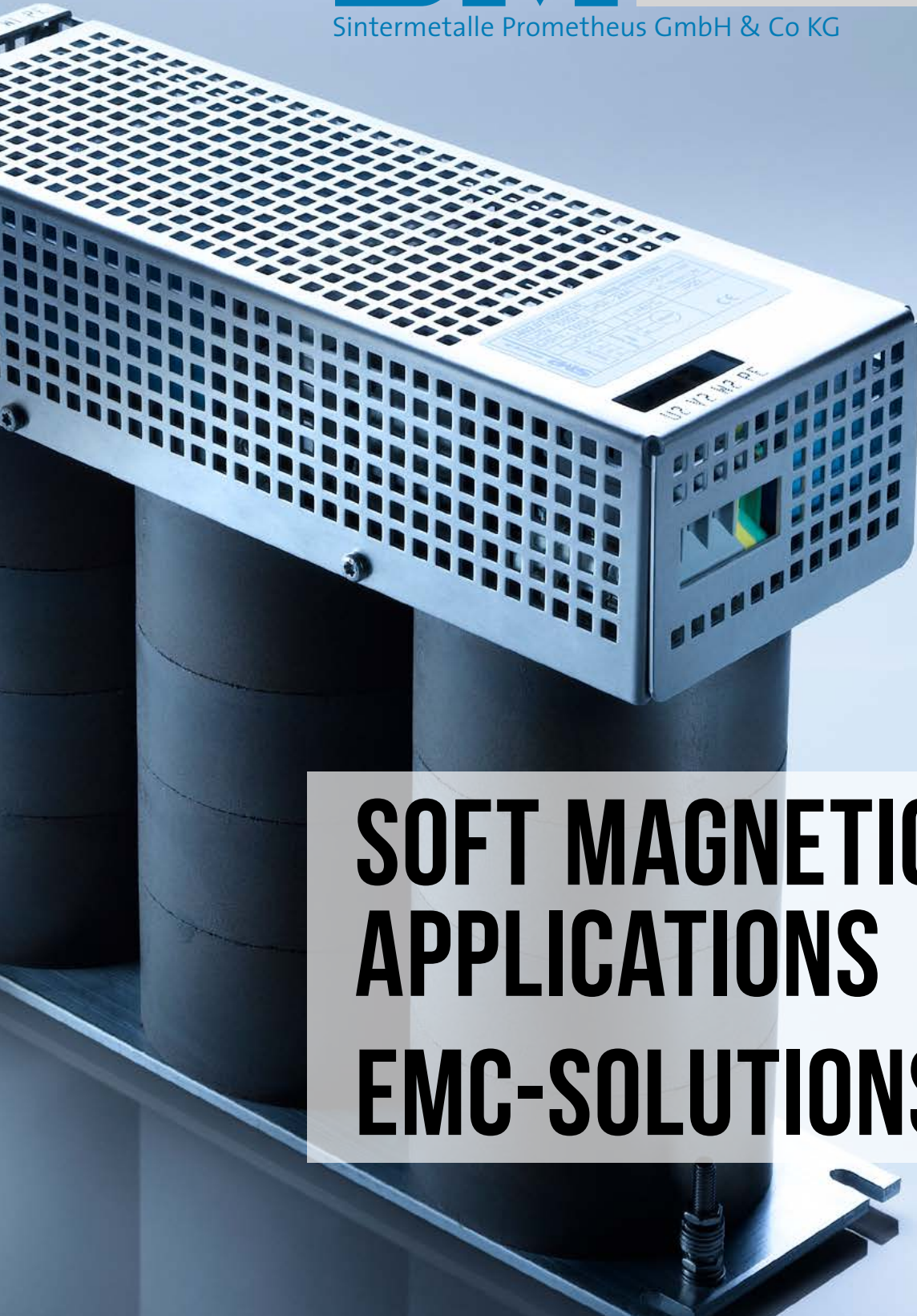


SMP

Sintermetalle Prometheus GmbH & Co KG



SOFT MAGNETIC APPLICATIONS EMC-SOLUTIONS





DECISIONS ARE BASED ON MATERIALS

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IT BEGINS WITH RESEARCH AND DEVELOPMENT

Since 1982 at the service of progress

- Research and development
- Highest quality
- Highest technical and administrative security
- Documentation of all processes
- Fair value for money
- Competent and individual advice through our know-how in material and electrical engineering
- High manufacturing depth to ensure quality and quantity



FROM MELTING TO PRODUCT.

SINTERMETALLE PROMETHEUS



Graben-Neudorf in Germany (D)



Kapfenberg in Austria (A)

SMP is a family company, which was founded in 1982 by Dr.-Ing. V. Gemenetzi. Our technology is based on the powder metallurgy of soft magnetic materials. Our strength is the high development- and production depth. All magnetic SMP-HFCM-materials are developed and produced by ourselves. All steps beginning from the raw material up to the end product are in SMP's hand.

The application field of SMP-HFCM-materials is the complete power electronics for the whole frequency spectrum up to the GHz-range.



„High Frequency
Composite Materials“

**SEVERAL PRODUCTION DEPARTMENTS AND
LABORATORIES ALLOW SMP TO PROVIDE
OPTIMIZED SOLUTIONS FOR YOUR APPLICATION.**

PRODUCTION DEPARTMENTS OF SMP

Powder Production

Production of soft magnetic materials with our atomization plant.

Pressing - Department

All cores and molded components are made by SMP with SMP powder composite materials HFCM. Therefore it is easy for us to realize special constructions beside our standard products.

Winding - Department

All coils are produced by SMP. We are capable of realizing different winding techniques, adapted to the requested application.

Tool Making - Department

Being able to design and optimize cores and injection-molding parts, SMP has also its own tool making department. Thereby, new constructions can be produced fast.

Injection Molding - Department

Having the ability to design and produce our insulation systems, SMP has also its own injection-molding department.

Mounting - Department

All components for filter systems and modules are assembled at SMP.

LABORATORIES OF SMP

EVERYTHING
UNDER ONE ROOF

RECORDED
DEVELOPMENT AND
PRODUCTION

TRACEABLE AT
EVERY TIME

SMP

Electrotechnical Laboratory

The products are tested electrically with the real application condition by modulating different currents and frequencies (reproduction of current - FFT):

- All forms of current curves can be reproduced
- Currents up to 1000 A
- Frequencies up to 20 kHz

Therefore we:

- optimize materials
- measure the losses and the Q factor of the final product
- test the heating behavior at different cooling conditions (liquid-cooling, air-cooling or free convection)

This laboratory is also used as a pre-stage for a release.

Laboratory for Material Engineering

New material technologies and customer specific solutions are developed and realized. The materials are developed and optimized in magnetic, electrical, mechanical and chemical properties.

EMC - Laboratory

SMP can measure conducted and radiated emissions. Therefore filters as well as the material characteristics are optimized for the customer application.

OWN POWDER PRODUCTION FOR THE RIGHT MATERIALS

The knowledge to master processes of powder metallurgy fulfills the component's requirements and ensure the continuous development of new soft magnetic materials.

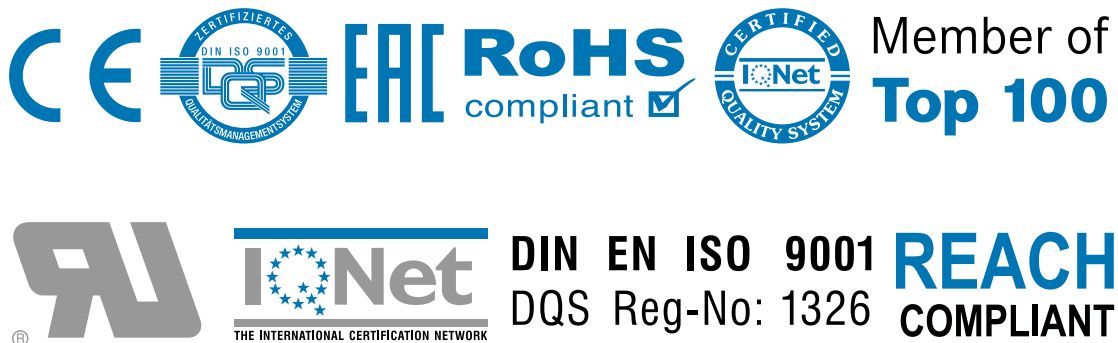


In house material development and production

- Own production of materials:
 - » Reliable supply by high capacities (250 tons per month)
 - » Material selection for highest quality
- Change of production parameters and generating solutions specific for applications
- Creating specific materials with special characteristics, like magnetostriction-free materials for quiet applications

Certifications & Standards

According to the varied requirements the components can be constructed to the application conditions.



All common standards are realizable:

- ISO 9001 : 2015 certified (DQS)
- EN / IEC
- UL:
 - » Simple possibility of product certification through UL.
- SMP has its own UL-accepted isolation system.
- Fire protection certification according to DIN EN 45545
- Protection class up to IP66 according to DIN EN 60529
- RoHS and REACH conformity

ADVANTAGES

Due to the high development and production depth, the physical properties of the SMP powder composite materials HFCM have the following huge advantages compared to electric sheet steel and ferrite solutions, shown in an example in power electronics:

- Up to 40 dB (μ V) lower EMC-emission (conducted and radiated emission)
- Weight savings up to 40%
- Volume savings up to 50%
- Low acoustic noise development due to our magnetostriction-free materials, which are developed and produced by our fabrication. An attractive application can be found in sine-wave filters: noises are hugely reduced at the motor and sine-wave filter.
- Higher fundamental frequencies possible without derating
- High control range in relation to ferrites. HFCM saturation induction up to 2 T.
- Effective smoothing of currents and voltages for isolation-protecting applications.
- High dynamic of the system due to the lower required All Mode inductance.

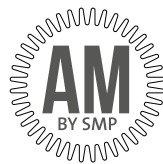




High Frequency Composite Materials

SMP-HFCM materials have a boundless freedom in the alloy formation, because no diverse punching- and rolling processes are needed compared with the electric sheet steel materials. Therefore, materials with special properties like „magnetostriction-freedom“ can be produced. This is for sine-wave filter-application very attractive, because noises are hugely reduced at the motor and sine-wave filter.

ALL MODE TECHNOLOGY



Differential mode and common mode disturbances, as well as all phase-shifted interferences are damped simultaneously and equally.

Product Range

- Frequencies: up to GHz-range
- Currents: up to 2000 A (special applications up to 3000 A)
- Saturation induction up to 2 Tesla
- Diameter of magnetic cores: 19 mm up to 300 mm
- Weight: 50 g up to 130 kg
- Temperature Class H according to DIN EN 60085
- HL 3 according to DIN EN 45545-2
- Protection Class up to IP66 according to DIN EN 60529

Further Technical Properties

- 3-dimensional-Isotropy: any kind of compact, shielded constructions are possible
- Minimal magnetic path length
 - » fewer Ampere windings are needed for the same magnetic excitation.
- Very low eddy current- and hysteresis losses
- High inductance-stability over frequency
- High control range: saturation induction up to 2 T
- High Curie temperature of the material (approx. 800 °C)

Optimized Solutions

By combining the SMP-HFCM technology and the All Mode technology about 50% less filter components are needed. For e.g. no additional Common Mode chokes or Common Mode filters.

FILTER TECHNOLOGIES

**LOW-NOISE FILTERS DUE TO
MAGNETOSTRICTION-FREE MATERIALS**

**Our filters are
set up as:**

- Sine-wave filter
- du/dt filter
- Acceptor circuit filter
- DC-Link filter
- Input filter
- etc.



EMC-COMPLIANT WIRING
SHIELDED CONSTRUCTION

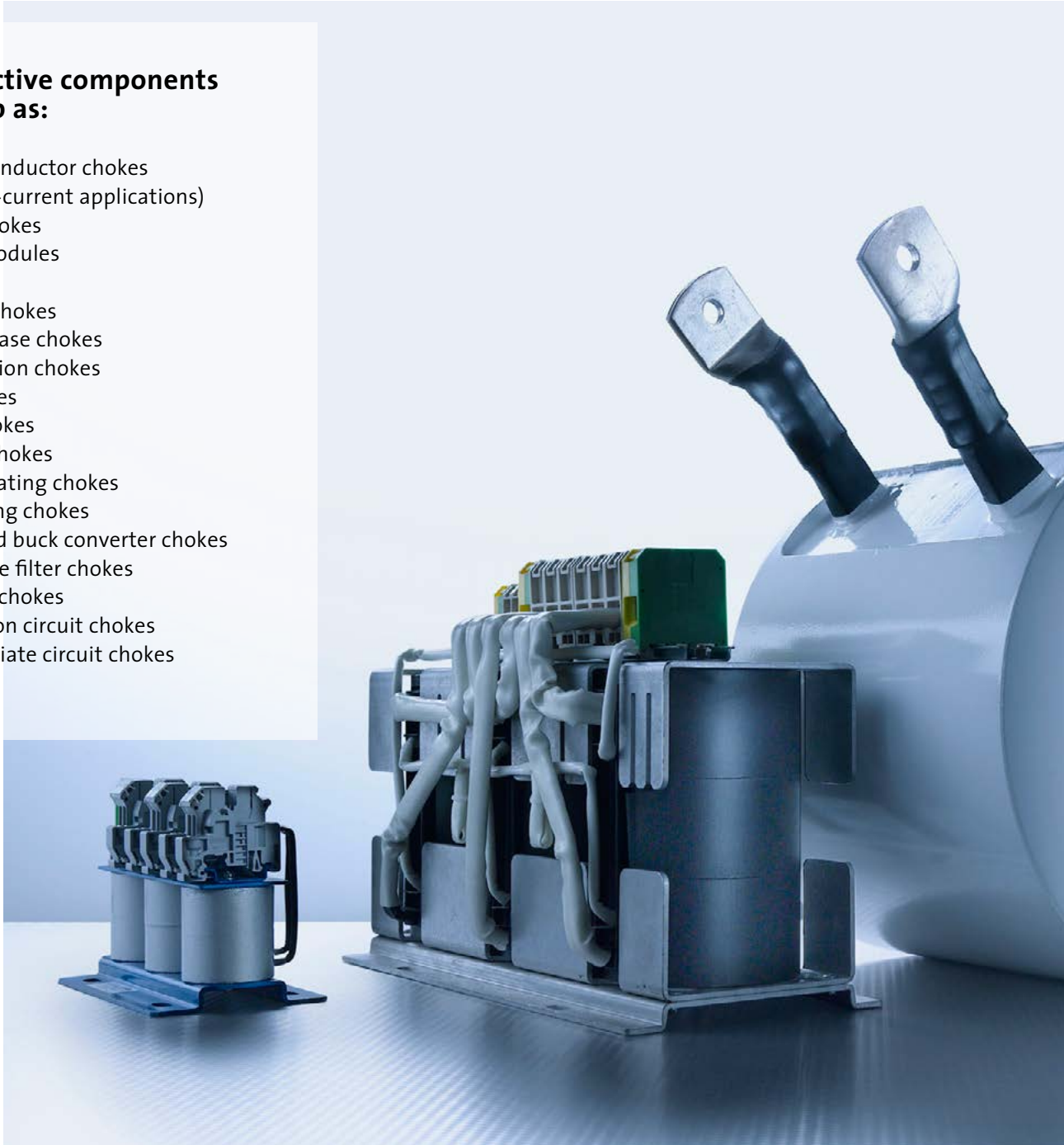


High Frequency Composite Materials

INDUCTIVE COMPONENTS

Our inductive components are set up as:

- Single-conductor chokes
(for high-current applications)
- Single chokes
- Choke modules
- LC filters
- Storage chokes
- Three-phase chokes
- Suppression chokes
- PFC chokes
- Input chokes
- Output chokes
- Commutating chokes
- Smoothing chokes
- Boost and buck converter chokes
- Sine-wave filter chokes
- Chopper chokes
- Absorption circuit chokes
- Intermediate circuit chokes
- etc.



MAGNETIC COUPLED COMPONENTS



Our magnetic coupled components are set up as:

- Transformers
- Controlling choke using the transformational utilization of an additional coil for:
 - » Current measurement
 - » Control signals
 - » Monitoring the saturation induction
 - » Adjustment of the Q-Factor and heating discharge of the choke with possible energy recovery
 - » Targeted adjustment of the inductance through magnetic bias of the magnetic materials
- Medium-frequency-transformers
- Flux-coupled choke (buildup as common mode- or differential mode-choke)

Realised by:

- Variation of coiling types:
 - » Bifilar coil
 - » Separated coil
 - » Overlapped coil
- Varying geometries of the moulded parts

**COMPACT,
QUIET,
MULTIFACETED**

CORES & MOLDED PARTS

YOUR DEVELOPMENT PARTNERSHIP FOR POWER ELECTRONICS



Our cores and molded parts are set up as:

- Magnetic molded parts:
 - » Stators
 - » Rotors
 - » Flux concentrating parts for motors and drive systems
- Magnetic cores:
 - » E-Cores
 - » U-Cores
 - » Half toroidal cores
 - » Ring punching
 - » Mushroom-Cores
 - » Rectangles
 - » Toroidal-Cores
 - » Isostatic pressed blocks

DRIVE TECHNOLOGY

Railway | Ship Technology | Electromobility

SMP has developed a set of chokes for converters in railway technology. High demands are posed to these components: They must be shake and shock proof in all directions, withstand high temperatures, fit into limited installation spaces, be protected against dust, dirt and water penetrating as well as be silent when used in passenger trains.

Thanks to our special developed magnetostriction-free materials we are able to produce very quiet chokes for these applications.

A high temperature resistance of the chokes is warranted by a UL listed, class H (180° C) insulation system.

INDUSTRIAL APPLICATIONS

Power Electronics | Automation | Signal Processing

The energy-efficient and high-performance chokes from SMP are very compact and space-saving. They are used in:

- Power converters
- Robotics
- Mechanical and plant engineering
- Circuit technology
- High-performance light sources
- Welding technology
- Induction heating
- Control engineering
- Manufacturing technology

BIOMEDICAL ENGINEERING

MRI | CT | X-Ray | Ultrasonic Devices

The chokes that SMP developed for a renowned German manufacturer of MRT scanners are located in the so-called gradient pulse amplifier. The task of the filter and line chokes is to provide both a clean sine wave as well as a low-loss recovery of the energy which is not needed.

In doing so, the chokes are characterized by their magnetostriction-free powder composite materials specifically developed for this application. These materials enable the construction of very low-noise chokes.

In order to keep the exposure to radiation low and the time in the cramped, unfamiliar situation short, the MRT device needs to be fast and efficient - chokes from SMP fulfill these high requirements.

RENEWABLE ENERGIES

Solar | Wind | Water Energy Storage System | Bioconversion

SMP provides low-loss components for both wind turbines as well as photovoltaic inverters. The energy-efficient and high-performance chokes from SMP are very compact and space-saving. But they are also distinguished by being maintenance-free and their longevity which comes at an advantage with regard to the costly maintenance of offshore wind turbines.

CONVENTIONAL ENERGIES

Thermal- | Nuclear Power Plants | Oil Exploration

SMP develops and delivers high-quality chokes in the field of oil exploration. In this context, protection against extreme environmental conditions is of key importance.

In the power plant section chokes with high performances are primarily in demand. The abundance of IP66 allows the mounting of the chokes outside of the inverter. To simplify the mounting SMP offers chokes with particular mounting brackets.



AEROSPACE INDUSTRY

Satellite- | Aircraft- | Space Technology

Utilizations of these applications are characterized by excellent compactness of SMP's components, especially by weight savings and low loss-products, which is extremely important in this industry.

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The enormous range of possibilities means that it is essential to consider the optimal shape of the components at the design stage. We will be glad to provide you with a suitably dimensioned component based on your data.

For inquiries please fill out our online inquiry forms on our website:



www.smp-online.com
www.smp.de

These online forms are available for download in PDF format.

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Top 100



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