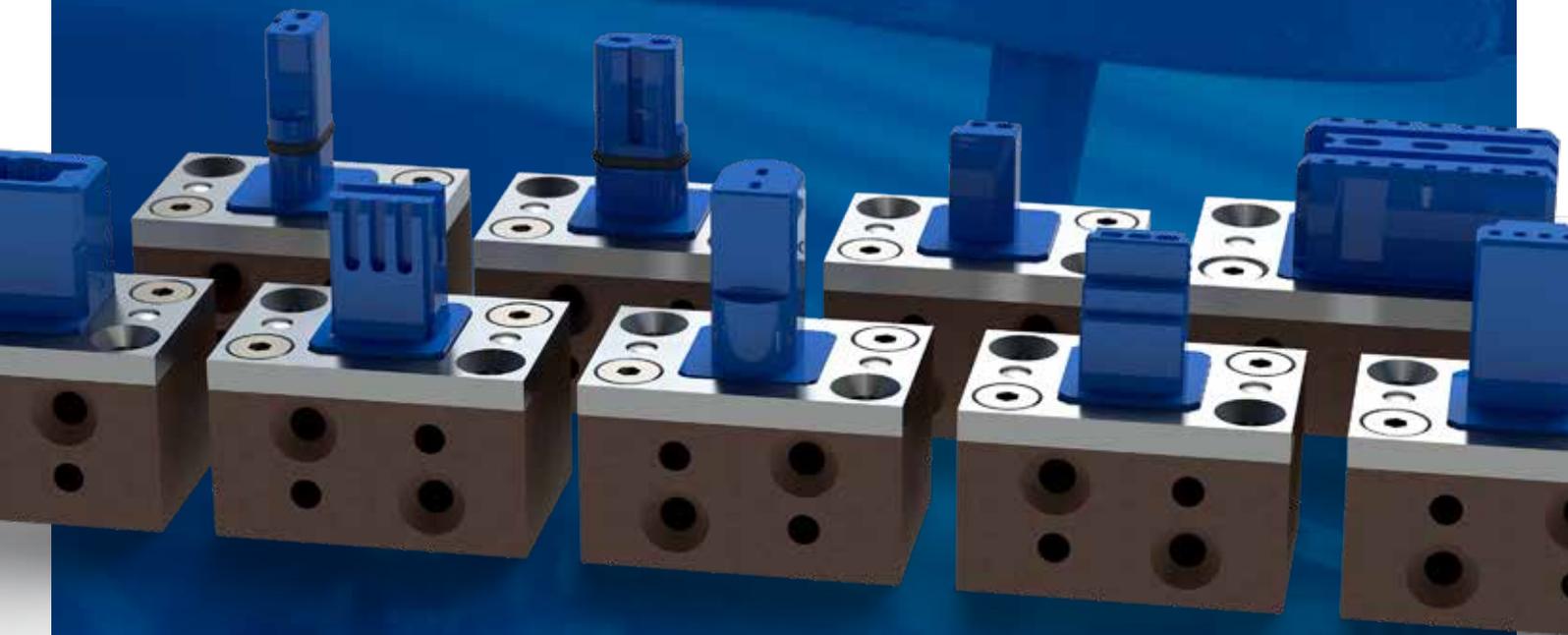


# EXTREMELY ANTI-WEAR HIGH-PERFORMANCE CERAMIC



DEVELOPED AS PART OF 5 YEARS' INTENSIVE RESEARCH.  
SUCCESSFULLY IN USE FOR 16 YEARS.

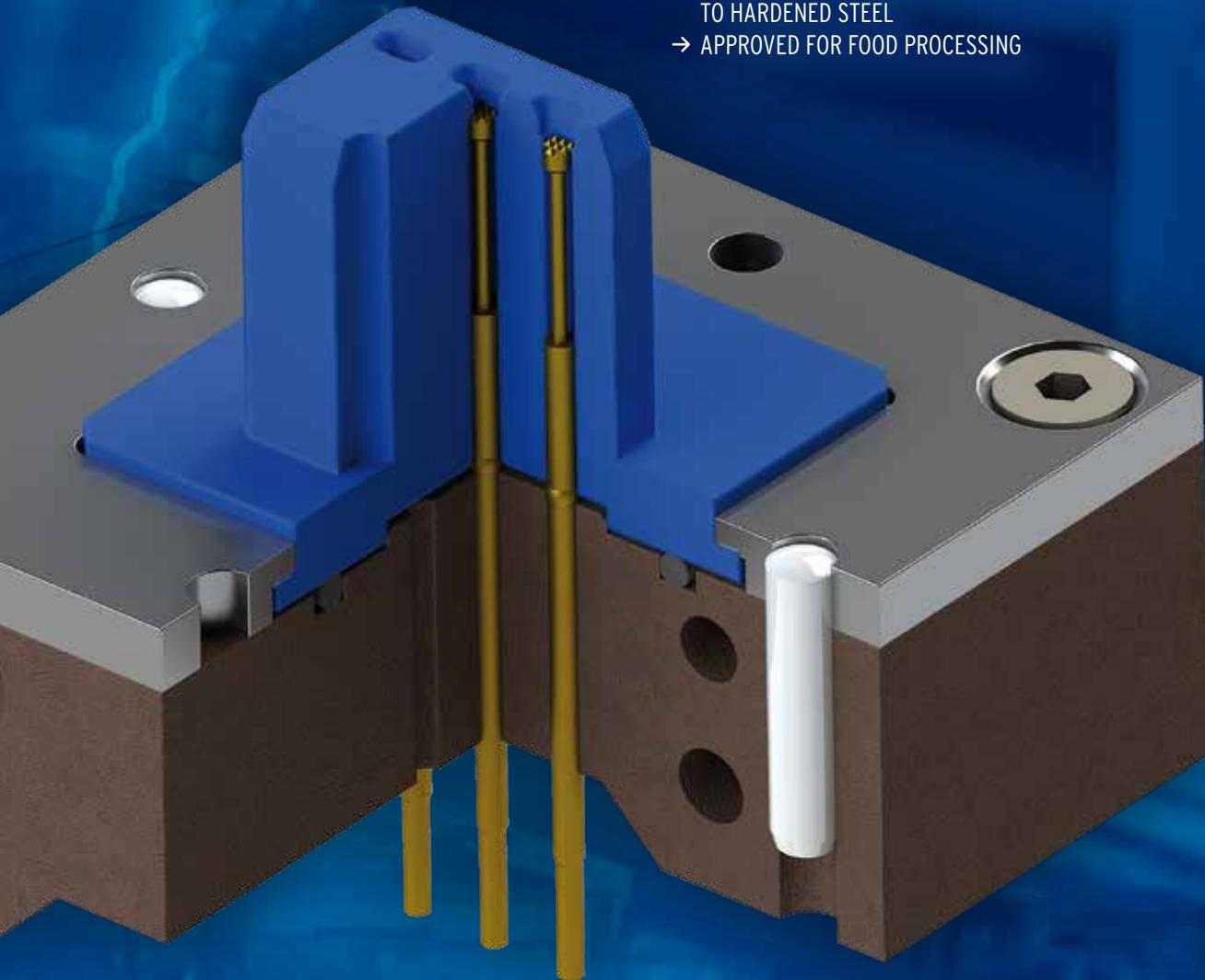


# CERAMIC: IN THE PAST!

Example: test plug for an automotive supplier as an assembly with components made of high-performance ceramic, plastic and metal

# CERAMIC: TODAY!

- EXCEPTIONALLY WEAR-RESISTANT
- EXTREMELY TEMPERATURE-STABLE
- ELECTRICALLY AND MAGNETICALLY NEUTRAL
- FREQUENCY-NEUTRAL
- SOLDER-RESISTANT AND ABRASION-RESISTANT
- RESISTANT AGAINST GALLING, PREVENTS ANY MATERIAL ACCUMULATION
- IDEAL FOR CLEAN ROOMS
- CHEMICALLY INERT
- MORE THAN 20 TIMES THE SERVICE LIFE COMPARED TO HARDENED STEEL
- APPROVED FOR FOOD PROCESSING



# WHY CERAMIC COULD TRANSFORM YOUR TESTING ONCE AND FOR ALL

THE SUPERIOR PROPERTIES OF DOCERAM HIGH-PERFORMANCE CERAMIC WITH REGARD TO HARDNESS, WEAR RESISTANCE, TEMPERATURE RESISTANCE, IMPACT STRENGTH, ABRASION RESISTANCE AND ANTI-ADHESION CONTRIBUTE TO MAKING PROCESSES AND SEQUENCES OF MACHINES AND PLANTS MORE SECURE AND QUALITY-FOCUSSED. COMPONENTS MADE OF HIGH-PERFORMANCE CERAMIC ARE INCREASINGLY REPLACING CONVENTIONAL MATERIALS SUCH AS METAL AND PLASTIC.

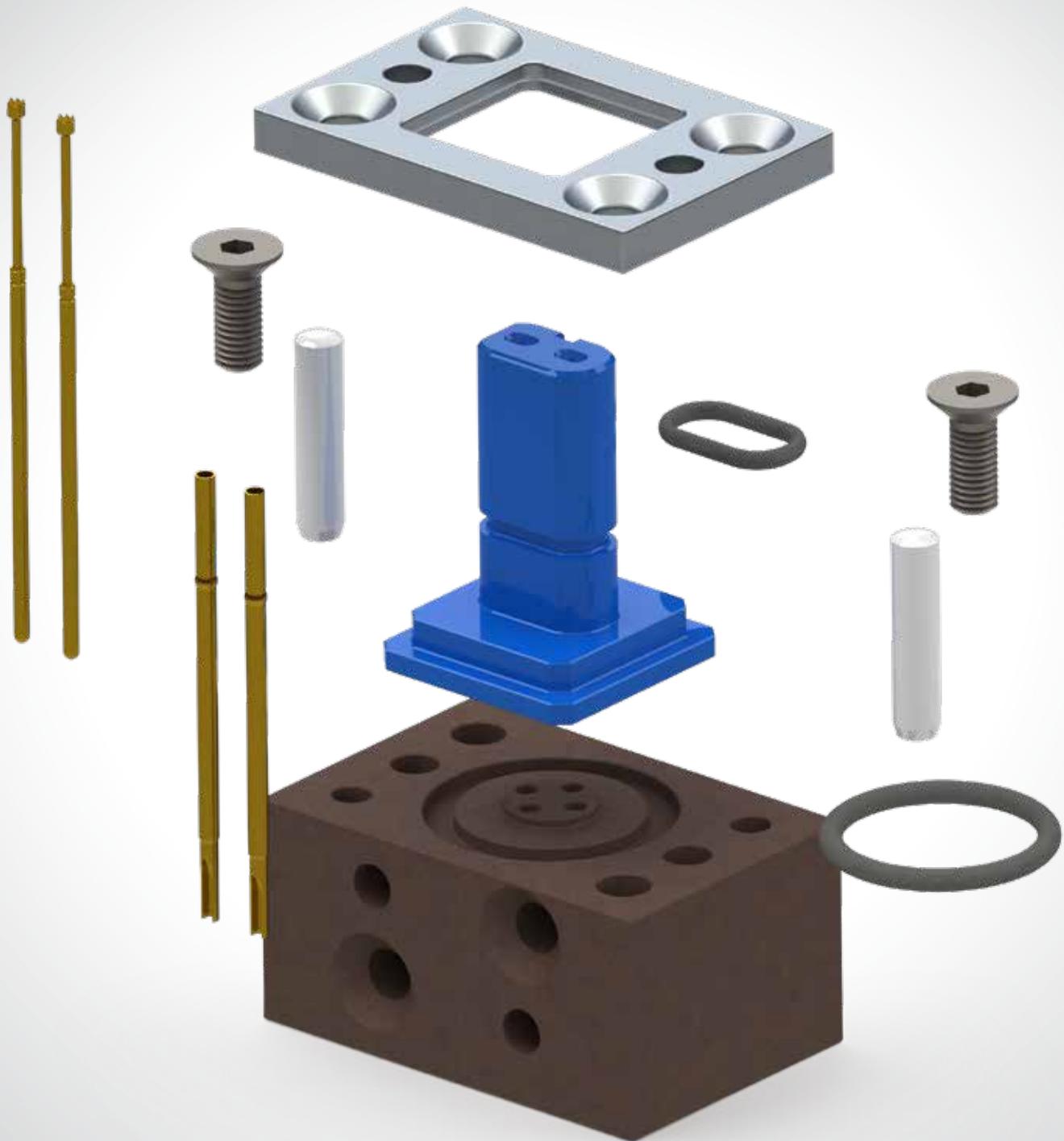
## BENEFITS OF TEST PLUGS MADE OF HIGH-PERFORMANCE CERAMIC:

- EXTREME ANTI-WEAR PROPERTY, LEADING TO SIGNIFICANTLY EXTENDED SERVICE LIVES
- IDEAL ALSO FOR COMBINED FUNCTION / SWASH CIRCUMFERENCE TESTS
- CAN BE REALISED EVEN FOR THE SMALLEST OF GEOMETRIES: 0.3 MM WALL THICKNESS
- HIGH TECHNICAL PURITY: THE COMPONENT IS NOT SUBJECT TO ABRASION OR INCORRECT MEASUREMENTS; THE SPRING CONTACT PINS DO NOT BECOME PREMATURELY FAULTY
- OPTIONALLY WITH INFEEED CHAMFER (FOR TESTING SWASH CIRCUMFERENCE)
- THE PLUG CAN BE CONSTRUCTED USING THE COUNTERPART (SOCKET)



CERAZUR IS A REGISTERED TRADEMARK OF DOCERAM GMBH (REGISTER NUMBER 2908516)  
DOCERAM IS A REGISTERED TRADEMARK (REGISTER NUMBER 2061094)  
'BLAUE KERAMIK' IS A REGISTERED COLOUR MARK OF DOCERAM GMBH (REGISTER NUMBER 301 12 473)

TEST PLUG ASSEMBLY FROM DOCERAM, COMPLETELY ASSEMBLED WITH CERAZUR COMPONENT. SUPPLIED EX WORKS AS AN INSTALLATION-READY MODULE IN CUSTOMER-SPECIFIC CONFIGURATION.



DAIMLER



SIEMENS

# PROCESS SECURITY, PRODUCT QUALITY - WE KNOW WHAT IS IMPORTANT

## TESTING SWASH CIRCUMFERENCE PLUGGABILITY



Contact pin outside of the swash circumference = not OK



Not OK contact pin is bent  
No contact possible

CERAMIC



DOCERAM TEST PLUGS MADE OF HIGH-PERFORMANCE CERAMIC ARE ALREADY BEING USED AS STANDARD BY RENOWNED CAR MANUFACTURERS FOR DEPENDABLE 100% TESTING OF CAR ELECTRONICS.

## SIGNS OF ABRASION/WEAR

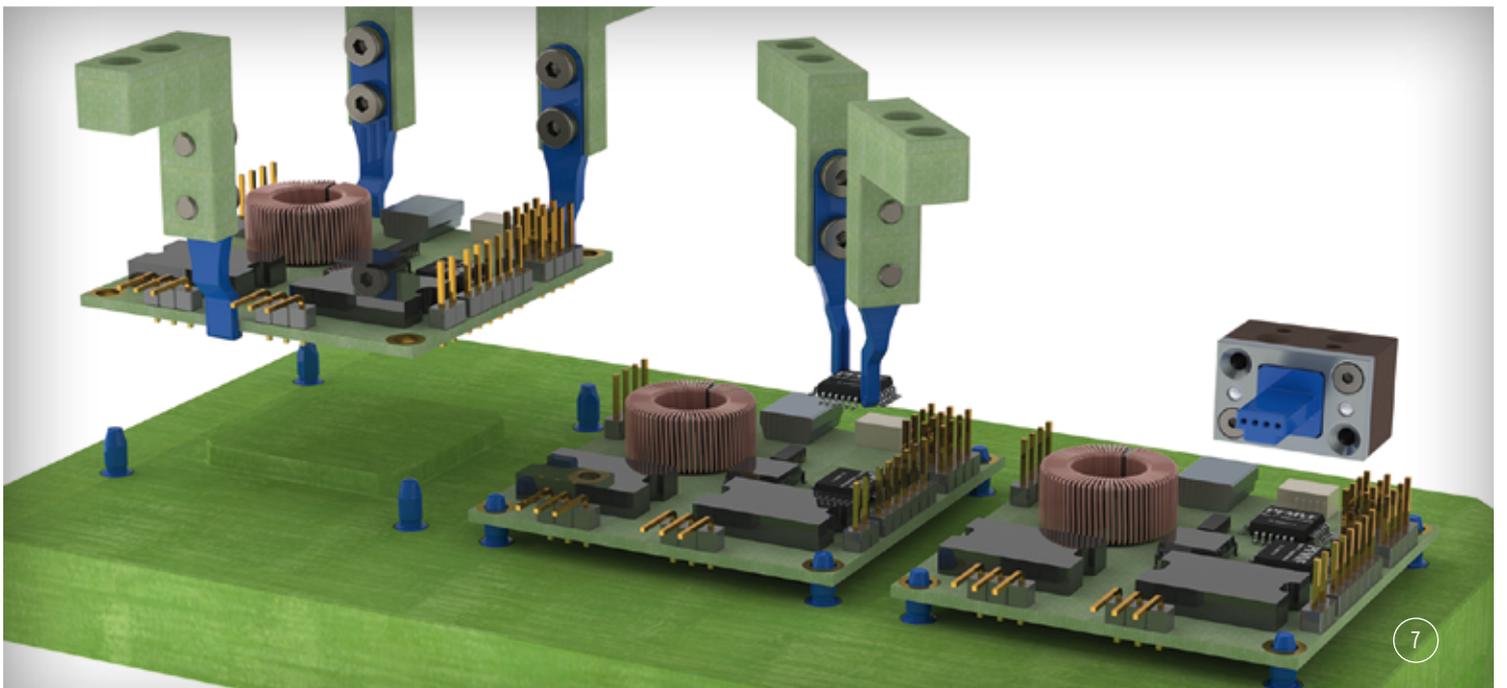
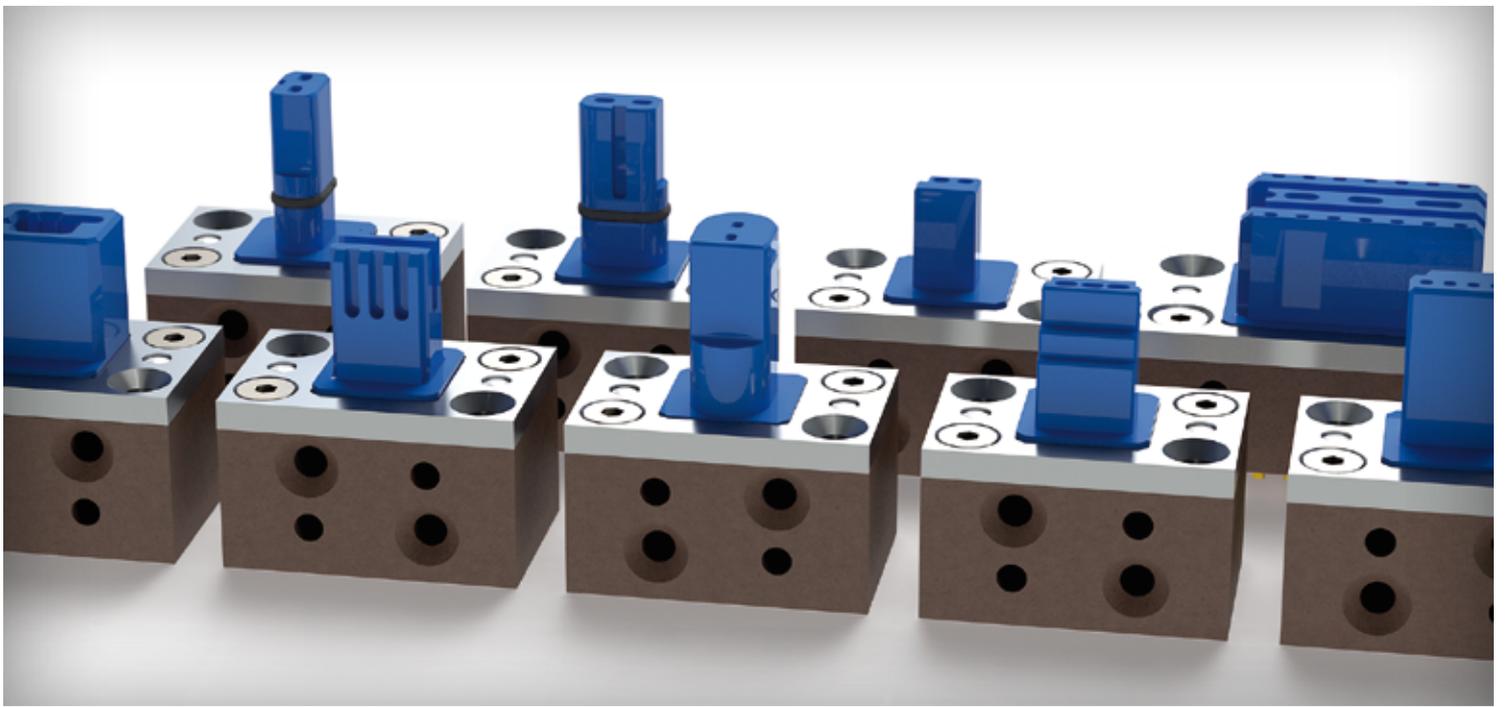
PLASTIC



Not OK contact pins = abrasion/dirt



Abrasion/dirt  
= Spring contact pins' service life massively reduced  
= Plug's shape/tolerance not OK



PROPERTIES	Unit	Cerazur	Aluminium oxide
Composition	-	ZrO <sub>2</sub> Y-PSZ	Al <sub>2</sub> O <sub>3</sub> >99.7%
Colour	-	blue	ivory
Density	(g/cm <sup>3</sup> )	6	3.9
<b>Bending strength</b>	<b>(MPa)</b>	<b>1300</b>	<b>390</b>
Compressive strength	(MPa)	3000	3900
E-modulus	(Gpa)	205	390
<b>Impact strength</b>	<b>(Mpa m<sup>1/2</sup>)</b>	<b>12</b>	<b>5.2</b>
Weibull modulus	-	25	12
<b>Vickers hardness</b>	<b>(HV 0.5)</b>	<b>1150</b>	<b>2000</b>
Thermal expansion	(10 <sup>-6</sup> K <sup>-1</sup> )	10	5.5-8.4
Thermal conductivity	(W/mK)	<2	28
Thermal shock resistance	(ΔT°C)	280	120
Maximum operating temperature	(°C)	1000	1700
Specific resistance at 20°C	(Ω cm)	>10 <sup>10</sup>	>10 <sup>17</sup>
strength	(kV/mm)	-	22

# THIS IS THE REAL VALUE

**SUMMARY:** FOR USE IN TECHNICAL APPLICATIONS, CERAZUR<sup>®</sup> OFFERS YOU AN VAST RANGE OF OPPORTUNITIES TO DESIGN PROCEDURES AND PROCESSES IN A MORE STABLE, LONG-LASTING AND SECURE MANNER. YOU CAN FIND OUR PRODUCTS IN THE FOLLOWING INDUSTRIES:

- ✓ MECHANICAL AND PLANT ENGINEERING
- ✓ AUTOMOTIVE AND SUPPLIERS
- ✓ WELDING TECHNOLOGY
- ✓ FIXTURE CONSTRUCTION
- ✓ FOOD INDUSTRY
- ✓ MEDICAL TECHNOLOGY
- ✓ CHEMICAL INDUSTRY
- ✓ METAL FORMING
- ✓ ELECTRICAL/ELECTRONICS INDUSTRY AND MECHATRONICS
- ✓ TESTING TECHNOLOGY
- ✓ PUMP INDUSTRY
- ✓ PAPER INDUSTRY
- ✓ TEXTILE INDUSTRY
- ✓ WIND POWER PLANTS
- ✓ OTHER INDUSTRIES

If you have any questions about high-performance ceramic, please contact us.

**Philipp Froese**  
Application Technology

☎ +49 (0) 231 / 92 50 25 - 949

✉ p.froese@doceram.com