

# Press Release

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## 3D Systems Unveils Advancements in Creation of World's Largest, Fastest Powder Metal 3D Printer for CCDC Army Research Laboratory

- New solution will revolutionize key supply chains associated with long-range munitions, next-generation combat vehicles, helicopters, air and missile defense capabilities
- First test print completed on unique 9-laser, 1m x 1m x 600mm metal 3D printer

**ROCK HILL, South Carolina, November 12, 2020** – [3D Systems](https://www.3dsystems.com) (NYSE:DDD) today announced it has achieved significant progress in the creation of the world's largest, fastest most precise powder metal 3D printer. Through a combination of multiple lasers, large build chamber, and unique material deposition processes, the Company is poised to enable the Combat Capabilities Development Command (DEVCOM) Army Research Laboratory (ARL) with technology designed to address their specific application needs for long-range munitions, next-generation combat vehicles, helicopters, air and missile defense capabilities. This unparalleled additive manufacturing solution – comprising materials, hardware, software and services - reinforces 3D Systems' dedication to customer-centric innovation, creating value through solutions designed to address its customers' unique application needs.

Since the \$15 million contract award in the third quarter of 2019, 3D Systems' engineering and applications experts have drawn upon their deep expertise and experience to develop a

unique 9-laser, 1m x 1m x 600mm metal 3D printer which is the only of its kind in the industry.

“When we embarked on this project, we needed a faster way to produce critical components for major ground combat subsystems,” said Ms. Stephanie Koch, ARL's Advanced Manufacturing, Materials, and Processes Program Manager. “The progress that has been made on this project to date is monumental. We look forward to the coming months as we progress to a full-scale production solution that will enable innovative new capabilities for transformational overmatch.”

“Development and demonstration of this first of its kind technology has far reaching implications across our industrial base as it shapes and transforms the supply chain around it,” said Lisa Strama, president and CEO of NCMS. “This project has also provided the unique ability to concurrently plan for and address a complex ecosystem for maximizing the benefit to US manufacturers’ competitiveness from the outset.”

At the end of October 2020, 3D Systems completed the first test print, using a selective powder deposition process. This unique concept limits the amount of material needed to produce very large parts by depositing the material only where it is needed in the build – accelerating time-to-final part and reducing material cost. The build chamber also includes a heated build plate to reduce thermal stress and also improve deposition quality during the build.

To create this next-generation platform, 3D Systems is leveraging key technologies from its Direct Metal Printing (DMP) platform, which is foundational to the Company’s DMP Flex 350, DMP Factory 350, and DMP Factory 500 3D printers. One of the most important components is the optical train that enables each of the next-generation printer’s nine lasers with its own melt pool monitoring system for enhanced quality control. By employing the same optical system as used in its DMP platform, the Company can leverage the existing material library which has been extensively tested and fine-tuned for optimal performance. Pulling from the data associated with these high-performance materials accelerates development of new materials.

The Company is also integrating its industry-renowned vacuum chamber concept for high, repeatable quality. 3D Systems’ inerting process is many times faster and consumes substantially less argon (at least ten times less) than conventional metal 3D printers. The inerting process dramatically reduces the oxygen level during processing to below 25ppm,

which is revolutionary compared to the 500-1,000 ppm in most conventional metal 3D printers. This results in exceptionally strong parts of high chemical purity while powder quality remains high through the lifetime of the material's usage. This results in a significantly reduced total purchase cost of compressed argon over machine lifetime as well as savings enabled by powder reusability for lower Total Cost of Operation.

The inclusion of six high contrast single-lens reflex (SLR) cameras within the build chamber delivers a comprehensive view of the build in-situ. Each camera is positioned above the powder bed with direct top-down view. This unique viewpoint eliminates the need for image manipulation, resulting in the ability to obtain build data real-time thus accelerating the process. The firmware within the system is capturing all digital input including sensor data, positional information, melt pool data and powder bed pictures into an SQL database. This enables full insight into the build and is invaluable for part and process validation and qualification. Additionally, 3D Systems is leveraging the same proven additive manufacturing software used within its DMP platform to optimize designs and streamline processes to accelerate print times and reduce material consumption.

"3D Systems was founded on a spirit of innovation, and our customers play a key role in catalyzing this process," said Chuck Hull, co-founder and chief technology officer, 3D Systems. "Our collaboration with ARL is allowing us to elevate our research and development efforts, achieving many industry firsts on our way to empowering the ARL to meet their goals. Our accomplishments through the first phases of this project will fuel the next, on our way to helping ARL scale their capabilities and bolstering their supply chain."

According to the U.S. Army Additive Manufacturing Implementation Plan, the Army has been using additive manufacturing (AM) for two decades to refurbish worn parts and create custom tools. Once developed, the Army will leverage its manufacturing experience by placing the new large-scale systems in its depots and labs. Subsequently, 3D Systems and its partners plan to make the new 3D printer technology available to leading aerospace and defense suppliers for the development of futuristic Army platforms.

### **Forward-Looking Statements**

Certain statements made in this release that are not statements of historical or current facts are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements involve known and unknown risks,

uncertainties and other factors that may cause the actual results, performance or achievements of the company to be materially different from historical results or from any future results or projections expressed or implied by such forward-looking statements. In many cases, forward-looking statements can be identified by terms such as "believes," "belief," "expects," "may," "will," "estimates," "intends," "anticipates" or "plans" or the negative of these terms or other comparable terminology. Forward-looking statements are based upon management's beliefs, assumptions, and current expectations and may include comments as to the company's beliefs and expectations as to future events and trends affecting its business and are necessarily subject to uncertainties, many of which are outside the control of the company. The factors described under the headings "Forward-Looking Statements" and "Risk Factors" in the company's periodic filings with the Securities and Exchange Commission, as well as other factors, could cause actual results to differ materially from those reflected or predicted in forward-looking statements. Although management believes that the expectations reflected in the forward-looking statements are reasonable, forward-looking statements are not, and should not be relied upon as a guarantee of future performance or results, nor will they necessarily prove to be accurate indications of the times at which such performance or results will be achieved. The forward-looking statements included are made only as of the date of the statement. 3D Systems undertakes no obligation to update or review any forward-looking statements made by management or on its behalf, whether as a result of future developments, subsequent events or circumstances or otherwise.

**About 3D Systems**

More than 30 years ago, 3D Systems brought the innovation of 3D printing to the manufacturing industry. Today, as the leading Additive Manufacturing solutions partner, we bring innovation, performance, and reliability to every interaction - empowering our customers to create products and business models never before possible. Thanks to our unique offering of hardware, software, materials, and services, each application-specific solution is powered by the expertise of our application engineers who collaborate with customers to transform how they deliver their products and services. 3D Systems' solutions address a variety of advanced applications in Healthcare and Industrial markets such as Medical and Dental, Aerospace & Defense, Automotive, and Durable Goods. More information on the company is available at [www.3dsystems.com](http://www.3dsystems.com).

**About NCMS**

The National Center for Manufacturing Sciences (NCMS) is a cross-industry technology development consortium, dedicated to improving the competitiveness and strength of the U.S. industrial base. As a member-based organization, it leverages its network of industry, government, and academia partners to develop, demonstrate, and transition innovative technologies efficiently, with less risk and lower cost. The NCMS is proud to work with the Army Research Laboratory (ARL) and the Advanced Manufacturing, Materials, and Processes (AMMP) program to advance and enable additive manufacturing to create next-generation manufacturing breakthroughs. AMMP will respond to requirements for affordable, complex parts that currently cannot be readily built. For more information, visit [www.ncms.org/ammp](http://www.ncms.org/ammp).

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