JEC COMPOSITES INNOVATION AWARDS
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JEC WORLD INNOVATION AWARDS WINNER 2026

Sports, Leisure & Recreation

Lifecycle: A repairable road bike

FENIX COMPOSITES

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Partners:

- **Alformet GmbH**
- **herone GmbH**
- **hyJOIN GmbH**

The innovation is a bike frame made of thermoplastic CFRP profiles and titanium lugs. It is joined by induction without additional adhesives or fastener elements. Through the reversibility of the process defective components can be removed and replaced in order to maximize the frame's life cycle.

The bike frame combines 3D-printed Ti6Al4V lugs with thermoplastic composite tubes. Titanium lugs are produced by DMLS, machined for bearing seats, and laser-structured for joining. The front triangle uses braided preforms of recycled carbon fibre/PA6 consolidated by herone, while the rear triangle uses Alformet's LATW-manufactured CF/PA6 tubes. Assembly relies on hyJOIN's thermal direct joining technology: induction heating melts the polymer, which flows into the lug's micro-structure, creating a strong (50+ MPa) adhesive-free joint. Tubes and lugs can be repeatedly separated and replaced, enabling full recyclability and repairability.

Key benefits

- **Highly resilient and reversible joint connection**
- **Low cycle times for joining**
- **Manufacturing process can be fully automated**
- **3D-printing allows the use of generative design**
- **Material, energy and cost effective**

On Innovation Planet 5 E 148 & Innovation Planet 6 D 119