



KRIEG® | WORKFLEX®
Healthy workplaces for more profitability

 www.workflex.de



ESD protection

The right workplace
for sensitive products

With checklist for
EPA protection zone



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WHAT IS ESD PROTECTION?

ElectroStatic Discharges, or **ESD** for short, are everyday phenomena. Most people are familiar with them from the sensation of a small electric shock, which occurs, for example, when walking on a synthetic fibre carpet. Although these discharges are usually harmless to humans, they can damage or even destroy sensitive electronic components.

Most damage caused by an electrostatic charge goes unnoticed by workers. These discharges are only noticeable to humans at 3,000 volts or more and must be at least 5,000 volts to produce a visible spark. Depending on the type, an electronic component can be damaged at 100 volts or less, causing entire devices or systems to fail.

Electrostatic discharges at a glance:

- From 3,000 volts – perceptible to humans
- From 4,500 volts – audible to humans
- From 5,000 volts – visible to humans



EPA

When working with electronic components in production or assembly, it is particularly important to set up an ESD-protected environment. These ESD protection areas are referred to as **EPAs (Electrostatic Protected Areas)**. EPAs are individual ESD workstations or complete electronics and semiconductor manufacturing facilities that have been set up with protective measures. The protective measures cover all areas from floor coverings, table coverings, tool handles and clothing to personal grounding and, depending on the required safety level, access controls. Humidity and a clean environment also play an important role.

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ergonomics coaches**

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Find out more about ESD at:
workflex.de/esd-schutz



TERMS EXPLAINED SIMPLY

ESD	ElectroStatic D ischarge
EPA	Esd Protected Area
ESDS	ElectroStatic D ischarge S ensitive Devices
Conductive	The property of a surface that can conduct electricity .
Electroscope	A device used to measure whether an object is electrically charged.
Personal grounding	Electrostatic charges present in the person's body are dissipated in a controlled manner. Grounding can be achieved, for example, by wearing an ESD wrist strap .
Norms	DIN EN 61340-5-1, the norm that contains the general requirements for protecting electronic components against electrical discharge.

DAMAGE AND ECONOMIC CONSEQUENCES

Damage to the small and tiny electronic components used in electronic devices can result in high operating costs for quality assurance, repairs and even product liability. Good ESD protection management prevents such cases and is often more cost-effective than complaints and product liability claims.

Solid ESD protection in the workplace is therefore essential in order to:

- avoid **damage to components** that may be caused by electrostatic discharges.
- **reduce operational costs** for quality assurance, repairs and product liability.
- **protect the company's image** by avoiding production downtime and complaints.
- **increase productivity and value creation** by reducing the number of absences and sick days caused by physical strain.



i Did you already know?

Electrostatic charges build up quickly in everyday life:

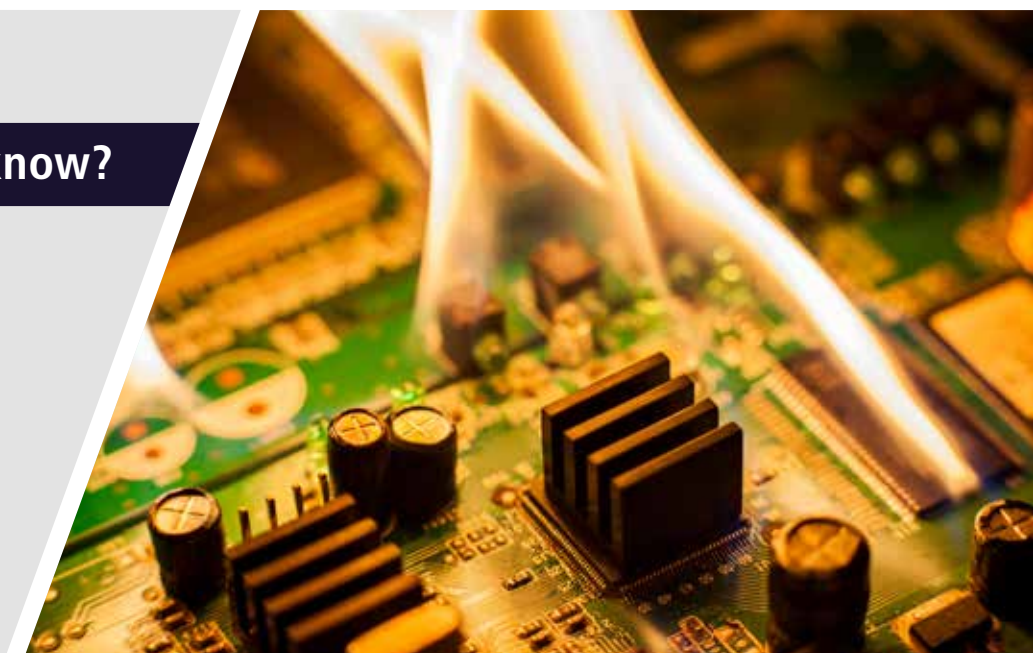
- Putting on & taking off synthetic clothing **8.000 V**
- Getting up from an upholstered chair **15.000 V**
- Rubbing of shoes on plastic flooring **12.000 V**
- Rubbing of shoes on carpets **30.000 V**
- Use of electrical devices **20.000 V**
- Unrolling adhesive tapes **1.000 V**
- Working with plastic containers **3.000 V**

i Did you already know?

Increased humidity in the room significantly reduces charge generation. The lower the humidity, the higher the voltages that occur.

The relative humidity should therefore ideally be above 50%.

Source: www.baua.de





Entrance: Entering the EPA
Personnel grounding tester for testing wrist straps and shoe tester plates for testing shoe grounding



Personal grounding

- 17** Grounding point, e.g. for personal grounding for wrist strap and spiral cable with push button



- 18** Permanent heel strap or ESD shoes



- 19** ESD protective clothing

Examples of grounding system connections

Depending on the grounding concept and room equipment

Personal grounding

Table top grounding

Shelf grounding



ESD PROTECTION AREA (EPA)

The ESD area refers to a workplace or production line that is completely protected against electrostatic discharge or grounded. In such an area, it is essential to take and comply with all necessary protective measures.

These protected areas can be tested, measured and compared with the ESD standard IEC 61340-5-1. It is also important to mark them clearly to prevent anyone from entering them without the appropriate protection.

The extent of ESD protection and equipment required depends on the safety level and the requirements for handling sensitive components. In addition, the grounding concept depends on the conditions at the location.

- 1** Marking of an ESD protection zone with signs (entrance/exit) and ESD zone marking tape
- 2** Personnel Grounding Tester and Shoe Tester Plate
- 3** Protocol for ESD testing
- 4** Marking of an ESD work zone
- 5** **MULTIPLAN ESD workplace system** with high-quality, conductive powder coating and ESD tabletop
- 6** Galvanised **ESD shelving PLANAFIX**
- 7** **VARIMOBIL ESD shelf trolley** with ESD castors
- 8** **BASETEC ESD drawer cabinet** with conductive powder coating and ESD castors

- 9** ESD work chair
- 10** ESD table mat/covering
- 11** ESD flooring or floor protection mats
- 12** Office equipment: ESD folders/transparent sleeves/bins, etc.
- 13** ESD magnifying lamp for precise work
- 14** ESD transport containers/open-fronted storage bins for ESD-compliant storage of ESDs
- 15** ESD packaging material
- 16** ESD cleaning products

CHECKLIST ESD PROTECTION ZONE (EPA)

To create an effective ESD-protected area, you can take the following steps:

1	Creating a control plan This helps you to observe and monitor ESD protection levels, component sensitivities and maintenance procedures.
2	Grounding the workplace Ensure that the work table and work surface are made ESD-safe by means of grounding connections and cables. The work area should be covered with antistatic floor mats.
3	Grounding of employees It is essential that workers wear ESD-safe closed clothing, use ESD shoes or a heel strap for voltage dissipation, and wear ESD wristbands that ground them.

4	Protect components These should be stored in special ESD-compliant containers or on antistatic mats. Mark the containers with ESD labels. Only use ESD-compliant tools and suitable packaging and transport materials for handling the components. The components must be protected from static electricity during transport and storage.
5	Cleaning the workplace Clean the workplace regularly. Dirt deposits and dust, e.g. on the castors of an ESD chair, ESD floor mats or special workplace surfaces, impair ESD protection and can cause failures. All surfaces, floors, chairs, drawer units and the castors of trolleys and chairs should be cleaned with an ESD cleaner.
6	Entry and exit checks Depending on the safety level of the technical components, entire EPA zones are unavoidable. In this case, warning signs at the entrance and exit are useful, as is ESD marking of the ESD work zone, e.g. on floors. Personnel grounding testers for checking wrist straps and shoe tester plates for checking shoe grounding should be set up before entering the zones. The humidity in the room should be kept high.
7	Staff training Train your employees on the sensitivities and handling of sensitive components throughout the entire production and processing chain. Everyone should be aware of all protective measures and ESD zones.

All these steps make sure you've got effective ESD protection at work, improve the quality of your products, and help reduce costs for your company. So, it's worth investing in an ESD-protected workplace.



Wrong

Did you already know?

Order and cleanliness are top priorities at the EPA. Eating and drinking at ESD workplaces is strictly prohibited.

To minimise the risk of electrostatic discharge, insulating objects such as:

- Food storage containers
- Cups and glasses
- Unprotected loose sheets of paper
- Standard transparent sleeves
- Standard folders

are not allowed in an ESD workplace.

Cleaning with the right cleaning products is a necessary step. Dirt and dust build up on surfaces and can affect conductivity, like on the castors of an ESD chair.

ESD cleaning products not only clean effectively, they also help to maintain the conductivity of the surface by not leaving behind a protective film. Using the wrong cleaning products can also damage specially treated surfaces that have been coated to improve conductivity.

Cleaning products such as dustpans and brushes, vacuum cleaners, etc. should also be ESD-compatible in order to provide the greatest possible protection.

Correct



YOUR PARTNER FOR ESD WORKPLACES

As a manufacturer with many years of experience in the ESD sector, we place particular value on high-quality workplace environments. In the ESD sector, such as electronics manufacturing and semiconductor processing, it is important to protect components from electrical discharges. That is why our workbenches have an antistatic coating. The voltage is dissipated via a grounding cable. In addition, we can offer you a wide range of accessories with ESD protection.

IN-HOUSE PRODUCTION



MADE IN
GERMANY

Our company headquarters are located in Heimsheim - very close to Stuttgart. At three of our own production sites in Germany with more than 120 employees, we manufacture our own workplace systems, storage shelving and office furniture. From the first sketch to ready-to-move-in assembly: with us, everything comes from a single source.



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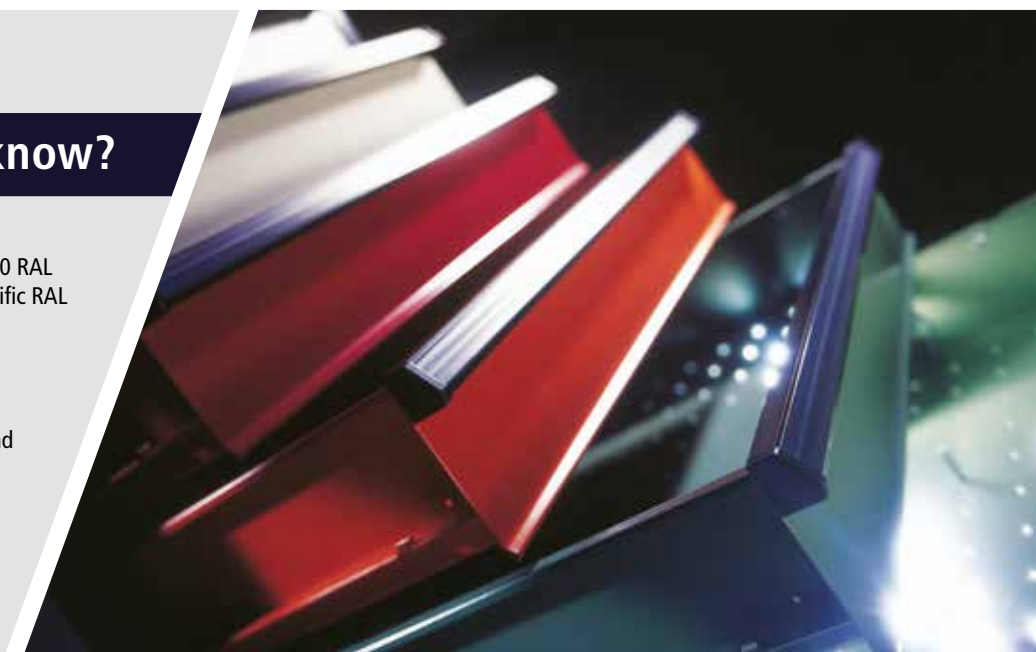
Did you already know?

In-house coating system

We offer our conductive powder coatings in 10 RAL colours at no extra charge. If you require specific RAL colours, we can provide these on request.

In-house wood processing - customised for you

The majority of our conductive work tables and workbench tops are manufactured in-house. We offer customised designs in special sizes to meet your requirements.



ESD PROGRAMMES

	MULTIPLAN ESD	UNIVERSAL ESD	CANTOLAB ESD
Workstation system	Work table system	Work table system	Testbench system
Application area	all-purpose	Electrical production & testing	Electrical production & testing
Adjustment range	up to 407 mm	up to 300 mm	up to 200 mm



The benefits +

- Tool-less push-fit accessory components throughout
- Rapid assembly and reconfiguration
- High stability under dynamic forces
- Functional table extension system
- Corner unit combo for full space utilisation
- Individual customised solutions
- Conductive work table system - the totally safe solution for all applications
- Coordinated conductive components for optimum safety for your production activities
- High stability due to self-supporting, conductive steel rack
- Flexibly combinable with 4-sided mounting option for extension gantry
- Conductive work table system - the totally safe solution for all application
- Coordinated conductive components for optimum safety for your production activities

Height adjustment plus tabletop			
Standard			
Clamp height adjustment	698 - 816 mm	738 - 848 mm	760 - 760 mm (adjustable leg)
Spezial			
Clamp height adjustment	698 - 1.105 mm	700 - 1.000 mm	730 - 930 mm
Ergo K			
Crank-handle height adjustment	700 - 1.100 mm	700 - 1.000 mm	-
Ergo E Memory			
Electric height adjustment	700 - 1.094 mm	700 - 980 mm	-
Load capacity	up to 1,000 kg	up to 1,000 kg	up to 750 kg
Portable design	✓	-	-
Corner unit/ group table areas	✓	-	-
Standard table sizes	17	17	7
Large format tables	✓	-	-
Table tops versions	3	3	3



Further information online:
workflex.de/multiplan-esd

High-quality, conductive powder coating for targeted dissipation of voltages via the coating layer.



IGR-certified versions:
MULTIPLAN ERGO K,
MULTIPLAN ERGO E

Simple and time-saving: →
Accessories can be attached to the mounting portal without tools.



Grounding point with two connections, e.g. for personal grounding

Work table system MULTIPLAN ESD

Conductive ergonomic workstation system for every purpose

Benefits

- Coordinated conductive components ensuring optimum safety for your production activities
- Tool-less push-fit accessory components throughout
- High-quality conductive powder coating for targeted voltage dissipation via the paint layer
- Grounding points for grounding the workplace and personnel
- Large format tables and portable versions available
- Time-efficient assembly and reconfiguration guaranteed

Technical data

- Infinitely variable height adjustment up to 407 mm
- High stability due to robust steel rack
- Load-bearing capacity up to 1000 kg with even weight distribution
- Versions: Standard, Spezial, Ergo K, Ergo E



IGR-certified versions:
UNIVERSAL ERGO K,
UNIVERSAL ERGO E



Further information online:
[workflex.de/
universal-esd](http://workflex.de/universal-esd)

Grounding point with
two connections, e.g.
for personal grounding

Work table system **UNIVERSAL ESD**

Conductive, economically optimal and ergonomically improved

Benefits

- Coordinated conductive components ensuring optimum safety
- High-quality conductive powder coating for targeted voltage dissipation via the paint layer
- Grounding points for grounding the workplace and personnel
- For seated or standing activities
- Expandable to any size of side-by-side cluster

Technical data

- Infinitely variable ergonomic height adjustment up to 300 mm
- Extremely stable and durable steel frame
- Load-bearing capacity up to 1000 kg with even weight distribution
- Versions: Standard, Spezial, Ergo K, Ergo E



High-quality, conductive
powder coating for targeted
dissipation of voltages via
the coating layer.

4-sided mounting option

Easy cleaning thanks to closed
square tubular frame

Grounding point with
two connections, e.g.
for personal grounding



Further information online:
[workflex.de/
cantolab-esd](http://workflex.de/cantolab-esd)

Work table system **CANTOLAB ESD**

The stable, durable and clean solution

Benefits

- Coordinated conductive components ensuring optimum safety
- High-quality conductive powder coating for targeted voltage dissipation via the paint layer
- Grounding points for grounding the workplace and personnel
- Flexible extension gantry with 4-sided mounting option
- Easy to clean thanks to enclosed square tubular frame
- Suitable as production, test and lab bench

Technical data

- Infinitely variable clamp height adjustment up to 200 mm
- Self-supporting tubular steel frame
- Load-bearing capacity up to 750 kg with even weight distribution
- Versions: Standard, Spezial

ESD PRODUCT AREAS



Further information online:
[workflex.de/
esd-ausstattung](https://workflex.de/esd-ausstattung)

MORE ERGONOMICS MORE ECONOMY

Focus on health at ESD workplaces

Not only ESD protection, but also an ergonomic workplace design is important for protecting your employees. With ergonomic workplace systems from KRIEG WORKFLEX, you can protect your employees from avoidable stress and offer optimum working conditions.

Your benefits

- ✓ Appreciably reduced physical strain
- ✓ Lower rates of absence and sick days
- ✓ Greater motivation and performance capability
- ✓ Greater productivity and added value
- ✓ Reduction of workplace-related costs

Factors that influence ergonomics

- ✓ Ergonomic workstation surface and chair
- ✓ Optimum grip space for supply of tools/materials
- ✓ Perfect delivery of IT/information
- ✓ Suitable workplace lighting
- ✓ Stress-relief through assist systems (page 18)
- ✓ Interlinked workstation systems

Our solution is an ergonomic ESD workplace that is set up for specific use and customised to the individual employee. Optimising the accessibility of work materials, tools and information not only reduces physical and mental stress, but also increases efficiency and productivity.



Did you already know?

Musculoskeletal disorders are the second most common type of illness, accounting for 18.5% of cases.

Source: DAK-Gesundheitsreport 2024



Ergonomics advice
Further information:
workflex.de/ergonomie



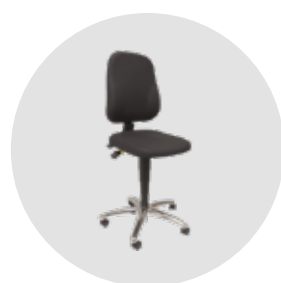
Lighting in the workplace
Further information:
workflex.de/beleuchtung



Seating advice
Further information:
workflex.de/stuhlberater



Grounding systems



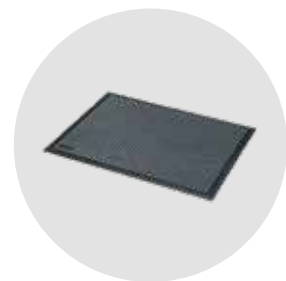
ESD work chairs



ESD cabinets &
ESD shelves



ESD ladders



ESD floor mats &
ESD floor coverings



ESD shelf trolley



ESD lighting



ESD container



ESD office equipment



ESD packaging



ESD workbench trolley



ESD cleaning products



Assembly Station ESD

The assembly station can be equipped with up to four wheels. Up to 18 items can be accommodated per wheel. The wheels are modular so that further levels can be added as required.

- ESD-conductive automated material supply for small components
- A weight control records the stock in real time
- A visual signal shows the correct box for quick removal



Assembly Station

Automated worker guidance and real-time inventory recording directly at the assembly workstation



ESD MEETS DIGITAL ASSISTANCE SYSTEMS

Digital worker assistance systems are the perfect complement to our ergonomic ESD workplaces, simplifying processes and guiding workers step by step. This increases productivity, significantly reduces training costs and minimises the error rate.



More about ESD at:
[workflex.de/
messe-esd-arbeitsplatz-multiplan](http://workflex.de/messe-esd-arbeitsplatz-multiplan)

Assembly Station and WORKFLEX® Work instructions App

The Assembly Station and the WORKFLEX work instruction app are perfectly coordinated to guide the employee step by step through the assembly process. With the help of real-time inventory recording, you also ensure more security of supply. In the WORKFLEX app, you can quickly and easily define minimum stock levels and set notifications as soon as these levels are undershot.

The Assembly Station automatically moves the correct article forward for the respective work step and visually indicates the place with the illuminated button. After the correct number of items has been removed, the work step is automatically confirmed and the next step is initiated. With the help of the WORKFLEX app, complete assembly and picking assembly sequences can be created.

The benefits: Assembly Station

- **Higher quality:** Automated worker guidance with interactive work instruction app and dashboard.
- **Time saving:** quickly introduce new workers and assembly instructions.
- **Space optimisation:** Compact order in a small space. Up to 18 boxes on one level.
- **Security of supply:** Real-time inventory recording through an integrated scale.
- **Flexibility:** Whether 2 or 4 levels. Scale the Assembly Station according to your requirements.

Workflows with the WORKFLEX® web app

Fully-digital portal for creating, managing and implementing work instructions

Work instructions can be generated, managed and implemented with the aid of the web app. Work instructions can be fully customised, and can be modified, supplemented and accessed at any time. The worker is guided step-by-step through the process, aided by text information, images and videos. The simple and user-friendly interface means that even people with no programming experience can enter new workflows.

Functions

- Standardising the creation, management and implementation of work instructions
- Simple integration of a documentation function
- Capture of data across the workflow
- Analysis of processes for greater optimisation potential
- Hardware available for enhanced support

Work instruction view in the web app



Further information online:
[workflex.de/
arbeitsanweisung-workflex](http://workflex.de/arbeitsanweisung-workflex)

The benefits: Web-App

- No programming experience necessary
- Simple generation of work instructions
- Less time needed to train new employees
- Increase in productivity, reduction of error rates
- Reduced time and effort for work preparation
- Support through media data such as images and videos

Sample project **ALLMENDINGER**

Rebuilding the electronics workshop with ESD protection

The mission:

Ten large work islands in a U-shaped arrangement with a total of 40 new electronics workstations were to be created in the former machine hall at Allmendinger. These were to be used for daily tasks such as soldering or as a rework station for electronic components. The workbenches had to be ESD-compatible in order to protect the sensitive electronics from damage during the work process.

The realisation:

Smooth workflows were created in structured paths. To protect sensitive components from voltage breakdowns, the workplaces were equipped with complete ESD protection.

The result:

New, conceptual ESD workplaces were created on 1,200 m². Various islands and bays in the previous machine hall were arranged as continuously connected workplaces. This resulted in a significant amount of work space being gained in a very small area.



Further information:
workflex.de/allmendinger



Sample project **M&C TECHGROUP**

Added value through multi-variable ESD workstations

The mission:

Within the new production building offering 6,000 m² of space, the focus needed to be on variably configured ESD workstations to enable the rapid initiation of production for a range of product series. The complex energy supply to the workstations was the sticking point.

The realisation:

A prototype was used to test and perfect the special requirements for the energy supply to the workstation. Individual cable ducts and centrally located extension columns were constructed to enable the pluggable components to be used for multiple sides. The workstations were configured and assembled in a systematic and multi-variable arrangement.

The result:

Optimally coordinated, ergonomic workstations with ESD protection for electronic components were created for the M&C Techgroup. The workstations are perfectly designed for fast and flexible retooling.



Further information:
workflex.de/techgroup



ALL-ROUND CONCEPT



Single-source solution - from the first sketch to assembly ready for use.

- Detailed on-site analysis
- ESD advice and planning
- CAD visualisation
- On-site assembly
- ESD workplaces designed and manufactured in-house
- ESD products

Would you like ESD advice?

Let our ergonomics coaches advise you on ESD workplace systems for your individual needs.

ESD workplace consulting:
+49 (0) 7033 - 909 46 81
Call now!

YOUR BENEFITS



In-house production - customised solutions



Wide range of worktable sizes



Many accessory components in the standard programme



10-year manufacturer's warranty



JAHRE GARANTIE



MADE IN GERMANY

10 colours at the same price – conductive powder coating for your ESD workplace



light grey
RAL 7035



water blue
RAL 5021



alu silver
RAL 9006



grey-green
HF 0001



anthracite
RAL 7016



reseda green
RAL 6011



ruby red
RAL 3003



brilliant blue
RAL 5007



red orange
RAL 2001



light blue
RAL 5012



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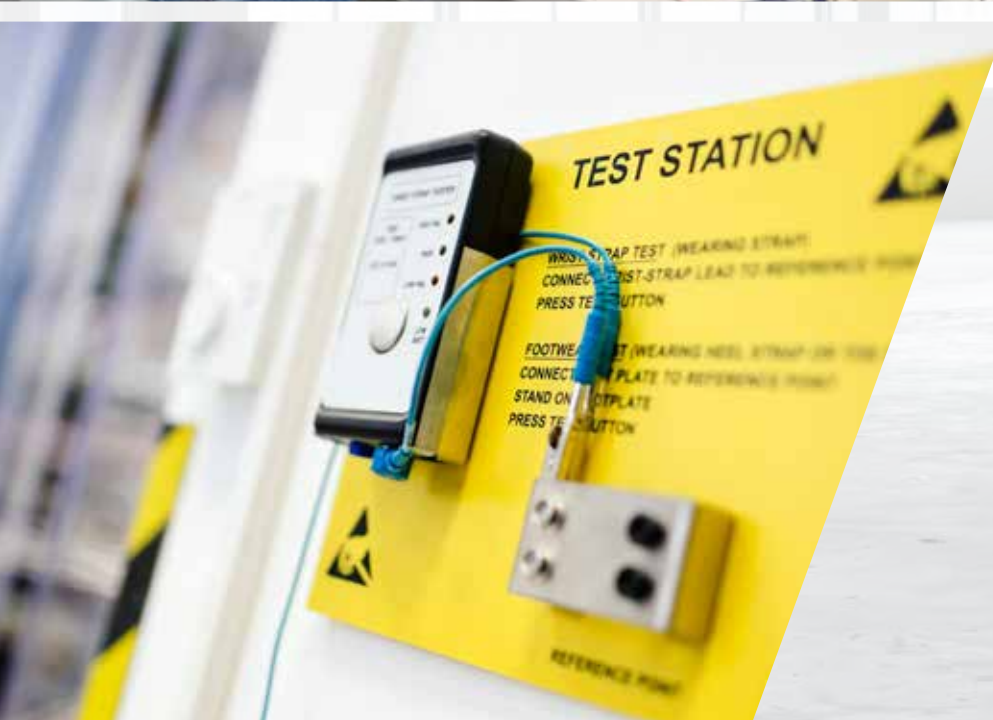
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