FZM

February 2025

Material Type: Magnesia partially stabilized zirconia (Mg-PSZ) (ZrO_2, MgO)
MECHANICAL AND PHYSICAL PROPERTIES OF THE MATERIAL (TYPICAL)

Characteristic	Standard	Specification	Unit	Value
Content			[%]	> 99.7
Density (ρ_b)	DIN EN ISO 18754		[g/cm³]	≥ 5.70
Open (apparent) porosity (π_a)	DIN EN ISO 18754		[vol-%]	0
Average size of crystallites (g_{mli})	ISO 13383-1	A1	[µm]	50
Flexural strength ($\sigma_{f,4}$)	DIN EN 843-1	Four-Point-Bending	[MPa]	500
Weibull modulus (m)	EN ISO 20501		[-]	> 15
Fracture toughness ($K_{1c,\ SEVNB}$)	DIN EN ISO 23146	SEVNB	[MPa·m^{0,5}]	6.3
Compressive strength ($\sigma_{c,m}$)	DIN ISO 17162		[MPa]	2000
Young's modulus of Elasticity (E)	EN 843-2	dynamic	[GPa]	207
Poisson's ratio (μ)	EN 843-2	resonance	[-]	0.31
Vickers Hardness (HV 1.0)	DIN EN ISO 14705	Procedure A	[GPa]	12.0
Maximum service temperature (T_{max})		in air	[°C]	900
Mean coefficient of linear thermal expansion ($\bar{\alpha}$)	DIN EN ISO 17562	-100 - 20 °C 20 - 500 °C 20 - 900 °C	[10^{-6}/K]	7.7 10.4 10.6
Specific heat capacity (c_p)	DIN EN 821-3	20 °C	[J/(kg·K)]	400
Thermal shock resistance	DIN EN 820-3	R_1, Type A, in water	[°C]	250
Thermal conductivity (λ)	DIN EN ISO 18755	20 °C 500 °C 900 °C	[W/m·K]	3 2.3 2
Volume resistivity (ρ)	DIN EN 62631-3	20 °C 900 °C	[Ω·cm]	10^{10} 84
Dielectric strength	DIN EN 60243-1		[kV/mm]	> 30
Typical colour			[-]	yellow

The preliminary remark in DIN 60672-2 applies analogously to the property values given in the table, according to which the reported values apply only to the test specimens on which they were determined. Assignment to other forms is therefore only conditional permissible. The reference values given are to be understood as such. They refer to a temperature of 20 °C, unless otherwise stated.

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