

Macor® (MGC) Material Specifications



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Technical Products, Inc. is an authorized distributor of MACOR® machinable glass ceramic (MGC). We inventory large quantities of stock both [in-house](#) and [online](#) ready to ship in 1-3 business days.

MACOR® (MGC) glass ceramic offers an outstanding combination of thermal, mechanical, electrical and chemical properties. MACOR® (MGC) material withstands high temp. up to 1000 °C (no load) and demonstrates high electrical resistivity and dielectric strength. It can also be machined (using ordinary metal working tools) in intricate shapes and precision parts.

Mechanical Properties	SI/Metric	Imperial
Density	2.52 g/cm ³	157 lbs./ft ³
Porosity	0%	0%
Young's Modulus, 25°C (Modulus of Elasticity)	66.9 GPa	9.7 x 10 ⁶ psi
Poisson's Ratio	0.29	0.29
Shear Modulus, 25°C	25.5 GPa	3.7 x 10 ⁶ psi
Knoop Hardness, 100g	250 kg/mm ²	-
Modulus of Rapture, 25°C (Flexural Strength)	94 MPa (Minimum specified average value)	13,600 psi
Compressive Strength (After Polishing)	345 MPa up to 900 MPa	49,900 psi 130,000 psi

Thermal Properties	SI/Metric	Imperial
Coefficient of Expansion CTE -100°C → 25°C	81 x 10 ⁻⁷ /°C	45 x 10 ⁻⁷ /°F
CTE 25°C → 300°C	90 x 10 ⁻⁷ /°C	50 x 10 ⁻⁷ /°F
CTE 25°C → 600°C	112 x 10 ⁻⁷ /°C	62 x 10 ⁻⁷ /°F
CTE 25°C → 800°C	123 x 10 ⁻⁷ /°C	68 x 10 ⁻⁷ /°F
Specific Heat, 25°C	0.79 kJ/kg°C	0.19 Btu/lb.°F
Thermal Conductivity, 25°C	1.46 W/m°C	10.16 Btu.in/hr.ft ² °F
Thermal Diffusivity, 25°C	7.3 x 10 ⁻⁷ m ² /s	0.028 ft ² /hr.
Continuous Operating Temperature	800°C	1472°F
Maximum No Load Temperature	1000°C	1832°F

Electrical Properties	SI/Metric	Imperial
Dielectric Constant, 25°C		
1 kHz	6.01	6.01
8.5 GHz	5.64	5.64
Loss Tangent, 25°C		
1 kHz	0.0040	0.0040
8.5 GHz	0.0025	0.0025
Dielectric Strength (AC) avg. 25°C, under 0.03mm thickness	45 kV/mm	1143 V/mil
Dielectric Strength (DC) avg. 25°C, under 0.03mm thickness	129 kV/mm	3277 V/mil
DC Volume Resistivity, 25°C	10 ¹⁷ Ohm.cm	10 ¹⁷ Ohm.cm

Chemical Properties				
Solution	pH	Time	Temp.	Weight Loss (mg-cm ²) Gravimetric
5% HCl (Hydrochloric Acid)	0.1	24 hrs.	95°C	100
0.002 N HNO	2.8	24 hrs.	95°C	0.6
0.01 N NaHCO (Sodium Bicarbonate)	8.4	24 hrs.	95°C	0.3
0.02 N NA CO (Sodium Carbonate)	10.9	6 hrs.	95°C	0.1
5% NaOH (Sodium Hydroxide)	13.2	6 hrs.	95°C	10
Chemical Durability				Class
DIN 12111 / NF ISO 719		Water		HGB2
DIN 12116		Acid		4
DIN 52322 / ISO 695		Alkali		A3

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