

Press Release

Wiesbaden, August 12, 2020

Consortium develops a new generation of thermal insulation for high-temperature furnaces

In the joint project "AeroFurnace" funded by the German Federal Ministry of Economic Affairs and Energy (BMWi), the consortium, consisting of the Bavarian Center for Applied Energy Research e.V. (ZAE Bayern) as joint coordinator, the furnace manufacturer FCT Systeme, and SGL Carbon has succeeded in improving the thermal insulation properties of a new composite material by up to 120 percent compared to commercially available felt-based carbon materials. This enabled the project partners to move into a new quality level of thermal insulation in high-temperature industrial applications and pave the way for more energy efficient thermal insulation.

Dr. Gudrun Reichenauer, coordinator of the joint project and head of the work group Nanomaterials at ZAE Bayern: "In this project, we have been able to make the latest findings from the world of nanomaterials accessible to the market through intensive cooperation and thus set new standards in the field of thermal insulation materials."

Dr. Thomas Kirschbaum, project manager at SGL Carbon: "In furnace simulations at the partner FCT, we have already been able to demonstrate what the new material can do: Depending on the temperature program, up to 40 percent of the required process energy can be saved with the new thermal insulation material. The potential of the new material is great." This prediction will be reviewed under real conditions in a demonstrator component in the second half of 2020 as part of the still ongoing BMWi project.

Dr. Jürgen Hennicke, project lead and head of R&D at FCT Systeme: "As a leading manufacturer of industrial vacuum or inert gas high temperature furnaces, the new generation of insulating materials enables us to create furnaces with a more favorable ratio of usable space to external dimensions, thus offering customers improved cost efficiency and productivity".

Based on laboratory samples in plate form it has already been demonstrated that the production of the new material can be represented by technically simple processes and is in principle well scalable. However, there is still a long way to go before the product is ready for serial production.

The third largest share of final energy in Germany is used for the generation of heat in industrial processes (22.6 percent). In many industries, e.g. in the steel and ceramics industry, energy-intensive high-temperature processes run above 1000°C – these alone require almost 50 percent of the industrial process heat. Suitable thermal insulation materials can significantly reduce energy demand while maintaining the same usable volume.

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About SGL Carbon

SGL Carbon is a technology-based company and world leader in the development and production of carbon-based solutions. Its high-quality materials and products made from specialty graphite and composites are used in industrial sectors that determine the future: automotive, aerospace, solar and wind energy, semiconductor and LEDs as well as in the production of lithium-ion batteries, fuel cell and other energy storage systems. In addition, SGL Carbon develops solutions for chemical and industrial applications.

In 2019, SGL Carbon SE generated sales of around 1.1 billion euros. The company has approx. 5,100 employees at 31 locations in Europe, North America, and Asia.

Materials, products and solutions from SGL Carbon are embedded in the major topics of the future: sustainable mobility, new energies and cross-industry digitization. Further developments in these areas demand more intelligent, more efficient, networked and sustainable solutions. This is where the entrepreneurial vision of SGL Carbon evolves around: contributing to a smarter world.

Further information on SGL Carbon can be found at www.sgllcarbon.com/press.

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About Bavarian Center for Applied Energy Research (ZAE Bayern)

As one of the leading institutes in the field of applied energy research, the Bavarian Center for Applied Energy Research (ZAE Bayern) combines excellent research with fast implementations of the results in economic practice. ZAE Bayern's main research priorities are "increased use of renewable energies" and "increasing energy efficiency". A special feature of ZAE Bayern is its scientific depth, from the fundamentals to the application, with which the core topics of research and development are pursued. ZAE Bayern develops energy-saving concepts, techniques and systems, investigates energy storage technologies and develops renewable energy sources. For example, ZAE Bayern's research at its locations focuses on thermal and electrochemical energy storage, energy-optimized buildings and urban districts, energy-efficient processes, building-integrated photovoltaics, solar thermal energy, geothermal energy, thermophysics, nanomaterials, smart grids and energy systems. In its research activities, it combines materials research, component development and system optimization in an interdisciplinary approach. ZAE Bayern offers its partners from industry and science a broad range of services, from metrological services to complex research and development projects. ZAE Bayern is supported by the Bavarian State Ministry of Economic Affairs, Regional Development and Energy.

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About FCT Systeme GmbH

FCT Systeme GmbH designs and manufactures high-temperature plants for the production of modern high-performance materials such as non-oxide ceramics, powder metallurgical materials and composites at its site in Frankenblick, Germany.

With more than 40 years of experience the company focuses on spark plasma sintering systems (also known as Field Assisted Sintering FAST/SPS), hot pressing, gas-pressure sintering (Sinter HIP) and vacuum sintering covering the complete range from the laboratory plant to the highly specialized industrial plant.

The company is committed to the development of customized and efficient plants that achieve maximum performance and service life. A team of highly skilled technicians, engineers and scientists works in close cooperation with the customer to develop solutions for process optimization.

The company undertakes extensive investments in research and development: its in-house technical center contributes constantly to improving and developing innovative plant concepts and sintering processes. In addition, customers are offered the opportunity to carry out different test runs on several plant types ranging from single tests for process optimization to the manufacture of small batches according to customer specifications. Great importance is attached to the consequent improvement of existing concepts as well as to the development of new plant types especially with regard to increasing efficiency.

Important note:

To the extent that our press release contains forward-looking statements, the latter are based on information that is available at present and on our current forecasts and assumptions. Forward-looking statements, by their very nature, entail known as well as unknown risks and uncertainties that may lead to actual developments and events differing substantially from the forward-looking assessments. Forward-looking statements must not be understood to be guarantees. Instead, future developments and events depend on a large number of factors; they comprise various risks and imponderables and are based on assumptions that may possibly turn out not to be appropriate. These include unforeseeable changes to fundamental political, economic, legal and societal conditions, particularly in the context of our main customers' industries, the competitive situation, interest and exchange rate trends, technological developments as well as other risks and uncertainties. We perceive additional risks e.g. in pricing developments, unforeseeable events in the environment of companies acquired and Group member companies as well as in current cost savings programs from time to time. The SGL Carbon assumes no obligation and does not intend to adjust or otherwise update these forward-looking statements either.