



E L E C T R O N I C S

Solutions for miniaturizing
trends in microelectronics

Lasering of Ceramics

Lasering – go for highest precision

Doing more with less: The ongoing miniaturization drives us to the next generation of electronic components. CeramTec has over 40 years experience in laser machining and is one of the biggest laser-houses worldwide. This allows us to produce a wide range of contour geometries, drill hole combinations, through holes and break lines without the need for time-consuming and costly tooling. Computer-controlled lasers are used for scribing, cutting, drilling and structuring of ceramic substrates to extremely small tolerances.

CeramTec's lasering-capabilities:

- complex geometries
- drilling for through-hole metallization,
- smallest cut-outs and diameters,
- double shots on crossing points,
- individual laser pitch and depth within the same scribe-line.

Optimized Laserlines for small chip resistor sizes

- Substrates from 50 µm to 3 mm thickness (standard)
- Dimensions up to 260 x 350 mm² (other dimensions on request)
- Drilling diameter down to 40 µm
- Drilling holes up to 40.000/2x2 inch²
- Laser ridge < 5 µm

Materials and surface quality

Material	Typical R _s Value	Content
Rubalit® 708 S	≤ 0.60 µm	96%, Al ₂ O ₃
Rubalit® 708 HP	≤ 0.60 µm	96%, Al ₂ O ₃
Rubalit® 710	≤ 0.12 µm	99,6%, Al ₂ O ₃
Alunit®	≤ 0.60 µm	Y-stabilized
Zirkolit®	≤ 0.60 µm	Y-stabilized

Why Lasering?

- high dimensional accuracy
- fast deliveries
- economical for small and large volumes
- fast design changes on demand
- flexibility for samples and prototyping
- no tooling

CeramTec – your qualified partner for the electronics industry

CeramTec is one of the world's biggest international manufacturers of ceramics for advanced applications. The company has an over 100-year history and specializes in the development, production and customer support of innovative products made from ceramic materials. It is also a systems integrator for customers from the fields of electronics, medical engineering, automotive engineering, energy and environment and mechanical engineering. More than 3,600 Employees are worldwide active at production sites in Europe, USA and Asia.



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CeramTec Contacts

Electronic Applications

Try our products and solutions –
see what we can offer you!

Email: myceramtec@ceramtec.de

CeramTec Facts

- ISO-certified
- More than 100 years of experience
- Worldwide sales organization and manufacturing sites
- Biggest ceramics laser facilities in the world
- Laser express service

Miniaturising – Applications & Trends

Miniaturising Applications

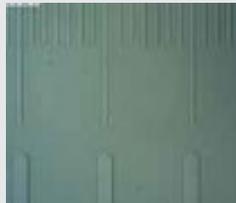
- High Power/Thin film Chip Resistor
- LED Packages
- Sensors

3D Structuring

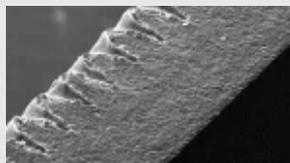
- Micro holes



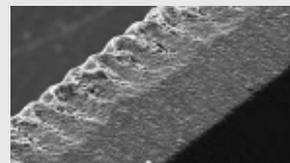
- Cavities
- Complex structures
- No residues on the surface (no glass)
Ra ≤ 1 μm surface roughness



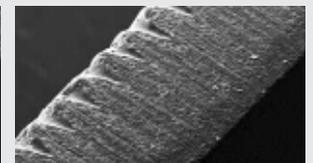
Edge finished:



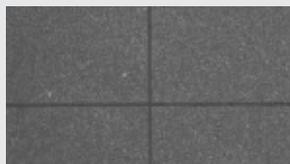
Laser scribed Edge



Edge treated



Perfect Edge



Continuous groove

Tolerances for lasered substrates

	Standard	Edge-treated	Perfect-edge
	Length an width		
at nominal thickness ≤ 0.635 mm	+ 0.20 mm - 0.05 mm		
> 0.635 mm ≤ 0.76 mm	+ 0.25 mm - 0.05 mm	+ 0.15 mm - 0.05 mm	+ 0.10 mm - 0.05 mm
> 0.76 mm ≤ 1.27 mm	+ 0.30 mm - 0.10 mm		
Distance from edge to snap-line/hole center			
at nominal thickness ≤ 0.635 mm	+ 0.15 mm - 0.05 mm	+ 0.10 mm - 0.05 mm	
> 0.635 mm ≤ 0.76 mm	+ 0.20 mm - 0.05 mm	+ 0.10 mm - 0.05 mm	+ 0.075 mm - 0.05 mm
> 0.76 mm ≤ 1.27 mm	+ 0.25 mm - 0.10 mm	+ 0.10 mm - 0.075 mm	
Distance between snap-lines/hole center	± 0.05 mm		
Hole diameter			
at nominal thickness ≤ 0.63 mm: $\varnothing \leq 3$ mm	± 0.05 mm		
≤ 0.63 mm: $\varnothing > 3$ mm	± 0.075 mm		
at nominal thickness > 0.63 mm: $\varnothing \leq 3$ mm	± 0.075 mm		
> 0.63 mm: $\varnothing > 3$ mm	± 0.10 mm ¹		
Overall camber (measured between parallel plates, 45°)			
at nominal thickness > 0.63 mm	Standard: 0.3% of length Premium: 0.2% of length		
at nominal thickness ≤ 0.63 mm	quoted upon request		
Thickness	+ - 10%		
Perpendicularity	within outside dimension tolerance	0.015 mm / 25.4 mm	0.0125 mm / 25.4 mm
Parallelism	within outside dimension tolerance		

¹ but not less than ± 0.05 mm

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The measured values mentioned before were determined for test samples and are applicable as standard values. The values were determined on the basis of DIN-/DIN-VDE standards and if these were not available, on the basis of CeramTec standards. The values indicated must not be transferred to arbitrary formats, components or parts featuring different surface qualities. They do not constitute a guarantee for certain properties. We expressly reserve the right to make technical changes.