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Schweißen & Schneiden 2025
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15.–19.09.2025
Hall 6, booth 6D26

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EDcut Combines Process Expertise with System Technology

Fraunhofer IWS Offers Scalable Platform for New Laser Applications

(Dresden, 09/09/2025) EDcut serves as a development platform for laser-based cutting processes with high dynamics. Researchers at Fraunhofer IWS combine precise system technology with long-standing process expertise to open new industrial applications and to create technology-based solutions together with partners, from feasibility studies to system integration. The institute in Dresden will present the platform at the "Schweißen und Schneiden" trade fair in Essen from September 15 to 19, 2025.

Fraunhofer IWS has built EDcut as a ready-to-use system for research and development. The platform utilizes a solid-state laser with beam deflection via a galvanometer scanner, focusing optics, and a dynamically movable gas nozzle for fusion cutting. This makes the system especially suitable for metals and composites with small material thicknesses.

The currently realized working area measures 50 millimeters in length and width. For larger components, the system can be coupled with additional motion axes. Integration into roll-to-roll systems is also foreseen. EDcut thus opens new design possibilities for automated cutting with high feed rates and changing geometries.

Industrial Applications in Focus

EDcut targets companies that want to implement flexibly configurable cutting processes in production or expand existing systems. Applications range from notching technical foils to cutting delicate structures in metal strips to processing bipolar plates for hydrogen systems. "In variant production with frequent geometry changes or novel materials, laser cutting holds a technological edge," said Dr. Jan Hauptmann, head of the Ablation and Separation department at Fraunhofer IWS. "Our platform aims to make this advantage accessible for industrial partners."

Possible cooperation models include process studies, prototype manufacturing, and integration of system technology into existing production lines. "EDcut allows us to develop new cutting processes quickly and close to practice," emphasized Dr. Hauptmann. "This lowers barriers in early technology development and accelerates

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implementation for customers." The open architecture also enables combinations with market-available components, for example, for path guidance or control.

Combination of Process and System Competence

A key added value lies in the close interlinking of technology and system development. Alongside application technology, Fraunhofer IWS contributes expertise in optical design, beam guidance, and control. Specific components, particularly optical assemblies, are developed in-house and tailored to the requirements of highly dynamic laser cutting.

"We combine in this system our entire experience in cutting process development with the competence to design customized system solutions," said Dr. Hauptmann. "That makes us a development partner, not a supplier of a finished product." At the same time, the platform serves as a testbed for future applications. In addition to thin-sheet processing, the ongoing development of laser cutting focuses on new approaches to dynamic beam shaping. Initial material samples indicate that suitable modulation can significantly improve cut quality and speed in thick-sheet cutting.

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Technical Data EDcut

Working area:	50 × 50 mm
Speed:	≤ 1 m/s
Acceleration:	≤ 5 m/s²
Laser power:	≤ 2 kW

Materials and Lasers – Competence with a System: **The Fraunhofer Institute for Material and Beam Technology IWS** develops complex system solutions in materials and laser technology. We define ourselves as idea drivers developing customized solutions based on laser applications, functionalized surfaces as well as material and process innovations – from easy-to-integrate custom solutions to cost-efficient solutions for small and medium-sized enterprises to industry-ready one-stop solutions. Our research focuses on aerospace, energy and environmental technology, automotive, medical and mechanical engineering, toolmaking, electrical engineering and microelectronics, and photonics and optics sectors. In our five future and innovation fields of battery technology, hydrogen technology, surface functionalization, photonic production systems and additive manufacturing, we are already creating the basis today for the technological answers of tomorrow.

Researchers at Fraunhofer IWS have developed the EDcut system, which utilizes a solid-state laser, scanner optics, and a gas nozzle to precisely cut metals and composites with small material thicknesses.
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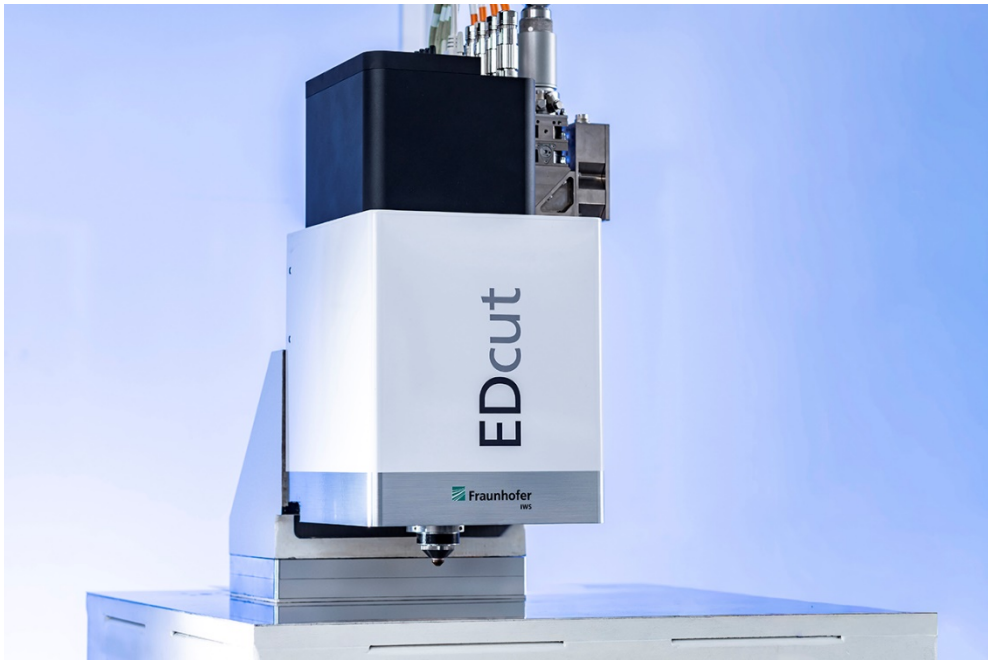

EDcut enables flexibly configurable laser cutting processes from technical foils to delicate structures in metal strips and bipolar plates for hydrogen systems.
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