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ExOne and Fraunhofer IFAM Deepen Partnership on Metal Binder, Materials Development

BREMEN, GERMANY / NORTH HUNTINGDON, PA, USA | September 1, 2021
– The ExOne Company (Nasdaq: XONE), the global leader in industrial sand and metal 3D printers using binder jetting technology, and the Fraunhofer Institute for Manufacturing Technology and Advanced Materials (“Fraunhofer IFAM”), one of the most important independent research institutions in Europe, today announced they are deepening their partnership on binder and materials development projects following the success of CleanFuse™ metal binder.

Fraunhofer IFAM’s relationship with ExOne on metal binder jetting development spans more than two decades. They have been working together since about 1998, when ExOne, then part of Extrude Hone, launched the world’s first commercial metal binder jetting system, the RTS-300. In recent years, they have jointly refined and optimized CleanFuse, an ExOne binder based on a development by Fraunhofer IFAM. The result is a clean-burning binder for optimal 3D printing of stainless steels and premium metals.

“When we started developing the first binder version on the Innovent, we soon realized we had a major breakthrough. ExOne was immediately very enthusiastic about our development, because of its exceptional green part strength and clean burnout at low curing temperature. Together with ExOne, we refined the binder, which is now CleanFuse,” says Prof. Frank Petzoldt, Deputy Director of Fraunhofer IFAM since 1999.

Following this success, Fraunhofer IFAM and ExOne have decided to intensify their cooperation and are currently working on a CleanFuse version for processing reactive materials such as aluminum and titanium.

“At ExOne, we truly believe in the power of collaboration – of bringing together a diversity of experts and knowledge – to solve complex problems in the best possible way,” said Rick Lucas, ExOne Chief Technology Officer and VP, New

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Markets. “Fraunhofer IFAM has been a leading collaboration partner for us – helping to improve our understanding of binders, different types of powders, and how they work together through the entire process chain from printing to final sintering to deliver a quality part.”

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Fraunhofer IFAM has a strong foundation in the development and processing of metallic and polymer materials as well as comprehensive knowledge of additive manufacturing technologies – especially for sinter-based processes. The institute’s location in Bremen is fully equipped for sinter-based additive manufacturing and offers all technologies for the printing, depowdering, debinding and sintering of metal parts. The researchers have special know-how around metal powders, binders and their interaction. For research and development in the field of metal binder jetting, they work with a range of ExOne printers starting with the Innovent+ for material and process development. Three printers feature ExOne’s patented Triple Advanced Compaction Technology (ACT) delivering industry-leading green part density. Recently, the institute has put the X1 25Pro production-speed metal binder jetting system into operation in order to investigate feasibility in context of pilot and pre-series production. Manufacturers interested in metal binder jetting are welcome to schedule a visit to Fraunhofer IFAM Bremen to learn more about the technology and the application possibilities in their fields.

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About Fraunhofer IFAM

The Fraunhofer IFAM is one of the most important independent research institutions in Europe for adhesive bonding technology, surfaces, shaping and functional materials. Research and development primarily address industries with special significance for future viability: aviation, automotive, energy technology, medical technology and life sciences, and maritime technologies. At our institute's five locations – Bremen, Dresden, Stade, Wolfsburg and Braunschweig – as well as at the Test Center for Maritime Technologies on Helgoland – we put our central principles into practice: scientific excellence, a focus on the application of technology, measurable utility at the highest quality for customers. www.ifam.fraunhofer.de

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About ExOne

ExOne is the pioneer and global leader in binder jet 3D printing technology. Since 1995, we've been on a mission to deliver powerful 3D printers that solve the toughest problems and enable world-changing innovations. Our 3D printing systems quickly transform powder materials — including metals, ceramics, composites, and sand — into precision parts, metalcasting molds and cores, and innovative tooling solutions. Industrial customers use our technology to save time and money, reduce waste, improve their manufacturing flexibility, and deliver designs and products that were once impossible. www.exone.com

Pictures

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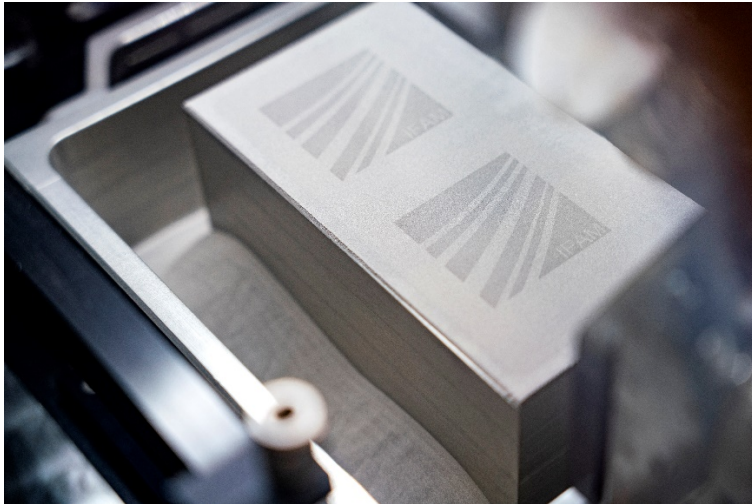
CleanFuse Binder, stainless steel metal powder and 3D printed parts before (right) and after (left) sintering. © Fraunhofer IFAM



Working with the ExOne Innovent+ at Fraunhofer IFAM. © Fraunhofer IFAM

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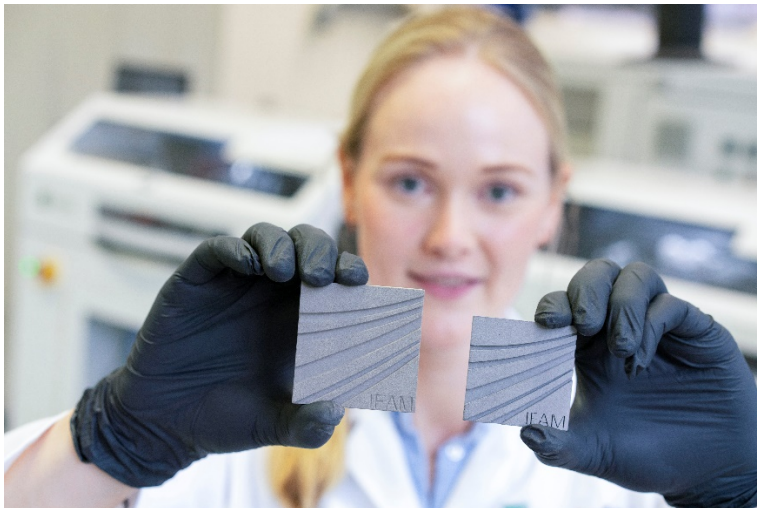
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View into the printing process with the ExOne Innovent+. © Fraunhofer IFAM



Parts produced by metal binder jetting before (left) and after (right) sintering. © Fraunhofer IFAM

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With the new X1 25Pro from ExOne, Prof. Frank Petzoldt and his team want to investigate pilot and pre-series production of components using metal binder jetting. © Fraunhofer IFAM