

**Corporate Communications**

CeramTec corporate contact:  
Christoph Hermes  
Head of Communication  
Phone +49 (0) 7153 611-803  
E-mail: [pr@ceramtec.de](mailto:pr@ceramtec.de)

Press contact echolot pr:  
Barbara Geier  
Phone +44 (0)7983 242 195  
E-mail: [geier@echolot-pr.de](mailto:geier@echolot-pr.de)

## Press Information

SiSiC plates for semiconductor machinery

### **Why CeramTec's silicon carbide ceramic is a crucial component for highly advanced chip production**

***Plochingen/Southampton, 1 September 2020. With photolithography systems for semiconductor manufacturing becoming ever more sophisticated, component suppliers need to be able to provide products of the highest quality to meet the current and future demands in chip production. Based on ongoing in-house research and development, CeramTec's "Rocar SiF" plates made of high-performance SiSiC as a lightweight silicon carbide ceramic achieve an optimal balance of material properties which contribute to higher chip quality.***

The company, a global leader in the production of advanced technical ceramics, provides SiSiC (silicon infiltrated silicon carbide) plates made of silicon carbide with a specific amount of metal silicon, which form the basis for electrostatic chucks. These wafer chucks are used in semiconductor machinery for the production of chips to accurately position the silicon wafer in the machine, employing an electrostatic field to clamp the wafer under vacuum conditions. Silicon carbide as the hardest ceramic material offers not only the stiffness and absolute flatness needed to enable this process but

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also excellent thermal conductivity as well as thermal shock, wear and corrosion resistance.

### *Material composition key for optimal use in semicon machinery*

“Balancing the needs for a material that is highly homogeneous and refined while retaining the highest possible conductivity is a challenge when it comes to producing these plates,” explains Heiko Schulz, Sales Director Machinery at CeramTec. “Our Rocar SiF product is the result of years of research and ongoing development, providing our customers now with the ‘best of both worlds’: The material is as homogeneous as possible, meaning that the conductive free silicon portion is as evenly spread across the microstructure as possible and at the same time retains optimum conductivity. This enables high-precision microstructuring of the SiSiC surface and, ultimately, more accurate handling of the silicon wafer which has a direct impact on chip quality and obtainable chip structure.”

### *Component matching demands of latest manufacturing processes*

Lithography as the use of light to print tiny patterns on silicon is a fundamental step in mass-producing computer chips and a new generation of lithography machines now operates at the cutting-edge of what is physically possible. As a small but crucial component, CeramTec’s SiSiC plates undergo a finishing process before being

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incorporated in this highly advanced EUV (extreme ultraviolet) lithography systems used by computer chip makers, which make silicon features down to a few nanometers in size on the memory chips and processors of tomorrow to meet the growing demand driven by 5G, IoT or autonomous driving applications. “Our customers who perform this finishing process of adding customised patterns on the SiSiC plates benefit from the composition of our Rocar SiF material as it simplifies processability which ultimately shortens the very time-consuming refining procedure of the plates,” adds Heiko Schulz. Given the expected growth of worldwide semiconductor manufacturing equipment market which is already manifested in the increasing number of EUV lithography systems being installed, semiconductor industry suppliers can therefore benefit from working with a high-quality base material to increase efficiency and productivity.

For more information on the CeramTec material, please see <https://www.ceramtec.com/ceramic-materials/silicon-carbide/>

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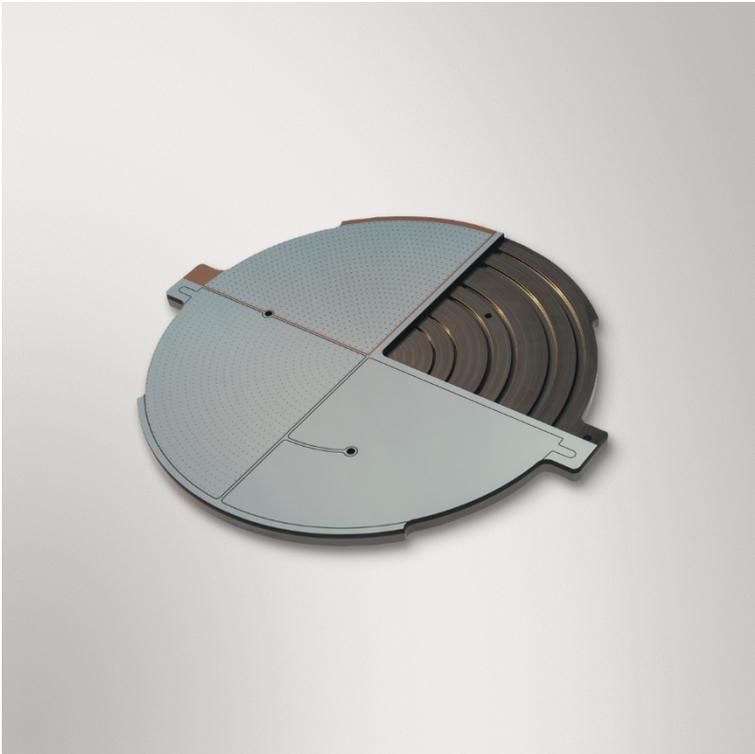
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## Notes to the Editor

### Image:



Caption: Electrostatic chuck design with feature.  
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## **About CeramTec GmbH**

CeramTec is a world-leading manufacturer of technical ceramics and is specialised in the development, manufacturing and sale of parts, components and products made from ceramic materials. With over a century of developmental and production experience, CeramTec is a global leader in the manufacturing of advanced ceramics and engineers these materials for use in a wide variety of applications. Advanced ceramics from CeramTec are used in a range of industries, including medical engineering, the automotive industry, electronics, energy and

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environmental engineering, as well as equipment and mechanical engineering. The current portfolio comprises well over 10,000 products, components and parts made from technical ceramics, along with a wide variety of ceramic materials.

With production sites and subsidiaries in Europe, the UK, America and Asia, CeramTec maintains its presence around the globe as a manufacturer and supplier. The company is headquartered in Plochingen, near Stuttgart. In 2019, CeramTec generated over €620 million in revenues. CeramTec employs more than 3,500 staff worldwide, around 2,000 of which are in Germany.

**CeramTec GmbH**  
CeramTec-Platz 1-9  
73207 Plochingen  
Germany

**CeramTec UK Limited**  
Antelope Park, Bursledon Road  
Thornhill, Southampton  
Hampshire, SO19 7TG  
United Kingdom

[www.ceramtec.com](http://www.ceramtec.com)  
[www.ceramtec.com/linkedin](http://www.ceramtec.com/linkedin)  
[www.ceramtec.com/twitter](http://www.ceramtec.com/twitter)  
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