TECHNICAL DATA SHEET

ZENTRUM > ZENCOR > LINE

CONDUCTIVE E.S.D.

ZEN GUARD
ELECTROSTATIC SHIELD TECH

Corrugated plastic sheet with permanent conductive properties

Corrugated polypropylene sheet formulated with a PP and graphite compound, designed for packaging and handling of products sensitive to electrostatic discharge (ESD). Unlike virgin PP —an insulator by nature—, ZEN GUARD incorporates graphite into its polymer matrix, providing intrinsic and permanent electrical conductivity, independent of ambient humidity and with no degradation over time. Inherent black color, with a rough, porous finish, metallic sheen and slightly oily touch.

OPERATING PRINCIPLE

Electrostatic charge is generated by friction, contact or separation between surfaces, and can damage electronic circuits at voltages as low as 100 V. The Conductive E.S.D. line operates as a low surface resistivity medium (10^3 to 10^5 Ω/sq) that allows charges to flow rapidly toward a grounding point, dissipating friction-induced static, preventing potential build-up and functioning as a path-to-ground when connected to earth.

CLASSIFICATION WITHIN THE ESD SPECTRUM

CONDUCTIVE	DISSIPATIVE	ANTISTATIC	INSULATIVE
10^3 a 10^5 Ω/sq	10^6 a 10^9 Ω/sq	10^9 a 10^{12} Ω/sq	> 10^{12} Ω/sq

FEATURES AND APPLICATIONS

Features: high mechanical resistance to impact, flexing and compression; durability in returnable packaging cycles with no loss of conductivity; chemical stability against oils, greases and mild solvents; lightweight; die-cuttable, scorable, thermoformable and weldable via ultrasonic or hot-air methods; reusable and recyclable as PP (resin code 5).

Applications: packaging for electronic components and semiconductors (PCBs, chips, modules); level separators and trays for appliances and white goods; returnable automotive packaging for modules and harnesses; logistic pallets and dividers; workstations and trays in ESD-safe cleanrooms; packaging for electronic medical devices.

TECHNICAL PROPERTIES

PROPERTY	SPECIFICATION
Base material	Polypropylene (PP) compounded with conductive graphite
Color / finish	Inherent black · rough porous texture, metallic sheen, slightly oily touch
Surface resistivity	10^3 to 10^5 Ω/sq (permanent conductive range, non-migratory)
Reference standard	Meets ESD criteria for electronic packaging
Available densities	550 g/m² (3 mm) · 700 g/m² (4 mm) · 1000 g/m² (5 mm)
Recyclability	Recyclable as PP (resin code 5)

DIMENSIONAL SPECIFICATIONS

The most commonly used gauges are listed below; other thicknesses and dimensions can be manufactured upon request, subject to volume and application.

Thickness (mm)	Thickness tol.	Density (g/m²)	Density tol.	Width (mm)	Length (mm)	Squareness (mm)
3	± 0.15	550	± 5%	+ 10	+ 15	< 10
4	± 0.15	700	± 5%	+ 10	+ 15	< 10
5	± 0.15	1000	± 5%	+ 10	+ 15	< 10

SHEET DEFORMATION TOLERANCES (mm)

Gauge (mm) \ Size (m)	≤ 1.22	1.22 to ≤ 2.00	2.00 to 2.80
3	16 mm	24 mm	44 mm
4	12 mm	20 mm	40 mm
5	12 mm	20 mm	40 mm

STORAGE AND HANDLING

Store indoors, in a dry environment, away from direct heat and prolonged UV exposure. Stack horizontally on a flat surface. Service temperature: -10 °C to 60 °C. For industrial use; not suitable for direct food contact without an intermediate barrier. The conductive property is permanent and requires no reactivation, humidification or post-treatments.

COMPETITIVE ADVANTAGES

- Permanent conductivity: unlike topical antistatics or migratory additives, the property is not lost through cleaning, friction, time or humidity changes.
- Returnable packaging: withstands multiple use cycles without mechanical or electrical degradation, reducing total packaging cost per trip.
- Moisture resistance: unlike corrugated cardboard, it does not weaken or lose properties in humid environments.
- Versatile processability: die-cuttable, scorable and weldable, enabling custom designs (boxes, dividers, trays, containers).
- Lightweight: lower weight per m² than equivalent rigid materials, reducing logistics costs.
- Washable and reusable: suitable for customer-supplier returnable packaging systems.

Note: Up to 1 cm is added to the dimension specified in the purchase order to compensate for shrinkage; length tolerances are independent of this. The use of recycled material may cause slight variations in tone and flatness inherent to the process.

ZENTRUM®
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