igus Unveils First Recyclable Plastic Bicycle Frame for E-Bikes

# igus continues to expand its bicycle component business and presents the first injection-molded polymer bicycle frame for Advanced Bikes

**9 July 2024** – igus®, a leader in motion plastics, has developed the first recyclable plastic bicycle frame for the German e-bike manufacturer [Advanced Bikes](https://www.advanced.tech/). Building on the success of [RCYL](https://rcyl.bike/en/igusbike-goes-rcyl/), a bicycle made from 50% recycled fishing nets, this new innovation supports sustainable mobility. Leveraging decades of expertise in plastics manufacturing, igus has created a high-performance, injection-molded polymer frame and new bicycle components for Advanced Bikes.

# Revolutionizing Bicycle Frame Production

In 2023, e-bike sales in Germany surpassed traditional bicycles for the first time, driven by environmental awareness. However, most bike frames today are made of steel, aluminum, or carbon fiber, materials that are energy-intensive to produce and often end up in landfills. To address this, Advanced Bikes partnered with igus to develop a sustainable composite plastic bicycle frame, now featured in the new Reco Urban trekking e-bike.

"Advanced's goal was to create an injection-molded composite frame from 100% recyclable plastic," says Jan Philipp Hollmann, Head of Bike Components at igus. "With over 30 years of experience in developing components like plain bearings, rod ends, gears, and spherical bearings, we embraced the challenge of designing and producing this innovative frame."

# Environmental Benefits and Advanced Design

To ensure the frame's strength, rigidity, and low weight, igus uses a composite material of high-performance plastics and carbon fibers in granulate form. The company quickly developed a multi-part injection molding tool to achieve the frame's complex geometry, resulting in a 3.3 kg lightweight, corrosion-resistant, and durable single-piece frame. Manufacturing in Germany allows for short logistics distances and just-in-time production aligned with demand. Additionally, igus's "[chainge](https://www.igus.com/cable-carriers/services/echain-recycling-program)" recycling program can regranulate end-of-life frames for reuse.

"In the future, we plan to produce other recyclable bicycle components such as pannier racks, rims, handlebars, and seat posts using injection molding," explains Helge von Fugler, founder and Managing Director of Advanced Bikes. "This is essential for creating a fully recyclable e-bike."

# High-Performance Plastic Components

igus produces bicycle frames using both injection molding and rotomolding at its headquarters in Cologne. Beyond frames, igus's expertise extends to new bicycle components, including wheels, cranks, handlebars, and planetary gears. These high-performance plastic components are lightweight, lubrication-free, and corrosion-resistant, making them easy to clean and maintain.

# Rigorous Testing for Maximum Safety

All components undergo extensive testing before use. igus performs 135 trillion test cycles and 15,000 tests annually in its 4,000-square-meter test laboratory, with 250 square meters dedicated to bicycle test rigs. The new Reco frame, for instance, is checked using computer tomography for potential issues and undergoes all relevant frame tests. Customers receive a 30-year guarantee from Advanced Bikes, ensuring the highest safety standards.

# From Design to Finished Product

"With our bicycle components made of high-performance plastic, we are offering the bicycle industry access to a completely new technology," says Hollmann. "In this way, we also appeal to OEM manufacturers who want to bring their own ideas into reality with us."

Using plastic allows for rethinking design and geometry. igus provides everything from design, R&D, mold making, compounding, testing, and production to recycling. The just-in-time production line ensures quick delivery, reducing customers' storage needs and making business more predictable and profitable.

For more information about igus technology for the bicycle industry, visit <https://www.igus.com/industries/industries-bicycle>



### Image PM2824-1

*The new bike frame is 3.3 kg, recyclable, and molded in a single piece. To ensure that it has sufficient strength, rigidity, and low weight, igus uses a composite material consisting of high-performance plastics and carbon fibers. (Source: igus GmbH)*



### Image PM2824-2

*In order to drive forward the transformation to a circular economy, e-bike manufacturer Advanced Bikes is relying on igus for future frame production. (left: Helge von Fugler, founder and Managing Director of Advanced Bikes; right: Jan Philipp Hollmann, Head of Bike Components at igus). (Source: igus GmbH)*

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| ABOUT IGUS: igus GmbH develops and produces motion plastics. These self-lubricating, high-performance polymers improve technology and reduce costs wherever things move. In energy supplies, highly flexible cables, plain and linear bearings, and lead screw technology made of tribo-polymers, igus is the worldwide market leader. The family-run company based in Cologne, Germany, is represented in 35 countries and employs 4,600 people across the globe. In 2023, igus generated a turnover of €1.136 billion. Research in the industry's largest test laboratories constantly yields innovations and more user security. Two hundred 234,000 articles are available from stock, and service life can be calculated online. In recent years, the company has expanded by creating internal startups, for example, ball bearings, robot drives, 3D printing, the RBTX platform for Lean Robotics, and intelligent "smart plastics" for Industry 4.0. Among the most significant environmental investments are the "chainge" program – recycling used e-chains and participating in an enterprise that produces oil from plastic waste. | |