

# Freemelt receives order from UKAEA for proof-of-concept of production scalability of tungsten tiles for future fusion energy power plants

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**Freemelt has received an order from UKAEA (United Kingdom Atomic Energy Authority) to conduct production scalability tests of 3D printed tungsten tiles for fusion energy power plants, strengthening Freemelt's position in the energy sector. The order value is approximately SEK 0.7 million with expected delivery during the first quarter of 2025.**

This project is a continuation of previous feasibility studies that Freemelt has performed in collaboration with UKAEA. The proof-of-concept project target to demonstrate volume production using Freemelt's E-PBF (Electron Beam Powder Bed Fusion) technology and industrial machine, eMELT.

Freemelt and UKAEA have been collaborating since April 2023 and has previously carried out two feasibility studies, the first focused on process development, and the second focused on application testing. In this new project Freemelt will demonstrate production scalability of tungsten tiles, a critical step in validating the potential for future volume production. As part of this study the repeatability of the E-PBF process will be evaluated to support component qualification programmes for potential use in next generation fusion energy power plants. Fusion energy has great potential as energy source, and during the coming years, large experimental tokamaks\* and fusion power plants will require significant volumes of advanced components.

"The fact that we now advance the collaboration to volume production tests of tungsten tiles is an important confirmation that our E-PBF technology meets the demanding requirements in fusion energy. Tungsten is one of the most challenging materials to process, and our technology enables the production of complex components with high quality. This is an opportunity to further strengthen our position in the energy sector," says Daniel Gidlund, CEO of Freemelt.

Fusion has the potential to revolutionize the energy sector. Unlike today's nuclear power, which relies on fission (nuclear splitting), fusion does not produce long-lived radioactive waste. However, for the process to succeed, extremely high temperatures and advanced materials that can withstand the harsh conditions of the fusion environment are essential.

Recent advancements in fusion, both internationally and through Swedish companies like Novatron, have increased the interest in the technology. Total investment in the energy sector is expected to rise from USD 300 billion in 2024 to USD 500 billion by 2030, corresponding to an annual growth rate of 7.4%. In the fusion sector, investments reached USD 7.1 billion in 2024, driven by large-scale research projects and increased private investments from companies such as Commonwealth Fusion.

Test fusion machines like experimental tokamaks are essential for validating fusion technology before scaling to commercial electricity production. They require millions of tungsten components.

ITER, the world's largest experimental tokamak, is predicted to need between 1 and 1.5 million tungsten tiles, while smaller power plants under development by Tokamak Energy will require about 10 percent of ITER's volume.

UKAEA is the UK's national organisation responsible for fusion energy development and commercialisation, driving several advanced research projects to commercialise fusion as a safe, sustainable, and emissions-free energy source. Through collaborations with industry and academia, UKAEA is driving the development of new materials and manufacturing methods required for future fusion power plants.

\*The tokamak is an experimental fusion reactor designed to harness the energy of fusion

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## About Us

Freemelt develops advanced 3D printers for metal components and aims to become the leading supplier in additive manufacturing (AM) using E-PBF technology, targeting SEK 1 billion in revenue by 2030. The solutions primarily support companies in the defense, energy, and medical technology sectors in Europe and the USA, enabling them to drive innovation and improve production efficiency. Founded in 2017, Freemelt has expanded its product portfolio to include three printer models, with two designed for industrial production and one (Freemelt ONE) targeting research institutes and universities. The modular industrial printers (eMELT) leverage E-PBF technology, delivering significantly higher efficiency compared to other machines on the market while maintaining flexibility in metal selection.

Freemelt generates revenue primarily through the sale of advanced 3D printers at fixed prices, complemented by support and maintenance services, which are expected to account for 25% of total revenue by 2030.

The company is now focused on further industrializing its product and service portfolio and driving commercialization in the European and North American markets. Read more at [www.freemelt.com](http://www.freemelt.com)

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## Attachments

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