

EOS Expands its Metal Material Portfolio for Industrial 3D Printing

- **NEW** Nickel-Based Superalloy Material: IN738 – for high-strength, high-stress energy and turbomachinery applications
- **NEW** Nickel-Based Superalloy: K500 – cost effective, corrosion resistant for chemical, maritime, and space industries

Turku, Finland, November 12, 2024 – EOS, a leading supplier of responsible manufacturing solutions for industrial 3D printing, today announced the addition of two (2) new metal additive manufacturing (AM) materials: **EOS NickelAlloy IN738** and **EOS NickelAlloy K500**, both delivering excellent performance, part properties, and value to a variety of industries that leverage EOS Laser Powder Bed Fusion (LDPF) 3D printing technology.

EOS IN738: For high-performance energy and turbomachinery systems operating under extreme stress

EOS IN738 is a Nickel-based material, that combines high-strength and heat resistance, with a tensile strength of 1,265 MPa and 4.5% elongation. Compared to traditionally manufactured superalloys, EOS IN738 withstands higher-temperature environments and shows significantly less deterioration in high-stress applications such as turbine blades and other energy components. Additively manufactured parts produced with EOS IN738 also take advantage of one of the inherent benefits of industrial 3D printing: design optimization – providing additional cooling and increasing the component’s overall lifespan.

Comparison of IN738 with IN939 and Haynes® 282®

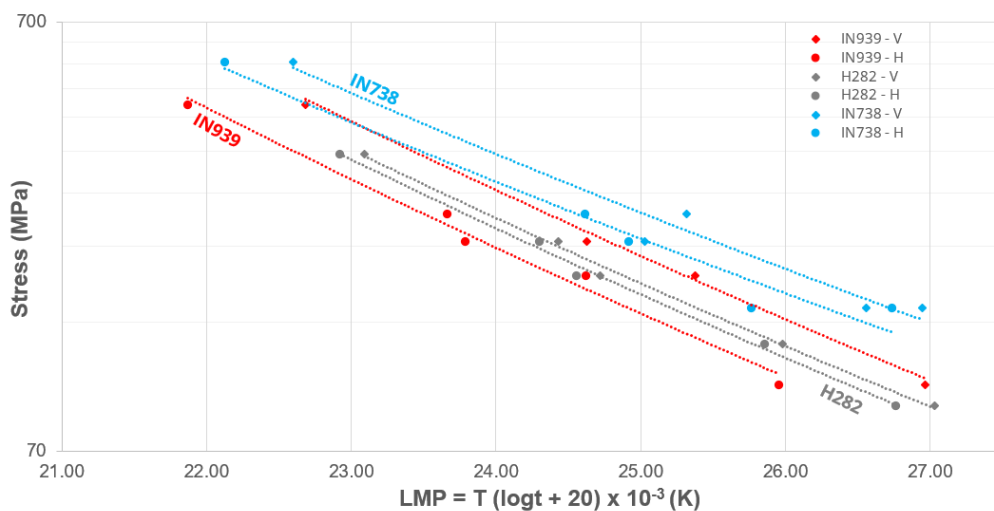


Image 1: EOS IN738 MPa in comparison to IN939 and Haynes 282

Winnipeg-based [Precision ADM](#) provided an early test case for EOS IN738, producing turbine blades for a Canadian energy customer experiencing the strain of supply chain

and spare part inventory shortages. This project was both a test for EOS IN738 as well as perhaps the first known use-test of AM in a rotating turbomachinery part.

“Because of EOS technology and EOS IN738 material, we successfully produced a turbine engine blade that achieved 110% of standard running RPM, and withstood up to 1,700 degrees Fahrenheit produced by an active turbine,” said Precision ADM’s Director of Medical and Industrial Sales and Business Development, Derek VanDenDreissche, B, SC. “These tests not only showcased the first-ever successful 3D printed turbine engine blade, but that EOS IN738 can withstand the high levels of heat and stress that turbomachinery applications require. Simply put, EOS IN738 was critical to the success of this project.”

EOS K500: Cost-effective, strong and corrosion-resistant

EOS K500 was developed at the request of a major space launch organization and provides a complete solution for manufacturers seeking a balanced combination of strength and moderate thermal conductivity, bridging the performance of nickel-alloys and copper-alloys. This material is ideal for space applications like thrusters and nozzles, as well as chemical processors making pumps and valves, and maritime applications.

“EOS K500 fills an important gap between two worlds of AM materials, the high mechanical strength of nickel-superalloys and the thermal conductivity of copper alloys,” said Business Development Manager of EOS Metal Materials, Juha Kotila, M. Sc. “The EOS material development team successfully created EOS K500 as a solution for space applications where both mechanical strength and thermal conductivity are needed at the same time, or in extreme conditions.”

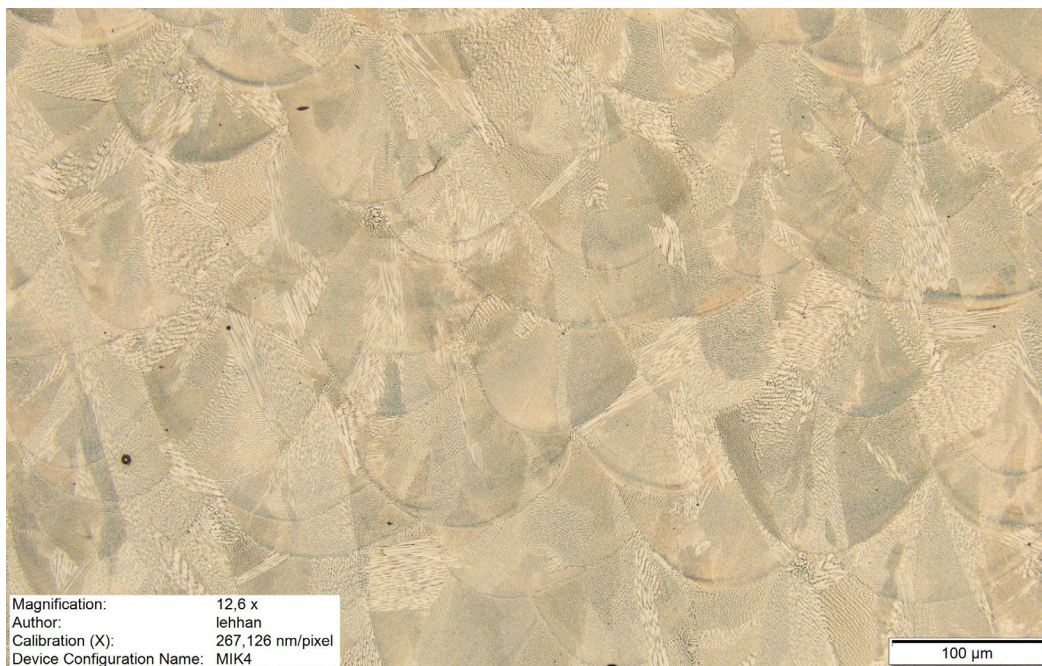


Image 2: Etched EOS K500 as manufactured microstructure etched ASTM E407 recipe 40



"EOS continues to lead in providing advanced material solutions for industries using additively manufactured parts in challenging conditions," said Hanna Pirkkalainen, Head of Product Management. "EOS IN738 offers a crack-free solution for high-stress, high-temperature applications, while EOS K500's combination of strength, corrosion resistance, and thermal conductivity enables its applications to perform exceptionally well in extreme temperatures. With these additions to our metal materials portfolio, we can broaden our application range and expand the reach of industrial 3D printing."

EOS IN738 and EOS K500 will be commercially available for all EOS M 290 family platforms in December 2024, the [EOS M 400-4](#) in the first half 2025.

About EOS

[EOS](#) provides responsible manufacturing solutions via industrial 3D printing technologies to organizations around the world. Since 1989, EOS has shaped the future of manufacturing by enabling its customers to innovate and differentiate through expert guidance, technology and services, leveraging its end-to-end additive manufacturing (AM) industry partnerships. From strategy to education to production, EOS is the leading global partner for both metal and polymer AM solutions, accelerating time-to-market for its customers through high-quality production efficiencies and sustainable solutions.

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