

Gain Efficiency with Shaped Field Magnets

Arnold's Shaped Field Magnets (SFMs) offer new options for designers of next-generation rotating equipment and sensor systems. By managing the magnetic field distribution, Arnold's Shaped Field Magnets provide new opportunities for performance enhancement and offer greater design flexibility.

Arnold's patent-pending Shaped Field Magnet technology can boost performance and reliability for a host of applications, often at lower cost, and can also replace standard permanent magnets in existing equipment.

Key Benefits

- **Higher efficiency** – SFMs can offer higher magnetic fields in the working zone within a given design envelope.
- **Reduced system weight** – Both magnet size and back iron dimensions can be streamlined by taking advantage of the efficiencies of SFMs.
- **Fewer constraints for system designers** – By offering a focused field with fewer stray fields and greater projection, SFMs allow designers more freedom to shape their components around the magnets.
- **Increase performance of existing designs** – Many systems immediately see significant performance improvement simply by substituting SFMs into existing designs, minimizing revision and requalification costs.
- **Improved reliability** – Using SFMs to reduce system weight, increase clearances, or thicken wear surfaces can improve efficiency and contribute to reductions in operating cost as well as improve reliability.
- **Better accuracy** – Instead of increasing the field, SFMs can be tuned for greater homogeneity, leading to improved accuracy in sensor applications.

Breadth of Applications

Motor couplings. Magnetic drive couplings benefit from the focused field and reduced weight of Arnold's SFMs. Torque increases as high as 60% have been achieved from a fixed design envelope.

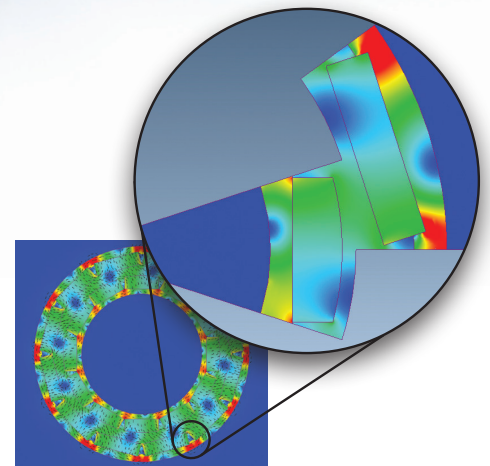
Sensors. By shaping the magnetic field for the greatest projection on the working side, SFMs allow Hall effect sensors to be driven from standoff distances 40% greater than with traditional magnets.

How SFMs are Made

Arnold's patent pending process for SFM fabrication shapes the material's anisotropy as part of the magnet manufacturing process. The particular field shape that is desired is calculated during the design phase, so that the various stages of compaction, sintering, and field alignment work together to provide an optimized magnetic field for each application.

Better, More Efficient Designs

In order to best take advantage of the potential that SFMs offer, Arnold engineers work closely with our customer's technical teams to understand their application and deliver the best possible design. The result is a unique magnet for each application, using a fully optimized manufacturing process, minimizing waste and handling. By integrating the assembly of these magnets in our manufacturing process, we are also able to find more efficiency, and deliver fully assembled and qualified components to our customers at highly competitive prices. To find out how SFMs can enhance your design, contact Arnold's engineering team to discuss your application.



▲ **Conventional magnetic** torque transfer coupling shows significant fringing and wasted magnetic field, along with a strongly saturated back iron.

▼ The **SFM solution** offers increased field strength with reduced fringing and more efficient use of magnetic field. In addition, the reduced saturation allows thinner iron.

