Improving High Speed Rotor Performance

Designed specifically for permanent magnet systems, Wraptite™ composite sleeves offer a superior design alternative to metallic solutions, particularly in applications that require high rotational speed or the containment of high centrifugal forces, such as high speed motors and generators. Arnold Magnetic Technologies offers a customized service and is able to assist in the engineering design of your rotor and containment requirements. Arnold provides a total in-house solution, from design concept through system integration.

Wraptite composite materials include a choice of carbon fibre, Zylon and glass fibre composites using epoxy, cyanate ester and BMI-based resin systems. Our technology includes the winding of multi-filament tows directly over the rotor to be contained, or the production of sleeves which are pressed into position to produce an interference fit.

Key Features & Benefits (compared to containment by metallic sleeves)

- Low density and high strength-to-weight ratio resulting in lower self load and self-containment of the sleeve
- Potential for greater containment stresses for same thickness sleeve, increased rotor speeds, or alternatively a thinner sleeve with same containment capability
- Thinner sleeves enable reduced air gap between rotor and stator and improve magnetic and motor/generator performance
- Reduction or elimination of eddy currents in the containment sleeve, which reduces heat generation and improves efficiency
- Outstanding stiffness and strength
- Minimal interference with magnetic field
- Continuous operating temperature up to 180°C
- Hoop stress generated by direct winding up to 1400 Mpa, dependent upon rotor geometry, sleeve thickness and fibre/resin choice.

Breadth of Applications

Wraptite can be utilized in a broad range of applications, specifically those in which high rotational speed creates demands that are not easily met or cannot be met by metallic solutions. These applications include motorsport, oil and gas, aerospace and general industrial.

Every project has unique considerations. Contact our engineering team to discuss your requirements and to determine the optimum design for your application.