Nuclear Researchers to Use Freemelt EBM Metal 3D Printer for Materials

3DPRINT.COM article 23.09.05. Freemelt, known for its open architecture electron beam 3D printers has recently secured an order for its Freemelt ONE system from the Institute for Nuclear Research (ATOMKI) in Hungary. This new collaboration represents a milestone for 3D printing technology, particularly in the high-stakes field of nuclear material science.

The market for electron beam powder bed fusion (E-PBF) systems is a small but growing one. Previously dominated by GE's Arcam line, the E-PBF sector now includes players backed by established companies including: JEOL, Wayland Additive, and pro-beam. Freemelt differentiates itself by not only operating in the space longer than these new entrants, but also with its open architecture approach. With capabilities like a 6 Kw electron beam gun and bed temperatures up to 1200C, Freemelt systems are ideal for research institutes working on new materials and advanced 3D printing methods.

"The open architecture and free parametrization of the properties of the beam makes Freemelt ONE an ideal tool for research purposes," said Professor, Dr. Kalman Vad of Atomki.

When it comes to energy applications, Freemelt ONE is specifically optimized for materials that can withstand the extreme conditions found in nuclear reactors. For instance, one of the core materials Freemelt focuses on is tungsten, known for its incredible heat resistance and suitability for radiation shielding. This makes Freemelt ONE a match made in heaven for applications in fusion and fission reactors. Additionally, the printer's unique periscope function allows for real-time monitoring of components as they are being created. This feature, exclusive to Freemelt technology, could provide invaluable insights during the development process.

As one of Hungary's leading facilities in atomic and nuclear physics, ATOMKI plans to use the Freemelt ONE in a range of applications including surface science and surface topology. This involves the creation of new surface structures and composite materials through a method known as non-adiabatic alloying.

"We are happy that the collaboration with MTA Atomki now has resulted in an order of our Freemelt ONE machine. We see an increased activity and interest from the energy sector, and this order is an important step and confirmation of the value that Freemelt and Additive Manufacturing technology can bring to the energy transformation," Freemelt CEO Daniel Gidlund said. "An important part of our offering is that our customers can develop, evaluate and test material processes in our research machine Freemelt ONE and when ready, transfer them seamlessly into high-volume production through our industrial machine eMELT. We see this new order as an important a milestone on our journey to be a market leading supplier of metal 3D-printing solutions."

The Rise of 3D Printing in Nuclear Power
As the world grapples with the challenges of reducing carbon emissions and the rising price of fossil fuels, the resurgence of nuclear power has become a topic of keen interest. The limitations of renewable energy sources like wind and solar have brought attention to the stability that nuclear power can offer in an energy-efficient system.

The nuclear power industry, often seen through the lens of risk and high costs, is increasingly benefiting from advancements in 3D printing technology. Various organizations, from universities to private companies, are leveraging 3D printing to make nuclear energy more efficient and cost-effective.

For example, the University of Pittsburgh and companies like GE and Hitachi are working on projects specifically aimed at reducing the costs of additive manufacturing for nuclear energy. Siemens has successfully installed 3D printed parts in operational nuclear plants, illustrating the technology's utility in maintenance and replacement. Idaho National Lab and Argonne National Lab are exploring 3D printing for safety testing and fuel recycling, respectively. In China, researchers are also using 3D printing to develop components for fusion reactors.

These efforts indicate that 3D printing can optimize fluid transfer, reduce mass, and even mitigate human error in the assembly process. 3D printing is thus positioned to have a transformative impact on an industry that is both technologically complex and critical to global energy infrastructure. Freemelt's technology is stepping into this significant transition, offering solutions that could be pivotal in reshaping the industry.

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About Us

Freemelt is a high-tech company whose ground-breaking solution creates new opportunities for rapid growth in 3D printing, also known as additive manufacturing. The company's protected technology enables cost-effective printing to a consistent and high quality. By choosing an open-source solution, the conditions are created for strong growth and expansion towards manufacturing markets. Freemelt was founded in 2017, is listed on Nasdaq First North Growth Markets, has 38 employees, head office in Gothenburg and a manufacturing unit in Linköping. Read more at **www.freemelt.com.**

Image Attachments

FreemeltONE Full Product NO SHADOW
MTA Atomki Intro Picture

Attachments

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