WE MAKE MATERIALS FIT FOR THE FUTURE!

Fraunhofer Institute for
Applied Polymer Research IAP

Potsdam Science Park

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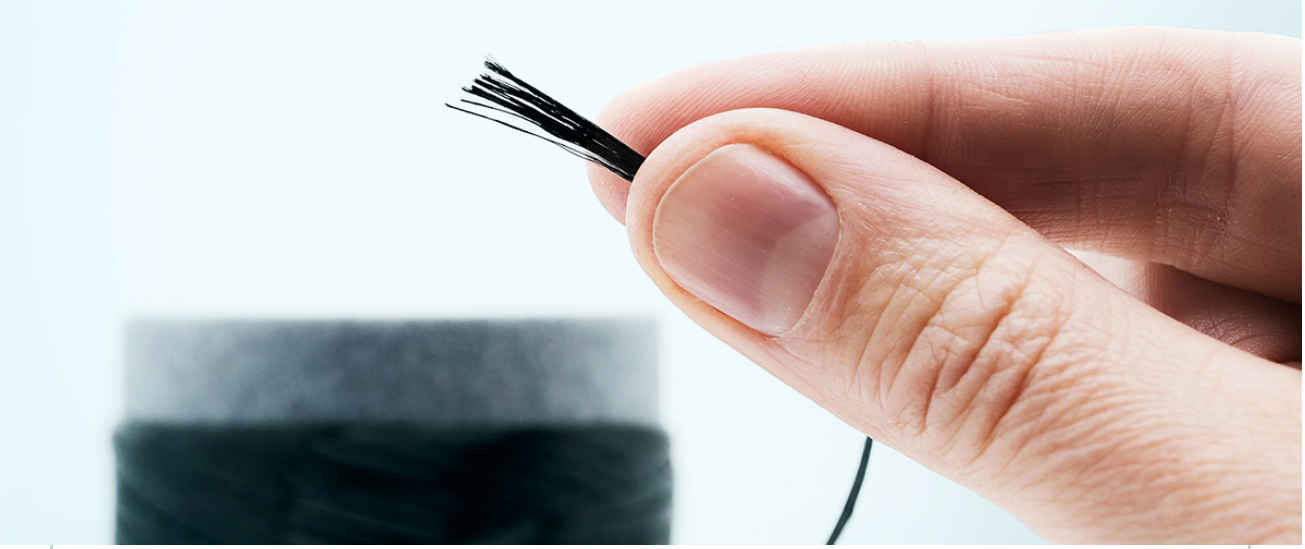
Fraunhofer IAP - News

We make materials fit for the future!



Ultra-thin and high-performance: The bio-based carbon fibers developed at the Fraunhofer IAP. Their mechanical, electrical, and thermal performance matches that of conventional petroleum-based carbon fibers. © Fraunhofer IAP / Kristin Stein

Dear reader,

Circular economy, sustainability, and innovation drive us forward. Our goal is to enable the transition to sustainable business practices. One example is bio-based carbon fibers, which are high-performance, versatile, and environmentally friendly. Developed at Fraunhofer IAP in collaboration with Brandenburg University of Technology Cottbus - Senftenberg, they combine sustainability with high performance. Our fibers open up new perspectives for high-tech applications such as hydrogen tanks, batteries, and the shielding of sensitive electronics. Innovative spinning methods and catalytic processes create fibers with tailor-made properties that are a genuine alternative to petroleum-based materials.

Efficient heating and cooling without climate-damaging refrigerants are key challenges in many areas. Compact, efficient solutions for temperature control are particularly important in the automotive industry and for electronic components. To meet this need, we are developing electrocaloric polymer films that change their temperature in a controlled manner when an electrical voltage is applied or removed. This makes them ideal for use in heat pumps and future cooling systems.

We also report on progress in isocyanate-free polyurethanes. Fraunhofer researchers have developed a synthesis that does not use toxic isocyanates. They use carbon dioxide and recycled polyurethanes as raw materials. This is a groundbreaking contribution to the carbon cycle economy.

Our innovations show how research and development are closely linked to environmental responsibility. We invite you to join us in shaping the future of sustainable materials and technologies.

You can find numerous other research projects in our Annual Report. We hope you enjoy reading it!

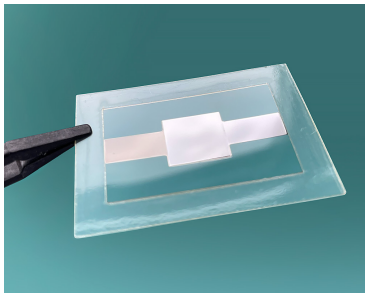
Your team at Fraunhofer IAP

CONTENT

NEWS FROM RESEARCH AND DEVELOPMENT

Energy Transition and Mobility

Electroactive polymers for heating and cooling



We have developed electrocaloric polymer films with a very low thickness of only four micrometers and processed them into multilayer components. In the future, they will be used in various systems for heating and cooling. For example, in heat pumps for temperature control in vehicle interiors, battery modules, electronic components, control cabinets, or laser systems.

MORE INFO

Bioeconomy and Sustainability

Next-generation sustainable carbon fibers

Carbon fibers are indispensable in lightweight construction, mobility, energy, and electronics. But their production is expensive, energy-intensive and mostly based on petroleum. That is why we are working with Brandenburg University of Technology Cottbus - Senftenberg to develop a new generation of carbon fibers made from cellulose. Their mechanical, electrical, and thermal properties are on a par with those of high-end petroleum-based fibers. They also offer

an attractive cost and environmental balance.

MORE INFO

Bioeconomy and Sustainability

Turning CO_2 into a raw material: The path to sustainable polyurethanes

Fraunhofer researchers have developed a sustainable approach to the production and processing of isocyanate-free polyurethanes. Carbon dioxide and amines from the chemical recycling of polyurethanes are used as raw materials to produce more environmentally friendly alternatives. Dr. Christoph Herfurth provides insights into the challenges and opportunities of this innovative approach.

READ THE INTERVIEW

Bioeconomy and Sustainability

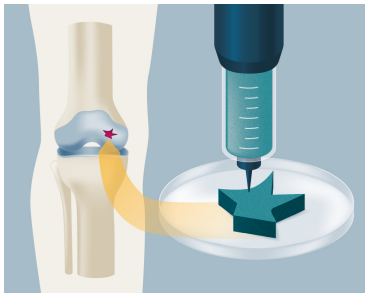
Transforming the economy with approaches from the bioeconomy

In the research field of bioeconomy, the Fraunhofer Society is driving forward the transition to a bio-based circular economy. More than 200 research and industry projects have been implemented since 2016. The Fraunhofer magazine presents current solutions, including the NaMoKau project, in which the Fraunhofer IAP is involved. In this project, researchers are developing a synthetic rubber with adjustable viscoelastic properties.

TO THE FRAUNHOFER MAGAZINE

Health and Quality of Life

Cartilage cells from a 3D printer

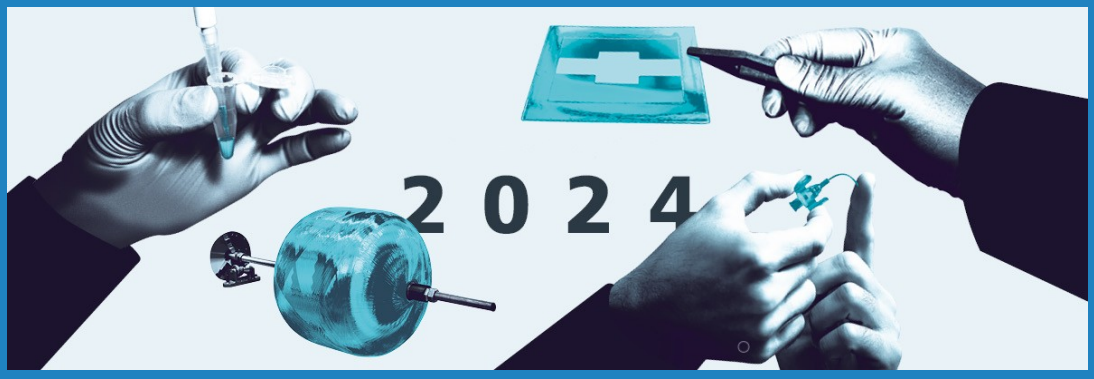


Professor Ruben R. Rosencrantz, Head of Life Sciences and Bioprocesses at Fraunhofer IAP, and his team are researching biopolymers that interact with cells and tissues. These form the basis for producing customized cartilage cell implants using 3D printing. The tailor-made implants are intended to help improve the treatment of cartilage defects. The Fraunhofer magazine reports.

TO THE FRAUNHOFER MAGAZINE

ANNUAL REPORT 2024

Responsible research



At Fraunhofer IAP, we are actively shaping industrial change – for a sustainable, healthy, and future-proof society. How do we do that? Find out in our latest annual report for 2024! In 2024, we placed a special focus on sustainability. Along the entire value chain of polymers, we develop solutions that conserve resources, reduce environmental impact, and open up new technological perspectives. Curious?

READ THE ANNUAL REPORT

ON OUR OWN ACCOUNT

Innovative approaches to the circular economy

Plastics are an integral part of our everyday lives – from packaging to vehicle parts. However, their versatile applications also pose challenges for disposal and recycling. The “Handbook of Circular Plastics Economy” shows how we are shaping the transition to a sustainable circular economy. We share our expertise and innovative approaches in articles on the following topics:

- Plastics: Chemical fundamentals and potential for renewable carbon
- Renewable carbon for plastics: Quo Vadis?
- Chemistry of selected thermoset classes and bio-based access routes
- Recycling strategies for thermosetting polymers
- Innovative rubbers for more sustainable tires

Are you looking for a scientific partner? Get in touch with us.

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Lab Services at the Potsdam Science Park

Are you looking for co-operation partners, laboratory equipment for test measurements or do you just need a specific device for a short period? Take advantage of the Lab Services offered by the Potsdam Science Park. The Fraunhofer IAP is a partner of this network.

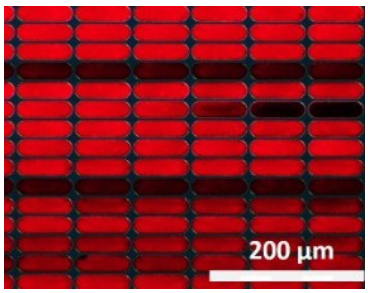
MORE INFO

EVENTS

Meet the Fraunhofer IAP team here

Busan, Korea | August 19, 2025 - August 22, 2025

IMID



At IMID 2025, we will present our latest developments and findings in printed electronics and quantum technology: high-performance QD LEDs and color conversion from quantum dots based on indium phosphide, as well as printed QD LED demonstrators.

MORE INFO

Düsseldorf, Germany | October 08, 2025 - October 15, 2025

K 2025

Visit us at K 2025! We will be presenting new types of polybutylene succinate (PBS) plastic made from plant-based residues. They are suitable for a variety of processing methods, from injection molding and deep drawing to extrusion and spinning. Meet our team in Hall 7 / Booth SC05 and discover our exhibits for packaging, consumer goods, and textiles.

MORE INFO

Potsdam, Germany | October 13, 2025 - October 14, 2025

PSP Conference 2025 – SUSTAINABILITY

On October 13 and 14, 2025, the PSP Conference will bring together founders, researchers, and decision-makers with a focus on sustainability at the Fraunhofer Conference Center. In addition to providing impetus for a sustainable future through cutting-edge research and innovation, the conference will offer participants the opportunity to look behind the

scenes at Fraunhofer IAP and get to know our institute.

MORE INFO

Berlin, Germany | October 22, 2025 - October 23, 2025

TechBlick

Forward-looking electronics – additive, sustainable, flexible, hybrid, portable, structural, and in 3D. At TechBlick 2025, we will be presenting our developments: color-stable quantum materials, printing inks for displays, innovative display components, OLED displays, and perovskite solar applications.

MORE INFO

We make materials fit for the future!

Creative solutions are the key to overcoming the challenges of the present and the future – whether they be climate change, pandemics, the energy transition, structural change or new mobility concepts.

Fraunhofer IAP tackles these challenges through innovative materials, processes and technologies, targeting the entire value chain – from the idea to the customized prototype.

Our subject areas:

- BIOECONOMY and SUSTAINABILITY
- ENERGY TRANSITION and MOBILITY
- HEALTH and QUALITY of LIFE
- INDUSTRY and TECHNOLOGY

TO THE HOMEPAGE

Potsdam Sciene Park

Fraunhofer IAP is part of the largest science location in the state of Brandenburg: the Potsdam Science Park. Just 30 minutes from the center of Berlin, more than 12,500 people research, work and study in the fields of biotechnology, medical technology, optics, geosciences, astrophysics and gravitational physics. On an area of more than 50 hectares, the innovation- and founder-friendly park continues to offer office and laboratory space for startups and ready-to-build plots for small and

medium-sized companies. We live science!

TO THE HOMEPAGE OF THE POTSDAM SCIENCE PARK

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Fraunhofer is Europe's largest application-oriented research organization. Our research efforts are geared entirely to people's needs: health, security, communication, energy and the environment. As a result, the work undertaken by our researchers and developers has a significant impact on people's lives. We are creative. We shape technology. We design products. We improve methods and techniques. We open up new vistas. In short, we forge the future.

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