

Oerlikon Introduces New High Entropy Alloy to Replace Super Duplex Stainless Steels

November 18, 2021 – Frankfurt/Main – Oerlikon AM presents a new alloy to customers who are interested in being at the forefront in adopting an innovative new material to additively produce structural components, such as centrifugal pump impellers. The additive material is designed to match the strength and corrosion resistance of super duplex stainless steels (DSS). It is a high-entropy alloy with a nanoscale duplex microstructure.

Leveraging an inherent benefit of additive manufacturing, customers can create complex geometries using this new alloy that super duplex steel cannot address with conventional manufacturing. Smoother surfaces for the same structural application can also be realized in the printing process. Additionally, parts printed with the new alloy are crack-free when using a standard Powder Bed Fusion – Laser Beam process without baseplate preheating.

Components made from duplex stainless steel have challenging metallurgy and require complex post processing like heat treatment to avoid the formation of unwanted or detrimental phases in the microstructure. They are also sensitive to embrittlement at elevated temperatures.

The new alloy is the solution to replace DSS as it not only matches the corrosion resistance standards of DSS and provides superior strength properties, but is also less susceptible to changes caused by high temperature operation and requires only a single-step heat treatment.

Oerlikon developed this alloy as part of the NADEA project – a European research initiative on high-entropy alloys and in partnership with several industrial and academic partners. Using its proprietary Scoperta Rapid Alloy Development tool, Oerlikon was able to significantly shorten the process in developing the alloy.

Interested parties can visit Oerlikon at booth E101, Hall 12.1 at formnext to see the material and a 3D-printed impeller or contact Oerlikon AM (am@oerlikon.com) directly for more information.

About Oerlikon AM

Oerlikon AM is a leading provider of additive manufacturing solutions with metals and polymers. The extensive portfolio of solutions offered by Oerlikon AM ranges from the co-development and contract manufacturing of high-quality and performance-optimized components, through research and development, to the production of the company's own metal powders for 3D printing. Moreover, materials, process and applications engineering, certified manufacturing processes, post-processing of components and quality management enable Oerlikon AM to provide its global circle of customers from different industries with optimally customized comprehensive solutions.

Oerlikon AM supplies the aerospace, energy, automotive and tooling sectors, as well as various other high-tech industries. Together with Oerlikon Balzers and Oerlikon Metco, Oerlikon AM forms the Surface Solutions Division of the Swiss-headquartered Oerlikon Group. The Division provides unique



and integrated solutions from material selection, through to manufacturing, post-processing, and coating of functional components.

As part of the Oerlikon Group, Oerlikon AM now employs more than 200 people at its four sites throughout Europe, the United States and China.

More information available at: <https://www.oerlikon.com/am>

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