THEVA

PRESS RELEASE

THEVA ACHIEVES RECORD PERFORMANCE IN HTS TAPES AND INTRODUCES NEW HIGH PERFORMANCE CONDUCTORS TO THE MARKET

Ismaning, 31st July 2020 – High-temperature superconductors (HTS) are characterized by their enormously high current carrying capacity compared to conventional electrical conductors. At 500 A/mm^2 this is approx. 100 – 200 times higher than that of copper wire. In almost all fields of application for HTS conductors - from high field magnets to cables - the current density therefore plays a crucial role in the performance of the overall system.

THEVA has now succeeded in doubling the current carrying capacity of its Pro-Line superconductors. In test series on production lines, standard processes were used to produce tape conductors over more than 400 m long, which carry more than 1000 A transport current at 12 mm width and 75 µm thickness, which corresponds to a current density of 1100 A/mm^2. The record level was even 1350 A, i.e. 1500 A/mm^2, under standard measuring conditions in liquid nitrogen at 77 K (-196°C).

This development was made possible by a unique feature of the THEVA manufacturing process. This process is characterized by a very simple layer architecture, using a MgO buffer layer with tilted orientation. The special growth mode allows the production of very thick HTS layers without degradation of crystalline quality, so that the current carrying capacity scales linearly with the HTS layer thickness. With this tuning screw, it was possible to achieve the high current carrying capacity by simply adjusting the coating processes. This development enables THEVA to bring Pro-Line superconductors with significantly increased current-carrying capacity to the market.

Currently, the complex product qualification process is underway, in which not only the electrical and magnetic performance, but also the mechanical properties are determined in detail. Completion of this process is planned in autumn. However, the results so far are very encouraging and already show that the conductors meet the same high requirements as the previous Pro-Line superconductors.

Already today, the new HTS tapes with a guaranteed current carrying capacity of up to 850 A can be ordered from THEVA. Compared to the previous maximum value of 500 A this is an increase of 70%!

This development represents a significant improvement for all users. It allows customers in the field of high-field magnets for cutting-edge research to exploit even higher magnetic fields. In power engineering, e.g. for generators and high-current cables, the improved Pro-Line superconductors allow significantly more compact designs and higher power densities to be achieved.

About THEVA Dünnschichttechnik GmbH:
With nearly 25 years' experience in coating technology and equipment engineering, and patented production technology, THEVA manufactures high-temperature superconductors (HTS) for the loss-free transmission of extremely high electric current. Today the company stands for a unique approach in superconductor production.
THEVA has invested over fifteen years in development to build Germany's first commercial HTS production plant.
Thanks to its very high energy density, THEVA Pro-Line superconductor can replace conventional copper wire in high-performance applications. It opens entirely new scope for the design of electrical components. Manufacturers of cables, power switches, large electric drives and power rails can rely on the high quality and performance of the material.
THEVA provides high-end solutions in coating technology and equipment engineering.
THEVA Dünnschichttechnik GmbH was founded in 1996 and today has around 50 employees. Headquartered in Germany and with representatives in Asia and the USA, the company has a global presence for its customers.
In 2012, with Target Partners and BayBG two powerful VC partners came on board. Since 2016 eCapital and Bayern Kapital have also been supporting the growth of the company. As of the third financing round in 2017 EnBW New Ventures is also among the investors.

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