

PRESS RELEASE

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Premiere at the Fraunhofer IWU | B2B Production Forum on Nov. 16 - 17 in Chemnitz

Leading the Way in Industrial-Scale Hollow Embossing: Fraunhofer IWU Presents flexROLLmax for Larger Components and Material Thicknesses

Hollow embossing is an efficient, resource-saving forming process that offers clear advantages over conventional methods, especially when producing complex hollow structures. At EuroBLECH 2024, Fraunhofer IWU introduced the BPPflexROLL—a highly efficient system for manufacturing bipolar plates (BPP) for fuel cells or heat exchanger plates. Now, the new flexROLLmax expands the production spectrum to include large-format components such as electrolyzer plates. As the “big sister” of the BPPflexROLL, it opens up new segments of the sheet metal sector for embossing components. It handles sheet thicknesses up to 0.5 mm and component sizes up to 1.2 meters in edge length with ease.

The flexROLLmax complements the existing machine portfolio of the Fraunhofer IWU, which already boasts unique expertise in processes and machinery for embossing reliefs on metallic surfaces. In collaboration with interested partners, the Chemnitz-based research institute aims to extend hollow embossing to entirely new product categories. Structural and functional components for household and building technology, as well as the electrical industry, are just a few examples of potential applications.

Key Advantages of Hollow Embossing:

High Production Rates and Cost Efficiency

Unlike discontinuous processes such as classical hollow embossing or high-pressure sheet metal forming, where one press stroke produces a part, followed by a pause, hollow embossing is a continuous process using a pair of rollers. This characteristic enables a significant increase in output and creates economies of scale. Ultimately, this results in much lower production costs per part, supporting the market viability of industrial products.

Reduced Process Forces and Compact Machine Design

Thanks to its incremental nature (forming in small, successive steps), hollow embossing dramatically reduces process forces by a factor of approximately 10 compared to conventional methods. Lower forces mean smaller, lighter, and more cost-effective machine components. In turn, more compact machine components mean reduced investment costs, space requirements, and energy consumption.

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Flexibility and Adaptability

Both the BPPflexROLL and the flexROLLmax are modular and flexible in design, making them easy to relocate and reconfigure; the number of roller sets required depends on the specific geometry of the component. These characteristics increase production flexibility, as different geometries will be producible on the same machine with minimal changeover.

Potential for Process Monitoring and Quality Control

Fraunhofer IWU is working to evolve hollow embossing into a “cognitive forming process.” By integrating sensors and intelligent algorithms, it is possible to monitor and ensure part quality during the forming process, thereby minimizing scrap.

flexROLLmax Premieres at the Fraunhofer IWU | B2B Production Forum

Fraunhofer IWU and fourteen partners will host the B2B Production Forum in Chemnitz on September 16 - 17, 2025, bringing together researchers and industry professionals. The flexROLLmax will be a featured highlight in the section “Profile Processing in Sheet and Solid Forming.” Other key topics in keynote talks, workshops, and live demonstrations include:

- **Finishing and Grinding:** Development trends and new processes
- **Digitalization in Manufacturing:** Seamless process integration, cloud services, and industrial service solutions, including process monitoring in metal-cutting machines and “Hands-On Shopfloor Digitalization”
- **Hydrogen System Production:** Latest manufacturing technologies, system design, and applications
- **Precision Toolmaking and Functional Surfaces:** Subtractive processes for toolmaking and the design of functional surfaces
- **CNC Robotics:** Easy integration of robots into manufacturing processes
- **Automated Assembly and Disassembly:** Efficient design of assembly and disassembly workflows
- **3D Printing:** Speed and precision in industrial plastic and metal additive manufacturing
- **Batix New Work:** Digitalization in production technology

More information and registration: [Fraunhofer IWU Open House | B2B Production Forum](#) (in German)

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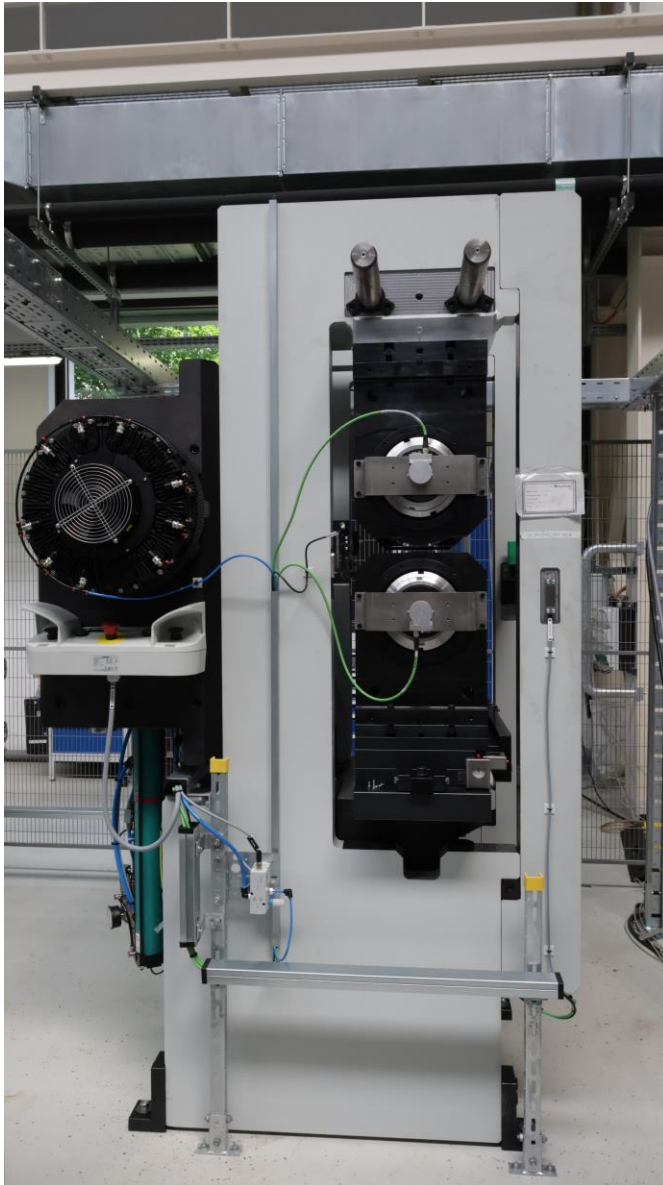


Fig. 1 Compact and powerful: the flexROLLmax can emboss sheet metal up to 0.5 mm thick.
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Fig. 2 The main advantage of hollow embossing is its continuous process, enabling high throughput at low costs. The image shows Bipolar plate production with BPPflexROLL.
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Fig. 3 Impressions from last year: Fraunhofer IWU Open House | Automation.
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Procurement of the flexROLLmax system was part of FRHY (a subproject of the H2Giga flagship project), funded by the German Federal Ministry for Research, Technology, and Space (coordinated by Project Management Jülich)).



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The **Fraunhofer Institute for Machine Tools and Forming Technology IWU** is an innovation-driven partner for research and development in production engineering. Around 670 highly qualified employees work at our locations in Chemnitz, Cottbus, Dresden, Leipzig, Wolfsburg, and Zittau. We unlock potential for competitive manufacturing, across industries like automotive, aerospace, electrical engineering, and precision engineering. Our research and contract research encompass the entire manufacturing ecosystem, from individual components to processes, methods, complex machine systems and human interaction. As one of the leading institutes for resource-efficient manufacturing, we bank on highly flexible, scalable cognitive production systems using nature as an example. We take a holistic approach to the entire process chain, aligning with circular economy principles. We develop technologies and intelligent production plants and optimize forming, cutting, and joining manufacturing steps. Our services include innovative lightweight structures and technologies for processing new materials, functional transfer to assembly groups, and the latest technologies of additive manufacturing (3D printing). We provide solutions for climate-neutral factory operations and large-scale production of hydrogen systems, thus paving the way for the transition to renewable energies.