

Technical Data Sheet (TDS) – DPQA0001098-001
Anti-Static (ESD) Hard Coat on PMMA (Cast Acrylic)

Material Description

Anti-Static (ESD) Hard Coat applied to cast PMMA (acrylic) sheets provides a durable, transparent surface that controls electrostatic discharge while maintaining clarity, abrasion resistance, and cleanability. The coating dissipates surface charge to reduce dust attraction and protect sensitive electronics from ESD events.

Substrate

- Cast acrylic (PMMA)
- Typical thickness range: 1.0–20.0 mm
- Coating applied to one or both surfaces

Physical Properties

Property	Test Method	Units	Typical Value
Coating Thickness	Internal	µm	3 - 6
Adhesion (cross-hatch)	ISO 2409	Class	0
Pencil Hardness	ISO 15184	-	4H
Surface Resistivity	ASTM D257	Ω/sq	10 ⁶ –10 ⁸
Surface Energy	ASTM D2578	mN/m	>38

Optical Properties

Property	Test Method	Units	Typical Value
Light Transmission	ASTM D1003	%	>89
Haze	ASTM D1003	%	>2
Refractive Index	ISO 489/A	-	~1.49
Optical Distortion	Internal	-	Low

Note

All values shown are typical and subject to variation depending on substrate grade, thickness, and processing. Anti-fog performance is influenced by ambient humidity, air flow, and application method. Material selection should be validated through customer-specific testing.

Mechanical Properties

Property	Test Method	Conditions	Typical Value
Scratch Resistance	ISO 1518	-	Improved
Abrasion Resistance	Taber CS-10F	500 cycles	<5% haze
Impact Resistance	ISO 179	kJ/m ²	18
Edge Chipping Sensitivity	Internal	-	Moderate

Thermal Properties

Property	Test Method	Units	Typical Value
Service Temperature Range	-	°C	-40 to +80
Vicat Softening Temperature	ISO 306	°C	>110
Coefficient of Thermal Expansion (CTE)	ASTM D696	mm/m·°C	0.077

Fire Performance

Fire performance is governed by the PMMA substrate:

- UL 94 HB (typical)
- Compatible with BS 476 Part 7 Class 3
- Hard coating does not materially alter the fire rating

Chemical Resistance (General)

- Resistant to:
 - Dilute acids
 - Alcohols
 - Mild detergents
- Limited resistance to:
 - Oils
 - Fuels

• **Not recommended for:**

- Ketones
- Aromatic solvents
- Chlorinated solvents

Processing and Fabrication

Process	Compatibility
CNC machining	Excellent (post-coating preferred)
Laser cutting	Excellent
Screen printing	Compatible
Digital printing	Compatible
Optical lamination	Compatible
Bonding systems	Must be validated

Typical Applications

- Touchscreens and user interfaces in static-sensitive environments
- Equipment panels for electronics, cleanrooms, and ATEX areas
- Protective covers for displays, monitors, and sensors
- Enclosures for medical, aerospace, or industrial controls

Design Considerations

- Ensure grounding paths are integrated into the assembly
- Avoid solvents that may degrade the anti-static layer
- Coating reduces static attraction but may not fully eliminate charge buildup under all conditions
- Higher CTE than glass requires appropriate bond-line design

Disclaimer

Material properties are typical values and not guaranteed. Final performance depends on substrate grade, coating process, and end-use environment. Electrostatic protection must be validated per application-specific requirements.