



ExOne Collaborates with Maxxwell Motors on Development of 3D Printed Copper Windings for Electric Drive Systems

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NORTH HUNTINGDON, Pa.--(BUSINESS WIRE)--Aug. 17, 2021-- The ExOne Company (Nasdaq: XONE), the global leader in industrial sand and metal 3D printers using binder jetting technology, is collaborating with Tennessee-based startup Maxxwell Motors on development of a unique copper e-winding design for its innovative axial flux electric motors, which can be used in electric cars as well as a range of other heavy-duty vehicles and industrial devices.

This press release features multimedia. View the full release here: <https://www.businesswire.com/news/home/20210817005232/en/>



Founded in 2018 based on a vision of improving how electric motors are designed and manufactured, without rare-earth magnets, Maxxwell holds nine U.S and global patents and has launched two products, a 10 kW air-cooled motor generator and a 150 kW liquid-cooled motor.

The company is led by the team of Chairman Gary Wells, the former CEO and current board member of Wells' Dairy, maker of Blue Bunny and other ice cream brands, and CEO Michael Paritee, a former General Motors executive that managed several advanced vehicle programs and has guided technology firms for more than a decade.

Optimized copper windings and rotors in electric motors are among the factors enabling the automotive industry's transition to hybrid and pure electric power vehicles. However, current methods of manufacturing the windings are costly, inefficient, and limit designs in a way that also limits their performance.

ExOne and Maxxwell Motors have successfully proved out a new concept for binder jet 3D printing a high-efficiency copper e-winding design that eliminates many of the challenges that come with traditional manufacturing of copper coils for electric motors. This new process eliminates the need for traditional coil wrapping, bending, tooling, and other inefficient process steps, also improving final part performance. (Graphic: Business Wire)

ExOne and Maxxwell have successfully proved out a new concept for binder jet 3D printing a high-efficiency design in copper that eliminates many of the challenges that come with traditional manufacturing. Additional development and testing are now underway.

"When we 3D print it, a lot of the challenges just go away, and we can actually improve the performance of the motor itself," Paritee said. "At Maxxwell, we're taking the most sustainable, and additive manufacturing, point of view as possible to truly improve efficiency, reduce waste and optimize performance."

Ultimately, Maxxwell's goal is to binder jet 3D print winding assemblies as a monolithic piece, eliminating the need for coil wrapping, bending, tooling, and welding of individual parts together.

When produced with binder jet 3D printing, the final part would require less manufacturing steps and energy utilization, as well as less material waste to produce – also resulting in components that are more efficient and deliver improved performance. What's more, high-speed binder jetting is relatively affordable.

"The ExOne team is proud to work with both traditional manufacturers and visionary startups working to change the world with innovative concepts such as these," said John Hartner, ExOne's CEO. "As the automotive industry enters a new era of electrification, our world-class team of engineers stands ready to help solve some of the most pressing challenges with our binder jet 3D printing technology."

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. As home to the world's leading team of binder jetting experts, ExOne also provides specialized 3D printing services, including on-demand production

of mission-critical parts, as well as engineering and design consulting. Learn more about ExOne at www.exone.com or on Twitter at @ExOneCo. We invite you to join with us to #MakeMetalGreen™.

About Maxxwell

Maxxwell is a global leader in Axial Flux motor development. Maxxwell Motors is accelerating the transformation of electric motor design & manufacturing with a portfolio of motor and generator solutions. Founded in 2018 by specialists in electro-magnetic design and manufacturing, the company is addressing the unmet challenges of making electric motors that do not need magnets or rare earth materials to operate. Learn more about Maxxwell at www.maxxaf.com

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Sarah Webster
Chief Marketing Officer
724-516-2336
sarah.webster@exone.com

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