



Overzicht datasheet materialen

- Advice
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MATERIAL		OXIDES								NITRIDES						CARBIDES				GLASS CERAMIC	TUNGSTEN CARBIDES		METALS		
		ALUMINA				ZIRCONIA				SILICON NITIRDE			ALUMINIUM NITRIDE		BORON NITRIDE		SILICON CARBIDE			BORON CARBIDE	MACOR	WC-060	WN 095	CAST IRON	STEEL
Type		Al ₂ O ₃ 99,7%	Al ₂ O ₃ 99,5%	Al ₂ O ₃ 97.6%	Al ₂ O ₃ 60%	ZrO ₂ MgO stab.	ZrO ₂ CeO stab.	ZrO ₂ Y ₂ O ₃ stab.	ZrO ₂ HIP	Si ₃ N ₄ RBSN	Si ₃ N ₄ SSN	Si ₃ N ₄ HPSN	AlN T180	AlN T140	BN	BN HPBN	SiC SiSiC	SiC SSiC	SiC HPSiC	B ₄ C		WC with ± 6% Co	WC with ±9.5% Ni	GG-25	C-15
Properties																									
Density	g/cm ³	3.80	3.86	3.76	2.60	5.7	6.15	6.05	6.05	2.50	3.30	3.20	3.30	3.26	2.10	1.80	3.10	3.10	3.20	2.50	2.52	14.9	14.5	7.2	7.8
Porosity	%	0	0	0	0	0	0	0	0	1.20	0	0	0	0	3	2	3	0	0	0	0	0	0	0	0
Mechanical properties																									
Hardness (Vickers)	kg/mm ²	2000	2200	1500	1800	1200	900	1300	1350	300	1550	1600	1200	1200	18	20	2200	2500	2500	3000	250	1500	1370	200	200
Compressive strength	N/mm ²	2500	2070	1720	2100	1800	2000	2000	2000	800	2800	2800	2100	2100	700	800	700	2500	2700	2600	352	5300	5000	1000	1000
Bending strength	N/mm ²	340	310	296	185	1000	800	1000	1400	250	750	850	390	390	70	70	320	420	590	400	105	1600	1250	300	450
E-modulus	kN/mm ²	320	320	300	180	180	215	205	205	120	275	320	310	310	20	30	410	430	450	450		608	608	120	210
Weibull modulus	m	25	25	15	10	20	20	25	25	15	17	20	15	15	19	20	10	12	13	10					
Fracture toughness K _{1c}	Mpa√m	4	4	4	3	9	15	10	10	2.5	6	7	6	6			3.2	4	4	3					
Coefficient of friction		0.15	0.15	0.17	0.18	0.20	0.18	0.18	0.17	0.10	0.10	0.10					0.08	0.07	0.07						
Thermal properties																									
Max. use temperature																									
* in air	°C	1900	1725	1650	1600	900	1200	1200	2000	1400	1100	1100	1000	1000	800	1000	1400	1600	1600	500	1100	700	700	350	300
* in inert atm.	°C	1900	1725	1650	1620	900	2200 very	2200 very	2200	1750	1500 very	1300 very	1800 very	1800 very	2200	2200	2000 very	2000 very	2000 very	2000	1100			450	400
Thermal shock resistance		good	good	good	good	good	good	good	good	excellent	good	good	good	good	excellent	excellent	good	good	good	good					
Expansion coefficient	10 ⁻⁶ K																								
* 20°C - 200°C		7.0	6.9	6.9	3.6	8	10	10	10	3.0	3.2	3.2	4.6	4.6	2.5	2.5	4.0	4.1	4.1	5.0	9.4	5.5	5.0	9.0	11.0
* 20°C - 600°C		7.6	8.3	8.5	4.5	9	11	11	11	2.2	2.5	2.5	5.2	5.2							11.0				
* 20°C - 1000°C		8.0	9.4	9.0	5.1	9	11	11	11	3.3	3.6	3.4	5.6	5.6			5.8	5.8	5.8		12.3				
Thermal conductivity at 20°C	W/mK	29	29	27	3	3	2	2	2	10	35	35	180	140	25	40	110	110	180	45	1.6				
Electrical properties																									
Resistivity																									
* at 20°C	ohm cm	10 ¹⁴	10 ¹⁴	10 ¹⁴	10 ¹³	10 ¹⁰	10 ⁹	10 ⁹	10 ⁹	10 ¹⁵	10 ¹²	10 ¹³	10 ¹⁴	10 ¹⁴	10 ¹²	10 ¹⁵	0.2	10 ²	10 ²	0.2	10 ¹⁴				
* at 400°C	ohm cm	10 ¹²	10 ¹²	10 ¹²	10 ¹³	10 ¹¹	10 ¹⁰	10 ¹⁰	10 ¹⁰	10 ¹¹											10 ⁷				
* at 1000°C	ohm cm	10 ⁶	10 ⁶	10 ⁶	10 ²	10 ¹¹	10 ¹⁰	10 ¹⁰	10 ¹⁰	10 ⁷	10 ⁷	10 ⁷				10 ⁹	0.05	0.2	0.2						

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