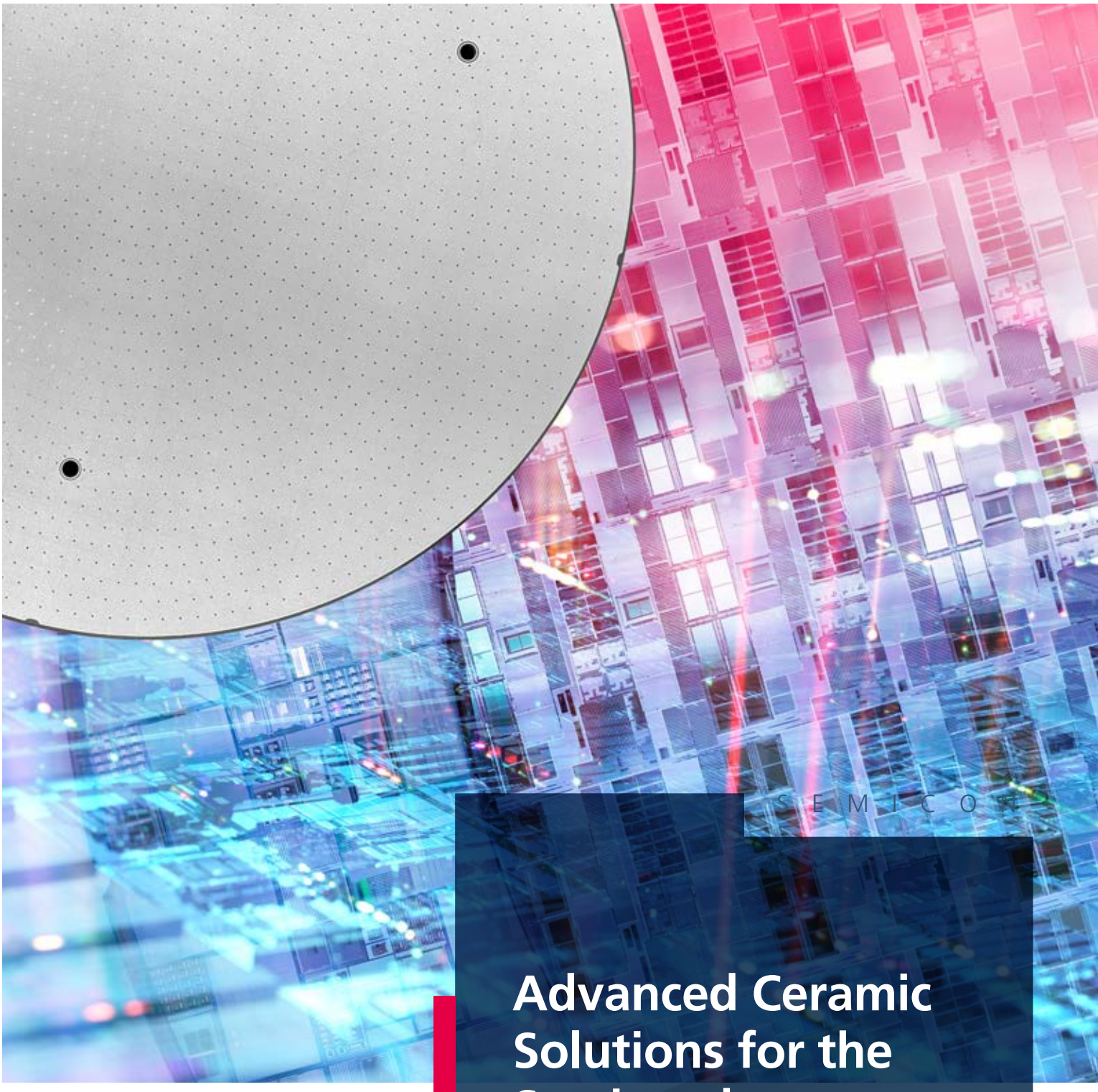
CeramTec



SEMICON

Advanced Ceramic Solutions for the Semiconductor Industry

THE CERAMIC EXPERTS

CeramTec – customised solutions for challenging applications

CeramTec advanced ceramics with their unique material properties such as resistance, homogeneity and reliability open up enormous performance potential for a large variety of industries and applications.

Over 120 years of experience in technical ceramics and many years of experience in the semiconductor industry, combined with comprehensive material and process know-how and outstanding product characteristics make us one of the key go-to solution partners, when it comes to ceramic components utilized in the semiconductor industry. These ceramics are characterized by harsh processing environments, must withstand tough conditions and require long lasting functional performance and reliability.

CeramTec offers solutions meeting all these requirements: tailor-made from high-purity advanced ceramics and perfectly implemented according to your individual needs!

From the initial idea to the final product
Agile and flexible cooperation along the entire process chain

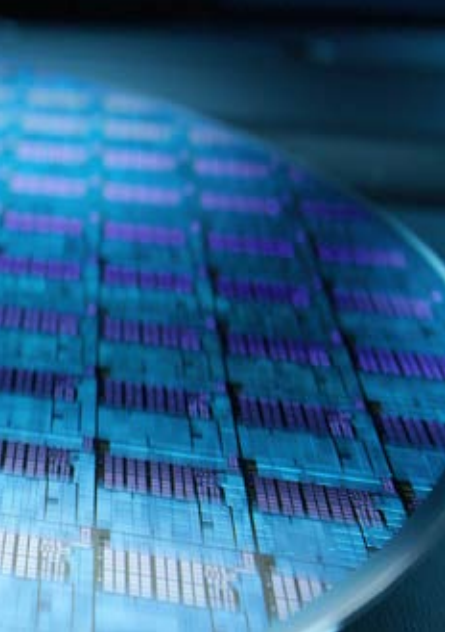
Consulting
- Customised material properties and design

Engineering
- Prototype and material development
- Risk management
- Simulation and modeling
- Specification

Manu-facturing
- Series production
- Change management
- Audits

Quality
- Quality assurance
- 100% controls
- Traceability

Customized high-performance ceramic solution



Advanced ceramic solutions – indispensable for the semiconductor business

Discover the advantages offered by our advanced ceramics portfolio and benefit from our solution expertise for a variety of handling and manufacturing processes in the semiconductor industry. We develop our ceramic components and parts according to your individual application requirements, so you can design and maintain your processes flexibly and reliably.

The optimal solution for your needs

Because we see ourselves not only as a pure manufacturer of high-quality ceramic semiconductor components, but rather as a strong development partner who transform your requirements into individual solutions: with state of the art products, in almost any desired geometry and design, with the corresponding material properties, vertical range if manufacture and optimum functionality.

Our material is your success

Whether in wafer processing, semiconductor manufacturing or handling - our components made of high-performance ceramics enable long lasting performance and reliability. CeramTec offers the right ceramic for every requirement:

- Al_2O_3 – high purity and rigidity
- AlN – high thermal conductivity and electrical insulation
- SiSiC – low thermal expansion and density
- Si_3N_4 – high fracture toughness and low thermal expansion

Exceeding highest industry demands

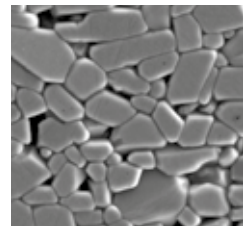
KEY PROCESS STEPS	TECHNICAL PARAMETERS	REACHABLE VALUES/REQUIREMENTS
Hard machining – milling	Flatness, parallelism, Ra	Flatness < 1 µm Ra ≥ 0,05 µm
Grinding	Flatness	5 µm < Ø 200 mm / 10 µm > Ø 200 mm
	Parallelism	5 µm < Ø 200 mm / 10 µm > Ø 200 mm
	Roughness	Ra from 0,15 µm to 0,6 µm
Eroding	Symmetrical positioning	up to 0,05 mm (holes/grooves positioning)
Lapping & polishing	Flatness, parallelism, Roughness	Ra from 0,06 µm to 0,35 µm Flatness < 2 µm Parallelism < 2 µm
Structuring	Roughness	Roughness < 3,2 µm / Size < 150 µm
Special measurement	Local slope/local flatness	Objective resolution 50 nm - 25 µrad
Cleaning & packaging	Cleanliness	ISO 5 / Clean room 100 / package in clean room (based on customer request)

Material expertise for the semiconductor industry

Discover our solution expertise for a wide range of semiconductor applications and benefit from outstanding material properties and individual design.

Alumina – Rubalit

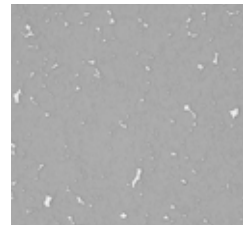
Products	Material benefits
• Wafer Polishing Plates • End Effectors / Wafer-Handling • Metalised Products • Chamber Rings / Sputtering Targets	• High rigidity • High thermal resistance • Surface shape / roughness control



Microstructure Rubalit

Silicon carbide – ROCAR

Products	Material benefits
• Wafer Polishing Plates • Electrostatic Chucks • Vacuum Chucks • End Effectors / Wafer-Handling • Chamber Rings	• High thermal conductivity • Low thermal expansion • High rigidity • Good chemical resistance • Variety of surface finishes



Microstructure ROCAR (SiSiC)

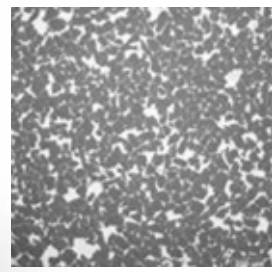
Additive manufacturing – design freedom meets optimum material properties

Experience complete design freedom with ROCAR 3D silicon carbide (SiSiC) and Alumina (Al_2O_3), unique materials in one of the most innovative manufacturing processes of our time: 3D printing. Together with us you can create lightweight structural and functional parts, reduced in their design to include only absolutely necessary elements. Get your finished parts faster without time- and cost-intensive processing steps such as green machining, milling and joining and enhance further cost-saving potential through component optimization.

Unbeatable process advantages of 3D printing:

+ Print directly from CAD data
+ No milling necessary, therefore lower tool costs
+ Cavities and undercuts possible
+ Short production lead and tooling times
+ Maximum flexibility: make design changes with a mouse click
+ Printing of inline channels possible
+ Simultaneous production of several components on one 3D printer

Exemplary components in addivitve manufacturing



ROCAR 3D microstructure Maximum homogeneity: the layer structure is no longer detectable in the microstructure.

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