INTERNATIONAL Syalons

ADVANCED ZIRCONIA CERAMICS

Zircalon 5 & Zircalon 10

Zircalon 5 and **Zircalon 10** are yttria stabilized zirconia ceramics and are amongst the toughest of all monolithic ceramics. They are characterized by high impact resistance and very high strength and toughness resulting in excellent wear resistance.

Zirconia is typically used in applications in the metal forming industry as weld location pins for resistance welding of captive nuts on sheet metal.

The table below compares their typical mechanical, thermal and electrical property data of the two grades.

Property	Units	Zircalon 5	Zircalon 10
Density	g/cc	6.13	6.05
Porosity	%	0	0
3 point Modulus of Rupture 20°C (Specimen 3x3x50, span 19mm)	MPa	1000	1200
Weibull Modulus	-	15	15
Compressive Strength	MPa	>2000	>2000
Young's Modulus of Elasticity	GPa	205	205
Poisson's Ratio	-	0.30	0.30
Hardness (HRA)	-	91	91
Hardness (Vickers Hv_{50})	GPa (Kg/mm^2)	13.24 (1350)	13.24 (1350)
Fracture Toughness K^1C	$MPam^{½}$	4.0	5.0
Thermal Expansion Coefficient (0-1200°C)	K^{-1}	$10.0x10^{-6}$	$10.0x10^{-6}$
Thermal Conductivity	W/(mK)	2.0	2.0
Thermal Shock Resistance	ΔT°C quenched in water	250	250
Maximum Use Temperature	°C	1000	1000
Electrical Resistivity	ohm cm	10^{11}	10^{11}

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.

Applications

Zircalon is used predominately in applications requiring excellent impact and wear resistance, in industries such as metal forming and oil and gas. Components such as weld location pins, as used in resistance welding, benefit from the outstanding toughness and strength of **Zircalon**. Its excellent chemical corrosion resistance also make it a candidate material in chemical and process industry applications.

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 **Zircalon** has to offer.

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