

▲ ZENIT



**ANTISTATIC TRANSPARENT**

**ESD PLASTIC SHEETS**

## ESLON®-DC ESD PLASTIC SHEETS

### PROTECTION AGAINST ELECTROSTATIC DISCHARGES IN PRODUCTION PROCESSES

Electronic manufacturing is always in motion. Therefore small and large electrostatic charges occur in the automation technology and **electrostatic discharges** (=ESD) take place at every production step.

The discharges have to be conducted properly, because otherwise irreparable functional failures, costly defects, contamination by dust and dirt or explosions may occur.

A reliable protection against electrostatic discharges (ESD) must be ensured.

Microchips, circuit boards and sensors can be damaged by even small electrostatic discharges of 20 volts and require a comprehensive safety concept (acc. to IEC 61340-5-1).

In clean room technology, no dust particles may enter the production process. Pharmaceutical manufacturing and food processing also require a clean and hygienic environment that is as particle-free as possible. ESLON®-DC ESD (DC = dust clean) plastic sheets are the best solution for this.



### ESLON®-DC ESD PROTECTS HIGHLY SENSITIVE COMPONENTS

ESLON®-DC ESD plastic sheets are available in four base materials:

- Polycarbonate
- PMMA (Acrylic)
- PVC
- C-PVC

The conductive surface layer on both sides of the sheets guarantees permanent ESD protection against uncontrolled electrostatic discharges.

ESLON®-DC ESD plastic sheets comply with „ATEX“ directive 94/9/EC, II 2 GD (explosion protection).

For the effective isolation of light-sensitive production processes (e.g. UV-exposures, laser beams) there are transparent clear variants and transparent colour variants available.

## ESLON®-DC ESD APPLICATION

### ESLON®-DC ESD plastic sheets protect highly sensitive components from production to application, e.g. in:

- electronics and semiconductor industry
- machine and plant engineering
- wafer processing
- clean room technology
- automation technology & automatic placement machines
- chemical and pharmaceutical industry
- food industry
- printing and paper sector

### Due to high transparency, ESLON®-DC ESD plastic sheets are suitable as a material for:

- glazing
- inspection windows
- protective covers
- partition elements
- test equipment
- laminar flow units
- enclosures
- dry storage systems
- inspection systems

## PRODUCT OVERVIEW

ESLON®-DC ESD plastic sheets have a conductive surface layer on both sides to maintain all beneficial characteristics of the plastic material.

### ESLON®-DC ESD plastic sheets are available in:

- different plastic types
- different sheet thicknesses (from very thin to thick)
- multiple sheet formats (also in small quantities)
- tinted colours (besides the basic version „clear transparent“)
- three different ESD coatings (ESD Standard, ESD Hard Coat and ESD Thermoform)

### ESLON®-DC ESD

- electrostatically conductive on both sides
- excellent to process and work with
- flame-retardant types
- protection against damages caused by electrostatic discharge
- high transparency
- UV stability
- durability



### ANTISTATIC. TRANSPARENT. ELECTROSTATIC DISCHARGE.

(ELECTROSTATIC DISCHARGE = ESD)

#### POLYCARBONATE

ESD Standard | ESD Hard Coat | ESD Thermoform

#### PMMA/ACRYLIC

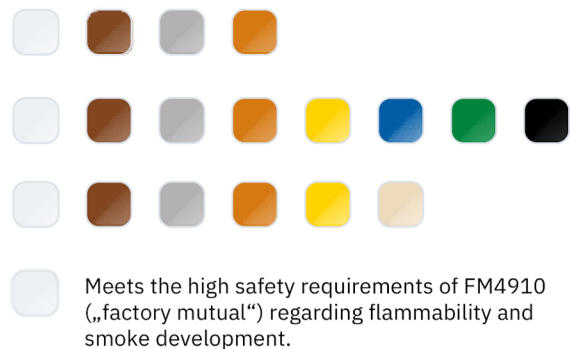
ESD Standard | ESD Hard Coat | ESD Thermoform

#### PVC

ESD Standard | ESD Hard Coat | ESD Thermoform

#### C-PVC

ESD Standard | ESD Hard Coat



ESD Standard



ESD Hard Coat



ESD Thermoform

### ESLON®-DC ESD PLASTIC SHEETS: COATING ESD STANDARD, ESD HARD COAT & ESD THERMOFORM

ESLON®-DC ESD plastic sheets are available in ESD Standard, ESD Hard Coat and ESD Thermoform. ESD Standard series is suitable for heat forming of the material, for more complex deformations, ESD Thermo form is the best choice. ESLON®-DC ESD Hard Coat is recommended for flat applications. Due to UV-cross linking of the coating the material is scratch-resistant and resistant to organic solvents.

# POLYCARBONATE

Polycarbonate is classified as a member of the polyester family. Polycarbonate possesses a great degree of impact strength, excellent transparency and very good dimensional stability. Polycarbonate is chemically resistant against weak acids, ethanol and oils. The material has little to no chemical resistance against bases, methanol, or aromatic hydrocarbon.

## PRODUCT OVERVIEW | EXTRACT

PLASTIC TYPE	Code	Colour	Standard Sizes (mm)	Sheet Thickness (mm)										
				1	2	3	4	5	6	8	10	12	15	
POLYCARBONATE ESD Standard	PC407AS	clear	1000 x 2000	●	●	●	●	●	●	●	●	●	●	●
			1212 x 2424		●	●	●	●	●	●	●	●		
	PC427AS	smoked-brown	1000 x 2000			●	●	●	●	●	●	●	●	●
			1212 x 2424			●	●	●	●					
	PC497AS	smoked-grey	1212 x 2424			●	●	●	●	●				
POLYCARBONATE ESD Hard Coat Anti-Scratch	PH407AS	clear	1000 x 2000		●	●	●	●	●	●	●	●	●	
			1212 x 2424			●	●	●	●	●	●	●	●	
	PH427AS	smoked-brown	1000 x 2000			●	●	●	●	●	●	●		
			1212 x 2424				●	●	●	●	●	●		

● Available from 1 piece in the format   ● Available only in a minimum quantity and/or with longer delivery time   ● To be discontinued

## TECHNICAL CHARACTERISTICS

ELECTRICAL	Method	Unit	clear transparent		smoked-brown	smoked-grey
			PC407AS Standard	PH407AS Hard Coat	PC427AS Standard	PC497AS Standard
Surface resistivity	ASTM D-257	IEC 60093	Ω/□	10 <sup>6</sup> ~ 10 <sup>7</sup>	10 <sup>6</sup> ~ 10 <sup>7</sup>	10 <sup>6</sup> ~ 10 <sup>7</sup>
Electrostatic discharge	MIL B-81705B		s	< 0.1	< 0.1	< 0.1
Dielectric constant	ASTM D-150	IEC 60250		3	3	3
<b>PHYSICAL</b>						
Density	ASTM D-792	ISO 1183	g/cm <sup>3</sup>	1,20	1,20	1,20
Water absorption	ASTM D-570	ISO 62A	%	0.3	0.3	0.3
Pencil hardness	JIS K5400	ISO 15184	Scale	HB	H	HB
<b>OPTICAL</b>						
Light transmittance	ASTM D-1003		%	83	83	48
Haze	ASTM D-1003	ISO 14782	%	2	2	5
<b>MECHANICAL</b>						
Tensile strength	ASTM D-638	ISO 527	N/mm <sup>2</sup>	67	67	67
Flexural strength	ASTM D-790	ISO 178	N/mm <sup>2</sup>	90	90	90
Flexural modulus	ASTM D-790		N/mm <sup>2</sup>	2300	2300	2300
Charpy impact strength (23°C)	JIS K7110		kJ/m <sup>2</sup>	80	80	80
Notched impact strength (23°C)	ASTM D-256		J/m	847	847	847
<b>THERMAL</b>						
Heat deflection temperature	ASTM D-648		°C	135	135	135
Flammability	UL 94					

## PMMA/ACRYLIC

PMMA (Polymethylmethacrylate = acrylic glass) is created through the polymerization of monomeric methyl acrylate. PMMA distinguishes itself through its high transparency, durability and excellent weathering resistance, as well as a large range of application options (i.e. medical, automotive, optics, construction, light engineering, etc.). PMMA proves to be chemically resistant against acids and bases of light to medium concentration.

### PRODUCT OVERVIEW | EXTRACT

PLASTIC TYPE	Code	Colour	Standard Sizes (mm)	Sheet Thickness (mm)											
				2	3	4	5	6	8	10	12	15	20		
PMMA/ACRYLIC ESD Standard	AC405AS	clear	1000 x 2000	●	●	●	●	●	●	●	●	●	●	●	●
			1212 x 2424		●	●	●	●	●	●	●				
	AC425AS	smoked-brown	1000 x 2000	●	●	●	●	●							
			1212 x 2424				●	●							
	AC415AS	orange	1000 x 2000		●		●	●							
			1212 x 2424		●	●									
	AC105AS	smoked-grey	1000 x 2000		●		●	●	●	●					
			1212 x 2424		●		●	●	●						
PMMA/ACRYLIC ESD Hard Coat Anti-Scratch	AH405AS	clear	1000 x 2000	●	●	●	●	●	●	●	●				
			1212 x 2424		●	●	●	●	●	●	●	●			

● Available from 1 piece in the format   ● Available only in a minimum quantity and/or with longer delivery time

### TECHNICAL CHARACTERISTICS

ELECTRICAL	Method	Unit	clear transparent		smoked-brown	smoked-grey	
			AC405AS Standard	AH405AS Hard Coat	AC425AS Standard	AC105AS Standard	
Surface resistivity	ASTM D-257	IEC 60093	Ω/□	10 <sup>6</sup> ~ 10 <sup>7</sup>	10 <sup>6</sup> ~ 10 <sup>7</sup>	10 <sup>6</sup> ~ 10 <sup>7</sup>	10 <sup>6</sup> ~ 10 <sup>7</sup>
Electrostatic discharge	MIL B-81705B		s	< 0.1	< 0.1	< 0.1	< 0.1
Dielectric constant	ASTM D-150	IEC 60250		3	3	3	3
PHYSICAL							
Density	ASTM D-792	ISO 1183	g/cm <sup>3</sup>	1,19	1,19	1,19	1,19
Water absorption	ASTM D-570	ISO 62A	%	0.3	0.3	0.3	0.3
Pencil hardness	JIS K5400	ISO 15184	Scale	2H	5H	2H	2H
OPTICAL							
Light transmittance	ASTM D-1003		%	85	85	24	27
Haze	ASTM D-1003	ISO 14782	%	2	2	3	2
MECHANICAL							
Tensile strength	ASTM D-638	ISO 527	N/mm <sup>2</sup>	74,5	74,5	74,5	74,5
Flexural strength	ASTM D-790	ISO 178	N/mm <sup>2</sup>	117,7	117,7	117,7	117,7
Flexural modulus	ASTM D-790		N/mm <sup>2</sup>	2900	2900	2900	2900
Charpy impact strength (23°C)	JIS K7110		kJ/m <sup>2</sup>	20,3	20,3	20,3	20,3
Notched impact strength (23°C)	ASTM D-256		J/m	2,0	2,0	2,0	2,0
THERMAL							
Heat deflection temperature	ASTM D-648		°C	90	90	90	90
Flammability	UL 94						