



*Press release*

## **Inductive components with high frequency stability for railway applications**

*Graben-Neudorf, Germany, December 2025* – SMP Sintermetalle Prometheus presents inductive components with high frequency stability for use in railway applications. The components are used in all power electronic systems, such as inverters for three-phase asynchronous motors or auxiliary power units. The materials specially developed and manufactured by SMP are effective at frequencies up to the gigahertz range.

The components reduce interference currents and voltage spikes in power converter systems caused by parasitic effects and switching elements of the converter. The material plays a crucial role in this context: the objective is to achieve stable inductance at the operating point across the entire frequency spectrum in order to maximize interference damping. Compared with standard technologies using materials such as ferrite, electrical steel laminations and nanocrystalline materials, SMP's inductive filter systems exhibit interference levels up to 40 dB[ $\mu$ V] lower and are up to 40 percent lighter. Owing to the use of magnetostriction-free materials, they generate no audible noise. Thanks to their inductance stability, the components can be designed with lower inductance values, enabling high system dynamics. Voltage spikes that occur periodically at the inverter switching frequency are significantly reduced, thereby extending the service life of electric motors.

Fast-switching SiC and GaN semiconductors place high demands on magnetic materials. The very low losses of the materials used in SMP products improve the overall system efficiency. In addition, fewer filter components are required, reducing system volume and significantly increasing the cost-effectiveness of the overall power electronic system.

Inductive components from SMP are used in a wide range of applications in high-speed trains, metro systems, freight trains and passenger trains. The manufacturer is a leader in the development and production of electronic components that enhance the efficiency, safety and performance of state-of-the-art rail vehicles.

Headquartered in Germany, the company specialises in the development and manufacture of electronic filter systems, inductive components, medium-frequency transformers and soft magnetic moulded parts. The product portfolio is designed for currents of up to 2000 A, and up to 3000 A for special applications, as well as for frequencies reaching the gigahertz range.



The materials developed and manufactured in-house by SMP feature high saturation induction values of up to 2 Tesla. Individual components can be produced in sizes ranging from 19 mm to 300 mm and with weights from 0.05 kg to 130 kg. The class H insulation system (up to 180°C) is UL certified. Depending on the application, ingress protection ratings up to IP66 are available. HL classifications in accordance with EN 45545 can be specified upon request.

In addition to railway applications, SMP components are used in power electronics applications in drive technology, robotics, medical technology, automotive, aerospace, energy conversion and renewable energy systems.

**Picture:**

SMP choke with IP66 ingress protection rating

**Company information:**

SMP Sintermetalle Prometheus GmbH & Co KG develops and manufactures inductive components, filter systems and soft magnetic moulded parts. The products are marketed worldwide, with an export share exceeding 50 percent. The company was founded in 1982 by materials science expert Dr.-Ing. Vasilios Gemenetzis to manufacture sintered metals using a proprietary process. Since 1994, SMP has focused on the production of electrical components. Materials science continues to play a key role in the development of ultra-low-loss inductive components: the powder composite materials used are developed and manufactured in-house. To cover the entire production cycle, an additional plant for the development and manufacture of powder composite materials was established in 2008. In 2011, SMP expanded its production capabilities with an injection moulding department for in-house development and manufacture of coil formers and insulation systems. The company also operates an EMC laboratory for conducting both conducted and radiated emission measurements.

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