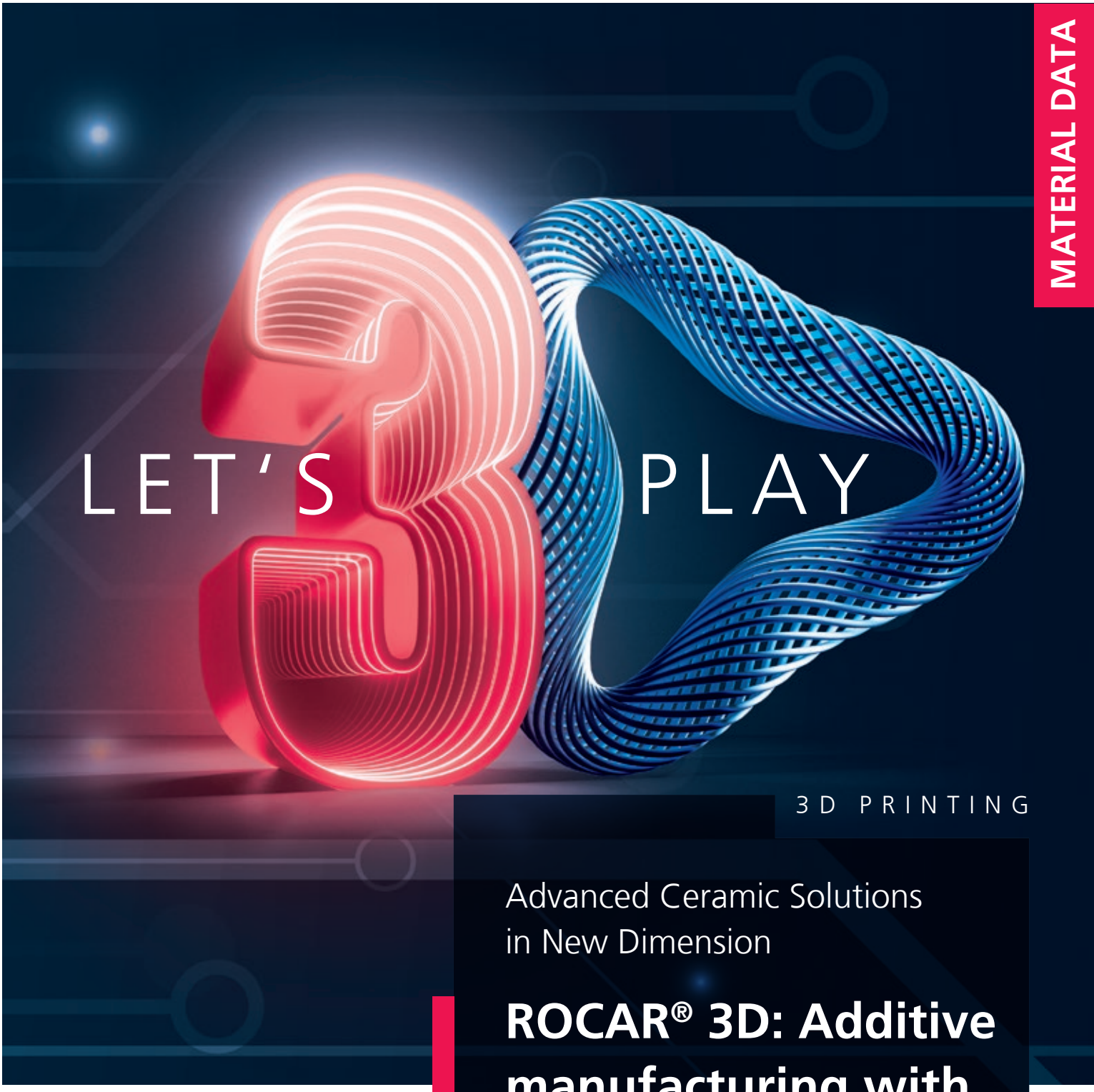
CeramTec

MATERIAL DATA



3D PRINTING

Advanced Ceramic Solutions
in New Dimension

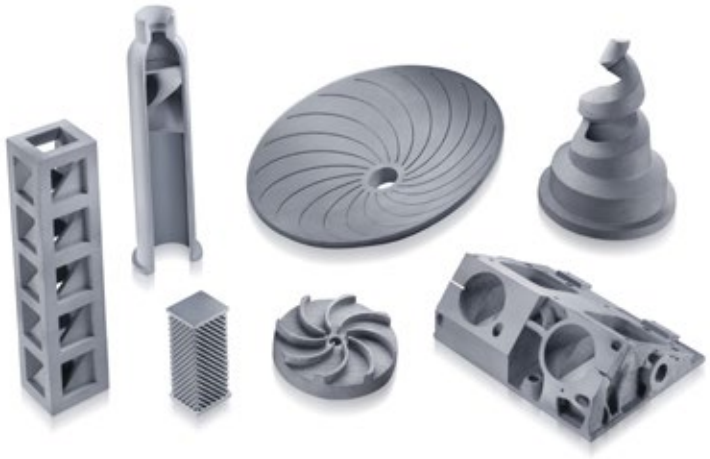
ROCAR® 3D: Additive manufacturing with SiSiC

THE CERAMIC EXPERTS

Additive manufacturing without compromise – ROCAR® 3D Silicon Carbide

ROCAR® 3D SiSiC – outstanding material properties

+ Temperature resistance up to 1,350 °C
+ High hardness, stiffness and flexural strength
+ Lower density than metal
+ Very abrasion-resistant
+ Thermal expansion near zero
+ High thermal conductivity
+ Resistant to oxidation
+ Erodible



ROCAR® 3D SiSiC Printing Process

System Specifications	
Build area (w/d)	1 job box, 500 x 400 x 300 mm / 19.7 x 15.7 x 11.8 in
Layer thickness	150 microns
Building speed	Approx. 10 mm height per hour
Material	SiC

Part Quality	
Accuracy	± 0,4% (min. ± 0.3 mm)
Minimum feature size	2 mm
Surface roughness	N11 / Ra25

ROCAR® 3D SiSiC vs. conventional SiSiC – material properties

Material Properties	AM SiSiC	Conventional SiSiC
Density	2.95 g/cm3	3.07 g/cm3
Si content	25 - 30 Vol% SiC%	10 - 20 Vol% SiC%
Hardness HV 0.2	>1200 / 2700 (Si/SiC)	>1200 / 2700 (Si/SiC)
Flex. Strength	220 MPa	350 MPa
E-Modulous	340 GPa	395 GPa
Fracture Toughness	2.0 MPa· $m^{1/2}$	2.5 - 3 MPa·$m^{1/2}$
Thermal Conductivity	160 W/mK (20 - 100°C)	160 W/mK (20 - 100°C)
Resistivity at RT	1.14*10-^{4} Ωm	-
Resistivity at 800°C	1.6*10-^{4} Ωm	5.5*10-^{4} Ωm

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