PRESS RELEASE

THEVA INTRODUCES SUPERCONDUCTOR WITH RECORD PERFORMANCE FOR MAGNETIC FIELD APPLICATIONS

Ismaning, August 27, 2021 - After two years of intensive development, THEVA has introduced a new high-temperature superconductor (HTS) wire type of its Pro-Line product group. Embedded nanoparticles increase the magnetic field strength by more than double, so that higher fields can be achieved in more compact magnetic coils. The conductor thus surpasses all conventional superconductors used to date and also the first-generation (1G) high-temperature superconductors. It thus opens up completely new perspectives for the realization and use of high magnetic fields in research and technology.

The material was specially designed for high-field applications and achieves incredibly high current densities of more than 800 A/mm^2 in a field of 20 Tesla and at a temperature of 20 Kelvin. This development was triggered by the extremely challenging requirements of private initiatives in the field of nuclear fusion. There, plasma is enclosed in a kind of magnetic bottle at 100 million degrees. The higher the field, the more compact such reactors can be built. "HTS wire are becoming real game changers there. Instead of plants covering a football field, such an HTS-based fusion reactor is only the size of a single-family house" explains Dr. Werner Prusseit, managing director of THEVA. "However, this development also opens up new perspectives in many other areas, including medical technology and analytics. For example, the first superconducting magnets have already been realized that produce a permanent field of more than 32 Tesla, and reaching the 40 Tesla mark should only be a matter of time. For nuclear magnetic resonance, this means a tremendous increase in resolution and the beam guidance in large accelerators, such as at CERN, can be kept more compact even with increasing particle energies".

The central key to this development is the incorporation of nanometer-sized non-superconducting phases into the superconductor matrix. These act as artificial pinning centers for the magnetic flux in the superconductor and prevent its (lossy) movement despite the enormous pull of Lorentz forces. The HTS material thus becomes stiffer in the magnetic field and allows the transport of higher currents. In addition, the substrate thickness supporting the superconducting layer could be reduced by 20 percent. This further increases the technical current density in the HTS wire.

In addition to the Pro-Line HTS wire, THEVA develops and builds solenoid coils for industrial and transportation applications, too. The increased performance of the HTS conductors also ensures a reduction in costs there, as less material has to be used to achieve the same field strength.

About THEVA Dünnschichttechnik GmbH:

With 25 years of experience in coating and equipment technology and a broad patent portfolio in production engineering, THEVA manufactures high-temperature superconductors (HTS) for lossless transport of extremely high electrical currents, representing a unique approach to superconductor manufacturing.

The company has invested more than fifteen years in development and set up the first commercial HTS conductor production facility in Germany. Thanks to its extremely high energy density, THEVA Pro-Line can replace conventional copper conductors in high-power applications and opens up completely new perspectives for the construction of electrical components. Manufacturers of cables, circuit breakers, large electric drives and busbars can rely on the material's high quality standard and performance. THEVA also stands for excellent solutions in coating technology and equipment engineering.

THEVA Dünnschichttechnik GmbH was founded in 1996 and is today with around 50 employees the leading European manufacturer of high-temperature superconductors. With headquarters in Germany and contacts in Asia and the USA, the company is present for its customers worldwide.

In 2012, two financially strong investors, Target Partners and BayBG, came on board. Since 2016, eCAPITAL and Bayern Kapital have also been supporting the company's growth. Since the third financing round in 2017, EnBW New Ventures has also been one of the investors.

Press contact:
Sara Landvogt
THEVA Dünnschichttechnik GmbH
Rote-Kreuz-Str. 8
85737 Ismaning
T: +49 89 923 346 16
M: info@theva.com
W: www.theva.com