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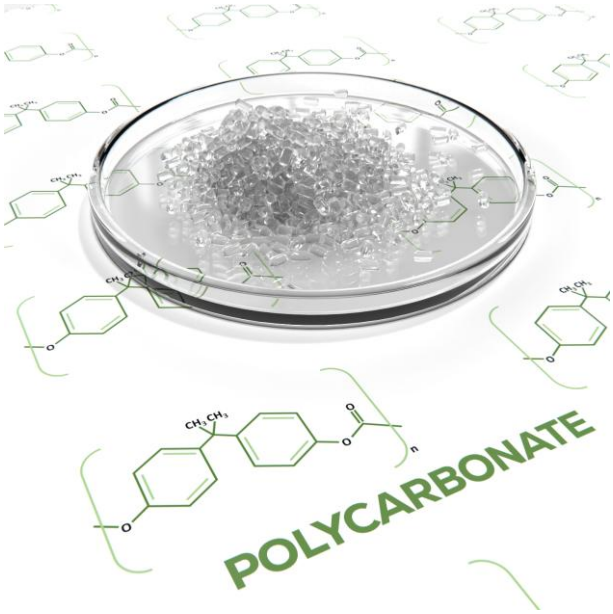
PC (Polycarbonate) & PMMA (Acrylic) — Material Datasheet (General)



Polycarbonate (PC)

Tough engineering thermoplastic with high impact strength, good fatigue resistance, and excellent electrical insulation.

Item	Value
Continuous Use Temperature	105 °C / 221 °F
UL 94 Flame Rating	V-2 (thickness dependent)
Density	1.19–1.21 g/cm^3

Mechanical properties (typical) — PC

Property	Test method	Typical value	Unit
Tensile strength (23 °C)	ISO 527	60–70	MPa
Tensile modulus (23 °C)	ISO 527	2.3–2.6	GPa
Elongation at break	ISO 527	80–120	%
Notched impact (Charpy)	ISO 179	6–12	kJ/m^2

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Thermal properties — PC

Property	Test method	Typical value	Unit
Glass transition temperature (Tg)	ISO 11357	147	°C
HDT (1.8 MPa)	ISO 75	120–135	°C
Thermal conductivity	—	0.20–0.22	W/(m·K)

Electrical properties — PC

Property	Test method	Typical value	Unit
Dielectric strength	IEC 60243	15–25	kV/mm
Relative permittivity (1 MHz)	IEC 60250	2.9–3.1	—
Dissipation factor (1 MHz)	IEC 60250	0.001–0.01	—

Moisture & environment — PC

Water absorption (24 h) 0.15–0.25% (ISO 62). Resistant to many weak acids and alkalis; avoid strong solvents/stress-cracking agents.

Assembly guidance — threaded parts & hinges (PC)

• Use a torque wrench and validate torque in application; account for creep/relaxation at temperature.

• Distribute bearing stress with washers or flanges; avoid sharp stress concentrators at thread run-outs and hinge knuckles.

• Consider UV-stabilized grades if exposed outdoors.

PMMA (Acrylic)

Transparent thermoplastic with excellent optical clarity and good electrical insulation; lower impact and heat resistance than PC.

Item	Value
Continuous Use Temperature	75 °C / 167 °F
UL 94 Flame Rating	HB (thickness dependent)
Density	1.17–1.20 g/cm^3

Mechanical properties (typical) — PMMA

Property	Test method	Typical value	Unit
Tensile strength (23 °C)	ISO 527	60–75	MPa
Tensile modulus (23 °C)	ISO 527	2.4–3.3	GPa
Elongation at break	ISO 527	2–7	%

Thermal properties — PMMA

Property	Test method	Typical value	Unit
Glass transition temperature (Tg)	ISO 11357	105	°C
HDT (1.8 MPa)	ISO 75	90–100	°C
Thermal conductivity	—	0.18	W/(m·K)

Electrical properties — PMMA

Property	Test method	Typical value	Unit
Dielectric strength	IEC 60243	10–20	kV/mm
Relative permittivity (1 MHz)	IEC 60250	2.6–3.4	—
Dissipation factor (1 MHz)	IEC 60250	0.02–0.06	—

Moisture & environment — PMMA

Water absorption (24 h) 0.20–0.40% (ISO 62). Resistant to dilute acids/detergents; avoid many solvents and stress-cracking agents.

Assembly guidance — threaded parts & hinges (PMMA)

• Validate torque carefully; PMMA is brittle compared to PC — prefer lower tightening torque and larger bearing areas.

• Use washers/flanges to reduce surface stress; avoid shock/impact loading at hinges.

• Protect from aggressive solvents; consider UV-stabilized grades if exposed outdoors.