



Press Release

First Time Right Metal Additive Manufacturing with Breakthrough Smart Fusion Technology

New EOS software monitoring package includes first-of-its-kind, real-time intelligent heat management which reduces and eliminates support structures, performs 2x-5x faster than other technologies

Krailling, Germany, April 12, 2023 – Committed to the advancement and adoption of metal additive manufacturing (AM), EOS has launched its **Smart Fusion** software technology for laser powder bed fusion (LPBF) metal 3D printing that automatically adjusts laser power in real-time. The technology eliminates the need for most support structures, minimizes material use, reduces post- processing requirements, and lowers the cost-per-part (CPP) for metal AM applications.

Smart Fusion intuitively detects potential build problems, auto-adjusts the laser power, and eliminates wasted time and resources typically associated with “trial and error” additive manufacturing. Unlike current technologies, Smart Fusion’s real-time capabilities are achieved without adding significant build-time.

Customer Beta testing of the Smart Fusion solution has consistently resulted in performance that is two to five times **(2x-5x) faster** than the leading competitors in the metal AM market. Lower CPP is a primary business driver for the adoption of Smart Fusion. Removing the need for support structures in metal AM makes for a more attractive business case. EOS partnered with several organizations during Smart Fusion’s testing phase where its speed and performance were validated.

“When we learned about Smart Fusion and started to test it several month ago, we knew it would be a game changer,” said Stefan Seidel, Chief Technical Officer at [Pankl Racing Systems](#), manufacturers of auto racing, aerospace, and other high-performance applications. “Not only does it significantly reduce the part cost, but it is also a facilitator in the use of optical tomography which, in our view, is a key element to introduce AM for serial production. Over the past few months, we have developed several products with EOS which really show the potential of Smart Fusion. ”

How it Works

Smart Fusion measures the amount of laser power (energy) which is absorbed by the powder bed. A special high-resolution camera overlooking the build chamber monitors each layer’s melt pool emissions via proprietary technology and data is fed back to the laser



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where it is adjusted. This results in homogeneous energy distribution across the whole build platform thereby reducing stress in the parts and avoiding metal overheating and movement in undesired directions.

At its core, Smart Fusion pairs with EOS' [existing monitoring solutions](#) and employs advanced algorithms to monitor the build layer-by-layer providing for more homogeneous, consistent parts. From a dataflow perspective, EOSPRINT prepares the data which is sent to the 3D printer, Smart Fusion then works with EOSTATE and its Optical Tomography (OT) camera to monitor, measure, and adjust the lasers via EOSYSTEM.

“Smart Fusion is another important breakthrough for metal AM, especially for those organizations with highly engineered applications, such as energy, space tech, mobility, and aerospace,” said Mirco Schöpf, EOS product line manager, software. “Other solutions in the market have significant drawbacks such as slower build times, and a need for an expert to make sure it works. Smart Fusion offers an industrialized solution that is faster, flexible, and more accessible.”

Another organization that piloted Smart Fusion engineers and manufactures hardware for the space industry. They compared Smart Fusion head-to-head with a leading competitive technology and the comparative builds proved Smart Fusion to be more than twice as fast and delivered better part qualities.

Smart Fusion lists for €27,000/\$29,262 (EOS M 290) and €38,000/\$41,184 (EOS M 300-4, and EOS M 400-4), requires the Smart Monitoring System package, and is available now for on the following EOS system and materials:

	EOS M 290	EOS M 300-4	EOS M 400-4
Material	Inconel IN718 HiPro 40/80µm	Inconel IN718 HiPro 80µm	Inconel IN718 HiPro 40/80µm
	Titanium Ti64 60µm	Ti64 60µm (late 2023)	Titanium Ti64 60µm
	Aluminum AlSi10Mg 60µm (late 2023)	Aluminum AlSi10Mg 60µm (late 2023)	Aluminum AlSi10Mg 40/80µm

EOS intends to soon expand Smart Fusion availability, including AMCM systems.

“The beauty of Smart Fusion is that it is incredibly flexible, easy-to-use, and will work with the majority of customer applications out-of-the-box,” added Schöpf. “We challenged our



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team to mitigate one of metal AM's significant challenges with a unique software solution and we could not be prouder of the results. ”

Smart Fusion will be featured May 2-4, 2023, at the EOS booth #4612 at RAPID+TCT 2023, in Chicago.

About EOS

EOS provides responsible manufacturing solutions via industrial 3D printing technology to manufacturers around the world. Connecting high quality production efficiency with its pioneering innovation and sustainable practices, the independent company formed in 1989 will shape the future of manufacturing. Powered by its platform-driven digital value network of machines and a holistic portfolio of services, materials and processes, EOS is deeply committed to fulfilling its customers' needs and acting responsibly for our planet.

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