



Mobility

# Fiber Reinforced Armor Sleeves

For high performance electric motors



# Fiber Reinforced Armor Sleeves

Fiber reinforced armor sleeves fasten and secure rotating assemblies. A typical application is the bandaging of high speed rotors. With high tensile strength, low weight and minimal wall thickness, they extend the range of high performance electric motors.

Fiber reinforced armor sleeves offer a wide range of important advantages.

The main advantage: as the engine temperature rises, thermal expansion remains zero. This offers new opportunities to the design.

A smaller air gap between rotor and stator is possible in order to reduce torque losses.

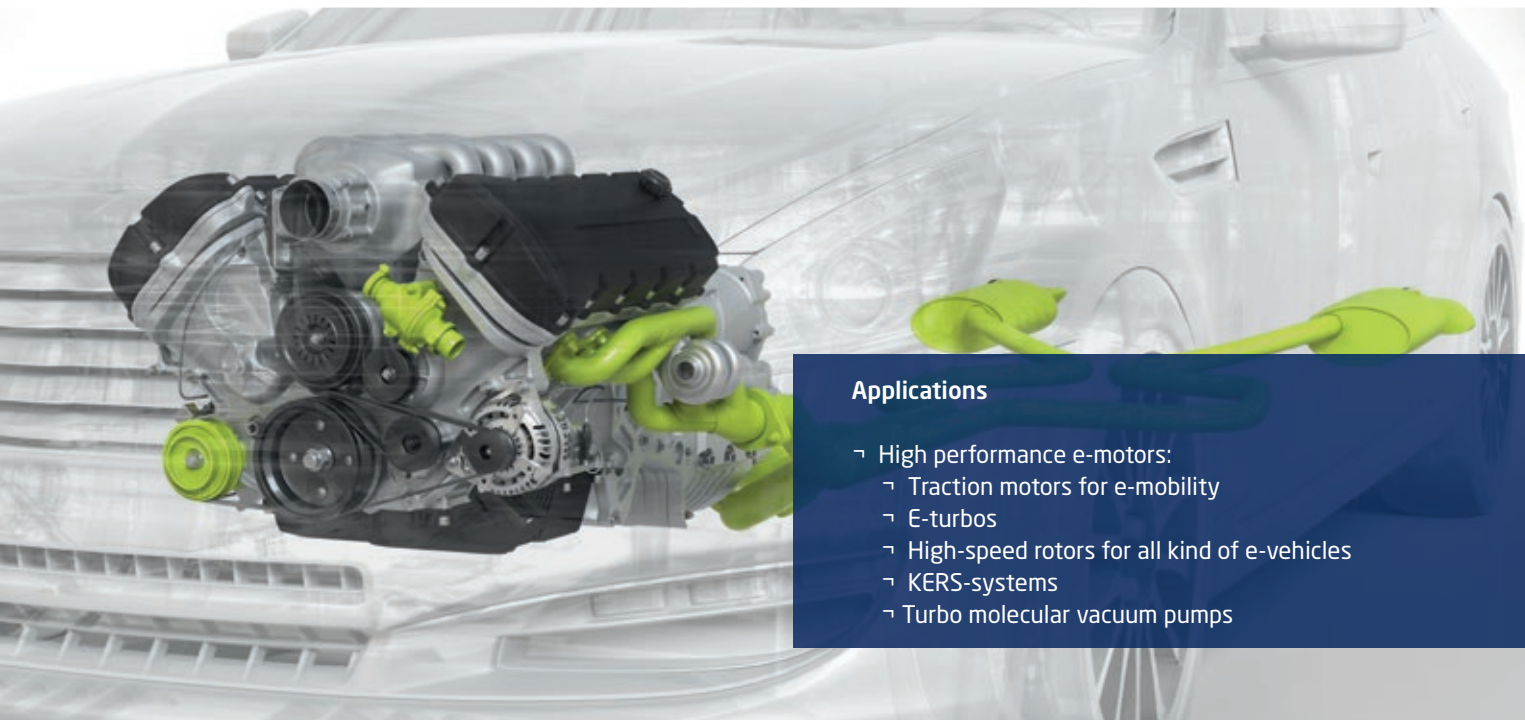
With our specialized production abilities, we are able to achieve minimal wall thickness matching with the motor concept. Therefore we offer high accuracy, big volumes and short product development cycles. Additionally, we can provide special services like press-fit of sleeves onto rotors.

## Your most important benefits:

- High tensile strength
- Low coefficient of thermal expansion
- Light weight and less mass momentum
- Reduce of eddy current losses
- High accuracy
- Different material grades available
- Dedicated service like FEM-simulation to define needed dimensions and material during development phase
- Capabilities for prototypes and assembly trials

## Fiber reinforced armor sleeves - typical characteristics:

- Tensile strength up to 2,200 MPA (standard material)
- Thermal expansion coefficient in fiber direction  $0.2 \cdot 10^{-6}/K$
- Application temperatures up to 180 °C
- Density 1.55 g/cm<sup>3</sup>



## Applications

- High performance e-motors:
  - Traction motors for e-mobility
  - E-turbos
  - High-speed rotors for all kind of e-vehicles
  - KERS-systems
  - Turbo molecular vacuum pumps

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