



MATERIAL PROPERTIES

PROPERTIES	UNITS	SIALON / SILICON NITRIDE					ALUMINA			ZIRCONIA			SILICON CARBIDE	
		Syalon 101	Syalon 050	Syalon 110	Syalon 201	Syalon 501	Aloxalon 96	Aloxalon 995	Aloxalon 999	Zircalon 5	Zircalon 10	Zircalon 30	Sycarb 10	Sycarb 20
Composition	-	β-Sialon	α/β-Sialon	Sialon/BN	β-Sialon	Sialon/TiN	96% Al ₂ O ₃	99.5% Al ₂ O ₃	99.9% Al ₂ O ₃	YSZ	YSZ	ASZ	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	5.60	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	1000	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	>2000	>3500	>2600
Young's Modulus	GPa	288	290	-	290	330	330	370	400	205	205	-	410	400
Poisson's Ratio	-	0.23	0.23	-	0.23	-	0.22	0.22	0.22	0.30	0.30	0.29	0.21	0.20
Hardness (HRA)	-	92	94	88	92.7	90.5	-	-	-	91	91	90.4	-	-
Hardness (HV ₅₀)	GPa	14.71	19.81	11.77	16.18	13.24	15.71	15.71	17.65	13.24	13.24	12.13	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	4.0	5.0	14-15	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	10.1	4.4	4.3
Thermal Conductivity	W/(mK)	28	20	27	21	19	20	30	30	2	2	3.5	150	110
Thermal Shock Resistance	ΔT°C	900	600	800	600	400	200	200	220	250	250	250	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 ¹³	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

International Syalons (Newcastle) Limited
Stephenson Street, Willington Quay
Wallsend, Tyne & Wear NE28 6TT

Tel: +44(0)191 2951010
Fax: +44(0)191 2633847
Email: enquiries@syalons.com