INTERNATIONAL Syalons

MATERIAL PROPERTIES

PROPERTIES	UNITS	SIALON / SILICON NITRIDE					ALUMINA			ZIRCONIA			SILICON CARBIDE	
		Syalon 101	Syalon 050	Syalon 110	Syalon 201	Syalon 501	Aluminon 96	Aluminon 995	Aluminon 999	Zircalon 5	Zircalon 10	Zircalon 20	Sycarb 10	Sycarb 20
Composition	-	β-Sialon	α/β-Sialon	Sialon/BN	β-Sialon	Sialon/TiN	96% Al_2O_3	99.5% Al_2O_3	99.9% Al_2O_3	YSZ	YSZ	MgSZ	SSiC	SiSiC
Density	g/cc	3.24	3.23	2.65	3.24	4.01	3.75	3.89	3.95	6.13	6.05	5.70	3.15	3.10
Porosity	%	0	0	10	0	0	0	0	0	0	0	0	0	0
MECHANICAL PROPERTIES														
Modulus of Rupture 20°C	MPa	945	800	500	825	825	300	330	500	1000	1200	500	450	420
Modulus of Rupture 1000°C	MPa	700	750	400	750	-	200	250	300	-	-	-	450	420
Compressive Strength	MPa	>3500	>3500	-	>3500	>3000	>2000	>2000	>2500	>2000	>2000	>1600	>3500	>2600
Young's Modulus	GPa	288	290	-	290	330	330	370	400	205	205	210	410	400
Poisson's Ratio	-	0.23	0.23	-	0.23	-	0.22	0.22	0.22	0.30	0.30	0.30	0.21	0.20
Hardness (HRA)	-	92	94	88	92.7	90.5	-	-	-	91	91	90	-	-
Hardness (Hv_{50})	GPa	14.71	19.81	11.77	16.18	13.24	15.71	15.71	17.65	13.24	13.24	11.77	25.50	23.54
Fracture Toughness (K_{1c})	MPa $m^{1/2}$	7.7	6.5	3.5	4.6	5.7	3.5	4.0	4.5	8.0	10.0	7.0	4.0	4.0
THERMAL PROPERTIES														
Thermal Expansion Coefficient	10^{-6} K^{-1}	3.0	3.2	3.0	3.0	5.6	7.0	7.8	8.5	10.0	10.0	11.0	4.4	4.3
Thermal Conductivity	W/(mK)	28	20	27	21	19	20	30	30	2	2	2.5	150	110
Thermal Shock Resistance	ΔT°C	900	600	800	600	400	200	200	220	250	250	350	350	400
Maximum Use Temperature	°C	1200	1450	1450	1450	700	1600	1700	1700	1000	1000	1000	1400	1400
ELECTRICAL PROPERTIES														
Electrical Resistivity	Ohm cm	10^{12}	10^{12}	10^{12}	10^{12}	$7.2x10^{-4}$	10^{15}	10^{15}	10^{15}	10^{11}	10^{11}	10^{11}	10^{4}	10^{2}

Typical physical property data. The values given only apply to the test bodies on which they were determined and therefore can only be recommended values

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