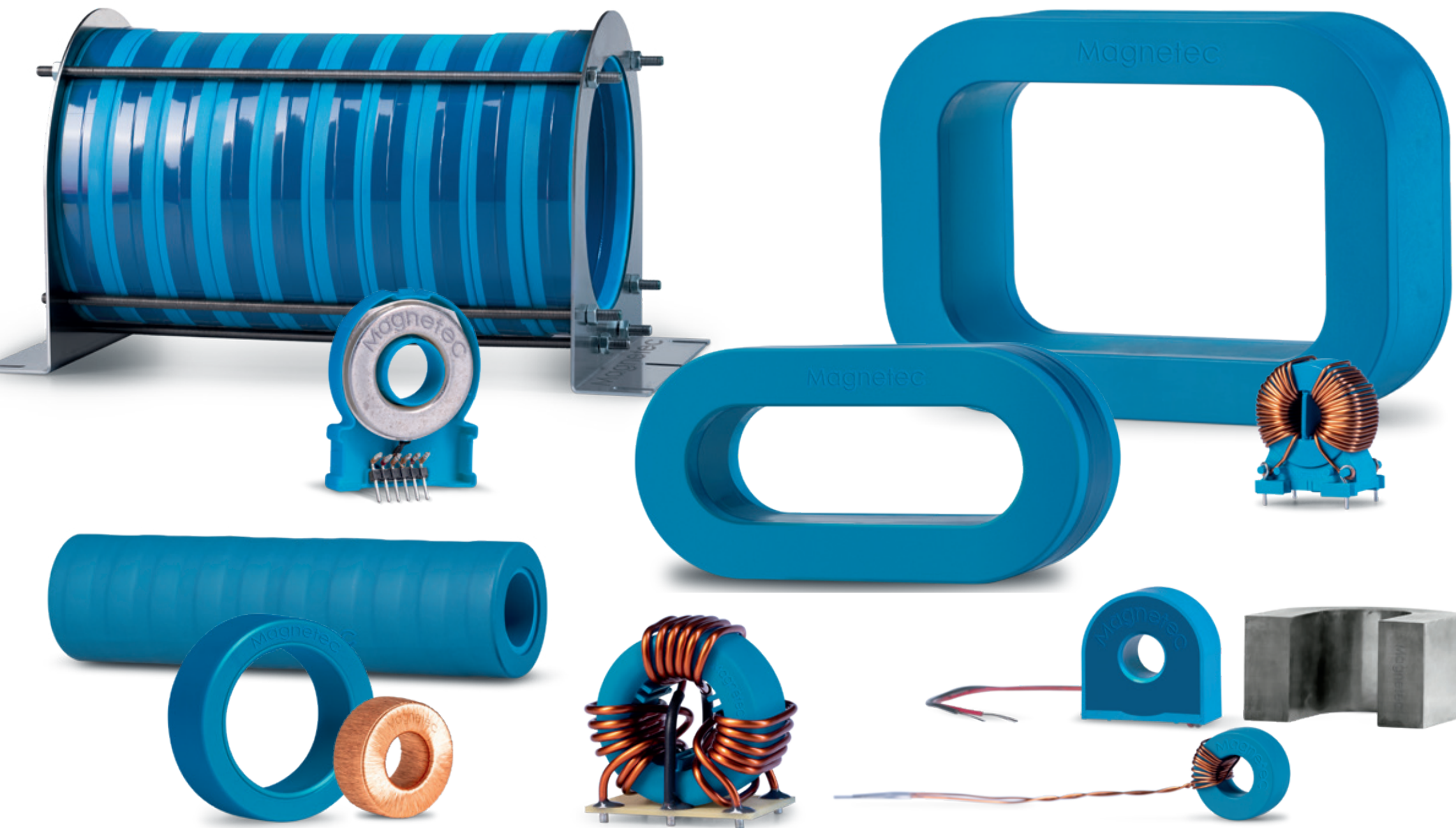




Product Overview



The MAGNETEC product portfolio

Our innovative product solutions for your needs

We at MAGNETEC have recognized what is important to our customers: ground-breaking product solutions for a wide range of applications and industries combined with honest and consistently dependable consulting services. This understanding is based on many years of industry experience, coupled with a tireless spirit of development.

MAGNETEC product solutions ensure consistent success across a variety of applications:

- Current measurements
- Current transformers for energy measurement
- Differential current sensors
- Residual current circuit breakers
- Motor bearing protection
- EMC solutions
- Power transformers
- Reduction of radiated emission
- Reduction of conducted emission
- MR series as alternative to ferrite cores

Nanperm[®], our basis for cores and chokes

Material Nanperm[®]

Nanperm[®] is a rapidly solidifying iron-based alloy with a very fine-grained crystalline structure. The average grain size of 10 nanometers justifies the term „nanocrystalline.“ This structure is responsible for the exceptionally good soft magnetic properties, which can be broadly adjusted via heat treatment while subjected to external magnetic fields.

Properties

- Saturation induction: ~ 1.2 T
- Coercivity: (quasi-static, 50 Hz) < 3 A/m
- Saturation magnetostriction: < 0.5 ppm.
- Electrical resistivity: ~ 115 $\mu\text{Ohm cm}$.
- Specific gravity: 7.35 g/cm³
- Curie temperature: ~ 600 °C
- Operating temperature range: - 40 ... + 200 °C
- Core losses: (0.3 T / 100 kHz / sinusoidal) < 110 W/kg
- Strip thickness: $\sim 17 \dots 23$ μm
- Grain size (typ.): 10 nm
- Permeability range: 1,000 ... 200,000



The MAGNETEC Portfolio

MAGNETEC's comprehensive standard product line is based on our unique nanocrystalline material Nanperm[®].

Our products are characterized by the highest permeability with low high frequency losses and can therefore be used for a wide range of applications.

Examples include:

- Common-mode chokes
- Absorber cores to reduce motor bearing currents
- Switching power supply transformers
- Drive transformers for fast-switching power semiconductors
- High-frequency current transformers
- High-precision energy meter cores and components
- DC-tolerant energy meter cores and components
- Current sensors with high nominal power
- Cores for di/dt limitation
- Sensor cores and components for residual current devices

CoolBlue®

CoolBlue® toroidal cores are made of the nanocrystalline material Nanoperm® by MAGNETEC and are used to reduce harmful motor bearing currents in high-power and/or high-current drive systems with high power and/or high switching frequencies. Unwanted bearing currents can cause fluting and pitting of motor bearings, a breakdown in bearing lubrication, and eventually the failure of the entire motor.

CoolBlue® cores reduce high-frequency interference by increasing the system impedance only for high-frequency currents, with no effect on the equipment's operation. These cores not only absorb significant amounts of current spikes at the motor terminals, but they also suppress the asymmetric EMI currents generated by the parasitic currents of the motor and the motor cable.

NaLA®

Our Line Absorber, NaLA®, are an ideal complement to CoolBlue® toroidal cores for use in inverter motor systems.

Symmetrical interference currents will be greatly reduced when combined with CoolBlue® toroidal tapewound cores. This significantly increases the motor's life.



Nanoperm® LM

Nanoperm® LM cores ($\mu_{\text{nom}} = 1,000-8,000$) offer significant advantages over conventional ferrite materials, particularly in applications with a high proportion of asymmetrical currents (e.g., frequency converters):

- Increased saturation induction at the same permeability level
- Components significantly reduced in size and weight
- Broadband and, in particular, better interference suppression in the high frequency range
- High operating temperature (typ. > 120°C)

Nanoperm® LC

Nanoperm® LC toroidal tapewound cores from MAGNETEC are cost-oriented cores for the manufacture of single-phase or multiphase current-compensated EMC chokes. Maximum attenuation is achieved with the square core cross-section while using the least amount of material. As a result, they provide an excellent alternative to existing ferrite-based solutions.

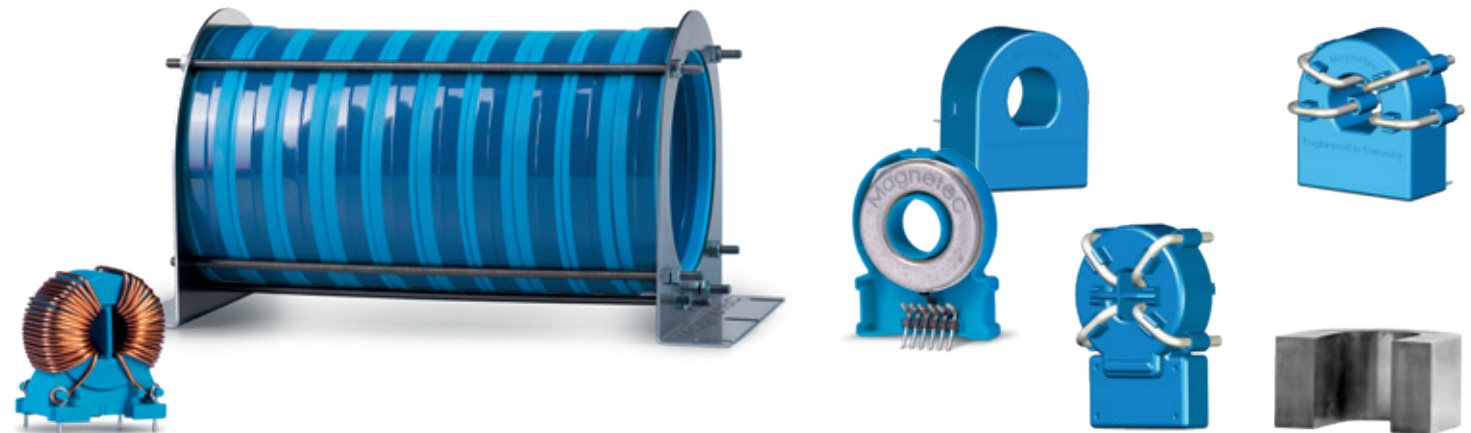
EMC Chokes

Toroidal tapewound cores made of the nanocrystalline material Nanoperm® are used in our single-phase or multiphase current-compensated EMC chokes. They have the highest insertion loss while being the smallest in size. There is a volume reduction of up to 60% when compared to commonly used ferrite-core chokes with the same nominal data. The choke designs comply with DIN EN 60938-1:2008-02 for nominal voltages of 230V, 400V, or 500V/600V.

The nominal inductance has a standard tolerance of +50%/-30%.

CoolTube®

Our CoolTube® products are intended to be used in place of shielded motor cables, which prevent the emission of high-frequency interference. Because of their simple installation, CoolTube® products are ideal as a retrofit solution to meet the increasingly stringent EMC standards. Typically, one CoolTube® product is enough for a motor cable length of 50 m and can be extended as needed, depending on the length of the motor cable.



Cut Cores

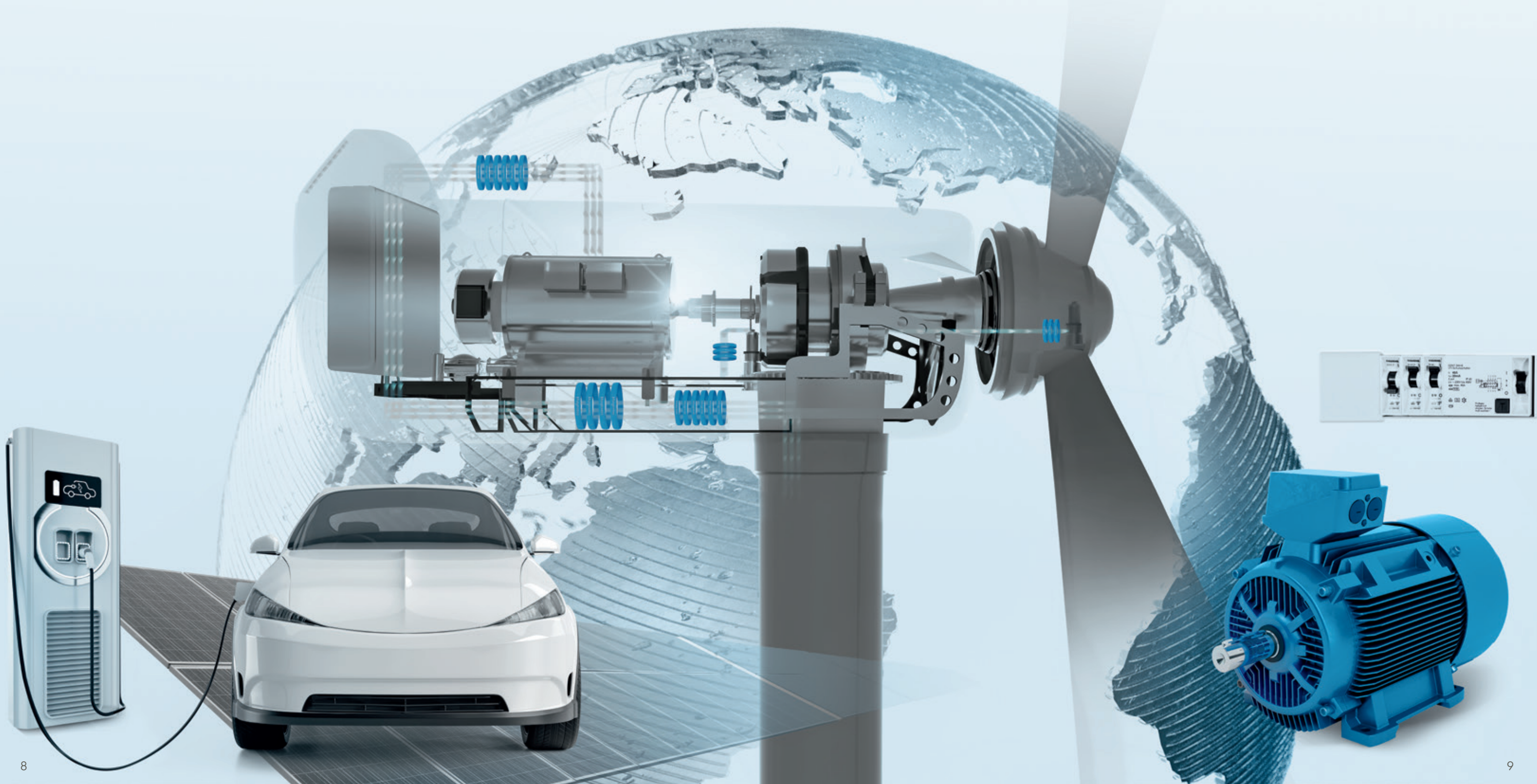
Because Cut Cores made from grain oriented electrical sheets have limited functionality in applications requiring higher frequencies and temperatures, nanocrystalline Cut Cores are used. Cut Cores are commonly used in power applications such as transformers and reactors.

MB-67x® and SafeBlue®

MAGNETEC offers AC/DC sensitive differential current transformers for charging cable (mode 2), AC wallbox (mode 3), DC charging station (mode 4) and optional in on-board charger applications.

The MB-67x® series features a high permeability Nanoperm® core, which makes the detection of very low (6mA) DC currents possible.

SafeBlue® advances the MB-67x® sensor technology by including an integrated evaluation unit. Sensor and evaluation system are perfectly aligned. This simplifies the integration in your application. The reliable detection of fault currents is thus ensured.



Product overview

Product	Features
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CoolBlue®



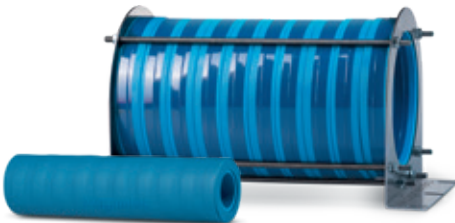
CoolBlue® toroidal cores made of the nanocrystalline material Nanoperm® for use as common mode cores, which are increasingly being used in inverter-motor/generator systems with medium to very high power and/or high cycle frequencies to reduce harmful motor bearing currents.

NaLA®



Nanoperm® line absorbers NaLA® are an ideal complement to MAGNETEC's CoolBlue® cores for use as differential mode cores in inverter-motor/generator systems to reduce high frequency interference.

CoolTube®



Our CoolTube® is made up of cores and serves as shielding for motor cables. CoolTubes® reduce the emission of high-frequency (radiated) interference through absorption.

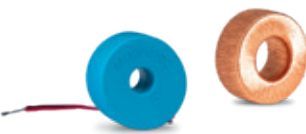
Product	Features
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Chokes



Single-phase or multiphase EMC chokes made of nanocrystalline material.

Current transformers



Current transformers made of the nanocrystalline material Nanoperm® have a particularly linear and stable hysteresis curve with a high saturation flux density, allowing for the precise detection of very small to very large currents with the least amount of phase error.

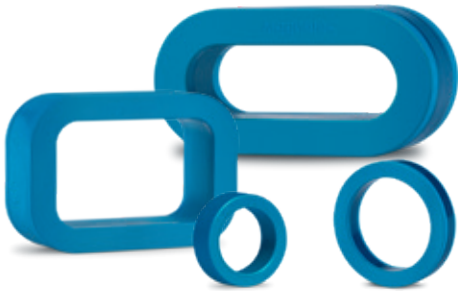
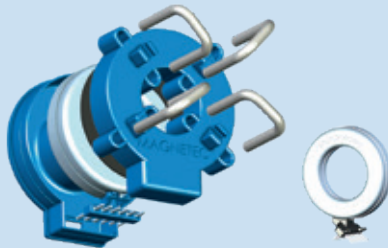
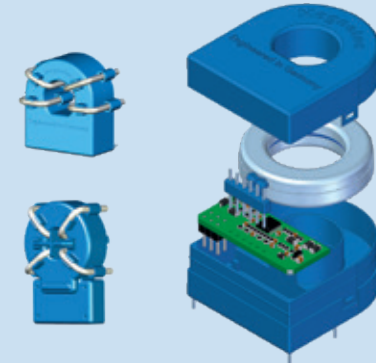
Cut Cores



Nanocrystalline Cut Cores overcome the issues associated with grainoriented electrical sheets because of their unique soft magnetic properties.



Product overview

Product	Features
<p>Standard Automotive cores</p> 	<p>Our automotive products have the highest permeability combined with the lowest high-frequency losses and are thus suitable for a wide range of applications.</p>
<p>MB-67x[®]</p> 	<p>MAGNETEC provides customers the single sensor (MB-67x[®] series) or the entire solution package (SafeBlue[®] series).</p> <p>Both, the MB-67x[®] series as well as the SafeBlue[®] series can be customized to fit customer specific application requirements.</p> <p>There are numerous design options for customization available (size, materials, surface, electric characteristics). Our SafeBlue[®] series, the perfectly aligned sensor and evaluation system, simplifies the integration into your application.</p>
<p>SafeBlue[®]</p> 	<ul style="list-style-type: none">- Usable in systems according to IEC 62955, IEC 62752, IEC 61851, IEC 61008, IEC 61009, IEC 61543, UL 2231, UL 2594, GBT 18487- Optional additional features possible, including functional safety according to IEC 61508 and UL 1998

Services

The MAGNETEC team, which is made up of highly motivated and skilled employees, will be happy to assist you whenever you need it and will work with you to ensure the successful completion of your project.

- Application consulting for motor bearing current reduction
- Advice on the design and dimensioning of cores to reduce high-frequency currents (e.g. generated by VFDs)
- Measurement of common-mode and peak currents on-site
- Provide measurement protocols with actionable recommendations



We look forward to your inquiry!

We will be happy to answer any questions you have about MAGNETEC's comprehensive product and service offering.

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