

Technical Data Sheet (TDS) - DPQA0001090-001
Cast Acrylic Sheet (PMMA)

Material description

Cast acrylic sheet is a high-clarity thermoplastic produced by casting methyl methacrylate monomer between glass plates.

It offers excellent optical performance, surface hardness, and environmental stability, making it suitable for display cover lenses and optical components.

Typical applications

- Display cover lenses
- Printed windows and graphic overlays
- Touch interface substrates
- Optical panels and light guides
- Medical, industrial, and scientific instrumentation housings

Key properties

Property	Typical Value
Chemical name	Poly methyl methacrylate (PMMA)
Manufacturing process	Cell cast
Density	~1.19 g/cm ³
Light transmission	~92% (clear sheet)
Refractive index	~1.49
Haze	<1% (uncoated, clear)
Surface hardness	Pencil hardness ~3H
Continuous service temperature	Up to ~80 °C
Short-term temperature limit	~90–95 °C
Glass transition temperature (T _g)	~105 °C
Water absorption (24 hrs)	~0.3%
UV stability	Excellent (non-yellowing grades)

Values are typical and not guaranteed.

Optical performance

- High optical clarity with minimal birefringence
- Excellent surface finish suitable for cosmetic and functional printing
- Compatible with anti-glare, anti-reflective, and hard-coat systems

Mechanical performance

Property	Typical Value
Tensile strength	~70 MPa
Flexural strength	~110 MPa
Flexural modulus	~3.2 GPa
Impact resistance	Moderate (higher than glass, lower than polycarbonate)

Environmental resistance

- Good resistance to weathering and UV exposure
- Resistant to dilute acids and alkalis
- Limited resistance to alcohols, hydrocarbons, and aromatic solvents
- Not recommended for prolonged exposure to ketones or chlorinated solvents

Fire Performance and Flammability

Standard	Test Method	Classification	Description
BS 476 Part 7	Surface spread of flame	Class 3	Moderate surface flame spread. Typical for unmodified cast acrylic.
UL 94	Vertical / horizontal burn	HB	Slow burning in horizontal orientation. No self-extinguishing.
NF P 92-307	French fire classification	M4 (without drips)	Combustible material. Burns without flaming droplets.
EN 13501-1	Reaction to fire (Euroclass)	E (typical)	Contributes to fire. No significant smoke or flaming droplets rated.
ASTM D635	Rate of burning	Burns $\leq$ 40 mm/min (typical)	Material burns at a controlled rate when tested horizontally.

Processing compatibility

- CNC machining and laser cutting
- Screen, pad, and digital printing
- Precision lamination and bonding
- Compatible with pressure-sensitive adhesives and optical bonding systems
- Thermoforming possible with controlled heating

Design considerations

- Brittle fracture compared to polycarbonate; edge finish and stress control are critical
- Thermal expansion should be accommodated in bonded or framed assemblies
- Coating and bonding processes must avoid solvent attack
- Inspection criteria should be defined for optical distortion, surface defects, and print alignment

Compliance

- RoHS compliant (material dependent)
- REACH compliant (material dependent)
- Food-contact and medical grades available on request

Storage and handling

- Store flat, supported, and protected from dust and abrasion
- Maintain protective masking until final processing
- Avoid prolonged exposure to heat sources during storage