



► Static dissipative and conductive flooring systems for...

ELECTRONIC ENVIRONMENTS

Welcome to Flowcrete

With the ever growing investment in the electronics manufacturing industry across the Indian subcontinent and beyond, the demand for electrostatic sensitive manufacturing environments is as high as ever.

Flowcrete's range of anti-static flooring can help to safely dissipate the build-up of electrostatic charge whilst meeting ANSI/ESD 2020, ASTM F150 and IEC 61340-5-1 requirements.

Flowcrete's broad range of industrial grade solutions meets all of the specialised needs associated with the electronic manufacturing and processing industries, with anti-static, low VOC, heavy duty flooring systems, chemical resistant finishes and hygienic wall coatings.



What is Static Electricity?

Electrical energy is generated by movement and if an object is insulated from earth the electrical charge builds up, this is known as a static charge because it does not flow to earth.

If the charge is large enough, when an earthed object nears the charged object the charge will jump through the air to go to earth, resulting in a spark and if you are the earthing object a static shock.

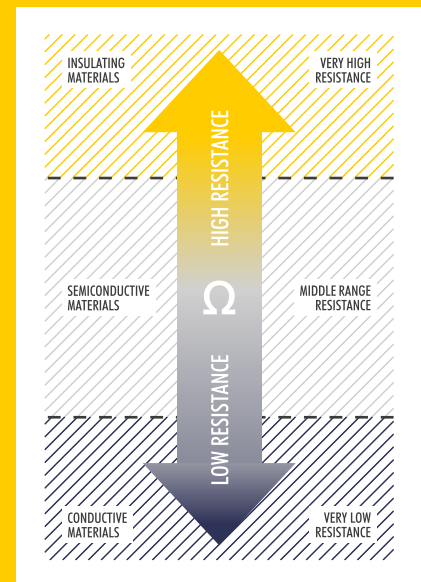
In most cases this is simply an uncomfortable nuisance but if there are explosive atmospheres or sensitive electronic components involved then the consequences can be disastrous.

What is Electrical Resistance?

Every material has an electrical resistance and this is measured in ohms (Ω).

Materials range from conductive (with very low resistance) which allow charge to flow to insulating (which do not allow charge to flow – think of electric cable, the electricity flows through the metal but is kept in the cable by insulating plastic cover).

In between are a whole range of resistances, often called semiconductors.

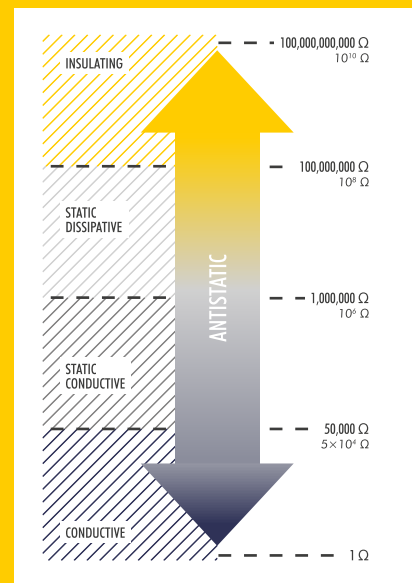


Static Resistance: Conductive & Dissipative

In the area between conductors and insulators, sometimes known as antistatic, values have been further subdivided into static conductive and static dissipative.

This can lead to confusion between antistatic, static conductive and static dissipative as well as between conductive and static conductive.

INSULATING	$> 100,000,000 \Omega$ (10^8)
STATIC DISSIPATIVE	$1,000,000 - 100,000,000 \Omega$ ($10^6 - 10^8$)
STATIC CONDUCTIVE	$50,000 - 1,000,000 \Omega$ ($5 \times 10^4 - 10^6$)
CONDUCTIVE	$< 50,000 \Omega$ (5×10^4)



What is Needed For Flooring?

In very simple terms the greater the danger from a spark or electrical discharge (shock) the more conductive the floor should be.

However, the lower the resistance of a floor the greater the risk there is of electrocution from a mains supply shock and that this has to be balanced against the risk of a spark or static discharge.

Thus BS2050 called for the ratings outlined in the table here.

FOR EXPLOSIVE AREAS	$< 50,000 \Omega$ (5×10^4)
FOR ANTI-STATIC AREAS	$50,000 - 10,000,000 \Omega$ ($5 \times 10^4 - 10^8$)
FOR ANAESTHETIC AREAS	$50,000 - 1,000,000 \Omega$ ($5 \times 10^4 - 10^6$)

However this is an old standard and as stated above the antistatic area is now subdivided, particularly for electronics areas where there is a risk of mains shock from hand tools, into static conductive and static dissipative in BS EN 100015-1 1992.



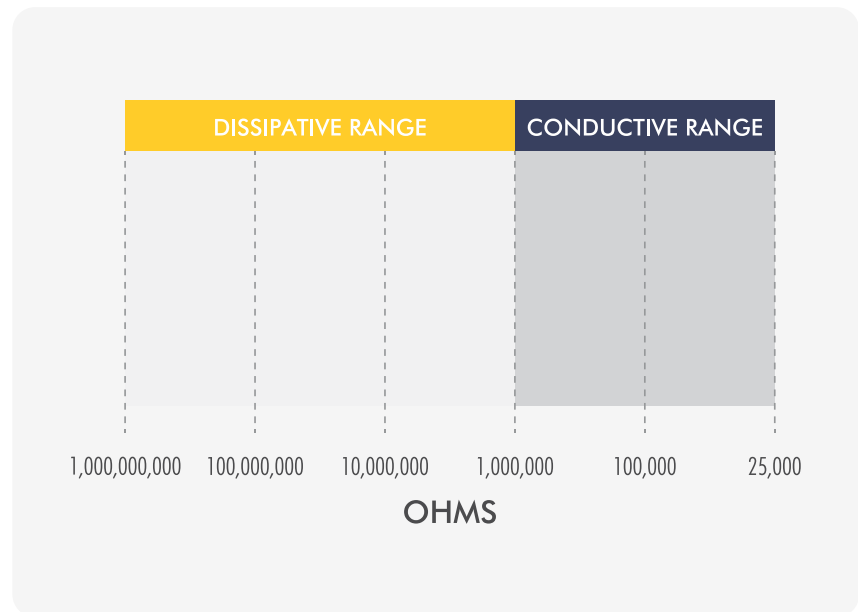
What is ESD Flooring?

Electrostatic Discharge (ESD) refers to the rapid, spontaneous transfer of electrostatic charge induced by a high electrostatic field.

Charge can build-up while simply walking across the floor of a processing environment.

Without flooring materials equipped with adequate protection, that charge can be passed to sensitive electronic components, causing irreversible damage.

Systems are categorised as Conductive or Dissipative, determined using various testing methods.



Test Methods

There are a large number of options available to measure electrical resistance and they can give different results for the same material, therefore it is important to know the details of the test method.

The main difference is the type of test i.e. S to S and S to R.



Earthing Requirements

This is simply an electrical connection to allow any charge which is transferred to the floor to escape to earth safely.

Typically one per 200 square meters but the exact requirements should be specified by an electrical engineer as should whether surface resistance or resistance to earth measurements are required.

Copper Grids or Not?

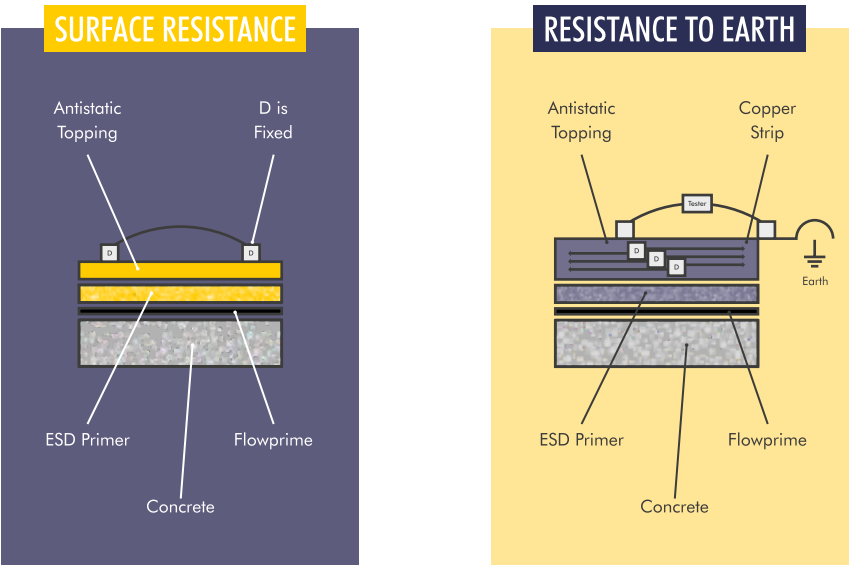
Surface resistance simply measures between two points a fixed distance apart, the location can be anywhere on the floor provided the fixed distance between the electrodes is maintained.

Surface Resistance

Resistance to earth measures between a fixed earth point on the floor, the distance from the point of measurement to the earth point has to be specified, if it is not then it should be assumed that it could be at any point on the floor.

This has a major impact on the need for a copper grid since for materials which are not conductors the measured resistance will increase with increasing distance between the measuring points. Thus the surface resistance will not change across a floor because the electrodes are fixed distance apart; the resistance to earth will increase as the electrode is moved further from the earth point.

To combat this, a conductive grid will be required to increase the size of the earth point and ensure that all parts of the floor are close to the earth point.



Flooring Comparison Chart

	ESD CARPET TILE	ESD CARPET	ESD VINYL TILE	ESD VINYL SHEET	ESD EPOXY	ESD RUBBER
ESD PERFORMANCE	Excellent	Good	Excellent	Excellent	Excellent	Good
INSTALL COST	Moderate	Lowest	Low	Low	Moderate	Highest
DURABILITY	Not suitable for heavy loads	Not suitable for heavy loads	Excellent	Excellent	Superior	Good
HABITUAL CLEANING	Vaccum only	Vaccum only	Sweeping and damp mopping	Sweeping and damp mopping	Sweeping and damp mopping	Sweeping and damp mopping
MAINTENANCE	Hot water extraction as required	Hot water extraction as required	Buffing and waxing optional	Buffing and waxing optional	Buffing and waxing optional	Sealing optional
INSTALLATION	Average	Easiest	Average	Average	Most Difficult	Average
SLIP RESISTANCE	Excellent	Excellent	Good	Good	Excellent	Superior
CHEMICAL RESISTANCE	Poor (not recommended)	Poor (not recommended)	Good	Good	Superior	Excellent
ACID, ALKALI & SOLVENT RESISTANCE	Poor (not recommended)	Poor (not recommended)	Good	Good	Superior	Excellent
ESD WEAR LAYER	N/A	N/A	No	No	Yes	No
COLOR THROUGHOUT	N/A	N/A	Yes (manufacturer specific)	Yes	Yes	Yes (manufacturer specific)
COLOR CONSISTENCY FOR LARGE PROJECTS	Yes	Yes	Yes	Yes	Yes	Yes

Electronic Environment Anti-Static Flooring Options

Product (Product Description)	Applications	Features & Benefits
Flowprime ESD Conductive (10 kg) 2 Component, Water based, conductive epoxy Primer	<ul style="list-style-type: none"> Used within electrostatic conductive or dissipative resin floor system. 	<ul style="list-style-type: none"> Conductive Primer used within electrostatic dissipative flooring Solvent Free; Odour less Provides electrical continuity under ESD resin toppings and to earthing point
Flowcoat ESD Conductive (5 kg/10 kg) 2 Component, Solvent free, Anti-static Epoxy Coating	<ul style="list-style-type: none"> For use in light to medium duty traffic areas (where conductive ESD standards are required) 	<ul style="list-style-type: none"> Anti-Static & Hard Wearing Low Odour High Chemical Resistance Meets ANSI/ESD S2020 and ASTM F150 Conductive requirements.
Flowcoat Dielectric (10 kg) 2 Component, Solvent free, High build Dielectric epoxy Coating	<ul style="list-style-type: none"> Hard-wearing coloured floor coating in areas such as high voltage sub-stations- switchgear panels, VCB's ,battery rooms, marshalling box flooring 	<ul style="list-style-type: none"> Ultra High Dielectric Strength and insulation resistance Tough wear and weather resistant Excellent chemical resistance High build Adhesion
Flowshield ESD SL (1mm) (16 kg) Antistatic, Self-Smoothing epoxy floor coating	<ul style="list-style-type: none"> Suitable for use in medium duty traffic areas (where conductive ESD standards are required) 	<ul style="list-style-type: none"> Meets ASTM F150-06, IEC 61340-4-1, ANSI/ESD S2020 and IEC 61340-4-5 conductive requirements Hygienic & easy to clean; Hard wearing Non-tainting & non-dusting; Attractive
Flowshield ESD SL (2mm) (20 kg) Antistatic, Self-Smoothing epoxy floor finish	<ul style="list-style-type: none"> Suitable for use in medium to heavy duty traffic areas (where conductive ESD standards are required) 	<ul style="list-style-type: none"> Meets ASTM F150-06, IEC 61340-4-1, ANSI/ESD S2020 and IEC 61340-4-5 conductive requirements Hygienic & easy to clean; Hard wearing Non-tainting & non-dusting; Attractive
Flowshield ESD Quartz 2mm (20 kg) Antistatic, Self-Smoothing 'decorative-vinyl' like epoxy floor finish	<ul style="list-style-type: none"> Alternative to vinyl for areas where a durable, hard-wearing, good chemical resistance, attractive floor with minimized visible scratches is required with conductive ESD standard. 	<ul style="list-style-type: none"> Meets ASTM F150-06, IEC 61340-4-1, ANSI/ESD S2020, and IEC 61340-4-5 conductive requirements A great alternative to vinyl flooring Attractive; Hygienic & easy to clean Non-tainting, non-dusting; Hard wearing Abrasion and Scratch resistance
Flowfresh ESD SL (2mm) (16 kg) Antistatic Polyurethane resin floor system with Polygiene® (anti-microbial additive)	<ul style="list-style-type: none"> Provides a hygienic, antistatic floor finish with exceptional chemical resistance. 	<ul style="list-style-type: none"> Meets ASTM F150-06, ANSI/ESD S2020, IEC 61340-4-1 and IEC 61340-4-5/ ESD S7.1. conductive requirements HACCP International Certified, Anti-Microbial Hygienic floor finish High Chemical and Abrasion Resistance; High Performance; Low Odour
Flowshield Dielectric (2mm) (20 kg) 2 Component, Solvent free, High build Dielectric epoxy self-smoothing system	<ul style="list-style-type: none"> Hard-wearing coloured floor finish (high voltage sub-stations- switchgear panels, VCB's ,battery rooms, marshalling box flooring) 	<ul style="list-style-type: none"> High Dielectric Strength and insulation resistance Tough wear and weather resistant Excellent chemical resistance High build and strong Adhesion
Flowfresh Dielectric (2mm) (18 kg) Dielectric, Polyurethane resin floor system with a smooth matt coloured finish with Polygiene® (anti-microbial additive)	<ul style="list-style-type: none"> Provides a hygienic, dielectric floor finish with exceptional chemical resistance where dielectric standards are required 	<ul style="list-style-type: none"> Ultra High Dielectric Strength and insulation resistance Anti-microbial, HACCP International Certified High Chemical and Abrasion Resistance High Performance and hygienic floor Low Odour

- Tremco Construction Products Group (CPG) India is a market leader in the manufacture of Construction Chemical products including seamless industrial and commercial resin flooring solution, waterproofing systems, roofing with insulation, systems for joints & durable sealants, admixtures, repair solution, fibres as well as other specialist construction products & coatings.
- Tremco CPG India belongs to an wider global Tremco Construction Products Group company (an RPM Inc. division) headquartered in Cleveland, Ohio (USA).
- Tremco Construction Products group is a powerful union of some of the world's most trusted & leading chemical and coatings technology brands owned by RPM Inc.



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