

Customized  
Engineering  
for Lower  
Weight/Cost  
and Higher  
Performance



## Case study: LUVOCOM® for e-bike motor transmission. Perfect fit in metal replacement. Optimized friction and wear performance.

The companies Podkrižnik, Biesterfeld Interowa and LEHVOSS Group cooperated in terms of material development and consulting for the development of an e-bike motor transmission.

The transmission is used in the mid-drive, serves as the main drive and releases a torque of 112 Nm at peak. Considerable forces and moments act in the load path of the transmission. This is a high requirement for the materials used and applies in particular to the materials used for the meshing gears. In this specific case, the sun gear of the planetary gear should be made of a suitable polymer material. Advantages of polymers compared to metal in the application:

- Noise reduction
- Favorable meshing conditions
- Reduced wear
- Lower mass
- Lower part manufacturing costs
- Lower carbon footprint

These advantages directly contribute to the requirements placed on the e-bike motor:

- Lowest possible total weight of the drive
- High reliability of the engine components in daily use and under high loads
- Cost-optimal production of all individual parts
- Low noise emission of the drive under load

The choice fell on a material from the LUVOCOM 1 product line (based on PA66) from the LEHVOSS Group. This meets the requirements and is now being used in serial production. The decisive factor in this project was the combination of the competencies of the project participants in the areas of component design, material development, processing, consulting and testing.

LUVOCOM 1



### About Podkrižnik

We offer comprehensive system solutions in the fields of Drive Technology, Gearboxes, Hydraulic Modules and High-precision Metal and Plastic Semi-manufactured Products. Our basic philosophy is based on simplicity. We have the ambition, an extraordinary will, state-of-the-art knowledge, cutting-edge technology and, above all, the energy to achieve the impossible.

### About Biesterfeld Interowa

Biesterfeld Interowa has been operating successfully in Austria and South Eastern Europe as a distributor of plastics, chemicals and rubber for more than 70 years.

The complete product portfolio qualifies Biesterfeld Interowa to be an objective and qualified development partner for the polymer industry. Biesterfeld Interowa offers fast and flexible logistics with warehouses in the whole region.

### About LEHVOSS

The LEHVOSS Group under the management of Lehmann&Voss&Co. is a group of companies in the chemical industry that develops, produces and markets chemical and mineral specialties for various industrial customers. Lehmann&Voss&Co., Hamburg, was founded in 1894 as a trading house. Since then, the owner-managed company has developed into a powerful global organization - with long-standing connections to well-known, mostly foreign suppliers and with its own production facilities in Europe, the USA and Asia.

The Customized Polymer Materials (CPM) division has been a partner to industry since 1984 in terms of material development, production and support, from design to part production. LEHVOSS offers customized solutions for challenging applications that are unique and stand out in the market.

LUVOCOM® high-performance compounds, LUVOTECH® and LUVOTECH® eco-technical compounds expand the possible uses of plastics and ensure in many industries that products made from them reliably fulfill their function even under high requirements.

With the 3D printing product lines LUVOSINT® and LUVOCOM® 3F the LEHVOSS Group offers innovative and customized polymers for 3D printing. They are dedicated to the most common technologies as powder bed fusion, fused filament fabrication (FFF) and fused granulate fabrication (FGF).



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