

# PRESS RELEASE

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## From Concept to Small Batch: Technology Development Center Brings PV Modules to Market Readiness

Today there exists a wide range of solar cells, connection technologies, encapsulation materials and processes from which solar photovoltaic (PV) module manufacturers can choose. At the same time, manufacturers are faced with the challenge of bringing the most highly efficient, durable and recyclable PV modules onto the market. Also customized modules for integrated applications are in demand. The Fraunhofer Institute for Solar Energy Systems ISE develops and tests new product ideas for manufacturers. Thus, companies can test new module concepts, without having to purchase the necessary equipment and materials themselves. Today, the institute opened its newly organized and expanded technology evaluation center Module-TEC with an area of 1,000 square meters. In this development and production environment, PV modules prototypes can be manufactured in small batches and tested on industrial systems.

"Germany and the European Union have a strategic interest to build up resilience in PV module production and not to remain dependent on Chinese suppliers," said Prof. Andreas Bett, Institute Director at Fraunhofer ISE, in his talk at the ceremonial opening of Module-TEC. "The new Center aims to promote innovations developed at Fraunhofer ISE and to support European material, module and system manufacturers in the market launch of technologically excellent and sustainable PV products."

The Module-TEC team has already achieved success with its industrial partners in the past: For example, the system manufacturer teamtechnik developed with Fraunhofer ISE a [conductive, lead-free and adhesive solar cell interconnection technology](#), and these systems are now being sold worldwide. This connection technology also serves as the basis for the so-called "matrix shingle" concept, which Fraunhofer ISE [realized together with M10 Industries AG](#) and subsequently resulted in the spin-off of M10 Solar Equipment GmbH. In 2023, Fraunhofer ISE and the German module manufacturer Heckert Solar developed a [PV module based on new, large-sized \(G12\) half cells](#) which enabled the manufacturer to reduce the material requirements for production in Chemnitz.

"We hope that the reorganization and expansion of our Module TEC facility will enable us to provide PV companies with even faster and more comprehensive support," said Prof. Holger Neuhaus, head of the PV Module Technology department at Fraunhofer ISE and of the Module-TEC facility, at the opening event. "In addition to implementing new PV technologies to create higher performance PV modules, we also aim to create

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a more sustainable module construction, for example. Besides this, we also see a great demand for the development of suitable PV modules for integrated applications, especially in the European market; for example, solar car roofs or building-integrated PV modules for the façade or roof."

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With over 1000 m<sup>2</sup> industrial facilities for cell interconnections, various laminators and existing expertise in a large variety of material and solar cell technologies and analyses, Module-TEC together with the TestLab PV Modules of Fraunhofer ISE offer unique possibilities for module development, including pre-certification according to IEC. The scientists and engineers at the facilities support PV companies with services ranging from virtual analysis and connection design through prototype construction and realization of small batches up to long-term stability analyses. Thanks to a large selection of connection technologies and module materials, different module concepts can be realized in the practice in a short amount of time.

**Further information:**

Module-TEC - Module Technology Evaluation Center: <https://www.ise.fraunhofer.de/de/fue-infrastruktur/tecs/module-tec.html>

TestLab PV Modules: <https://www.ise.fraunhofer.de/de/fue-infrastruktur/akkreditierte-labs/testlab-pv-modules.html>