



For more than 20 years, Windings has helped pioneer the development of electromagnetic solutions that support the electrification of motor vehicles. From hybrid / electric passenger cars and commercial vehicles to Formula 1 racing, Windings has partnered with Automotive industry leaders to design, test and manufacture custom electric motors, generators and related components including rotors, stators, lamination stacks and insulation systems.

## Core Competencies

- Engineering Services
  - Application Analysis
  - Design Analysis & Simulation
  - Prototyping
- Manufacturing Optimization
  - Concurrent Engineering
  - DFMA Analysis
  - Process Documentation
  - Tooling and fixture design
- Part Production
  - Motors
  - Rotors
  - Stators

## Motor Technologies

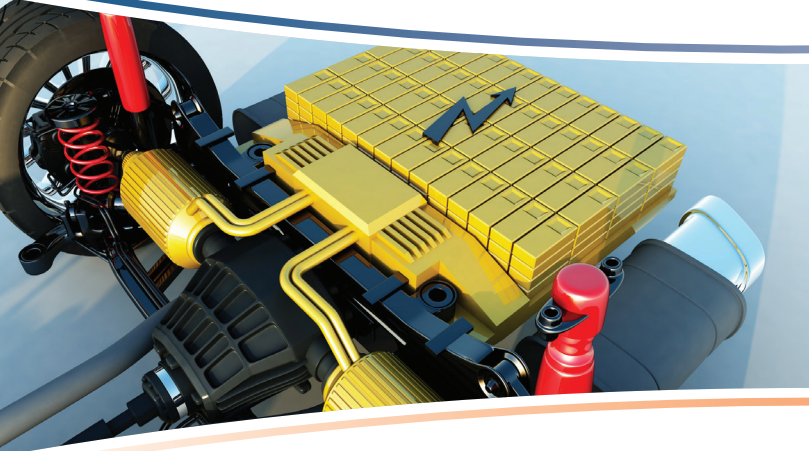
- Brushless DC Motors
  - Surface Mount Permanent Magnet
  - Interior Permanent Magnet (IPM)
- Three- and Five-Phase Induction Motors

## Development Focus

- Motorsports
  - Electric turbochargers for Energy Recovery Systems (ERS)
  - Motor Generator Units (MGUs) for Kinetic Energy Recovery Systems (KERS)
- Passenger Cars
  - Primary propulsion for electric vehicles
  - Electric transmissions for hybrid vehicles
  - Electric compressors
- Commercial Vehicles
  - Electric transmissions for mass transit vehicles
  - Electric fuel pumps for diesel engines

## Key Differentiators

- Customer Ownership of Custom IP
- Provider of Custom, Integrated Electromagnetic Solutions
- Engineering Partner to Our Customers
- Focus on Critical Applications in Extreme Environments



## Certifications

Windings leverages its Quality Management System (QMS), and strong heritage and experience in the Aerospace and Automotive industries, to comply with standard Automotive Quality Compliance Measures (APQP, PPAP, etc.)



- Dual certifications to the ISO 9001:2015 and AS9100 (Rev D) quality management systems.
- Registered with ITAR (International Traffic in Arms Registered).
- Compliant with EU Directive 2002/95/EC, Restriction on Hazardous Substances.
- Accredited with NADCAP for Chemical Processing and Welding:  
Chemical Processing – AC7100 (Rev E) and AC7110/1 (Rev H).  
Welding – AC7110 (Rev E) and AC7110/1 (Rev H).
- Employ J-STD-001 Application Specialists (Specifically to the Requirements for Soldered Electrical and Electronic Assemblies) and a certified trainer in J-STD-001 Application Specialist Training and J-STD-001 Space Addendum Application Specialist Training.

## About Us

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