

All you should know about electrostatic discharge (ESD)



ESD, commonly known as ElectroStatic Discharge (ESD) may seem harmless but can nevertheless cause severe damage to electronic components and assemblies !

ESD is one of the major problems facing the electronic industry. The majority of manufactured systems are made out of components highly sensitive to ESD.

When two objects with different charges come close together, electrons can suddenly flow from one object to the other. This sudden flow of Electrons is the transfer, or discharge, of static electricity; commonly known as **Electrostatic Discharge ESD**.

Damages caused by ESD can be avoided

ESD is most often caused by people !

- Your body becomes easily charged when you move.
- Your skin, hair and body can store large amounts of static electricity.
- You can transfer, or discharge, this electrical charge to components or assemblies and cause ESD damage.

ESD is also increased by

- Low Humidity (Dry air). The risk of ESD occurrence grows as air gets drier.
- Synthetics, plastics and insulators in the work area.
- Walking on normal floor, rubbing chairs on the ground..

A small discharge (20 Volts are sufficient) that cannot be seen, heard or felt has an effect similar to a lightning on electronic components and assemblies.

A 20 Volts ESD is sufficient to damage an electronic component !

Anyone who works with electronic components or assemblies can cause ESD damage. ESD is a daily life occurrence.

Most of the time the component is only weakened by an ESD. These weaknesses are known as « latent defect ». It is usually later, while in use, that it may react as a time-bomb and cause failures or ruin the whole assembly.

6 rules to prevent ESD

1. **Handle** any electronic item as a component sensitive to ESD.
2. **Do not touch** a part unless you are in a ESD protected area and are properly grounded by one strap at least. Remember: ESD damage is most often caused by people !
3. **Always wear** your ESD protection equipment (heel or wrist strap). Avoid synthetics or woollens.
4. **Keep** your work area free from food and beverages. Make sure it is clear of any static generating materials such as synthetic packaging materials, styrofoam cups or transparent adhesive tape.
5. **Avoid** any contact between components sensitive to ESD and insulating material (styrofoam, plastics, PET containers, synthetic packaging materials, PVC, nylon, wool, ...).
6. **Store and transport** ESD sensitive items in static-shielding containers.

Grounding is the most important and efficient protection when handling electronic components. Connected to the earth, the body generates hardly any static charge and cannot cause any damage to the components and assemblies.

To be grounded means that one's electrical charge is neutral because any charge generated by the body flows towards the earth and gets scattered.

The wrist strap is **the basic element of ESD protection**. Everyone handling sensitive components (memories, CPU's, disks, electronic cards) should wear a strap when unpacking, checking material and during installation.

Your behaviour makes the difference between quality and ESD damage !