

What is PC antistatic?

PC antistatic

PC antistatic (ESD)

PC antistatic is a crystal-clear polycarbonate solid sheet finished at the factory on both sides with a permanently antistatic coating. It reliably dissipates electrostatic charge without the effect fading over time, unlike migrating antistatic additives.

Structure and Working Principle

The base material is standard polycarbonate, the same as used for uncoated PC solid sheet. Both sides carry a permanently antistatic surface finish, and the sheet also ships with a factory-applied protective film.

Unlike migrating antistatic additives, which wear off or wash out of the surface over time and lose their effect, the dissipative property of this coating is retained for the entire service life of the sheet. Surface resistivity to IEC 60093 remains permanently in the range of 10^6 to $10^9 \Omega$. Uncoated standard polycarbonate, by contrast, sits at around $10^{16} \Omega$ and is therefore a very good insulator, on which electrostatic charge can build up and discharge abruptly.

Advantages and Limitations

Advantages

- Permanently electrostatically dissipative, no loss of effect over time
- Excellent scratch resistance and chemical resistance
- High impact strength – around 250 times more break-resistant than glass
- Dust- and dirt-repellent surface
- Factory-applied protective film on both sides

Disadvantages

- Not UV-stabilised, therefore not suitable for permanent outdoor weathering
- Light transmission reduced to approx. 70% compared with uncoated PC (approx. 90%)
- Antistatic coating not declared as food-safe

Applications

Thanks to its permanent dissipative property, PC antistatic is suitable wherever electrostatic charging could endanger sensitive components or where dust attraction caused by electrostatic charge is undesirable – for example in electronics and semiconductor manufacturing, in cleanrooms, and in chemical, pharmaceutical and food processing. The material is also used as protective screens, protective enclosures or machine door panes wherever a mechanical protective function needs to be combined with permanent electrostatic dissipation.

Availability and Processing

PC antistatic is manufactured by extrusion and is available in thicknesses of 3, 4, 5, 6 and 8 mm (thickness tolerance $\pm 10\%$). Mechanically it behaves largely like standard polycarbonate and can be sawn, milled, drilled and thermoformed using the usual plastics processing methods. Care must be taken during processing not to damage the two-sided antistatic coating through overheating or mechanical abrasion.

Typical Properties

- Permanently electrostatically dissipative
- Excellent scratch resistance and chemical resistance

Product Examples

- Protective screens
- Protective enclosures
- Machine door panes
- Cleanroom viewing windows

Typical Industries

- Electronics and semiconductor manufacturing
- Cleanroom technology

- High impact strength (250x more break-resistant than glass)
- Dust- and dirt-repellent surface
- Chemical, pharmaceutical and food processing
- Paper and printing industry

	Test Method	Unit	Value
Electrical Properties			
Surface resistivity	IEC 60093	Ω	10^6 to 10^9
Mechanical Properties			
Yield stress	ISO 527-1,-2	MPa	>60
Tensile modulus	ISO 527-1,-2	MPa	2350
Flexural strength	ISO 178	MPa	90
Impact strength (Charpy, unnotched)	ISO 179/1eU		no break
Density		g / cm ³	1.20
Thermal Properties			
Heat deflection temperature (1.8 MPa)	ISO 75-1,-2	°C	128
Vicat softening temperature B/50	ISO 306	°C	148
Thermal conductivity	ISO 8302	W / (m·K)	0.20
Continuous service temperature		°C	~120
General Properties			
Colour			colourless
Available thicknesses		mm	3 / 4 / 5 / 6 / 8
Thickness tolerance		%	±10
Manufacturing process			Extrusion
Fire behaviour (thickness 1-6 mm)	EN 13501-1		B-s1,d0
UV resistance			not UV-stabilised (not for long-term outdoor weathering)
Optical Properties			
Light transmission		%	~70

The base material of PC antistatic corresponds to standard polycarbonate; the mechanical and thermal properties therefore apply accordingly. Only the antistatic surface finish applied to both sides distinguishes the material from uncoated PC and affects surface resistivity and light transmission. Surface resistivity may vary within the stated range depending on thickness, climatic conditions and measurement method; it is not a constant guaranteed under all ambient conditions over the entire service life. The values stated are typical average values determined as part of ongoing quality assurance and are intended as an aid to material selection. They do not constitute a legally binding assurance of specific properties or of suitability for a particular purpose. The antistatic coating is not declared for direct food contact; for applications involving food contact it must be separately assessed whether migration-tested materials should be used instead. As properties can also depend on the dimensions of the semi-finished product and on the production batch, actual values of a specific product may deviate slightly from those stated here.

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Kunststofftechnik.de