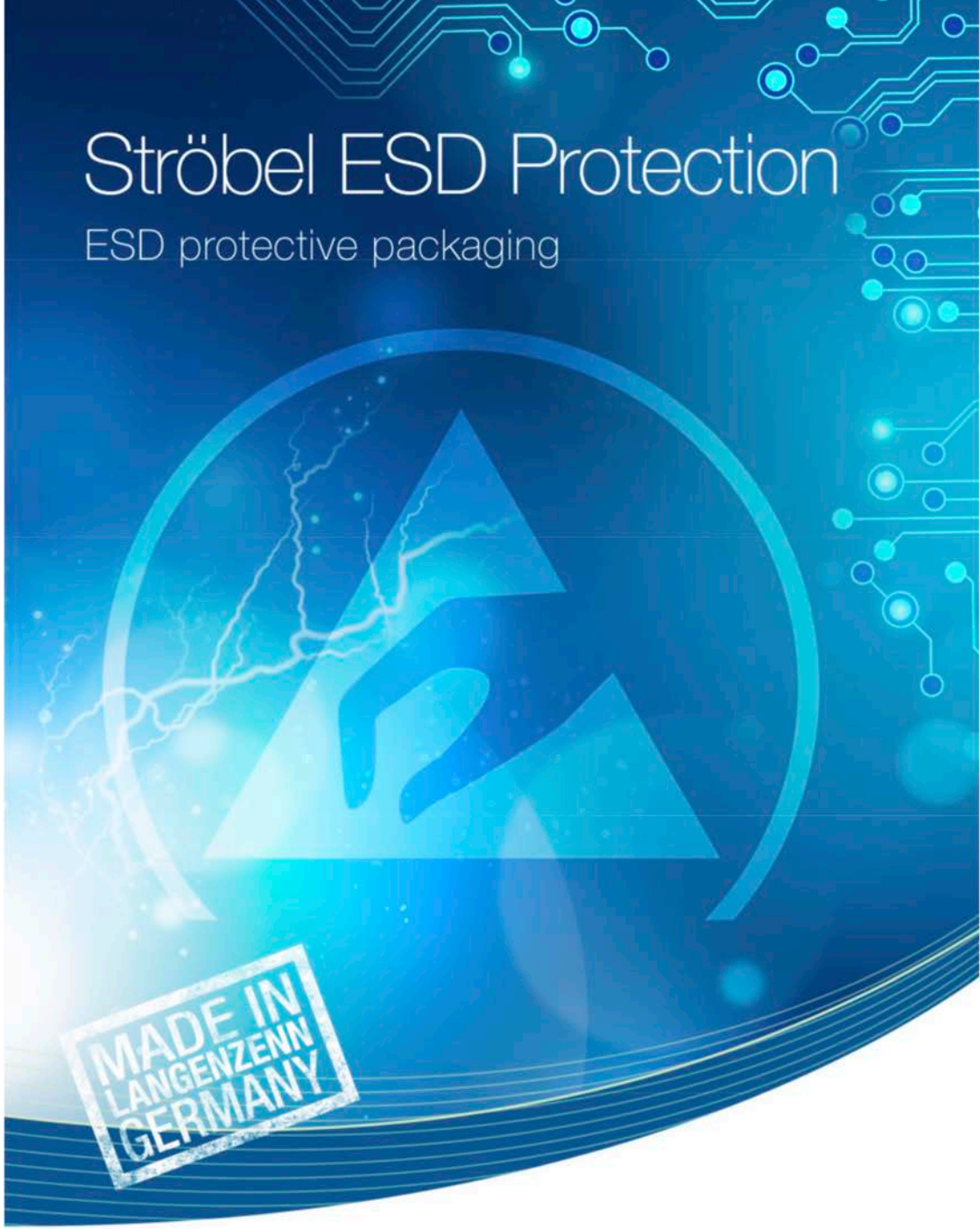
# Ströbel ESD Protection

## ESD protective packaging




Your partner for
customized packaging

Ströbel

# Electrostatic Discharge

## What is electrostatic discharge or ESD?

Electrostatic discharge (ESD) is the sudden flow of electricity between two objects with different charges. A charged object transfers electric charge to an object with lesser charge if the two touch.

Electrostatic charges are generated by friction between, or the separation of two materials.

ESD may damage or even destroy electrostatic discharge sensitive (ESDS) components such as: semiconductors, LEDs, PCBs, or chips.

## Examples of electrostatic discharge or ESD

Familiar examples of ESD include the shock we receive when we shake hands with someone, open a window, touch the monitor or the car door. But now imagine that this electrostatic discharge occurs unnoticed in auto airbag sensors, whose function is to trigger the airbags in case of a collision. In the worst case, this would prevent the airbags from being released, since the sensors would malfunction.

Electrostatic discharges are also a potential ignition source for flammable substances, like explosives or petrol.

## Causes of electrostatic charging

Electrostatic charging occurs when we walk across a carpet or vinyl floor, when synthetic clothes rub against each other, when we move plastic containers or unroll an adhesive tape, etc.…

## Perfect packaging: a prerequisite for your success

There's no getting around the fact that the commercial success of your products is largely dependent on their being impeccably packaged. Packaging preserves the product's value, optimizes packing times, storage costs, and shipping costs, and provides a firewall against complaints.

The more the product itself is protected, the less the packaging needs to be protective. For instance: a blank PCB should be packed in the most protective packaging material, i.e. **shielding** (***top***shield, EMI shielding) packaging.

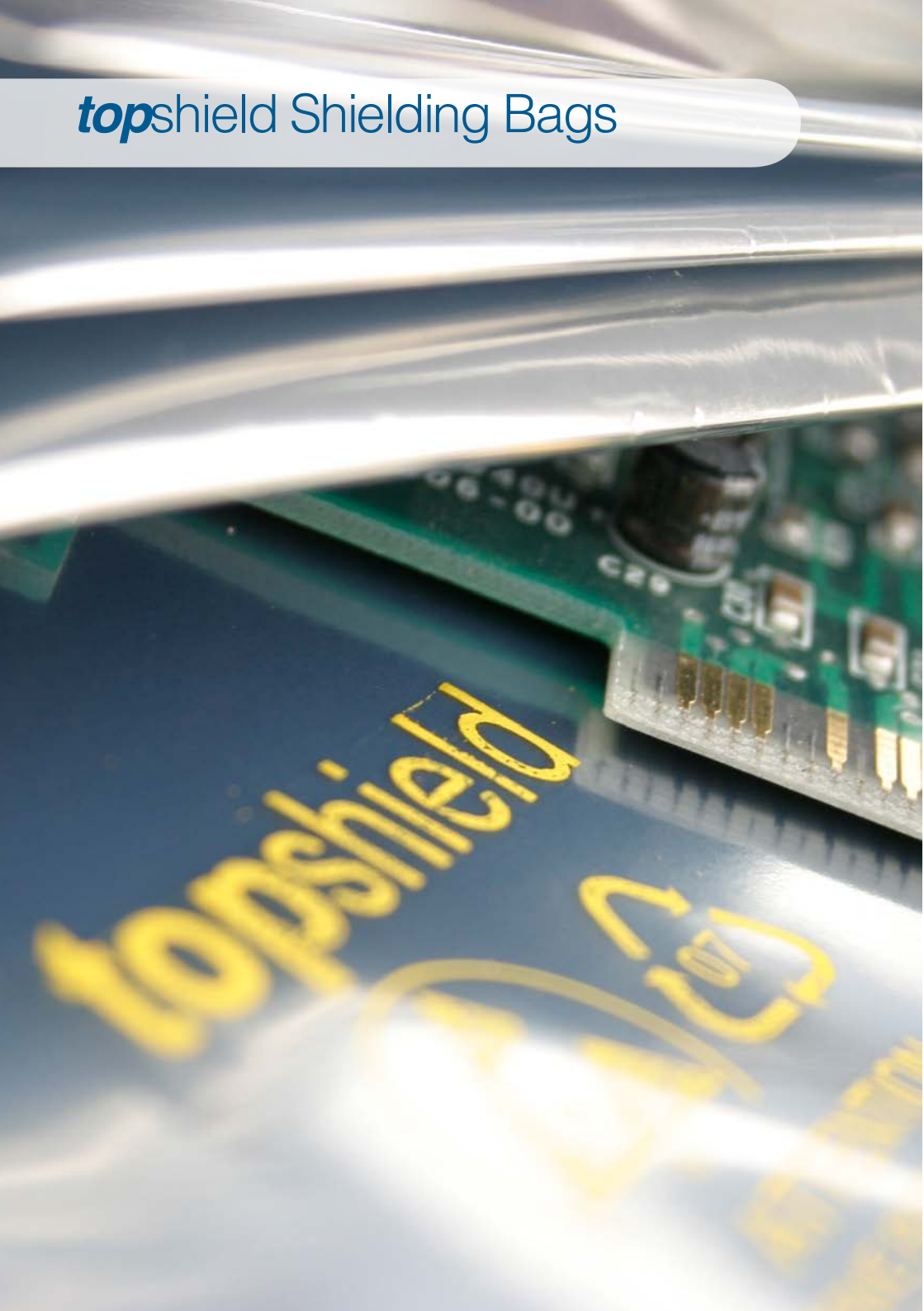
For ESD insensitive components like screws, however, which will be used in an EPA (ESD Protected Area), it is sufficient to use dissipative or conductive films.

# ESD Protection Products

## Welche ESD-Verpackung ist die richtige für Ihr Produkt?

| | Dissipative products | Conductive products | Shielding products | |
|---|---|---|---|---|
| | | | *top*shield | EMI shielding |
| Mark | D | C | S | S |
| Properties | • dissipative<br>• low charging | conductive | • dissipative surface<br>• shielding against discharges | • shielding against discharges<br>• protection against humidity<br>• suitable for vacuum packaging |
| Application domain | • protection against dust<br>• can be used in EPAs & inside shielding packaging<br>• for insensitive components | • can be used in EPAs & inside shielding packaging<br>• for insensitive components<br>• not suitable for components with batteries/ capacitors | • can be used in & outside of EPAs<br>• for ESDS (sensitive components) | • can be used in & outside of EPA<br>• for ESDS (sensitive components) |
| Material | PE + master batch (antistatic agent) | PE with carbon additives | metalized PE film, 75µ (3.0 mil) | PET/ AL/PE 100µ (4.0 mil) |
| Color | pink transparent | black | metalized, slightly transparent | metalized |
| Surface resistance | typical values: 10E10 - 10E11 ohms | typical values: 10E2 - 10E5 ohms | < 10E11 OHM | < 10E11 ohms |
| | dissipative, according to standard: 10E4 – 10E11 | conductive, according to standard : < 10E4 OHM | | |
| Volume conductivity | not specified | volume conductive | not volume conductive | not volume conductive |
| Energy test | - | - | < 30 nJ | < 5 nJ |
| | | | According to standard, shielding = <50 nJ | According to standard, shielding = < 50 nJ |
| | modelled on EN 61340-5-3 | modelled on EN 61340-5-3 | EN 61340-5-3 | EN 61340-5-3<br>IPC/ JEDEC J-STD-033C |

# *top*shield Shielding Bags



## *top*shield shielding bags

Our ***top***shield shielding bags provide electrostatic discharge sensitive (ESDS) components with outstanding protection against discharges, and are particularly suitable for use outside of ESD Protected Areas (EPAs). When sealed, these bags form a so called Faraday cage that blocks voltage spikes.

- ✓ Surface resistance: **≥10^4** to <10^11 ohms
- ✓ Electrical shielding <30 nJ
- ✓ For applications in and outside of EPAs
- ✓ Slightly transparent
- ✓ Printed with ESD warning logo
- ✓ Sealable or re-closable
- ✓ Film thickness: 75µ / 3.0 mil
- ✓ EN 61340-5-1 conformant

## *top*shield application domains

- ✓ PCBs
- ✓ IC bars
- ✓ Graphics cards

## *top*shield provided directly by the manufacturer

The fact that ***top***shield products are provided **directly by us, the manufacturer,** ensures top-notch quality, short delivery times and optimum prices – even for small order quantities.

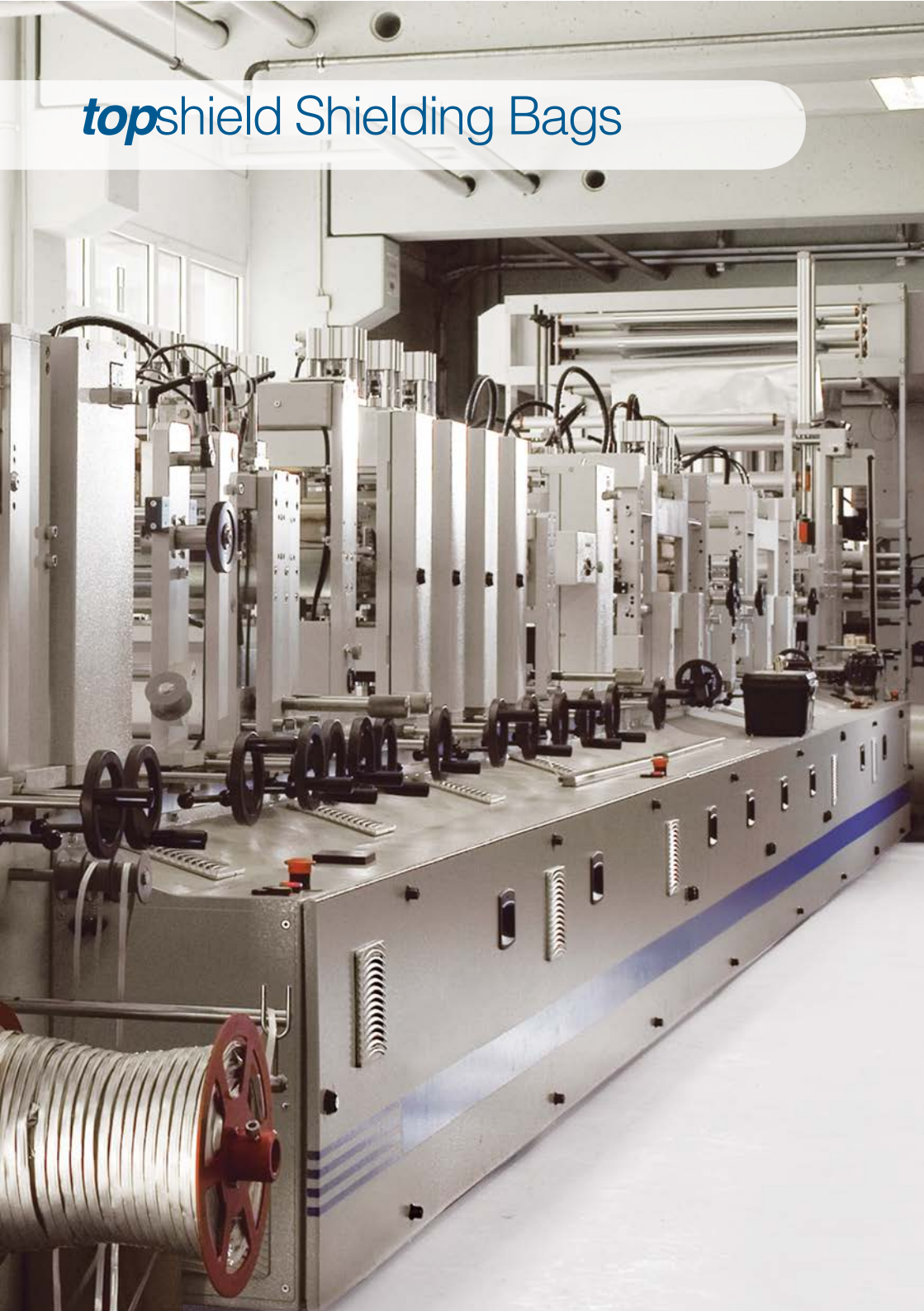
You can either choose from our vast selection of shielding bags, or – as we are a manufacturer – have us manufacture your own custom bags tailored to fit your needs.

## Choice of shapes and sizes

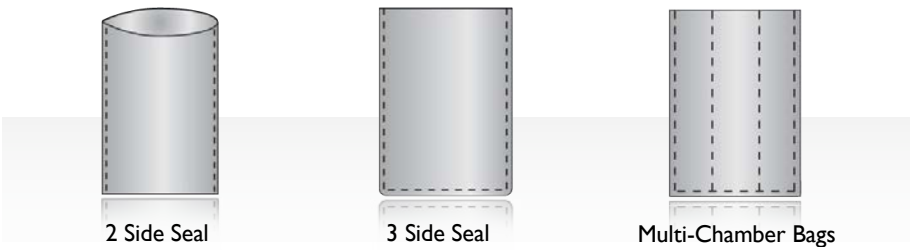
We see to it that you obtain the perfect bag for your application. Please do not hesitate to ask!

Learn more about our shielding bags: Just scan the QR code or visit our website at www.stroebel.de

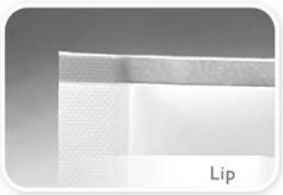
# *top*shield Shielding Bags

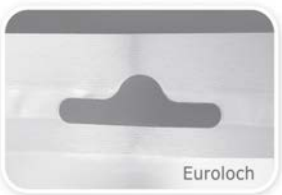


## Choice of shapes and sizes – our ***top***shield bag options



2 Side Seal | 3 Side Seal | Multi-Chamber Bags





## Standard bag sizes – inner dimensions

| | | | |
|---|---|---|---|
| 76 x 127 mm | 3 " x 5 " | 254 x 356 mm | 10" x 14 " |
| 102 x 102 mm | 4 " x 4 " | 279 x 381 mm | 11 " x 15 " |
| 127 x 152 mm | 4 " x 6 " | 305 x 406 mm | 12 " x 16 " |
| 127 x 203 mm | 5 " x 8 " | 305 x 457 mm | 12 " x 18 " |
| 152 x 203 mm | 6 " x 8 " | 356 x 457 mm | 14 " x 18 " |
| 152 x 203 mm | 6 " x 10 " | 406 x 457 mm | 16 " x 18 " |
| 203 x 254 mm | 8 " x 10 " | 406 x 660 mm | 16 " x 26 " |
| 203 x 305 mm | 8 " x 12 " | 457 x 457 mm | 18 " x 18 " |
| 254 x 305 mm | 10 " x 12 " | 457 x 609 mm | 18 " x 24 " |
| | | 508 x 609 mm | 20 " x 24 " |

Our bag configuration tool will help you find the perfect bag, with just a few mouse clicks. Just scan the QR code or visit our website at: www.stroebel.de

# *top*dry EMI Shielding

## *top*dry EMI shielding

Our ***top***dry EMI shielding bags provide electrostatic discharge sensitive (ESDS) components with outstanding protection, and are particularly suitable for use outside of ESD Protected Areas (EPAs).

- ✓ Protection for ESDS components in and outside of EPAs
- ✓ Non-transparent
- ✓ Printed with ESD warning logo
- ✓ Suitable for vacuum packaging
- ✓ Sealable or re-closable
- ✓ Film thickness: 100µ / 4.0 mil
- ✓ Electrostatic shielding <5 nJ
- ✓ According to IPC/ JEDEC J-STD-033B.1

Suitable for:

- ✓ Lining the interior of Euro containers and cardboard boxes
- ✓ Bulk products
- ✓ Large quantities
- ✓ Corrosion protection/ Long term storage
- ✓ Dry packaging

When sealed, these bags form a so called Faraday cage that blocks voltage spikes. Thanks to a special multi-layer that is impermeable to moisture, these bags provide outstanding protection against moisture and electrostatic charging and are suitable for vacuum packaging.

Application domains:

- ✓ Spare parts storage
- ✓ Automotive and industrial electronic components
- ✓ Shipping packaging for electric motors

## EMI-Shielding bag and covering options

# ESD Container

CP coated products provide protection for electronic components. The ESD container features special protective layers that equalize electrostatic potential and protect its content against electrostatic fields..

Our Corstat and Cortronic packaging provides maximum protection against ESD and allows you to package, transport, store and ship your goods in a safe manner.

A wide range of standard products allows us to deliver small quantities and within a short period of  time.

## Shipping Container

Standard color: blue

- ✓ The flat-lying shipping boxes can be delivered with appropriate inserts, if necessary: convoluted foam (pink dissivpative or black conductive) or with Flatpac
- ✓ Cortronic shipping box (fixing foil included)
- ✓ Shipping boxes for EPROMs with PE foam inside to hold and protect the eproms; with bentonite clay

## Storage Container

Standard color: black

- ✓ Corstat Reel Box
- ✓ IC bar magazine
- ✓ Tube Box
- ✓ Storage boxes
- ✓ Accessories, e.g. adhesive tape, dividers…

## Storage + Shipping Container

Standard color: black

- ✓ In-plant handlers + partition inserts
- ✓ Trays
- ✓ Multiboxes with lid and partitions

## Environment

All ESD containers can be used repeatedly without losing their shielding and dissipative properties.
The environment-friendly ESD containers are fully recyclable.

# Long Term Storage Solution

## EMI shielding, desiccant & humidity indicator: an ideal combination

Long term storage: our **topdry® desiccant bags** absorb the moisture in barrier layer bags and our **humidity indicator cards** monitor humidity inside the packaging. This allows you to store your products for up to five years.

Your packaging needs to be IPC/ JEDEC J-STD-033B.1 conformant? Our following products are also suitable for IPC/ JEDEC J-STD-033B.1 conformant packaging.

## Ströbel *top*dry® Desiccants


Ströbel topdry® desiccants provide optimal storage conditions, which are in accordance with DIN 55473.

- ✓ low-cost solution
- ✓ with bentonite clay

## miniPax® Desiccants

Our miniPax® desiccant bags are extremely durable, versatile, compact, and reasonably priced. These bags are particularly suitable for electronic instrumentation.


- ✓ desiccant for vacuum packaging with reduced dimensions
- ✓ with silica gel

## Humidity Indicators

... indicate relative humidity (RH) inside a given barrier packaging.


- ✓ indicate 10/20/30/40/50/60 percent RH
- ✓ reversible
- ✓ cobalt chloride free

Learn more about long term storage and how to protect your valuable products by watching our informative videos...

# Dissipative and conductive films

## Dissipative films

Dissipative (pink anti-static) films are low charging LD-PE films with anti-static additives (master batches). Dissipative films are sufficient when it comes to protect your products against dust, pack EDS insensitive products or products that are highly self-protected.


- ✓ pink anti-static
- ✓ low charging
- ✓ surface resistance: <10^11 ohms
- ✓ suitable for packaging in EPAs
- ✓ for packaging of ESD-insensitive components that will be used in an EPA

Our dissipative films are available in the following variants:

**Coverings:** As we manufacture box coverings and inserts at our own plant, we can deliver these items shortly.
**Bags: flat bags**, which are available with or without zipper (we always have a large stock of these items), **side gusset bags**, **bubble wrap bags** and **sheets of different sizes** (upon request).

## Volume Conductive Films

Volume conductive films acquire their properties from the use of carbon additives (soot). Being volume conductive, these films should only be used for low-sensitivity components or in electrostatic protected areas (EPAs), as they are permeable to voltage spikes.

- ✓ conductive
- ✓ black, opaque
- ✓ no electrostatic charging
- ✓ typical surface/volume resistance: 10^4-10^5 ohms
- ✓ suitable for packaging in EPAs
- ✓ for packaging of components that are ESD-insensitive and will be used in an EPA
- ✓ **not** suitable for components with batteries, capacitors or the like.

Our volume conductive films are available in the following variants:

**Flat bags** or **side gusset bags, box inserts** / **coverings** - upon request

## Your notes

## We also provide:

Export packaging that meets DIN/TL requirements

Aluminum composite bags
Öko-Line paper composite bags
VCI bags

Aluminum composite film
coverings for
large appliances and machines

Humidity indicator cards

Heat sealing tongs
Desiccants
Humidity indicator cards

Please do not hesitate to get in touch!

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