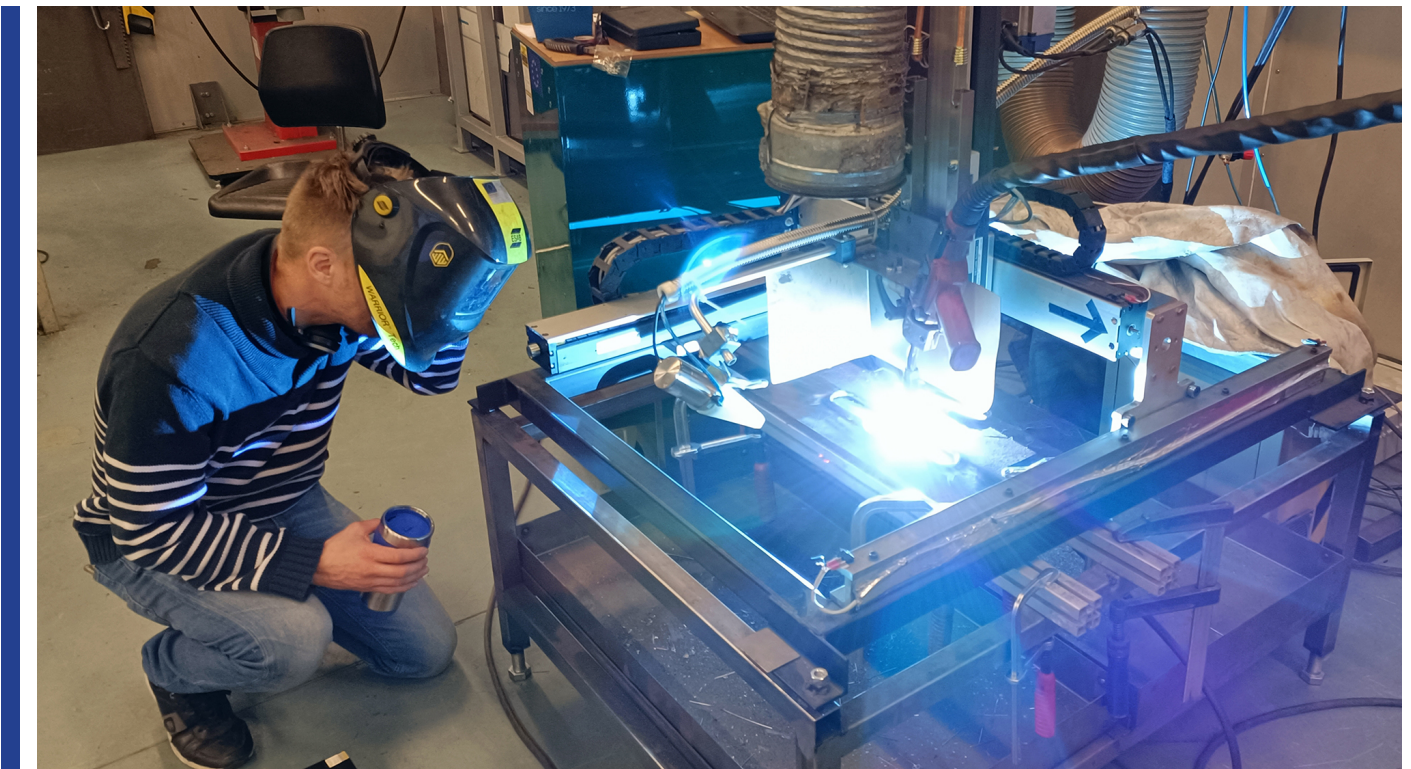


EU funding of 2 million for a Nordic project for the development and implementation of direct metal deposition methods in companies - Universities of Oulu and Lappeenranta involved with a budget of 1.1 million

The new joint Nordic research consortium's Implementation of DeD AM in future manufacturing (IDiD) project aims to promote the introduction of metal direct deposition methods in companies. Direct metal deposition is a 3D printing method that opens up new possibilities for the production of large and demanding pieces. The project received a total of 2 million Interreg Aurora funding, of which the Finnish research groups' share is approximately 1.1 million euros. The main implementer of the project is the University of Oulu's Future Manufacturing Technologies (FMT) research group, and the other implementers are the University of Lappeenranta, Luleå University of Technology (LTU) and UiT - the Arctic University of Norway.



3D printing of metals by direct layering is possible with modern robotic welding cells and CNC mechanized solutions that are used in industry. The goal of the project is to promote the renewal of the engineering industry in the region by utilizing already existing equipment for the direct deposition of metals.

"Direct deposition methods have finally developed into industrially mature production methods. The starting point of the project is the industry's need to get more informa-

tion about the possibilities and utilization of direct deposition methods. The project produces information on the management of the direct layering process and the properties of the direct layered structures that make direct layering possible. In addition to the best domestic expertise, we have good international partners in the project and the support of international equipment manufacturers", says research director Antti Järvenpää from the FMT research group of the University of Oulu's Kerttu Saalasti Institute.

As a manufacturing technique, metal 3D printing is rapidly becoming more common, and its main techniques are the powder bed method (PBF) and the direct deposition method (DED). Often, the acquisition costs of PBF equipment are still too high, but it is possible to do the direct deposition method with existing production equipment in industry. The direct deposition method is also a more usable method for manufacturing medium and large parts.

"The spread of direct deposition printing is important for the sustainable development of the metal industry: it also accelerates the digital manufacturing revolution. The introduction of metal printing methods in companies is also one of the keys to maintaining security of supply during crisis situations, such as war or a pandemic, when global supply chains do not operate normally," says Järvenpää.

"The activities of the Future Manufacturing Technologies (FMT) research group of the University of Oulu's Kerttu Saalasti Institute, which started in 2004, focus on refining and transferring the good properties of metallic materials into superior products using cost-effective manufacturing methods. 3D printing of metals is currently one of the group's main research areas. 3D printing research focuses on quality optimization. Here, fatigue resistance and the effect of print parameters and post-treatments on fatigue resistance is one of the most significant research areas," says Kari Mäntyjärvi, development manager of the FMT research group.

The modern research infrastructure of metal additive manufacturing/3D printing in northern Ostrobothnia is mainly focused on Nivala's ELME Studio and is supported by the up-to-date steel research center CASR research laboratory on the University of Oulu's Linnanmaa campus.

"Research cooperation is carried out in the network in close cooperation with companies. Nordic research partners are involved in the consortium of the IDiD project, and the operation is supported by a significant number of international partner companies," says Mäntyjärvi.

The IDiD project will be implemented between January 1, 2023 and December 31, 2025. In addition to the Interreg Aurora funding program, the project is being financed by the Federation of Lapland, the city of Nivala, Nivalan Teollisuuskylä Oy and two Finnish companies.

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