Rotor Assemblies

electron energy corporation

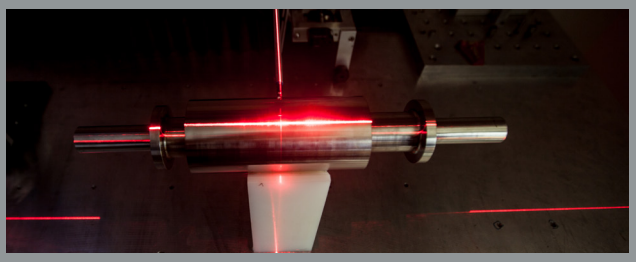
EEC works with customers to design, qualify, and produce complete rotor packages used in electric motors and generators for aerospace, medical, industrial, and defense applications.

Quality Service, Premium Materials & Innovative Solutions

Electron Energy Corporation (EEC) is an expert developer and leading producer of permanent magnet products and assemblies for a variety of markets, including aerospace, medical, defense, oil & gas, and power generation. Since 1970, EEC has produced high-strength magnets to provide maximum performance for these industries. Through a variety of services and capabilities, EEC works as an extension of the customer's engineering team to provide first-class magnet solutions.

In-House Production & Manufacturing

EEC has a broad range of permanent magnet types, including neodymium iron boron, samarium cobalt, alnico, and ceramic, to fulfill virtually any application requirement. Because EEC produces magnets in-house at our Material Technical Center, customers are provided with a wider selection of products that can be customized quickly and economically. These capabilities have enabled and enhanced many of our customers' products and systems.



Engineering & Assembly Support

As a vertically-integrated rare earth magnet producer, EEC engineers have a deep understanding of the magnets and the magnet assembly processes. This not only helps in developing superior products but also shortens the time-to-market by reducing costly time and errors. EEC provides comprehensive before and after engineering support. Your magnet experts are just a phone call away.

Research & Development

R&D is a key element in EEC's history of distinction in magnet solutions for medical and areospace applications. Our in-house R&D lab, world-class team of scientists and engineers, and university partnerships allow us to provide innovative solutions to serve both government and commercial sectors.

Prototyping

In an industry where protocols and standards are ever-changing, the timely development of new products is critical. EEC helps customers meet their objectives by providing fast, reliable, and more cost-effective proof-of-concept prototypes and product evaluations in as little as two weeks.

Design

EEC engineers can assist customers with magnetic circuit design by using finite element analysis (FEA). ANSYS Maxwell® 2D/3D and Cobham Opera® 2D/3D electromagnetic simulation software are currently used at EEC for magnetic circuit design services. We use SolidWorks® for mechanical design and stress analysis. Our engineering experts can provide innovative magnetic circuit design solutions for the most challenging applications reducing costs and enhancing system performance.

Premium Quality - Product Innovation - Full-Service Provider

Engineering Services

- Finite element analysis
- Prototyping
- Testing and validation

Application Engineering

- Design expertise
- Material selection
- Assembly development
- Total systems analysis

R&D Specialty Materials

- Research grade materials
- Customized compositions
- R&D projects

Product Platforms

- Samarium-cobalt
- Neodymium-iron-boron
- Alnico
- Assemblies

Your Vision. Our Expertise.

Design Considerations for Rotors

Electric motor manufacturers are under pressure to increase performance and reduce costs in order to provide more value to customers. Rotor assemblies using permanent magnets are critical to optimizing performance in any modern electrical motor. EEC's engineering team has extensive experience working with customers to design high-quality rotor assemblies that deliver performance for a range of demanding applications including high-speed motors, high temperature motors, space exploration, down-hole exploration, and implantable medical devices. Our unique ability to manufacture and design our own magnet materials and assemblies in-house allows EEC to customize solutions and modify magnet performance to optimize customer designs. Below are some of the common design considerations for rotors that EEC engineers work with customers to determine:

Material Selection

Understanding the tradeoffs between permanent magnet materials is critical to selecting the best grade of material for an electric motor application. As a producer of rare earth magnet materials, EEC's engineering team has an intimate understanding of the material science behind differences in permanent magnet materials, enabling them to advise customers on the best material selection for a given application. Additionally, EEC has the ability to create custom grades of permanent magnet material to satisfy unique customer requirements.

Designing for Manufacturing (DFM)

Customers are focused on the overall electric motor designs. EEC engineers focus on providing critical design input to ensure components are optimized for manufacturing with the goal of increasing performance and reducing cost. Our team provides input on opportunities to improve magnet component designs, shaft designs, sleeving options, and overall rotor packaging to assist customers in maximizing their motor designs.

Bonding & Sleeving

Selecting the right bonding and sleeving materials plays an intricate role in ensuring rotor designs perform as expected. EEC advises customers on the best adhesives to use based on retention and temperature requirements. Applications such as high-speed motors may require the addition of a retention sleeve. Our team can guide customers through the decision making process to determine the best metallic or composite sleeving material for the project.

Balancing & Testing

For many applications, rotors must be balanced to ensure optimized performance in the electric motor system. EEC provides balancing services to satisfy these types of requirements. Each rotor requirement is unique and EEC has the ability to tailor final inspection tests to meet individual customer requirements beyond our base testing standards

Real Motor Experience

EEC complies with strict export regulations defined by ITAR and DFARS. Our team of experts works closely with customers to bring value-driven magnet solutions to market. Our internal R&D team has years of experience working with cutting-edge technologies that have allowed us to develop breakthrough solutions such as Temperature Compensated Samarium Cobalt and Ultra-High Temperature Samarium Cobalt magnet materials.

DDTC REGISTERED · DFARS COMPLIANT · ITAR COMPLIANT · NIST 800-171 COMPLIANT

Our team of engineers has extensive experience providing magnet solutions across a broad range of motor applications. Since 1970, the engineering team at EEC has been partnering with the world's largest automotive, oil & gas, aerospace and medical leaders to develop magnet solutions and advance industry innovation.

EEC: Past and Present

1970

EEC was founded in a milk house with two employees, as Marlin Walmer pioneered the processing and subsequent commercialization of an entirely new class of permanent magnets (SmCo).

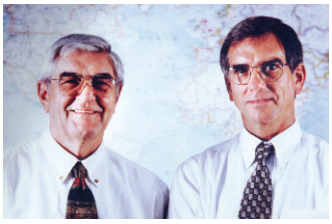
Mid 1970s

Marlin innovates Temperature Compensated SmCo that has near-zero change in magnetic flux over a wide temperature range.

1985

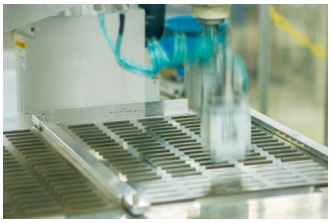
40,000 sq. ft. facility was built to support the steady growth of business from 1970 to 1985.

2000



EEC patented Ultra-High Temperature SmCo 2:17 magnets, that operate at temperatures up to 550°C.

2002



EEC began to offer finite element analysis and magnetic circuit design services.

2012

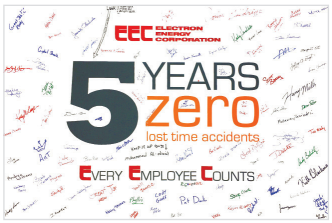
EEC's "Milk House" was recognized as an ASM Historical Landmark.

A new 45,000 sq. ft. facility was added to house the magnet finishing and assembly operations.

2014

EEC received 25 SBIR & STTR awards since 1996 from NASA, DOE, NSF, EPA, and DOD.

2016



EEC reaches 5-Years Zero Lost Time Accidents milestone.

2020

EEC celebrates 50 years in the magnet industry.

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