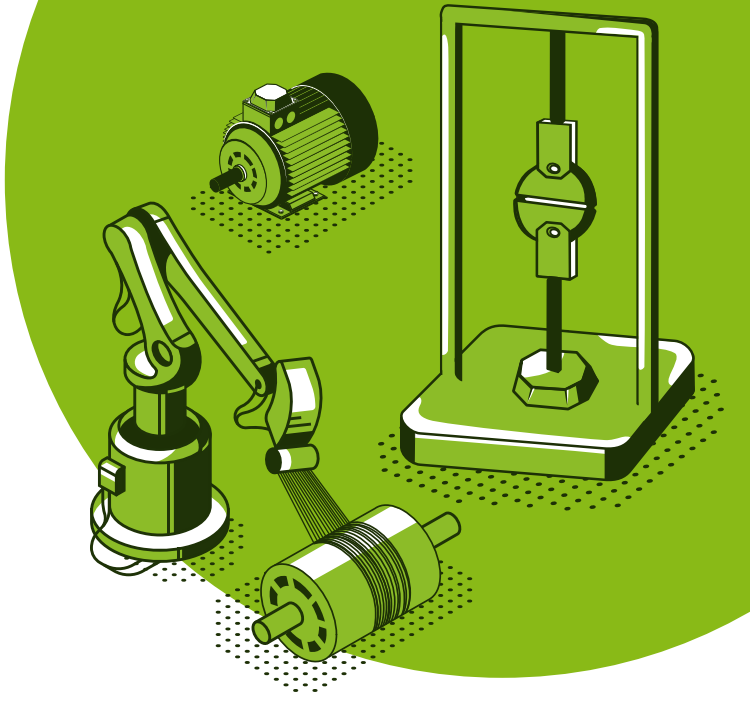
AZL Joint Partner Project

Composite Rotor Sleeves

Experimental Testing & Benchmarking Thermoset and Thermoplastic Materials, direct Winding and Press-Fit Technologies



AZL Aachen GmbH

Excellence in Lightweight Production

High-speed electric machines for EV traction motors, industrial drives and aerospace applications require reliable retention of permanent magnets under extreme centrifugal loads and elevated temperatures. Composite rotor sleeves (CFRP) enable higher RPM, tighter air gaps and reduced losses compared to metallic rings. However, selecting the right material system (thermoset or thermoplastic), laminate design and manufacturing route (press-fit or direct winding) strongly affects performance, durability, manufacturability and cost. AZL combines rotor design expertise with in-house winding and testing infrastructure to experimentally benchmark relevant material–process combinations under application-oriented conditions. The project is building on a 2025 benchmarking study with 15 partners.

What will you get?

Representative rotor/sleeve designs and load cases are jointly defined. Press-fit and direct winding technologies are benchmarked using technological and economic KPIs, leading to clear recommendations for material, design, and process selection within a pre-competitive consortium.

- WP1: Definition of use cases, material systems (thermoset & thermoplastic) and laminate designs
- WP2: Manufacturing and testing of press-fit sleeves (wet winding, towpreg, thermoplastic tape)
- WP3: Manufacturing and testing of direct winding solutions and durability assessment
- WP4: CAE correlation, benchmarking and final reportingrecyclability evaluation

Follow-Up to this Consortium

ARKEMA · covestro · DOMO · HEXCEL · HUNTSMAN · HUTCHINSON · KÜMPERS · LG Electronics · Rassini · MaruHachi · Schuler · Swancor · TORAY · eacc · SVENSQO · TOYOTA

Open to join

Duration: approx. 9 months

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