



About Magnetic Metals Corporation



Magnetic Metals' cores are at the heart of today's most advanced technologies. Electronic components containing our tape wound toroidal and tape wound cut cores achieve a near-perfect magnetic circuit unavailable with standard transformer laminations.

Founded in 1942, we have grown from supplying magnetic components to the U.S. military and NASA to providing cores used in:

- Power and navigation systems for the Aerospace and Defense industries;
- Transformer assemblies and GFCI's for electric vehicles and EV charging stations;
- Power supplies and transformers for medical electronic devices and power electronics;
- Communications equipment for the Telecom and Audio industries;
- Voltage monitoring & measuring devices for industrial controls and electric utilities, and many other applications.

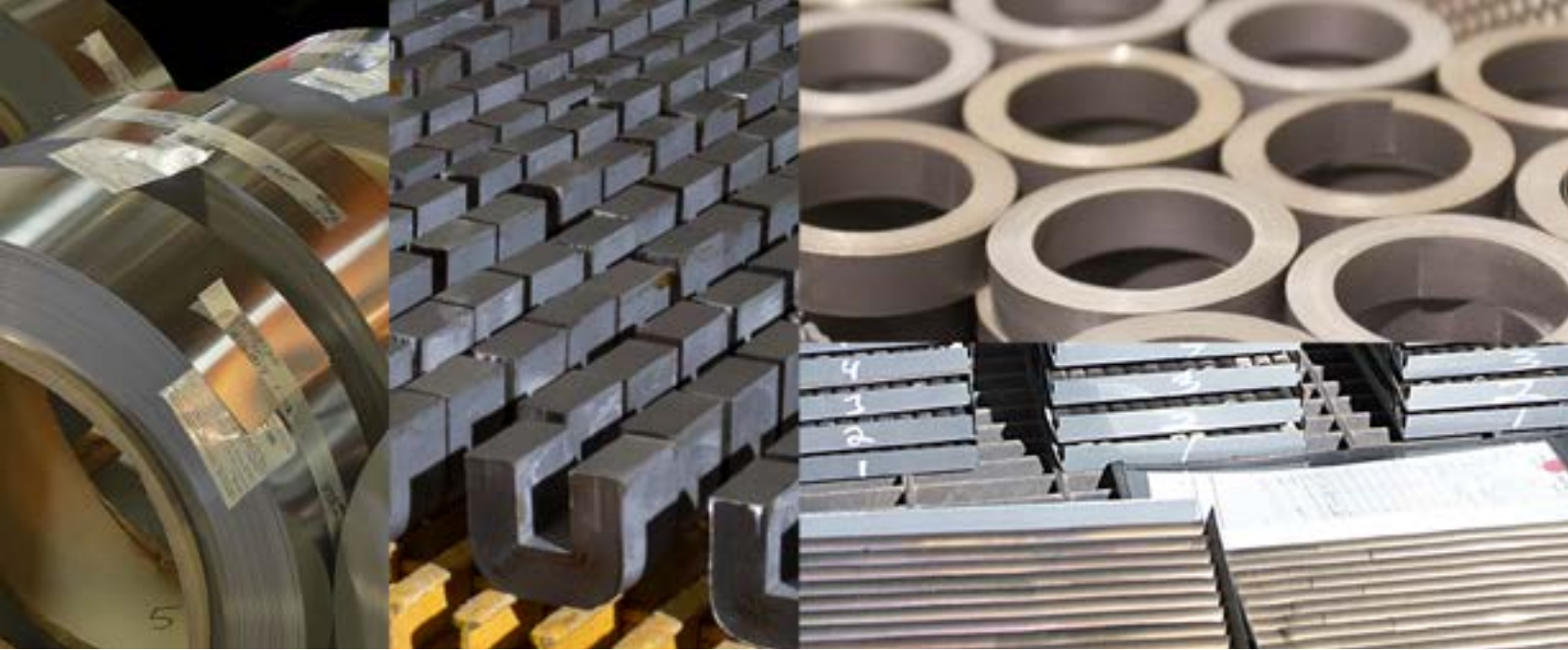
We employ a team-based development process – utilizing our technical expertise in material selection, metallurgical processing and fabrication – to engineer the highest quality magnetic components that meet our customers' most stringent specifications and application requirements.

Products and applications

Magnetic Metals products include:

- **Tape wound toroidal cores** – for voltage and current transformers, power supplies, motor controls, GFCI's, HVAC systems, inductors, converters and inverters.
- **Tape wound cut cores** – for transformers and assembly configurations with critical dimensional and weight requirements not available in standard laminations for chokes, current transformers and pulse applications.
- **Tape cores** – for input, output, audio, computer modems, communications and precision motor controls.

Advanced-Grade Materials and Value-Added Services



Magnetic Metals carries all types and thicknesses of soft magnetic materials, allowing us to tailor magnetic properties and performance characteristics – especially frequency, permeabilities and pulse properties – to your specific requirements.

We also provide magnetic testing for core loss, as well as direct-current loop and permeability testing as required to ensure quality and specification conformance.

Quality Assurance

Our Anaheim facility is ISO 9001:2015 and AS9100:2016 (D) certified. In addition to employing our own testing, Magnetic Metals conducts internal audits to verify that our quality management system complies with current requirements set by industry standards organizations.



Magnetic Metals Anaheim Division
Certificate No. 14587
ISO 9001:2015
AS9100:2016 Rev D



Registrant Code: M24352
Expiration Date: 05/31/2025

Special Services

Magnetic Metals can produce prototypes for testing and evaluation, initiate limited production, or scale up to a full production run. We can meet the largest volume tape wound toroidal and cut core orders in the industry. Our manufacturing and service capabilities include:

- Namlite® coating for optimal high frequency;
- Acid etching;
- Processing for low-noise and pulse applications;
- Core-matching;
- Customized core designs with short lead times;
- Hysteresis loop measurements (Bm/Br, Hc, etc.);
- Customized core construction.



Tape Wound Toroidal Cores



The tape wound toroidal core approaches the perfect magnetic circuit configuration as well as permitting the most efficient application of high permeability magnetic alloys. The physical and magnetic characteristics of the toroidal shape reveal many features which contribute to this near-perfect circuit.

For instance, the air gap in the magnetic path is so small that it can be considered non-existent. This minimizes losses, fringing, leakage, distortion, and decreases the magnetizing force necessary to produce a given flux within the material.

The tape wound core configuration also provides a good degree of self-shielding from external magnetic fields. The single, uniform, magnetic path causes any entering magnetic field to split into two and induce equal but opposite voltages in the two halves of a uniformly distributed winding. Thus, there tends to be no voltage apparently induced in the total winding.

Core Construction

Tape wound toroidal cores are fabricated on specially designed machines which wind insulated tape onto a mandrel under controlled tension to provide an extremely uniform cross-section. The wound cores are then annealed in a controlled atmosphere of hydrogen/nitrogen. This develops the specific magnetic characteristics required for the application.

Annealed cores are sensitive to mechanical stresses in varying degrees depending upon the alloy. These stresses cause changes in the magnetic characteristics of the material which may severely alter the performance of the finished core. To prevent these changes from taking place, the annealed tape cores are housed within cases which protect them from the strains of electrical winding and other external disturbances.

These cases are fabricated of various materials



depending upon the intended application: plastics; phenolic; nylon; glass-reinforced nylon; and aluminum are typically used.

A damping medium fills the space between the core and the case to minimize the motion of the core within the case, thus reducing the possibility of change in electrical characteristics under shock and vibration.

Available Shapes, Sizes and Materials

Magnetic Metals manufactures tape wound toroidal cores and other shapes for transformers, inductors, drive transformers, saturable reactors, magnetic amplifiers, current transformers, converters and inverters.

We offer a wide range of sizes and materials for tape wound toroidal cores. Almost any size can be made for minimum tooling costs. A wide selection

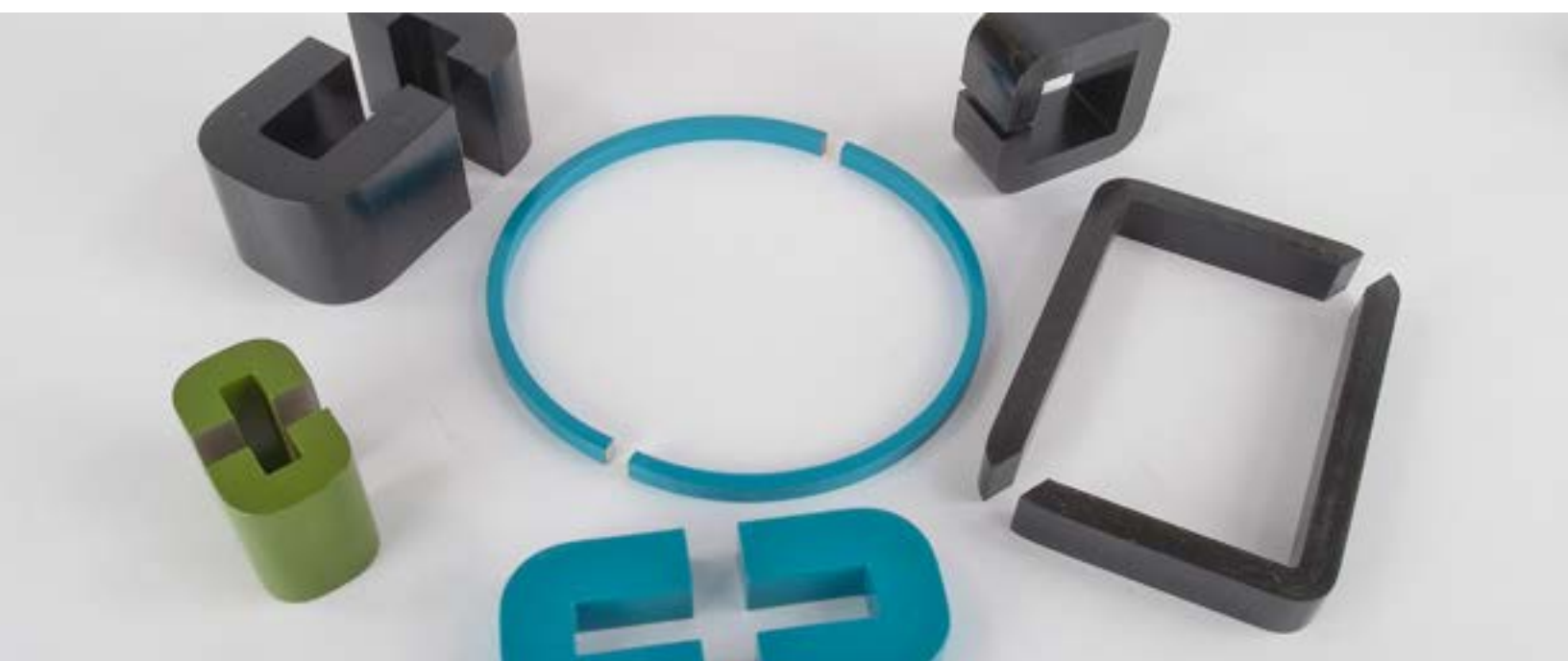
of cases or coating materials are also available to meet your requirements.

Materials include:

- Amorphous alloys;
- Cobalt iron;
- Microsil[™];
- Nanocrystalline alloys;
- Square 50 (Nickel iron);
- Supermalloy[™];
- and
- SuperPerm[™] 80 (Nickel iron).



Tape Wound Cut Cores



Tape wound cut cores are ideal for transformer design engineers who require one to several thousand transformers in shapes that are unavailable in standard lamination sizes. They also are ideally suited where weight or dimensional requirements are critical and have to be reduced, including chokes, pulse applications and current transformers.

Magnetic Metals' Tape Wound Cut Cores Also Offer:

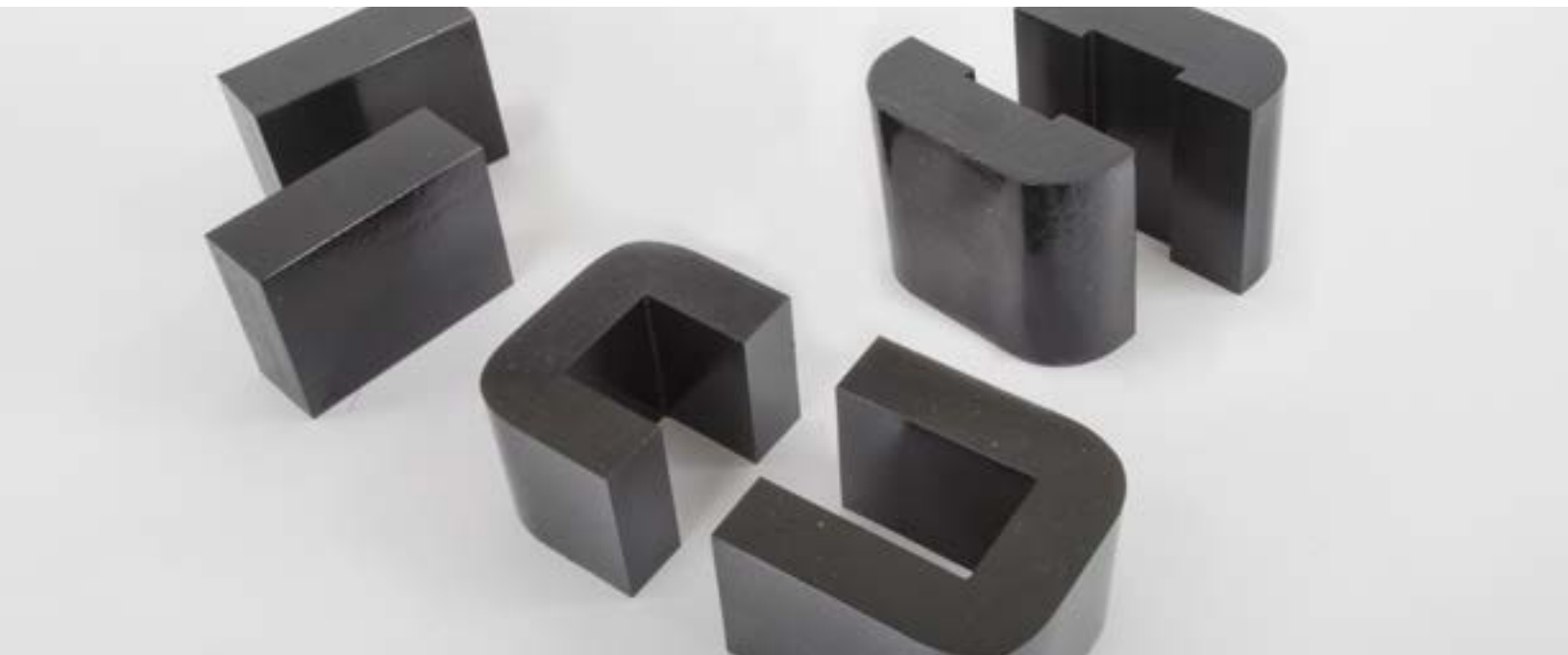
Full magnetic utilization of grain oriented silicon iron in the rolling direction;

- Lighter weight for same VA power rating;
- Flux densities through 21.0 kilogauss;
- Air gap that can be easily adjusted for specific choke design;
- Outstanding pulse performance, including high pulse permeability with or without reset;

- Operating frequency up to 40 kilohertz with thin gauge core material;
- Operating temperatures up to 350 F;
- Reduced core noise;
- Easy selection and low assembly costs;
- Wide range of core mandrels available from stock for quick delivery;
- High quality assurance of your finished parts from our proven designs and advanced manufacturing facility;
- Special sizes or shapes can be readily manufactured to meet your custom or standard designs.

Core Construction

Magnetic Metals tape wound cut core manufacturing processes are designed to produce cores having the lowest possible losses and magnetizing currents. Where required, special selection of steel is made to meet exacting specifications for very low



loss, high pulse permeability, etc. Through improved cutting procedures and butt end preparation, the air gap at the face is kept to an absolute minimum. As a result, the assembled cores exhibit exceptionally low hum and low exciting current.

The finished product is final tested to both mechanical and electrical requirements as described in the EIA Standard for Cut Cores RS-217A and according to Magnetic Metals' own stringent test requirements for cut cores.

Available Shapes, Sizes and Materials

Magnetic Metals can produce almost any size single-phase or 3-phase core without expensive tooling. Special geometric shapes and assembly configurations are available at minimal costs. Cores are manufactured with new computer controlled precision equipment or with traditional tape wound cut core manufacturing procedures.

Materials include:

- Amorphous alloys;
- Cobalt iron;
- Microsil[™] ;
- Nanocrystalline alloys;
- Square 50 (Nickel iron);
- Supermalloy[™] ; and
- SuperPerm[™] 80 (Nickel iron).





In the past 75 years, Magnetic Metals has grown from a manufacturer of nickel-iron transformer laminations for the U.S. military, to one of the largest and most competitive producers of tape wound magnetic cores used in the components of today's highly advanced electronics.

- 1942 Magnetic Metals Corporation founded in Camden, NJ, producing high grade nickel-iron transformer laminations for use in national defense.
- 1953 Expanded manufacturing capacity and product line to include oriented and non-oriented silicon steels.
- 1956 Developed use of low carbon steel for motor laminations, which improved electrical performance and reduced costs.
- 1960's Established the Western Division to provide the tape wound toroidal and tape wound cut cores needed by the aerospace and national defense industries.
- 1960's Established Metales Magneticos in San Juan del Rio, Mexico to supply the market with transformer and motor laminations.
- 1964 Established a lamination stamping operation in Brantford, Ontario, Canada.

- 1977 Inductotherm Industries acquired Magnetic Metals Corporation.
- 1979 Acquisition of Haddon Tool, manufacturer of precision rotating components.
- 1981 Established a GFCI core winding and assembly operation in Nogales, Mexico.
- 1985 Acquisition of SGL Industries, manufacturer of nickel and silicon tape wound toroidal cores.
- 2003 Acquisition of National Arnold Magnetics, the premier manufacturer of tape wound toroidal and tape wound cut cores.

Learn More

We recognize that every application is unique. That's why we encourage you to contact us to discuss your specific requirements. We'll use our technical expertise and flexible production capabilities to engineer and produce components with the maximum magnetic and performance properties available. Simply email info@magneticmetals.com or call (800) 331-0278 to receive immediate assistance.



Worldwide Headquarters

1950 Marlton Pike East, Suite 103, Cherry Hill, NJ 08003
 Phone: (856) 964-7842 Toll Free: (800) 331-0278
 Fax: (856) 365-8723
info@magneticmetals.com
www.magneticmetals.com

Western Division

2475 West LaPalma Avenue, Anaheim, CA 92801
 Phone: (714) 828-4625 Toll Free: (888) 892-8392
 Fax: (714) 828-4279
info@magneticmetals.com
www.magneticmetals.com

