

Technical Data Sheet (TDS) - DPQA0001102-001
Anti-Static Hard Coat on Polycarbonate (PC)

Material Description

Anti-Static (ESD) Hard Coat applied to polycarbonate (PC) sheets provides a clear, abrasion-resistant surface that controls static charge build-up and suppresses particle attraction in sensitive electronic or cleanroom environments.

The coating maintains surface cleanliness, reduces risk of ESD events, and improves chemical resistance and durability without compromising the base material's optical clarity, impact strength, or dimensional stability.

This coating system is typically specified where electrostatic discharge control and dust suppression are essential, such as in medical, cleanroom, or electronic interface applications, while preserving clarity, toughness, and surface performance.

- Polycarbonate (PC) – optical and engineering grades
- Typical thickness range: 0.5–10.0 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	0–1
Pencil Hardness	ISO 15184	–	HB
Surface Resistivity	ASTM D257	Ω/sq	10 ⁶ –10 ⁸
Surface Energy	ASTM D2578	mN/m	>38

Mechanical Properties

Property	Test Method	Conditions	Units	Typical Value
Scratch Resistance	ISO 1518	–	–	Improved
Abrasion Resistance	Taber CS-10F	500 cycles	% haze	<5
Impact Resistance	ISO 180/1A	notched	kJ/m ²	Retained
Edge Chipping Sensitivity	Internal	–	–	Low (process-dependent)

Optical Properties

Property	Test Method	Conditions	Units	Typical Value
Light Transmission	ASTM D1003	3 mm	%	88–90
Haze	ASTM D1003	–	%	<1
Refractive Index	ISO 489/A	–	–	~1.586
Optical Distortion	Internal	–	–	Low

Thermal Properties

Property	Test Method	Units	Typical Value
Service Temperature Range	–	°C	–40 to +120
HDT (1.8 MPa)	ISO 75	°C	~130
CTE	ASTM D696	mm/m·°C	0.065

Fire Performance

Fire performance is governed by the polycarbonate substrate, not the coating.

- Compatible with UL 94 V-2 and V-0 grades
- No adverse impact on EN 13501-1 ratings when correctly specified
- Coating does not contribute to flaming drips or smoke generation

Chemical Resistance (General)

- Resistant to:
 - Alcohols
 - Dilute detergents
 - Common cleaning agents
- Limited resistance to:
 - Oils and hydrocarbons
- Not recommended for prolonged exposure to:
 - Ketones
 - Aromatic solvents
 - Chlorinated solvents

Processing and Fabrication

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

Typical Applications

- Display covers for cleanroom environments or medical equipment
- Touchscreens, keypads, and HMI interfaces with ESD-sensitive components
- Equipment panels in laboratories, diagnostics, and electronic enclosures
- Protective windows requiring anti-static performance and optical clarity
- Rugged transparent barriers where static suppression reduces particle attraction

Design Considerations

- Specify anti-static coating early to align with static control and surface handling requirements
- Ensure proper grounding of assemblies when used near sensitive electronics
- Maintain coating orientation to the exposed surface for optimal ESD performance
- In-house controlled post-processing is preferred to preserve conductivity and optical finish
- Optional integration of a screen-printed or sprayed silver busbar can enhance overall electrostatic discharge performance when properly grounded.

Disclaimer

Typical values shown are not guaranteed. Final performance depends on substrate grade, coating thickness, processing conditions, and assembly validation.