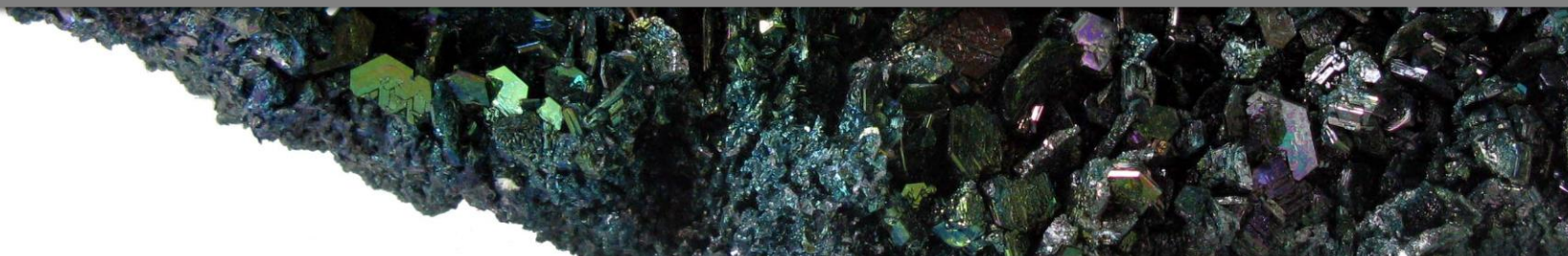


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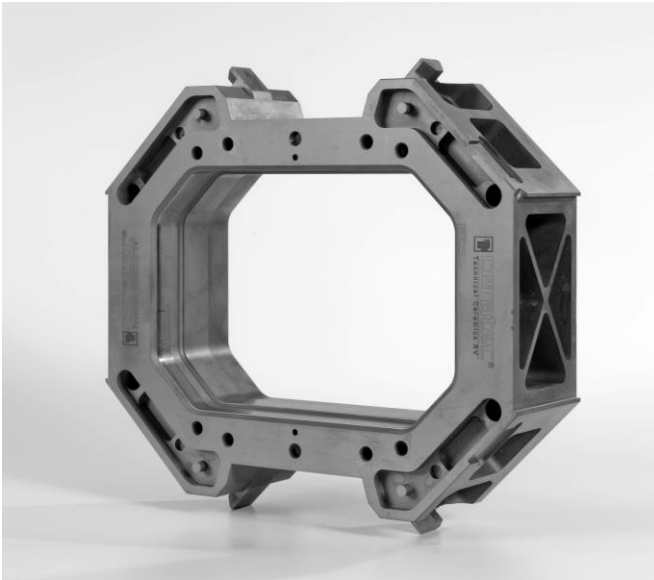
GROTE SILICIUMCARBIDE STRUCTUURDELEN

TIM VAN KAMPEN



WAAROM?

SICIUMCARBIDE STRUCTUURDELEN



Licht gewicht (3.10 g/cm^3)

Lage uitzetting (2.4×10^{-6} bij 20 graden C)

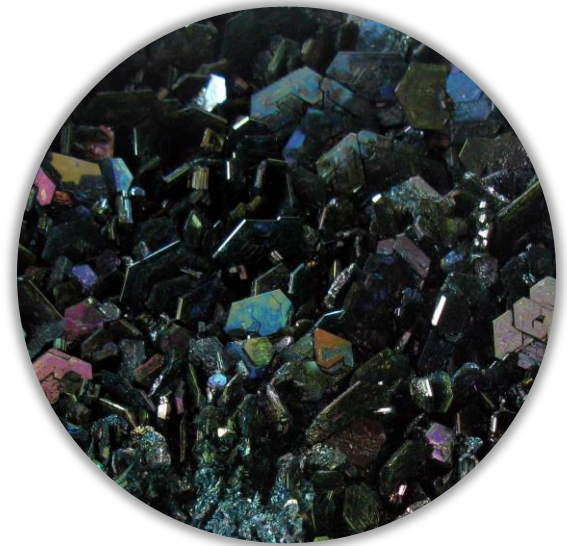
Hoge stijfheid (410 Gpa)

Goede warmtegeleiding (110 W/mK)

Zeer nauwkeurig te bewerken

Hitte en chemisch bestendig

HOE WORDT HET GEMAAKT OVERZICHT



SiO_2

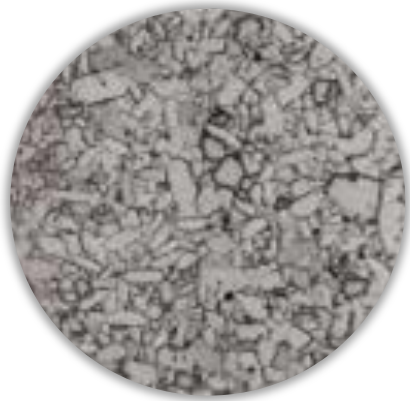
+

C

→

$\text{SiC} + \text{CO}_2$

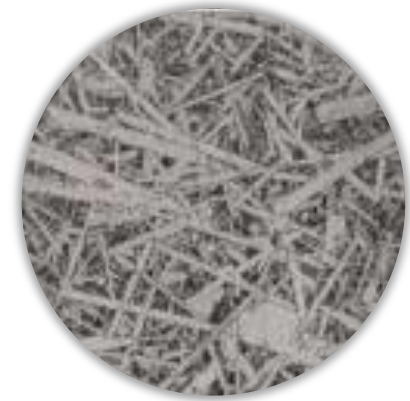
SiC Kristallstrukturen



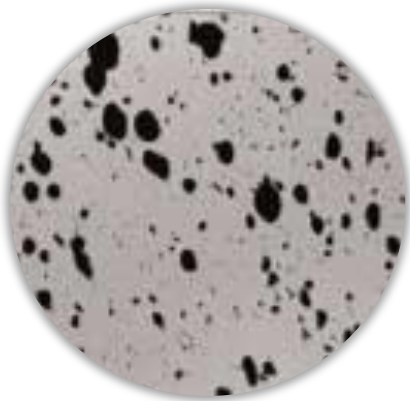
Ekasic F



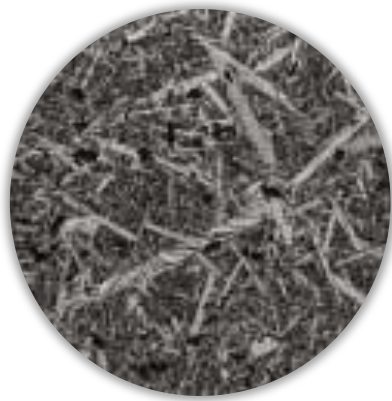
Ekasic D



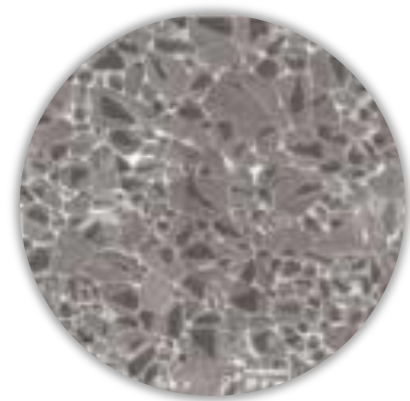
Ekasic C



Ekasic P

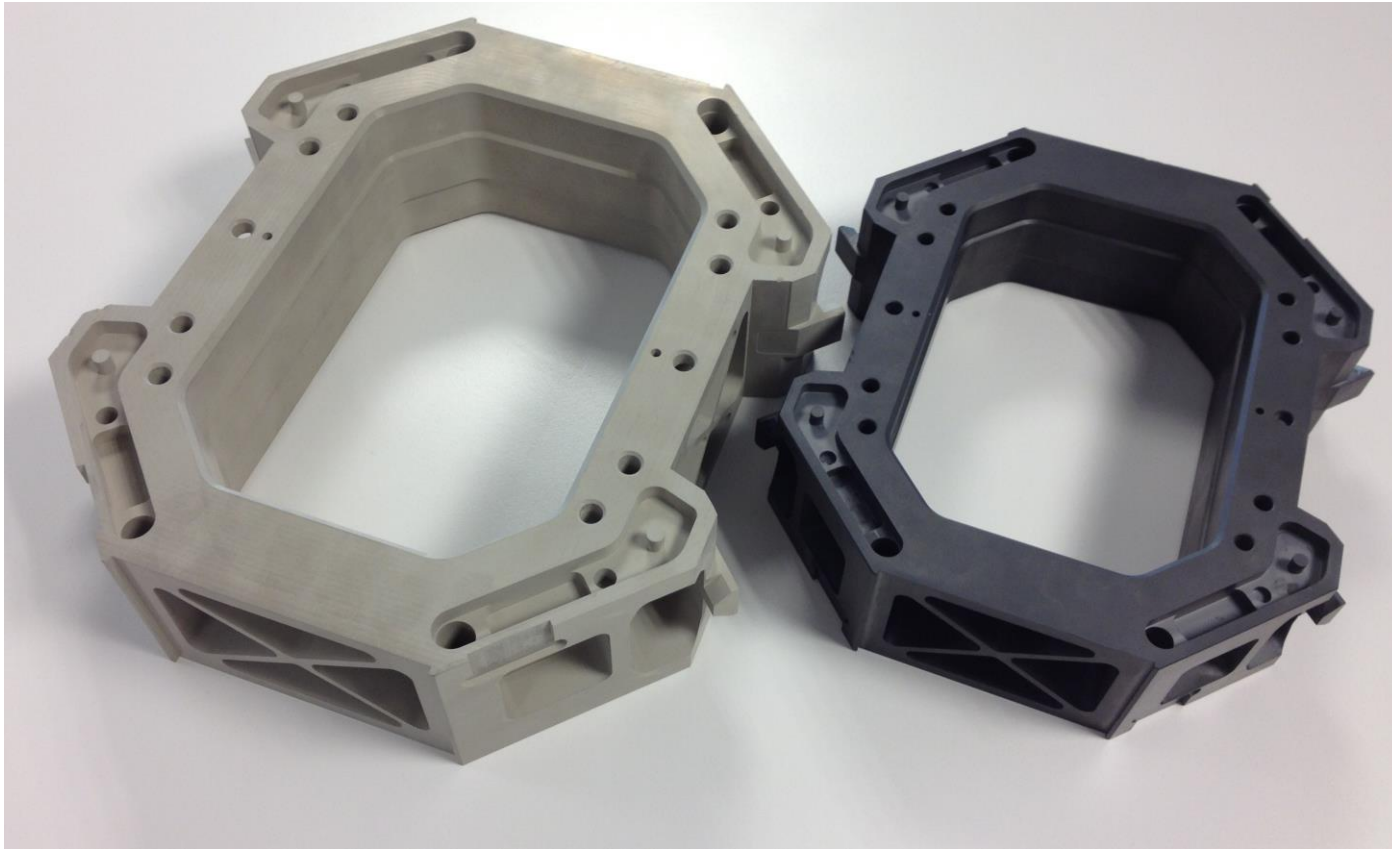


Ekasic G



Ekasic T

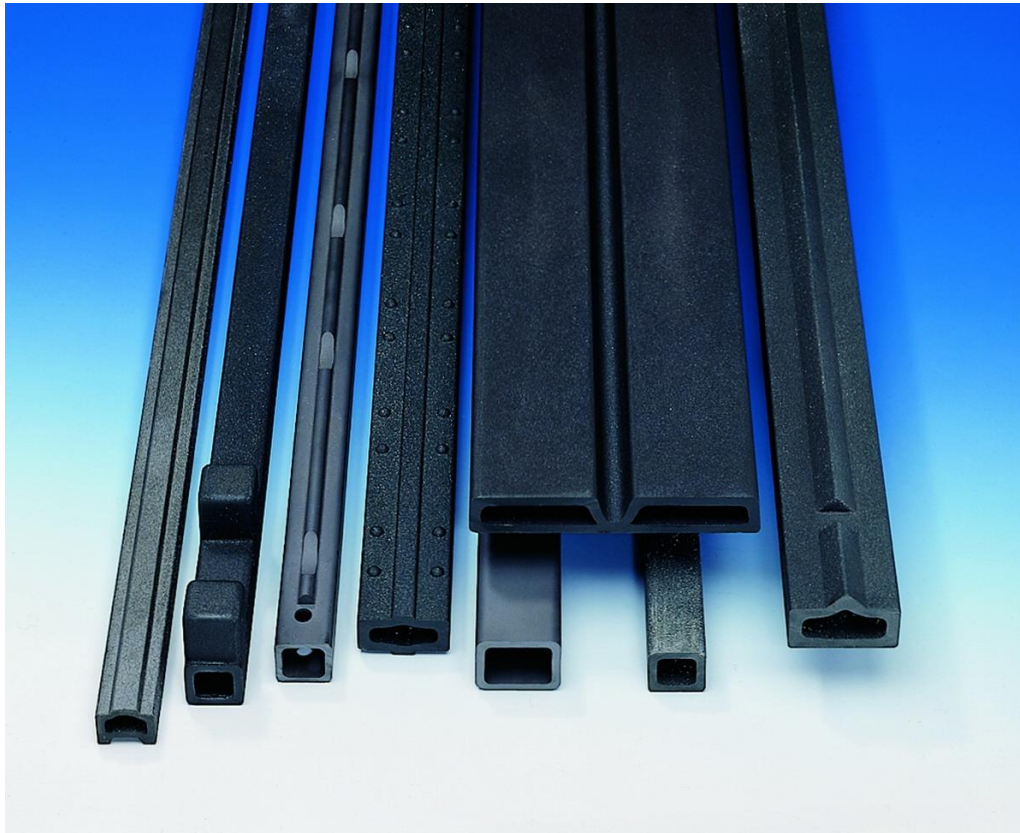
SILICIUMCARBIDE FRAME



WARMTEWISSELAAR



PROFIELEN

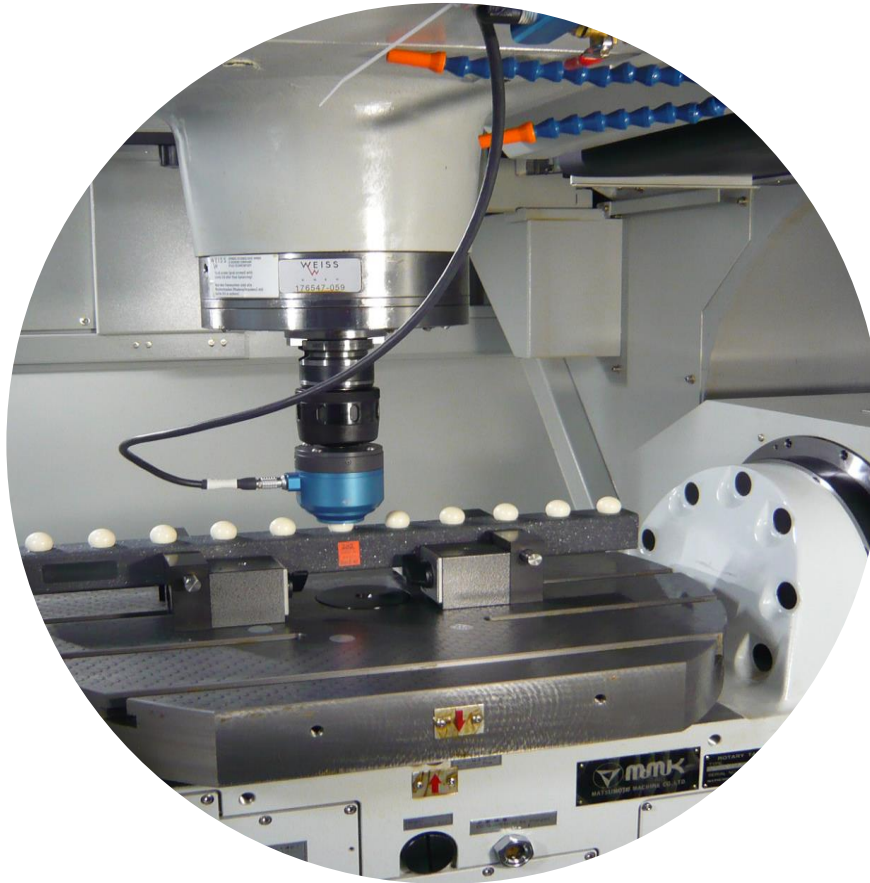


SILICIUMCARBIDE BEAM ALS LUCHTLAGER



Bron: Stage van Newport

KALIBRATIE BALK



KERAMISCHE VACUUMCHUCK



TYPISCHE EIGENSCHAPPEN:

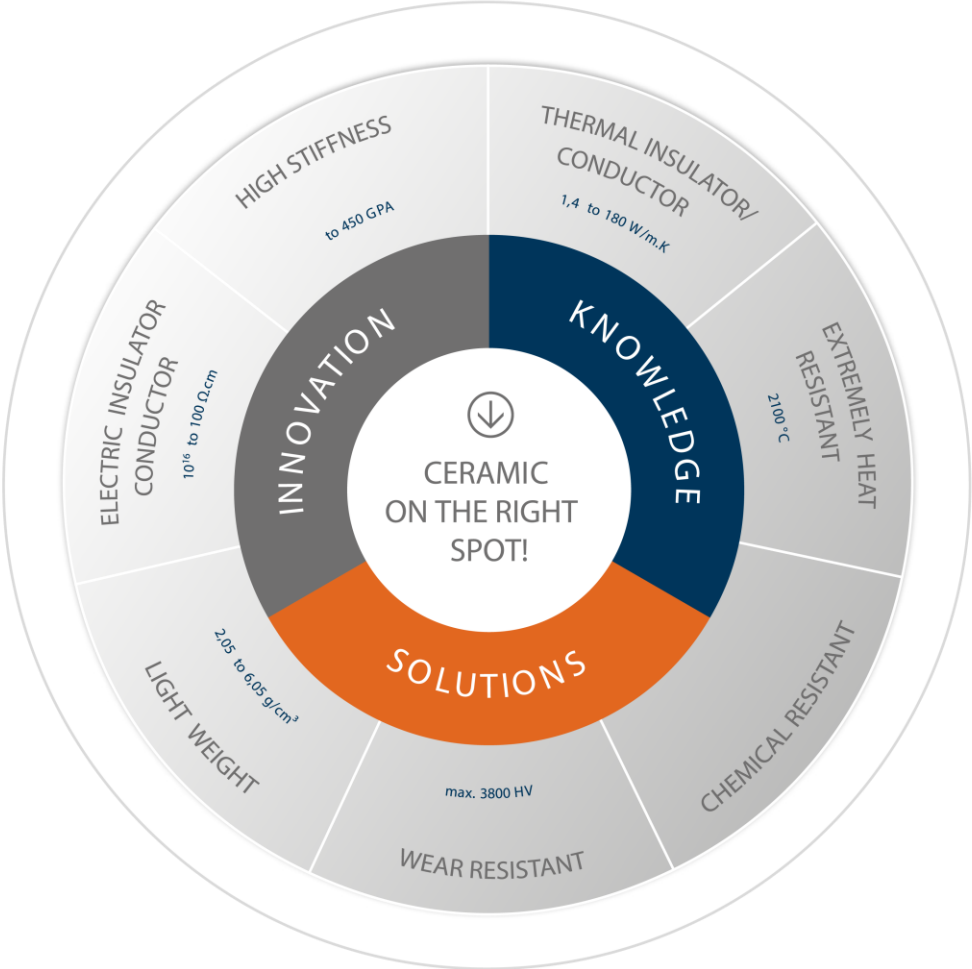
Hoge stijfheid, dus weinig vervorming

Elektrisch geleidend

Slijtvast

Zeer nauwkeurig vlak (20 nanometer)

EIGENSCHAPPEN



MATERIAAL DATASHEET

Technical Ceramic		Silicon Carbide SiC						
Material Properties								
Description	-	SiC F	SiC F+	SiC T	SiC D	SiC C	SiC P	SiC G
Colour	-	black	black	black / green	black	black	black	black
Density	g/cm ³	>3,10	>3,16	>3,21	>3,10	>3,10	2,76-2,89	>3,02
Porosity	vol %	<3,0	<1,0	<1,0	<3,0	<3,0	10 - 14	<3,0
Average Grain Size	µm	<5	<5	<2	bimodal	bimodal	<5	bimodal
Mechanical Properties								
Hardness Vickers HV 0.5		2600	2600	2300	2600	2600	2400	2500
Compressive Strength	MPa	2200	2200	2500	2200	2500	2000	2500
Flexural Strength	MPa	400	430	550	350	350	225	300
Fracture Toughness	MPa√m	3,2	3,2	5,0	3,2	3,2	3,2	3,2
Modulus of Elasticity	GPa	410	420	420	410	410	350	410
Weibull Modulus	-	10	15	15	10	10	15	10
Poisson's Ratio	-	0,17	0,17	0,16	0,17	0,16	0,17	0,16
Thermal Properties								
Maximum use Temperature	Air °C							
	Inert °C							
Specific Heat	J/kgK	600	600	600	600	600	600	600
Thermal Conductivity	W/mK	110	110	80	110	110	90	110
Thermal Expansion	20°C - 500°C	·10 ⁻⁶ /K	4,0	4,0	4,1	4,0	4,0	4,1
	500°C - 1000°C	·10 ⁻⁶ /K	5,8	5,8	5,8	5,8	5,8	5,8
Resistance to thermal shocks	K	202	212	268	177	179	133	150
Electrical Properties								
Electrical Resistivity at 20°C	Ω·cm	>10000	>10000	>10000	10-1000	10-1000	10-1000	10-1000
Dielectric Strength	kV/mm							

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Bedankt voor uw aandacht!

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