

TECH SCAN

RARE EARTH METAL FREE MAGNETS



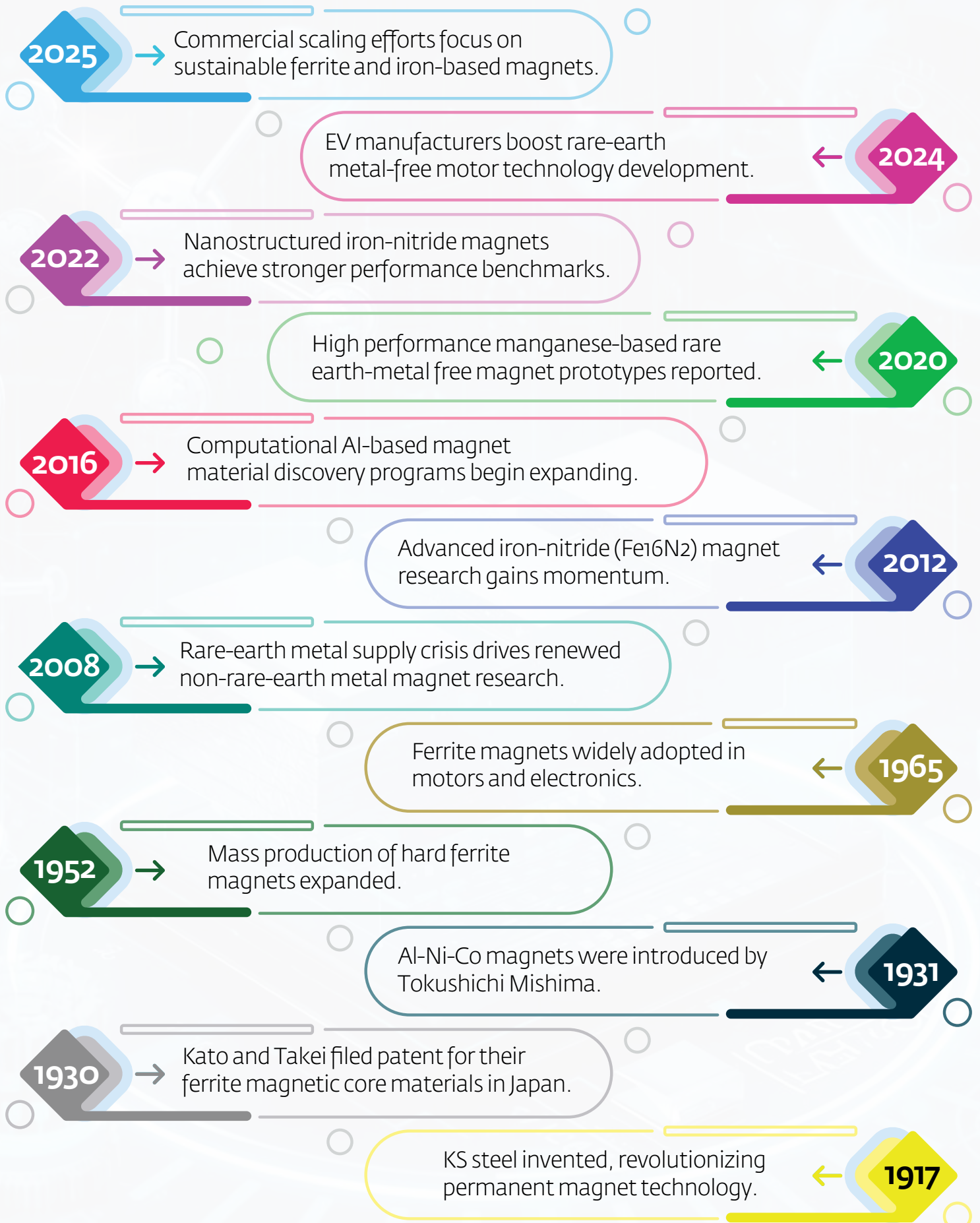
The world of advanced technology and manufacturing is witnessing a major shift with the emergence of rare earth metal free magnets. These innovative magnetic solutions are gaining attention as industries seek alternatives to traditional magnets that depend on rare earth materials. Their increasing relevance is driven by the need for sustainable resources, stable supply chains, and high-performance materials capable of supporting modern technological demands.

Rare earth metal free magnets are becoming essential in applications ranging from electric mobility and renewable energy to consumer electronics and industrial automation. Unlike conventional magnetic materials, these alternatives reduce dependence on limited and environmentally challenging rare earth resources, helping industries lower production risks and improve long-term sustainability. Their development represents a strategic move toward cleaner and more self-reliant technologies.

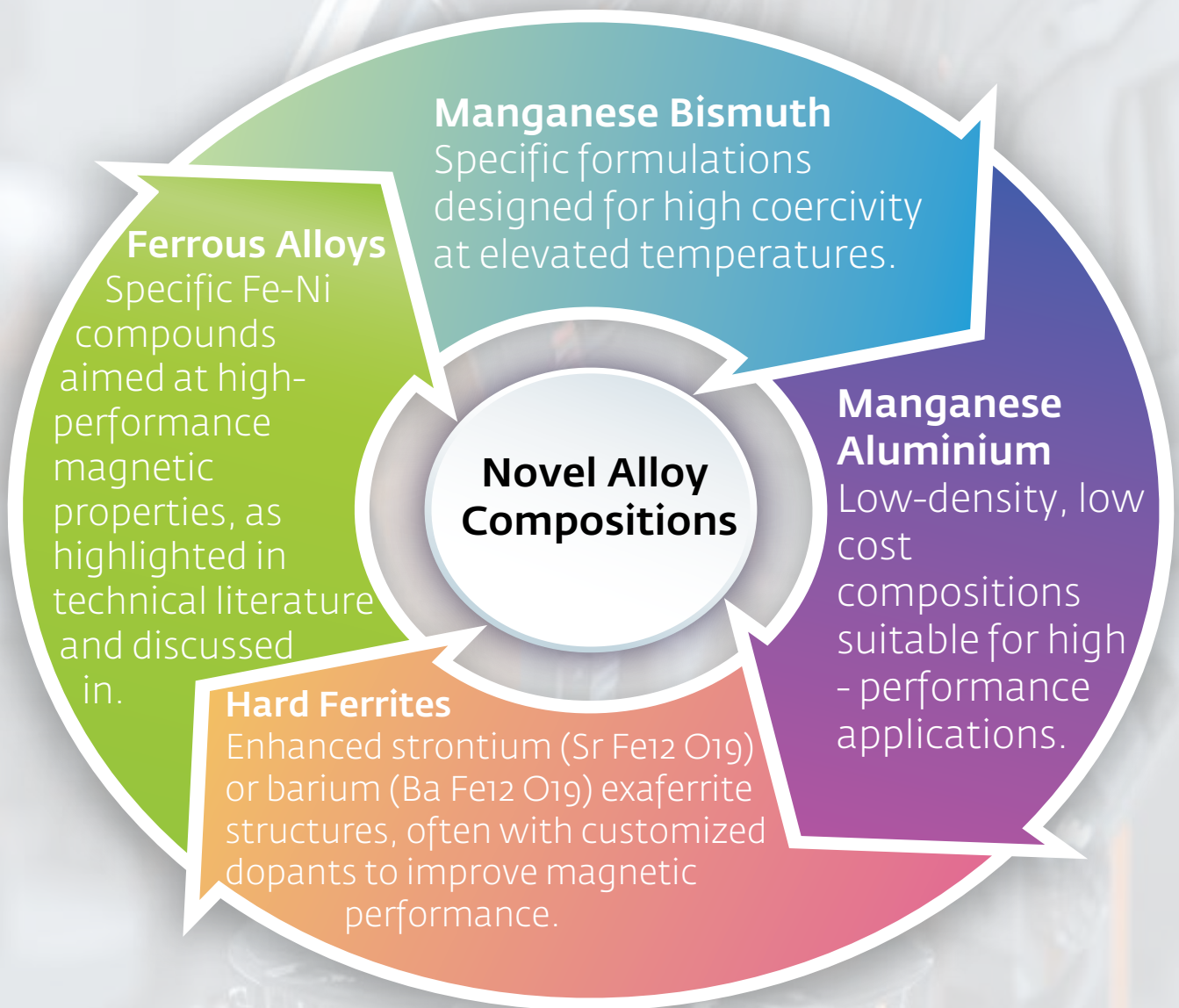
Innovation in this field is reflected through patents covering advanced magnetic compound, unique material engineering methods, and specialized production processes aimed at achieving strong magnetic capabilities without rare earth elements. These patented technologies focus on improving efficiency, heat resistance, durability, and overall operational performance, ensuring that the magnets can meet the rigorous standards required across multiple industries. Securing intellectual property rights for these advancements supports continued research and strengthens competitive growth within the sector.



INNOVATION TIMELINE



PATENTABLE COMPONENTS



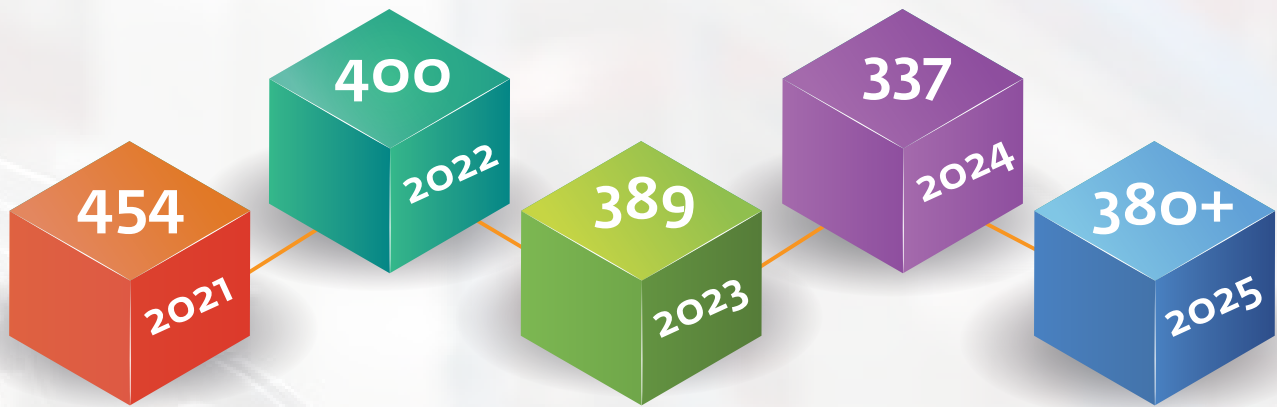
Methods of Production:

- **Nano-structuring:** Techniques tailored for creating nanometre-sized particles, including submicron particles in the 100 nm to 300 nm range.
- **Powder Metallurgy Processes:** Specialized methods for producing and processing metallic powders to enhance properties.
- **Alignment/Sintering:** Methods for aligning magnetic domains within the powder and densifying them via sintering.

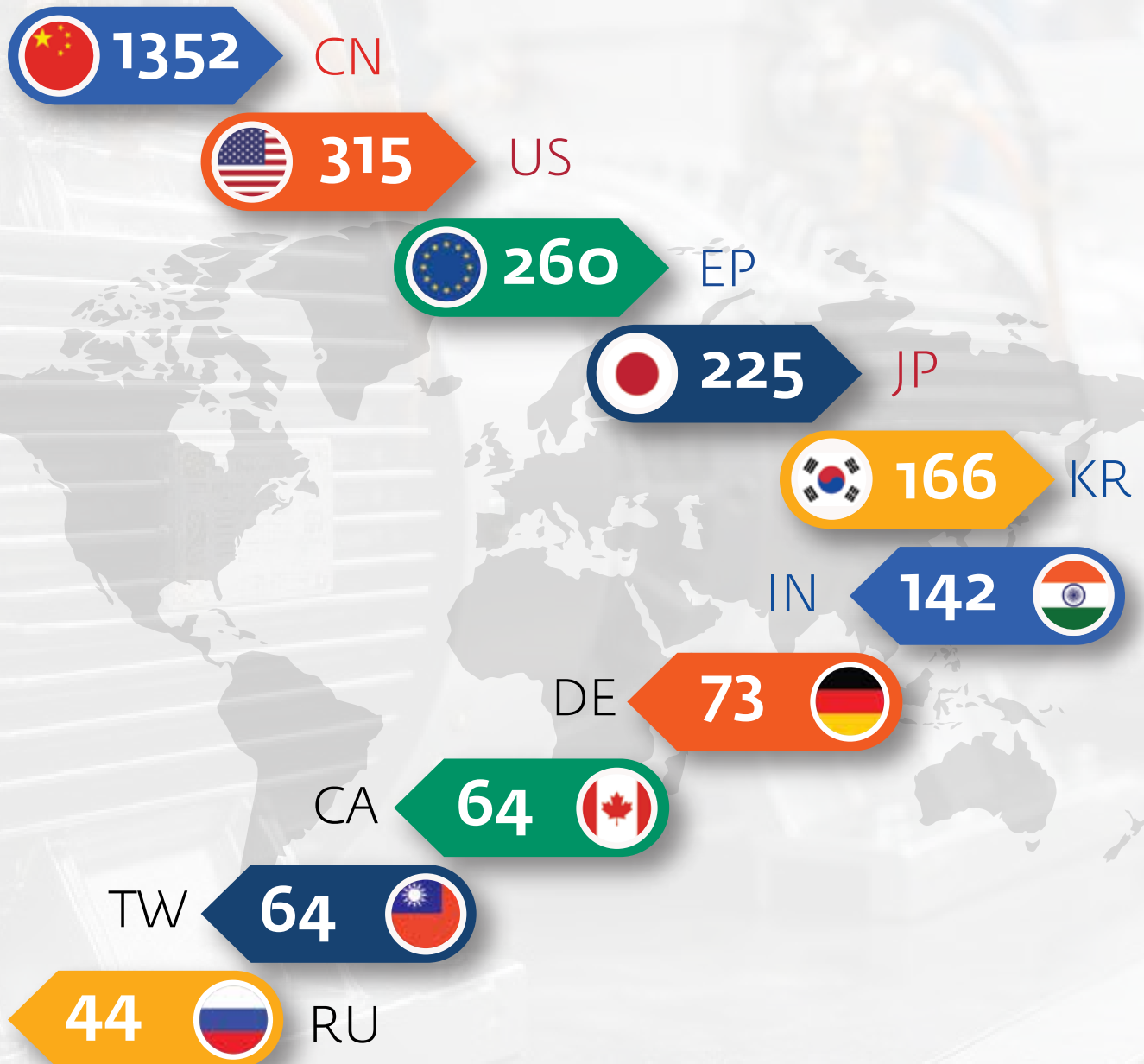
Performance-Enhancing Additives

Materials added to the alloy mix to improve particle alignment or decrease the sintering temperature, such as PVA or SiO_2 in ferrite manufacturing.

PATENT STATISTICS



PATENT LANDSCAPE



Database: Questel Orbit

Data Range: 01/01/2020 - 01/05/2026

TOP APPLICANTS



Database: Questel Orbit

Data Range: 01/01/2020 - 01/05/2026

NOTABLE INNOVATIONS

Patent Application	Priority date	Title	Assignee
CN121839343	11.03.2026	Neodymium-iron-gallium double-alloy heavy-rare earth-free 54H sintered neodymium-iron-boron magnet and preparation method thereof	Antai Agco Technology Co Ltd; Advanced Technology and Materials Co Ltd
DE102024201772	27.02.2024	Rotor of an electric high-speed machine	Robert Bosch GmbH
IN571089	31.05.2022	Composition and method for synthesis of strontium hexaferrite based non-rare earth magnets	Indian Institute of Technology (Banaras Hindu University), Varanasi
CN113151719	21.12.2020	A kind of rare earth-free Mn-Al-In permanent magnet alloy and preparation method thereof	Hangzhou Dianzi University
US11062827	09.01.2017	Sintered magnet composition without heavy rare earth element and a method of making the sintered magnet	Yantai Dongxing Magnetic Materials Inc
US9773594	04.01.2013	Non-rare earth magnetic nanoparticles	Virginia Commonwealth University
US20150051067	19.08.2013	Oxygen storage material without rare earth metals	Clean Diesel Technologies Inc
US9490685	12.10.2010	Axial gap motor using non-rare-earth magnets	Hokkaido University NUC
JP4650218	07.11.2005	Method for producing rare earth magnet powder	Proterial Ltd

WHITESPACES

Quantum-
Accelerated
Metallurgy

Nanostructured
Iron-Nitride (Fe-N)
Development

Manganese -
Based Alloys

High-Entropy
Alloys (HEAs)

Use in flux -
Concentration
Rotor Topologies

Integrated
Magnetic
Assemblies

Exchange - Coupled
Nanocomposites

Eco-Friendly
Binding Materials

Compact Data-
Centre Cooling
Motors

3D-Printed Magnet
Development

Heat-
Resistant
EV Traction
Motors

Heusler Alloy
Permanent Magnets

Oil & Gas Magnetic
Couplings

Advanced
Locking Systems

Magnet Recycling
Systems



If you would like to learn more about any of these areas or have specific questions, we're here to provide further information and insights. Our team is dedicated to driving progress and staying at the forefront of Rare Earth Metal Free Magnets.

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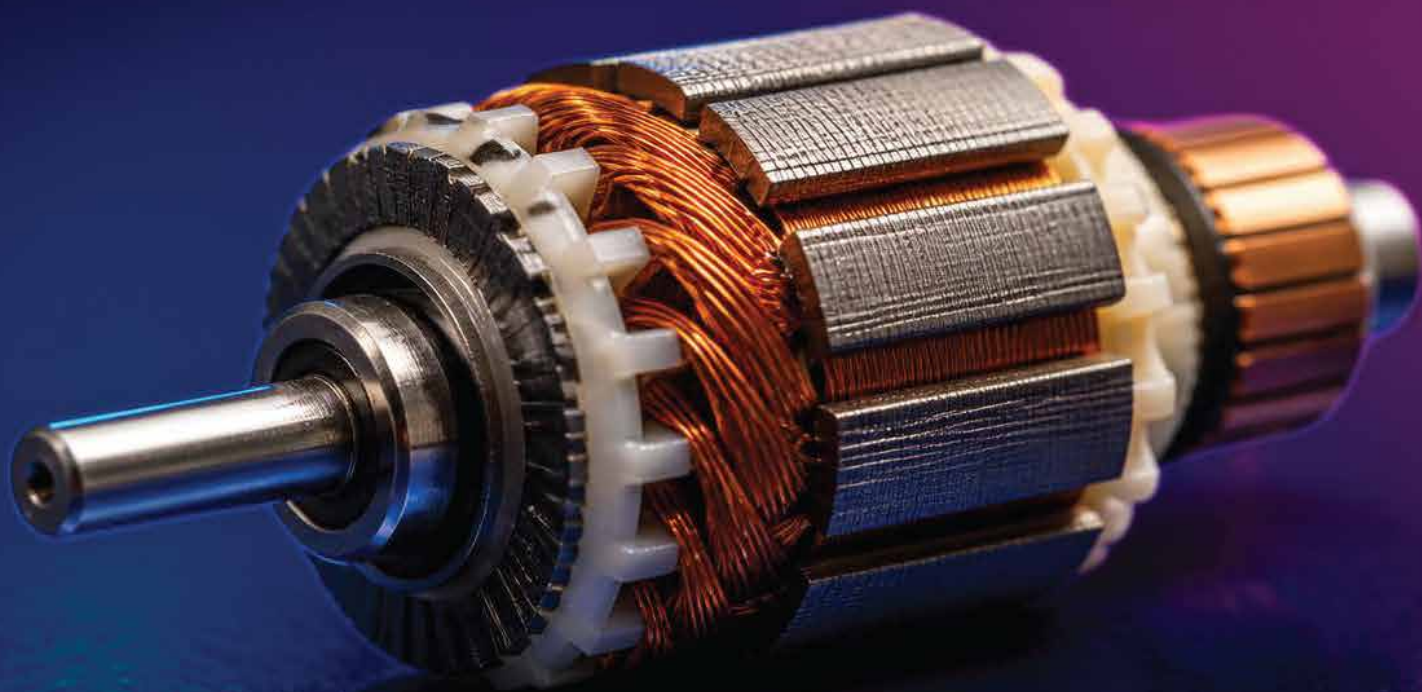
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