

PRESS RELEASE

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Fraunhofer ADDITIV at formnext 2025, Hall 11.0, Booth D31

From Material to Surface – A holistic approach to Additive Manufacturing

With a broad range of exhibits and research highlights, the Fraunhofer Competence Field Additive Manufacturing will present itself at this year's formnext, taking place November 18-21, 2025, in Frankfurt (Germany). Together with the Fraunhofer Group for Production, it will demonstrate how Additive Manufacturing (AM) sets new standards in industrial applications through innovative materials, efficient processes, and intelligent post-processing solutions.

This year, the **Fraunhofer Competence Field Additive Manufacturing** ("Fraunhofer ADDITIV") is showcasing its research results arranged by material groups: polymers, biomaterials, metals, and ceramics & multi-materials. In addition, innovations that precede and succeed the actual AM process are on display – including 3D-printing-specific software solutions and tailored post-processing technologies.

The main exhibit this year, titled *"Turtle"*, presented by the **Fraunhofer Group for Production**, exemplifies this approach: the turtle's body, produced entirely using various 3D printing technologies, demonstrates how diverse surface finishing and refinement processes developed by Fraunhofer can effectively and precisely generate desired surface properties on additively manufactured components. Each segment of the turtle's shell represents a specific post-processing method - from plasma and laser treatment to micropatterning and functional coatings. The exhibit thus symbolizes the effective industrialization of additive manufacturing toward series production readiness: *the final layer makes the difference*.

Sustainability remains a central topic in 2025. In the field of biological materials research, Fraunhofer demonstrates the potential of renewable resources for additive manufacturing. **Fraunhofer IGB** presents bio-based materials derived

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from fungal mycelium, serving as biodegradable functional materials for packaging, construction, and filtration technology. IGB also showcases biotechnological processes for producing cultivated meat that combine 3D printing and cell-based methods – a sustainable alternative to conventional meat production and a new field of application for additive manufacturing. These developments illustrate how biomaterials contribute to sustainable production, enable new functionalities, and extend far beyond industrial production.

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In metal-based materials, resource efficiency and circular economy take center stage. **Fraunhofer IGC** presents a cold-spray-based repair solution for maintenance of maritime infrastructures, a sustainable technology that significantly extends the lifespan of steel structures and reduces material consumption. Complementing this, **Fraunhofer ILT** develops additively manufactured tungsten components for fusion reactors – an example of AM's effective contribution to energy transformation. Meanwhile, **Fraunhofer IWU** showcases new surface optimization strategies for additively manufactured parts, using dedicated surface patterning and post-processing to produce hygienic, easy-to-clean 3D-printed components that meet the stringent requirements of the food and pharmaceutical industries.

Additive manufacturing's role in personalized healthcare is demonstrated by **Fraunhofer IMTE**, which develops patient-specific surgical tools and implants, enabling a fully digitalized process from diagnosis to rehabilitation. In addition, Fraunhofer researchers are working on ceramic and multi-material solutions that replicate natural tissue and surface structures. Complementing this, **Fraunhofer IAP** presents bio-based hydrogel resins for medical technology, derived from renewable raw materials and adaptable to individual applications. **Fraunhofer IGD** introduces an AI-based process for multi-material 3D printing of lifelike dental prostheses, achieving realistic color reproduction and an anatomically accurate layering of dentin and enamel.

For polymer-based processes, Fraunhofer's innovations at formnext 2025 focus on material efficiency and process stability. **Fraunhofer IPA** demonstrates how optimized polycarbonate powders and energy-efficient polymer laser sintering processes (PBF-LB/P) can enhance both the economic efficiency and sustainability of polymer-based 3D printing.

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Digital tools and intelligent software solutions connect all material domains. Simulation-based design workflows, AI-driven geometry optimization, and data-driven quality assurance integrate additive processes across all stages – from design and process control to finishing. This creates a holistic picture of additive production, where software, materials, and processes work together seamlessly. Visitors can explore this firsthand at the interactive software exhibition area, led by **Fraunhofer IGD**.

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An overview and orientation to the Fraunhofer joint booth can be found in the formnext 2025 special edition of Fraunhofer ADDITIV NEWS, including contributions from additional Fraunhofer ADDITIV member institutes – **EMI, IFAM, ILT**, and **IWS** – focusing on metal additive manufacturing. *“Our Fraunhofer researchers look forward to engaging with visitors to bring 3D printing innovations into industrial application, especially in economically challenging times. formnext is the ideal platform for this.”* says Dr.-Ing. Bernhard Mueller, spokesperson for the Fraunhofer Competence Field Additive Manufacturing.

At **formnext**, from November 18 through 21, 2025, more than 800 exhibitors and 30,000 visitors will gather in Frankfurt (Germany), transforming the city into the capital of additive manufacturing. The event focuses on the rapidly growing industrial use of AM, covering the entire process chain: in addition to additive production systems, visitors will find materials, automation solutions, software for design, planning, and production, as well as post-processing and quality control technologies.

More information: <https://formnext.mesago.com/events/en.html>

With 20 Fraunhofer institutes across Germany, the **Fraunhofer Competence Field Additive Manufacturing** (“Fraunhofer ADDITIV”) is Europe’s largest AM research network. It covers the entire additive process chain – from material development and efficient production processes to quality assurance and simulation tool advancement. With a focus on productivity, quality, and sustainability, Fraunhofer ADDITIV supports industry in implementing innovative solutions through robust processes and standards, automation, user-friendly methods, and comprehensive material and multi-material research. Trade fairs and conferences such as DDMC, formnext, and rapid.tech 3D provide platforms for presenting the latest research findings and for networking with

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industry and research partners.

More information: <https://www.additiv.fraunhofer.de/en.html>

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Fig. 1 Cover image of Fraunhofer ADDITIV News 1.25 – the special edition for formnext 2025, also serving as a guide and orientation aid for visitors to the Fraunhofer joint booth <https://www.additiv.fraunhofer.de/en/press---media.html>

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