



INTERNATIONAL
Syalons

**HIGH PERFORMANCE
ADVANCED CERAMICS**

Syalon 101

Syalon 101 is the first of the Si-Al-O-N family of ceramic materials which has been developed, characterised and is now being manufactured under carefully controlled conditions, ensuring the high quality material is consistently produced.

It is a general purpose engineering grade which is intended for applications demanding **high strength, toughness, wear resistance** and **thermal shock resistance**, where temperatures do not continuously exceed 1000°C, such as **industrial wear, non-ferrous molten metal handling** and **metal forming**.

The table below lists typical mechanical, thermal and electrical property data for Syalon 101.



Property	Value	Units
3 point RT Modulus of Rupture (Specimen 3 x 3 x 50, span 19.05mm)	945	MPa
Weibull Modulus	11	–
RT Unit Tensile Strength	400	MPa
RT Compressive Strength	>3500	MPa
RT Young's Modulus of Elasticity	288	GPa
RT Hardness (HRA)	92	–
RT Hardness (Vickers Hv _{0.3})	1500	Kg/mm ²
Fracture Toughness K ¹ C	7.7	MPam ^{1/2}
Poisson's Ratio	0.23	–
Density	3.23	g/cc
Porosity	0	%
Thermal Expansion Coefficient (0-1200°C)	3.04×10 ⁻⁶	K ⁻¹
Specific Heat	650	J/kg/K
RT Thermal Conductivity	28	W/(mK)
Thermal Shock Resistance	900	ΔT°C quenched in water
Electrical Resistivity	10 ¹⁰	Ohm m
Dielectric Constant	8.1	-
RT Loss Tangent (10GHz)	0.0019	-

Typical physical property data obtained under test conditions. All properties have been measured by independent testing authorities. 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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Syalon 101 continued...

Syalon 101 is a candidate for many chemical and process and molten metal handling applications as a result of its **excellent resistance to corrosion** by many acids and alkalis and molten metals as shown in the tables below.

Acid / Alkali	Conc. %	Temperature	Exposure time / hrs	Reaction
Hydrochloric acid	33	Boiling	100	None
Nitric acid	69	Boiling	100	Weak
Sulphuric acid	98	Boiling	100	None
Hydrofluoric acid	100	Boiling	100	Strong
Sodium hydroxide	50	Boiling	100	None

Metal	Temperature / °C	Exposure time / hrs	Reaction
Copper	1150	10	Strong
Brass	950	50	None
Aluminium	950	1000	None
Tin	300	100	None

Typical corrosion data obtained under test conditions. The values given only apply to the test bodies on which they were determined and therefore can only be recommended values.

Applications

Syalon 101 is used in a wide range of applications such as **thermocouple protection sheaths, heater tubes and ladles** in non-ferrous molten metal handling, **weld location pins** and **extrusion dies** in metal forming, **tappet shims** in automotive applications, **grinding media** and **de-watering foils** in industrial wear and **hydrocyclones** and **metering valves** in the oil and gas industry.

Technical Support

The successful integration of ceramics into industrial and engineering systems requires close collaboration between you, the end-user, and us, the material suppliers. Our Technical Specialists are available to discuss your requirements in detail and assist in exploiting the significant advantages which **Syalon 101** has to offer.

