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News Release

HP Launches World's Most Advanced Metals 3D Printing Technology for Mass Production to Accelerate 4th Industrial Revolution

HP Metal Jet up to 50x more productive, delivering low-cost, high-quality final parts; New Metal Jet Production Service opens up world of applications to global customers; Partnerships with GKN Powder Metallurgy, Parmatech, Volkswagen, Wilo and more

News highlights:

- New HP Metal Jet technology delivers mechanically functional final parts with up to 50x more productivity than other 3D printing methods and at significantly lower cost compared to other binder jetting systems
- Metal Jet Production Service to fill orders for production-grade final parts beginning in 2019
- Reinventing factory production for auto, industrial, and medical industries; New partnerships with GKN Powder Metallurgy and Parmatech to produce Metal Jet parts for Volkswagen, Wilo, and more

Chicago and Palo Alto, CA – September 10, 2018 — Today at the 2018 International Manufacturing Technology Show (IMTS), HP Inc. launched HP Metal Jet, the world's most advanced 3D printing technology for the high volume manufacturing of production-grade metal parts. Providing up to 50 times more productivity¹ at a significantly lower cost² than other 3D printing methods, HP Metal Jet is being deployed by manufacturing leaders GKN Powder Metallurgy and Parmatech for the factory production of final parts. Customers placing orders include global stalwarts Volkswagen and Wilo and innovative vertical market leaders such as Primo Medical Group and OKAY Industries.

As part of its mission to transform the way the world designs and manufactures, HP today also launched the Metal Jet Production Service³, enabling customers around the world to rapidly iterate new 3D part designs, produce final parts in volume, and integrate HP Metal Jet into their long-term production roadmaps.



"We are in the midst of a digital industrial revolution that is transforming the \$12 trillion manufacturing industry. HP has helped lead this transformation by pioneering the 3D mass production of plastic parts and we are now doubling down with HP Metal Jet, a breakthrough metals 3D printing technology," said **Dion Weisler, CEO and President, HP Inc.** "The implications are huge – the auto, industrial, and medical sectors alone produce hundreds of billions of metal parts each year. HP's new Metal Jet 3D printing platform and Production Service unlocks the speed, quality, and economics to enable our customers to completely rethink the way they design, manufacture, and deliver new solutions in the digital age."

HP Metal Jet is a groundbreaking, voxel-level binder jetting technology leveraging more than 30 years of HP printhead and advanced chemistries innovation. With a bed size of 430 x 320 x 200mm, 4x the nozzle redundancy and 2x the printbars⁴, and significantly less binder by weight, HP Metal Jet delivers greater productivity and reliability at a low acquisition and operational cost compared to other metals 3D printing solutions. HP Metal Jet will start with stainless steel parts, delivering isotropic mechanical properties exceeding industry standards.

Transforming Industries With HP Metal Jet Technology

In an industry-first collaboration, HP is partnering with **GKN Powder Metallurgy** to deploy HP Metal Jet in their factories to produce functional metal parts for auto and industrial leaders including **Volkswagen** and **Wilo**. GKN Powder Metallurgy is the world's leading producer of materials and products using powder metallurgy technologies and includes the brands of GKN Sinter Metals, GKN Hoeganaes, and GKN Additive Manufacturing. The company produces more than three billion components per year and expects to print millions of production-grade HP Metal Jet parts for its customers across industries as early as next year.

"We're at the tipping point of an exciting new era from which there will be no return: the future of mass production with 3D printing. HP's new Metal Jet technology enables us to expand our business by taking on new opportunities that were previously cost prohibitive," said **Peter Oberparleiter, CEO of GKN Powder Metallurgy**. "Our DNA and our expertise in powder production and metal part processing using digitally networked systems will enable us to drive industrialization across the whole additive manufacturing value stream. By combining the forces of HP and GKN Powder Metallurgy, we will push the productivity and capability of our customers to unprecedented levels based on the economic and technical advantages of HP Metal Jet technology."

Volkswagen, one of the largest and most innovative vehicle makers in the world, is integrating HP Metal Jet into its long-term design and production roadmap. The collaboration between Volkswagen, GKN Powder Metallurgy and HP has resulted in the ability to move quickly to assess the manufacturing of mass-customizable parts such as individualized key rings and exterior-mounted name plates. VW's multi-



year plan to use HP Metal Jet also includes the production of higher performance functional parts with significant structural requirements, such as gearshift knobs and mirror mounts. As new platforms such as electric vehicles enter mass production, HP Metal Jet is expected to be leveraged for additional applications such as the lightweighting of fully safety-certified metal parts.

"The auto industry is being revolutionized – not only do customers now expect personalization, but by 2025 the brands of Volkswagen Group will have introduced 80 new electric models," said **Dr. Martin Goede, Head of Technology Planning and Development, Volkswagen**. "A single car consists of six thousand to eight thousand different parts. A big advantage of an additive technology like HP Metal Jet is it allows us to produce many of these parts without first having to build manufacturing tools. By reducing the cycle time for the production of parts, we can realize a higher volume of mass production very quickly. That's why HP's new Metal Jet platform is a huge leap forward for the industry, and we look forward to raising the bar on what is possible to deliver more value and innovation for our customers."

GKN Powder Metallurgy is also leveraging HP Metal Jet technology to produce cost-effective industrial parts with higher hydraulic efficiency for **Wilo**, a global leader for pumps and pump system solutions. Wilo is looking to HP Metal Jet technology to produce initial hydraulic parts such as impellers, diffusors and pump housings with widely variable dimensions that must withstand intense suction, pressure, and temperature fluctuations.

Reinventing Healthcare With HP Metal Jet

To serve the medical industry, HP is also partnering with **Parmatech**, an ATW Company, to expand mass production of Metal Jet parts for customers including **OKAY Industries**, **Primo Medical Group**, and others. Parmatech is a world leader in metal injection molding and has been a metals manufacturing pioneer for more than 40 years, specializing in producing low-cost, high-volume metal parts for the medical and industrial sectors.

"HP Metal Jet represents the first truly viable 3D technology for the industrial-scale production of metal parts. Our customers demand extreme performance, quality, and reliability and HP's advanced technology and heritage of market disruption give us the confidence to deliver beyond expectations," said **Rob Hall, President of Parmatech**. "We are excited to deploy HP Metal Jet in our factories and begin manufacturing complex parts, such as surgical scissors and endoscopic surgical jaws, and new applications and geometries not possible with conventional metal fabrication technologies. HP Metal Jet technology will play a key role in our mission to develop innovative solutions for the unique challenges of our customers."



Designed for Mass Production: HP Metal Jet Pricing and Availability

In first half of 2019, customers will be able to upload 3D design files and receive industrial-grade parts in large quantities from the new **Metal Jet Production Service**. The parts will be produced in collaboration with HP partners GKN Powder Metallurgy and Parmatech to ensure the highest standards of engineering and production quality. For more information and to register for access to the HP Metal Jet Production Service go to HP.com/go/3Dmetalparts.

Complete technical information on HP's new Metal Jet technology can be found at HP.com/go/3Dmetals.

Commercial HP Metal Jet solutions will be offered at under \$399,000 and begin shipping in 2020 to early customers and with broad availability in 2021. Reservations for customers to pre-order Metal Jet systems are available today⁵.

HP Showcasing the Future of 3D Mass Production at IMTS

Join HP's President of 3D Printing, Stephen Nigro, on September 11 at 9:00am CT at the Sky Ballroom, West Building, McCormick Place for the opening keynote of the Additive Manufacturing Conference at IMTS. HP and its partners and customers will showcase their journey driving 3D printing metals technology into mass production. A live stream of the keynote is available by registering at <http://gbm.media/hp-keynote>.

About HP

HP Inc. creates technology that makes life better for everyone, everywhere. Through our portfolio of printers, PCs, mobile devices, solutions and services, we engineer experiences that amaze. More information about HP Inc. is available at <http://www.hp.com/go/3Dprinting>.

Forward-Looking Statements

This news release contains forward-looking statements that involve risks, uncertainties and assumptions. If the risks or uncertainties ever materialize or the assumptions prove incorrect, the results of HP Inc. and its consolidated subsidiaries ("HP") may differ materially from those expressed or implied by such forward-looking statements and assumptions.

All statements other than statements of historical fact are statements that could be deemed forward-looking statements, including but not limited to any projections of net revenue, margins, expenses, effective tax rates, net earnings, net earnings per share, cash flows, benefit plan funding, deferred tax assets, share repurchases, currency exchange rates or other financial items; any projections of the amount, timing or impact of cost savings or restructuring and other charges; any statements of the plans, strategies and objectives of management for future operations, including the execution of restructuring plans and any resulting cost savings, revenue or profitability



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¹ Based on comparable competitive binder jetting and selective laser melting (SLM) metals 3D printing solutions available as of July 31, 2018. Productivity claim based on: 1) up to 50 times more productive, on average, based on print speed for serial production up to 100,000 parts, and 2) solution acquisition cost.

² Low cost based on comparable competitive binder jetting and selective laser melting (SLM) metals 3D printing solutions available as of July 31, 2018. Expected printer price for 2020 launch for lead customers.

³ 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 Service¹ is expected to be available in Western Europe and US. Part production will be fulfilled and delivered by our trusted manufacturing partners with expected availability first half 2019.

⁴ HP Metal Jet technology provides up to 4 times more 3D printer nozzle redundancy and 2 times more printbars compared to competitive binder jetting metals 3D printing solutions available as of July 31, 2018.



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⁵ Reserve a printer is expected to be available in the following countries: US, UK, France, Germany, Italy, and Spain. HP Metal Jet printers are expected to become commercially available second half 2020 for lead customers, with expected broad availability in 2021.