

Electrostatic is the oldest known form of electricity. Already 2000 years ago our ancestors were scared and astonished of lightnings and charging processes (like amber at cat skin).

Today other aspects of electricity have gained a much more important meaning as the "classic" electrostatic – since a few decades we have to pay much more attention to the electrostatic charges and recharges as one of the main risks of semi-conductors.

Human sensors concerning electrostatic charges and recharges are very imperfect.

The sense (prickle) responds not until 3kV, the sense of hearing (krackling), not until 5kV, and the eye responds at 10 kV. Our components respond in a completely different way – much earlier: at some 10 volt and unfortunately with incalculable partial damage and quality downslide which can not be seen at the outside.

Abstract about ESD protection:

- All ESDS (Electrostatic Sensitive Devices), persons, work equipment, work spaces of protected areas are at the same potential (generally on the ground), i.e. they have to be conductive as well.
- In ESD protected areas (EPA Electrostatic Discharge Protected Area): Avoiding of isolators and other sources of electrostatic fields.
- Secure transports (ESD protective packaging) of ESDS into and out of ESD protected areas.
- Personnel training, motivation and awareness to effectively enforce ESD protection.
- Permanent control of realized ESD protection arrangements by an ESD co-ordinator.
- Integrated ESD control program.

Objective and internal: Audit your ESD protection management yourself:

Your personal rating of ESD protection in your environment within minutes – Suitable as overview of the current situation or as base of an consultation.

Questions (management related)	How important is the question for you?				Actual status		
	very	normal	less	none	yes	partly	no
Do ESD standards exist (especially DIN EN 61340-5-1, DIN EN 61340-5-2)?							
Is the content of the standards (especially DIN EN 61340-5-1) familiar?							
Is an ESD co-ordinator employed at the companys location?							
Is the ESD co-ordinator appropriate qualified? (know how about standards, measurements etc.)?							
Is there one / are there more ESD protected area (EPA) established and approved?							
Is there a daily check of personal protection elements (shoes, safety wrist straps,/coil cords) of users?							
Are there periodical random tests at the ESD protection equipment?							
Will the results of the daily/periodical tests be recorded?							
Does a company specific program exist?							
Is the conductivity of ESD floors detected while using measurements?							
Are all employees motivated and qualified concerning ESD protection and behaviour?							
Are temporary employees, cleaners, visitors and other persons involved into ESD protection?							
Is the ESD protection program integrated into QMS?							

Electrostatics

Questions (management related)	How important is the question for you?				Actual status		
	very	normal	less	none	yes	partly	no
Are the ESD-measuring instruments (Tera-ohmmeter, field meter) available for the ESD co-ordinator?							
Is there a conductive flooring in ESD protected areas and is the grounding characteristic proved?							
Does anyone wear conductive shoes (ESD shoes) inside the ESD protected area?							
Are there conductive desktops of tables, shelves, racks and so on?							
Do you have conductive chairs?							
Are there conductive transport carts used and checked frequently?							
Are the ESDS and other protecting facilities as well as packaging clearly labeled?							
Does anybody wear ESD clothes (smocks, shirts etc.)?							
If packagings are opened while checked within stock receipt: Is there an ESD workstation seted up?							
Do you influence the selection of cleaning agents especially floor cleaning agents utilized of cleaners within the EPA?							

Notes on the testing questions:

The questions are selected without any claim to be complete and without quality rating. Therefore the answering of these questions will only show a random sample of your ESD situation! Please answer the questions on a gut level, without long thinking and without extenuation – the result is just for you not for any other persons.

The questioning form contains only "yes-questions". If you can answer with yes – everything is alright.

If there is no "yes" you have the option to check or to let check of reliable authorities if and what amount of importance this question does have on you and your associate partners.

Value levels are set by yourself, e.g.:

very = 5 normal = 3 less = 1 none = 0

and enable you to quantify your "NO"conclusions.

Interesting is also to include further employees when answering questions and analysing results. This extends the observation horizon and accidental occurrence is also excluded as well as the important is highlighted.

Packaging badge example:



Device badge example:



* main function - badge

S (= shielding)

shielding / shielding effect against electrostatic recharging

D (= dissipative)

electrostatic conductive – resistance to ground $\geq 1 \times 10^5 \Omega$ und $< 1 \times 10^{11} \Omega$

L (= low charging)

marginal rechargeable (old term: antistatic)

C (= conductive)

electrostatic conductive – resistance to ground $\geq 1 \times 10^2 \Omega$ und $< 1 \times 10^5 \Omega$

ESD audits and training



- **Motivation and advanced training of employees with experience relevant contents**
- **Realization of trainings**
- **Checkup of materials**
- **ESD measuring and risk analysis**
- **External service: assuming office of the local ESD co-ordinator**
- **Periodic tests of ESD flooring including acceptance certificate**
- **Training as authorized ESD co-ordinator**



Training as authorized ESD co-ordinator according to DIN EN 61340-5-1 and how to optimally setup an effective and safe ESD management including a quality certificate.

Agenda

1. Day		2. Day	
1	1. Basics and effects <ul style="list-style-type: none"> - Electrical charging and discharging - Interacting material - Interacting factors - Effects in everyday life and office - Effects in laboratory and production 	5	protective ESD standards <ul style="list-style-type: none"> - DIN EN 61340-5-1 - DIN EN 61340-5-2 - DIN EN 61340-4-1
2	ESD in context with product quality <ul style="list-style-type: none"> - Loss of production according to ESD - Damage because of ESD - Long-term effects (degradation) - Electronic protective measures in design - Costs - Image of products and company 	6	ESD project management <ul style="list-style-type: none"> - Identification of need provisions - Implementation of ESD protection - Integration of ESD quality management system
3	practical experience <ul style="list-style-type: none"> - survey of ESD standards - electrostatic protected areas (EPA) - ESD products and protection means 	7	Tasks of an ESD co-ordinator <ul style="list-style-type: none"> - Appreciation of responsibility - Inspection and supervising - Measuring practice - ESD acceptance (validation)
4	ESD flooring <ul style="list-style-type: none"> - receivables and reality - Regeneration and updating 	8	Motivation of staff and give special instructions from time to time
9	Termination of seminar and certificate		

The two day workshop provides you with practical knowledge and experiences regarding reasons of appearance and protective measures. You will get to know the most important measuring methods and measurements will be carried out. This knowledge will prepare you optimally for your work as ESD co-ordinator.