



## Syalon 050

**Syalon 050** is a member of the Si-Al-O-N family - the first group of man-made ceramic alloys produced, and has been specifically designed for high performance under arduous wear conditions.

**Syalon 050** is a speciality material, which is intended for **industrial wear applications**, in which **high hardness** and **excellent wear resistance** are required. It also has **excellent high temperature properties**, maintaining good mechanical strength up to 1400°C.

The table below lists typical mechanical, thermal and electrical property data for Syalon 050.



Property	Value	Units
Composition	$\alpha/\beta$ -Sialon	-
Density	3.23	g/cc
Porosity	0	%
3 point Modulus of Rupture at 20°C (Specimen 3 x 3 x 50, span 19.05mm)	800	MPa
3 point Modulus of Rupture at 1000°C	750	MPa
3 point Modulus of Rupture at 1400°C	450	MPa
Creep Strain at 77MPa	0.1	% at 1327°C for 50 hrs
Weibull Modulus	8-13	-
Young's Modulus of Elasticity	306	GPa
Poisson's Ratio	0.27	-
Hardness (HRA)	94	-
Hardness (Vickers HV <sub>50</sub> )	19.81 (2020)	GPa (Kg/mm <sup>2</sup> )
Fracture Toughness K <sup>1</sup> C	6.5	MPam <sup>1/2</sup>
Thermal Expansion Coefficient (0-1200°C)	3.2x10 <sup>-6</sup>	K <sup>-1</sup>
Thermal Conductivity	20	W/(mK)
Thermal Shock Resistance	600	ΔT°C quenched in water
Maximum Use Temperature	1450	°C
Electrical Resistivity	10 <sup>12</sup>	Ohm cm

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.





**Syalon 050** also has **excellent resistance to corrosion**. Its behaviour is very similar to Syalon 101 although slightly better, particularly in acids and alkalis. This excellent behaviour makes **Syalon 050** particularly beneficial in the **chemical and process industries**.

The tables below show the corrosion behaviour of **Syalon 050** in various acids, and alkalis and molten metals.

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 050** is used in a wide range of applications such as **shot blast nozzles, seals, cutting tools, grinding media** and **metering valves**, where excellent wear resistance is required as well as **thermocouple protection sheaths** and **tubes** where it's excellent corrosion resistance to molten metals and chemicals at high temperatures is beneficial.

## 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 050** has to offer.

