

# MACOR® Machinable Glass Ceramic (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 temps. 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 <sup>3</sup>	157 lbs/ft <sup>3</sup>
Porosity	0%	0%
Young's Modulus, 25°C (Modulus of Elasticity)	66.9 GPa	9.7 x 10 <sup>6</sup> psi
Poisson's Ratio	0.29	0.29
Shear Modulus, 25°C	25.5 GPa	3.7 x 10 <sup>6</sup> psi
Knoop Hardness, 100g	250 kg/mm <sup>2</sup>	-
Modulus of Rupture, 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 <sup>-7</sup> /°C	45 x 10 <sup>-7</sup> /°F
CTE 25°C → 300°C	90 x 10 <sup>-7</sup> /°C	50 x 10 <sup>-7</sup> /°F
CTE 25°C → 600°C	112 x 10 <sup>-7</sup> /°C	62 x 10 <sup>-7</sup> /°F
CTE 25°C → 800°C	123 x 10 <sup>-7</sup> /°C	68 x 10 <sup>-7</sup> /°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 <sup>2</sup> °F
Thermal Diffusivity, 25°C	7.3 x 10 <sup>-7</sup> m <sup>2</sup> /s	0.028 ft <sup>2</sup> /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 <sup>17</sup> Ohm.cm	10 <sup>17</sup> Ohm.cm

Chemical Properties	pH	Time	Temp.	Gravimetric
5% HCl (Hydrochloric Acid)	0.1	24 hrs.	95°C	~ 100
0.002 N HNO (Nitric Acid)	2.8	24 hrs.	95°C	~ 0.6
0.01 N NaHCO <sub>3</sub> (Sodium Bicarbonate)	8.4	24 hrs.	95°C	~ 0.3
0.02 N Na <sub>2</sub> CO <sub>3</sub> (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

\*\*The information provided in this table is a compilation of publicly available data. This information is provided for comparison purposes only, and is not intended to be warrantable. Further, Technical Products, Inc. disclaims any and all liability from errors, in accuracies, or omissions.