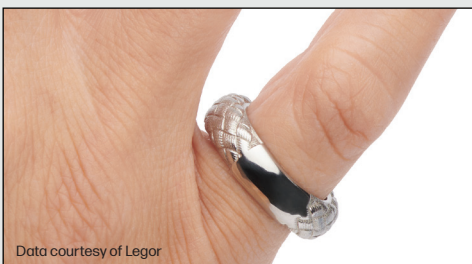


Data courtesy of Legor

HP supports your entire workflow, from initial idea to final part—even going beyond the HP Metal Jet Printing process—to cover your entire ecosystem, including sintering and surface finishing assistance if required.<sup>6</sup>

When it comes to sintering, HP can provide additional assistance with sintering operation requirements. Additionally, HP recommends parameters for each qualified material—that meet industry<sup>2</sup> standards for stainless steel—or can provide assistance to help develop these parameters.

After printing and sintering, if additional finishing is required, HP's engineering team can provide services that help you achieve your final desired part properties using alternative processes (such as machining, polishing, coating, and hot isostatic pressing).



Data courtesy of Legor

# Leverage Binder Jetting technology and HP's expertise in additive manufacturing

AM advantages over traditional metal manufacturing	Binder Jetting 3D printing advantages over other 3D printing processes	HP Metal Jet technology advantages
<p>Enables innovative new designs for:</p> <ul style="list-style-type: none"> <li>● Lightweight or consolidated parts</li> <li>● Performance improvements</li> <li>● Customization</li> </ul> <p>Improves customer economics:</p> <ul style="list-style-type: none"> <li>● Reducing manufacturing process steps</li> <li>● Reducing manual labor</li> </ul>	<p>Offers higher productivity:</p> <ul style="list-style-type: none"> <li>● Processing layer by layer versus point process</li> <li>● Isotropic properties for better surface finishing (i.e., requiring less post-processing)</li> <li>● No support removal required</li> </ul> <p>Uses metal powders from established global powder suppliers, which are less expensive than laser-based 3D printing powders.</p>	<p>Printhead advantage:</p> <ul style="list-style-type: none"> <li>● HP Thermal Inkjet technology drives economics</li> <li>● Higher resolution drives part quality (including surface finish and accuracy)</li> </ul> <p>HP Metal Jet binding agent advantage:</p> <ul style="list-style-type: none"> <li>● Leverages IP from HP Latex</li> <li>● Uses a minimum of binder, allowing for thicker and larger mass parts than metal injection molding (MIM).</li> </ul>

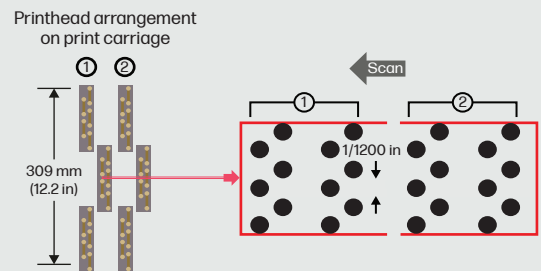
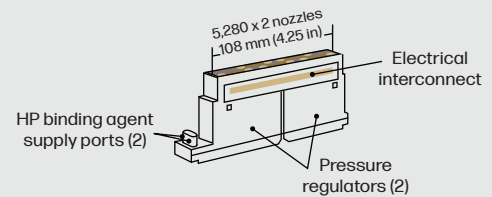
## Benefit from 80 years of HP heritage

HP has an 80-year history of innovation, including 30 years of HP Thermal Inkjet expertise in 2D and 3D printing. As a result, HP Metal Jet is the latest technology, designed specifically for industrial production-grade quality of 3D metal parts, building further on this strong heritage.

### HP Thermal Inkjet (TIJ) printheads and nozzle arrangement contribute to part quality and cost reduction

HP Metal Jet printers employ multiple printbars for high productivity and nozzle redundancy. The printhead is a complex, integrated system that controls how and where to apply fluids. It allows HP Metal Jet to accurately apply the binder to produce stronger parts with outstanding definition. Each printhead produces a 108-mm (4.25-inch) print swath with two independent columns of 5,280 nozzles that are spaced 1200/inch in each column. There are two independent supply ports for HP Metal Jet binding agent and two built-in pressure regulators.

HP Metal Jet printers address a 1200 x 1200 dpi grid with a layer typically between 35 and 140 microns thick. HP Metal Jet's high voxel resolution produces fine details and precision definition of edges and surfaces both inside and outside the part. Defects are suppressed with 4-times nozzle redundancy.<sup>3</sup>



### HP Metal Jet binding agent—key enabler for higher quality and productivity

HP Metal Jet binding agent is formulated with a polymer that binds the metal particles together wherever HP Metal Jet binding agent is printed. This binding agent produces thicker-walled parts more quickly than metal injection molding (MIM). Even better, no wax debinding is required with this process, which can save up to 20 workflow hours compared to traditional MIM.<sup>7</sup>



# Technical specifications

## HP Metal Jet S100 Printing Solution

Printer Performance	Technology	HP Metal Jet technology	Power	Consumption	HP Metal Jet S100 Printer: 8 kW	
	Effective building volume	430 x 309 x 200 mm			HP Metal Jet S100 Curing Station: 3 kW	
	Building speed	1990 cc/hr <sup>3</sup>		Requirements	HP Metal Jet S100 Printer: 3phase, 3W + N + PE, 220-240 / 380-415 Vac, 30 A max., 50/60 Hz, 8 kW; or 3phase, 3W + PE, 200-240 Vac, 48 A max., 50/60 Hz, 8 kW	
	Layer thickness	35 - 140 µm				
	Job processing resolution (x,y)	1200 dpi				
	Printer resolution (x,y)	1200 dpi				
	Printhead system	2 print bars/ 6 HP Thermal Inkjet printheads (63,360 nozzles)/ Automatic nozzle health detector and nozzle replacement				
Print redundancy	4-times nozzle redundancy at 1200 dpi resolution <sup>3</sup>					
Dimensions (w x d x h)	Printer	2975 x 1350 x 2410 mm	Certifications and statement	Safety	EU: Machinery Directive compliant, EN 60204-1, EN 12100-1, EN 13849-1, EN 13849-2, EN 1127-1 US/Canada: UL 2011, CSA C22.2 No.14-18	
	Shipping	3335 x 1550 x 2400 mm				
	Operating area	4775 x 3850 x 2410 mm				
Weight	Printer	851 kg	Electromagnetic	Compliant with Class A requirements, including USA (FCC rules), Canada (ICES), EU (EMC Directive)		
	Build unit	261 kg				
	Curing station	400 kg				
Network	Gigabit Ethernet (10/100/1000Base-T), supporting the following standards: TCP/IP, DHCP (IPv4 only), TLS/SSL		Environmental statement	REACH		
Processor and memory	Processor	HP Metal Jet S100 Printer: Intel® Xeon® W-2255 3.7GHz 10C 165W HP Metal Jet S100 Curing Station: Intel® Celeron® J3455 1.5 Ghz Quad-Core			Warranty & Service Coverage included	One-year limited hardware warranty
	Memory	HP Metal Jet S100 Printer: 128 GB DDR4 HP Metal Jet S100 Curing Station: 4G DDR3L memory				
	Hard disk	HP Metal Jet S100 Printer: 1 TB PCIe NVMe TLC SSD HP Metal Jet S100 Curing Station: SSD 240 GB				
	Industrial safety PLC	HP Metal Jet S100 Printer and HP Multi Jet S100 Curing Station: Siemens SIMATIC ET 200SP, CPU 1512SP F-1 PN 300 KB/1 MB 3 Ports SIMATIC S7 MEMORY CARD 24 MB				
	Software	HP Metal Jet Software Solutions	HP Metal Jet Command Center HP Metal Jet API HP Metal Jet Process Development Suite			
Compatible software		Autodesk Fusion 360 with Netfabb Premium				
		Autodesk Fusion 360 with Netfabb Ultimate				
		Materialize Connector for HP				
		Simufact Additive by Hexagon/MSC				
Altair® Inspire™ Print 3D						
Supported file formats	STL, 3MF					

# Technical specifications

## HP Metal Jet S100 Powder Management Station

Performance	Technology	HP Metal Jet technology
	Mixer capacity	78 liters (max weight: 350 kg)
	Speed range	14.3 rpm to 27.6 rpm
	Sieving technology	90 µm replaceable mesh with Ultrasonic Technology and external port for vacuum cleaning
Material transport speed <sup>9</sup>	Material transport speed <sup>9</sup>	2.5 l/min (based on HP Metal Jet SS 316L material and bulk density, measured with HP Metal Jet S100 Powder Management Station Vacuum Port 1)
	Build unit load speed <sup>10</sup>	2.5 l/min (based on HP Metal Jet SS 316L material and bulk density)
	Build unit load speed <sup>10</sup>	2.5 l/min (based on HP Metal Jet SS 316L material and bulk density)
Dimensions (w x d x h)	Station	System: 1966 x 2079 x 3175 mm System with accessories: 4545 x 2079 x 3175 mm
	Operating area	System: 2966 x 6800 x 3550 mm System with accessories: 5545 x 6800 x 3550 mm
Weight	System	1197 kg
	System with accessories	1665 kg
Network	Gigabit Ethernet (10/100/1000Base-T), supporting the following standards: TCP/IP, DHCP (IPv4 only), TLS/SSL	
Processor and memory	Processor	Intel® Celeron® J3455 1.5 Ghz Quad-Core
	Memory	4G DDR3L memory
	Industrial PLC	Siemens SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 F (Windows 10)
Power	Consumption	Basic 4 kW (with Vacuum Pump 7 kW)
	Requirements	3phase, 3W + PE, 380-415 Volts (line-to-line) (±10%) 3phase, 3W + PE, 480 Volts (line-to-line) (±10%) Maximum load current (per phase) 16 Amperes 50/60Hz
Certifications and statement	Safety	CE compliant according to Machinery Directive 2006/42/EC: EN 60204-1, EN 12100, EN 13849-1, EN 13849-2, EN 1127-1 US/Canada: UL 2011, CSA C22.2 No.14-18
	Electromagnetic	Compliant with Class A requirements, including USA (FCC rules), Canada (ICES), EU (EMC Directive)
	Environmental statement	REACH
Warranty & Service Coverage included	One-year limited hardware warranty	

## HP Metal Jet S100 Powder Removal Station

Performance	Technology	HP Metal Jet technology
	Automatic coarse depowder	Powder recovery with vibration control
	Build unit cleaning	Enclosed material recovery from build unit with optional manual vacuum cleaning
Dimensions (w x d x h)	Station	System: 2665 x 2212 x 2550 mm System with accessories: 2665 x 2700 x 2550 mm
	Operating area	System: 3900 x 3700 x 2550 mm System with accessories: 3900 x 5000 x 2550 mm
Weight	System	814 kg
	System with accessories	1043 kg
Network	Gigabit Ethernet (10/100/1000Base-T), supporting the following standards: TCP/IP, DHCP (IPv4 only), TLS/SSL	
Processor and memory	Processor	Intel® Celeron® J3455 1.5 Ghz Quad-Core
	Memory	4G DDR3L memory
Industrial PLC	Siemens SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 F (Windows 10)	
Power	Consumption	Basic 1 kW (with vacuum pump 4 kW)
	Requirements	3phase, 3W + PE, 380-415 Volts (line-to-line) (±10%) 3phase, 3W + PE, 480 Volts (line-to-line) (±10%) Maximum load current (per phase) 9 Amperes 50/60Hz
Certifications and statement	Safety	EU: Machinery Directive compliant, EN 60204-1, EN 12100-1, EN 13849-1, EN 13849-2, EN 1127-1 US / Canada: UL 2011, CSA C22.2 No.14-18
	Electromagnetic	Compliant with Class A requirements, including USA (FCC rules), Canada (ICES), EU (RED Directive)
	Environmental statement	REACH
Warranty & Service Coverage included	One-year limited hardware warranty	

# Ordering information

Printer	50V69B	HP Metal Jet S100 Printer
Accessories	6W7L0A	HP Metal Jet S100 RFID and Beacon
	50V67B	HP Metal Jet S100 Build Unit
	50V68B	HP Metal Jet S100 Curing Station
	50P69B	HP Metal Jet S100 Powder Management Station
	6L082B	HP Metal Jet S100 Powder Management Station Portable Tank
	6W7L3A	HP Metal Jet S100 Powder Management Station Portable Tank Fill Lid
	6L052A	HP Metal Jet S100 Powder Management Station Vacuum Port 1
	6W7K9A	HP Metal Jet S100 Powder Management Station Vacuum Port 2
	6W7L5A	HP Metal Jet S100 Powder Management Station Changeover Kit
	72R36A	HP Metal Jet S100 Powder Management Station Vacuum Pump Cables
	227Z8B	HP Metal Jet S100 Powder Removal Station
	6W7L2A	HP Metal Jet S100 Powder Removal Station Starter Kit
	6W7L1A	HP Metal Jet S100 Powder Removal Station Storage Drum 200 mm
	5R8W3A	HP Metal Jet S100 Powder Removal Station Platform
	6W7L4A	HP Metal Jet S100 Powder Removal Station Changeover Kit
	6L053A	HP Metal Jet S100 Powder Removal Station Vacuum Pump Cables
72R37A	HP Metal Jet S100 Powder Management and Removal Station Vacuum Pump	

HP Metal Jet printhead	V1Q82A	HP 3DM200 Printhead
HP Metal Jet long-term consumables	V1Q93A	HP 3DM100 Cleaning Roll
	V1Q96A	HP 3DM100 Build Unit Filter Sheets
HP Metal Jet binding agent	V1Q83A	HP 3DM200 Binding Agent 5L
HP Metal Jet stainless steel materials	V1R43A	HP Metal Jet SS 316L, 20 kg
	V1R44A	HP Metal Jet SS 17-4PH, 20 kg
HP Metal Jet Onboarding Services		HP Metal Jet Installation Services (HP Metal Jet Operator Training and Certification included)
		HP Metal Jet Design, Process, and Part Quality Trainings
		HP Metal Jet Post-Installation Training
HP Metal Jet Maintenance Services		HP Metal Jet Maintenance Service-Level Agreements
		HP Metal Jet Recertification Service
		HP Metal Jet Uptime Kits
		HP Metal Jet Train-to-Maintain Training
		HP Metal Jet Material Changeover Service
HP Metal Jet Professional Services		HP Metal Jet Application Evaluation Services
		HP Metal Jet Application Design and Process Optimization Services
		HP Metal Jet Application and Process Engineering Consultation Services
		HP Metal Jet Material Development Services
		HP Metal Jet Production Readiness Services

For more information, please visit: [hp.com/go/3Dmetals](https://hp.com/go/3Dmetals)

Connect with an HP Metal Jet expert or sign up for the latest news about HP Metal Jet Printing: <https://www.hp.com/go/3DContactus>

1. Powder removal involves a mix of automated and manual processes, where trace amounts of loose powder may be lost.
2. Meets ASTM and MPIF standards for stainless steel.
3. To achieve 4 times nozzle redundancy, nozzles are aligned so that four nozzles print the same 1/1200-inch dot row in the powder bed. This means up to four different nozzles can print HP Metal Jet binding agent in the same 1200 dpi grid point, helping to suppress defects. For more information, see [hp.com/metaljet-whitepaper](https://hp.com/metaljet-whitepaper).
4. HP does not provide manufacturing services. Customers work directly with and pay for manufacturing services provided by a trusted third-party manufacturing partner responsible for fulfilling the order. HP provides design compatibility check for HP Metal Jet printing. Metal Jet Production Service is available in the US and Western Europe.
5. Available through HP Metal Jet Professional Services.
6. Additional fee may be required for sintering and finishing support services.
7. Compared to metal injection molding, a time-consuming debinding process is unnecessary with HP Metal Jet technology, taking up to 20 hours out of the workflow.
8. In the case of a layer thickness of 50 microns, actual build speed is affected by build depth, materials, and processing parameter settings.
9. Material transport speed: considers transport from the HP Metal Jet S100 Powder Management Station Portable Tank to the HP Metal Jet S100 Powder Management Station using the HP Metal Jet S100 Powder Management and Removal Station Vacuum Pump.
10. Build unit load speed: considers material discharge from the HP Metal Jet S100 Powder Management Station (including sieving and compaction) to the HP Metal Jet S100 Build Unit.

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