A.T.E. ENTERPRISES PVT. LTD.
BU:- AxisValence

VALSTAT PRODUCT RANGE

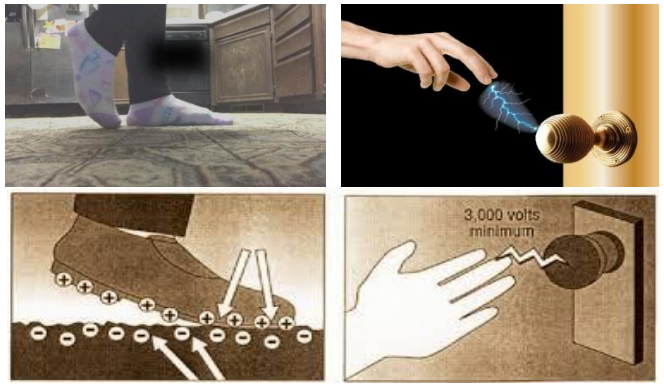
A.T.E. Enterprises Private Limited (Business Unit: AxisValence)

Date: 25-01-24

Have you encountered static charges?

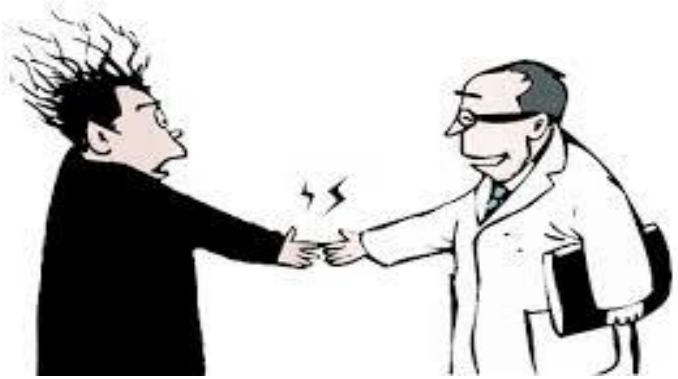
While seated inside car or touching the door handle

While walking on a carpeted floor and touching the door handle



Static charges while wearing or removing clothes

While handshaking



Induced Static charges

Static charges

No static charge

How Static Electricity differs from conventional electricity

Electricity is the form of a energy produced by charges.

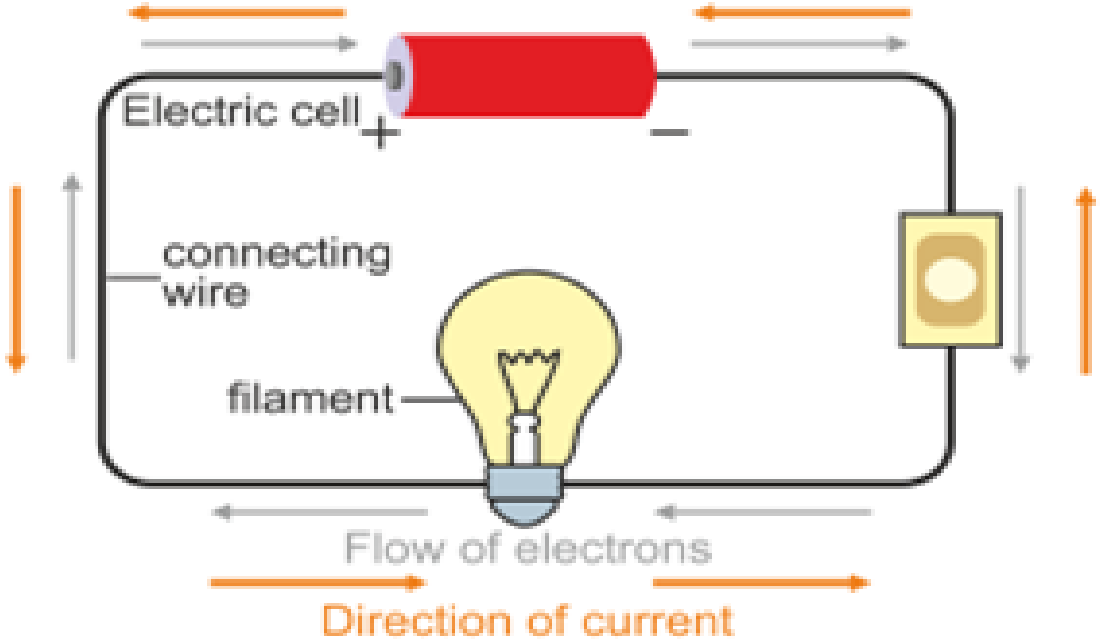
Static electricity – charges at rest.

It is the accumulation of excess positive or negative charges on an object. The charges are transferred from one object to another and remain at rest on it's surface.

e.g. comb rubbed with hair gains electrons becomes negatively charged, attracts pieces of paper.

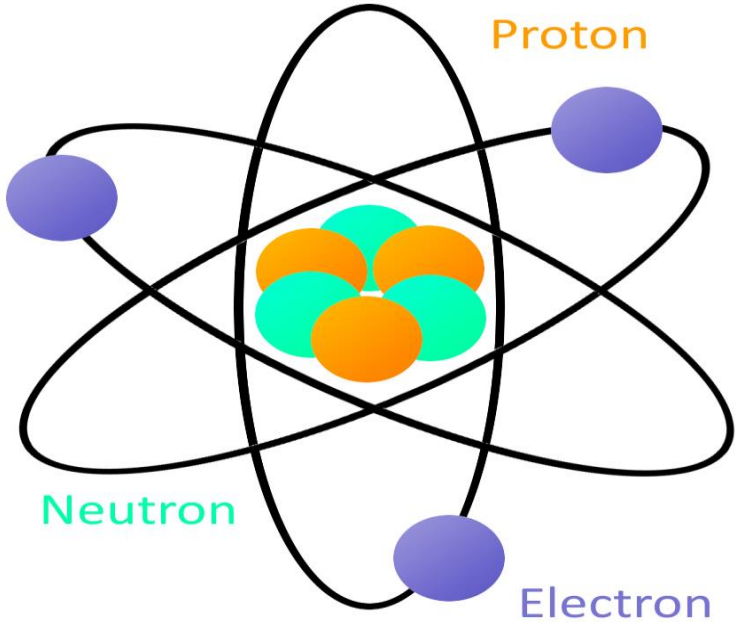
Current electricity – charges are moving.

Flow of electrons in a particular direction results into electric current or current electricity.



Building Blocks of Atoms

An atom is built with a combination of three distinct particles: electrons, protons, and neutrons. Each atom has a centre nucleus, where the protons and neutrons are densely packed together. Surrounding the nucleus are a group of orbiting electrons.



An ion is an atom (or group of atoms) that has lost one or more electrons, giving it a net positive charge (cation), or that has gained one or more electrons, giving it a net negative charge (anion).

Tribo-electric series:

The polarity of the static charge depends on the “triboelectric series” list.

When one material rubs against another; which one becomes positive and which one becomes negative depends on their relative ability to retain or release electrons.

Under ideal conditions, the material listed higher in tribo-electric series releases electrons and becomes positively charged. The magnitude of the static charge depends on the material, applied forces, separation rate, temperature, relative humidity, etc.,

Cause and effect of static electricity

CAUSES:

Contact induced charge separation

Electrons can be exchanged between materials on contact; materials with weakly bound electrons tend to lose them while materials with sparsely filled outer shells tend to gain them. This is known as the Tribo-electric effect.

Pressure induced charge separation

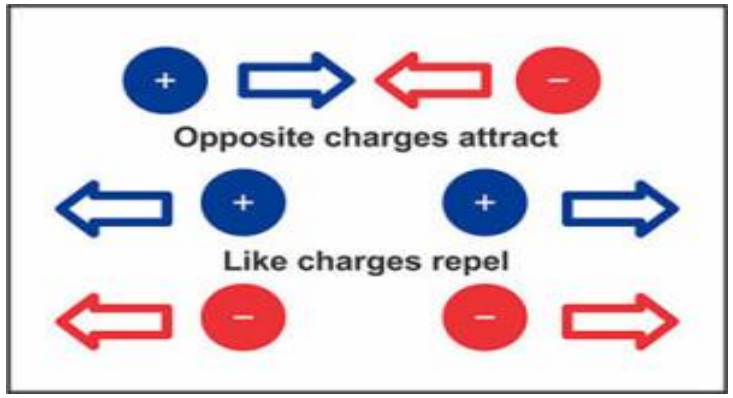
Applied mechanical stress generates a separation of charge in certain types of crystals and ceramic molecules.

Heat induced charge separation

Heating generates a separation of charge in the atoms or molecules of certain materials.

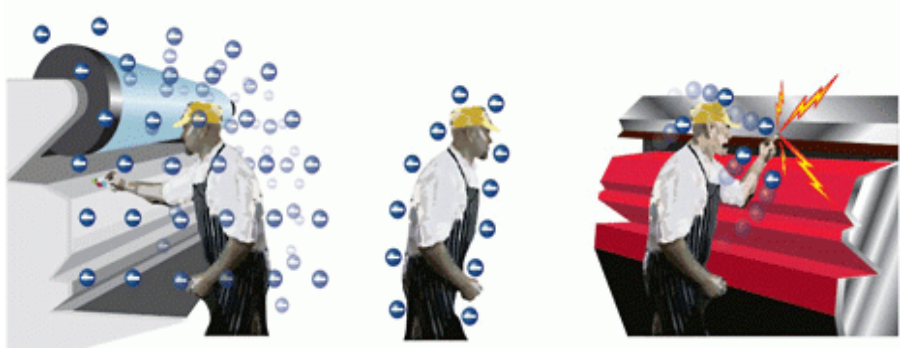
Charge induced charge separation

A charged object brought close to an electrically neutral object causes a separation of charge within the neutral object. Charges of the same polarity are repelled and charges of the opposite polarity are attracted.



Cause and effect of static electricity (Contd…)

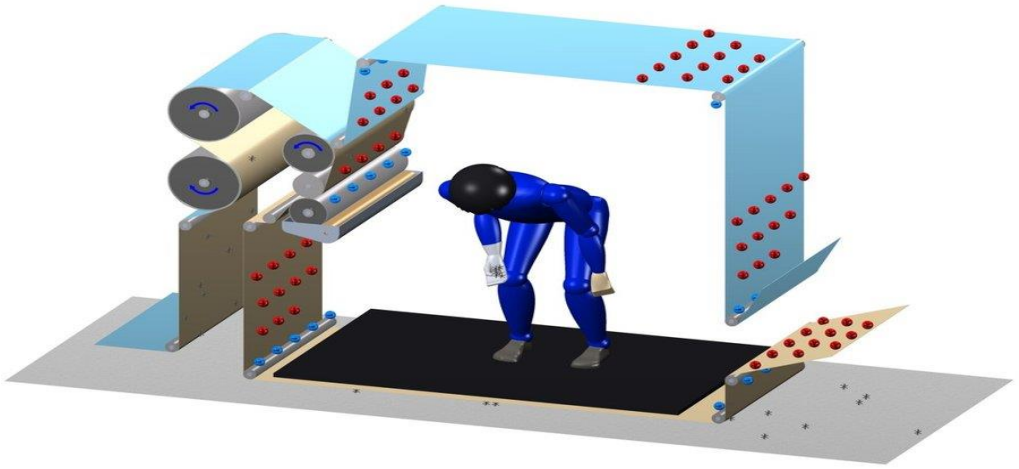
Effect:



Risks of shocks and sparks

Frequent stoppages

Quality issues



Dust attraction

Reduced productivity

Necessity for electrostatic measuring & monitoring

Continuous measuring & monitoring of electrostatic charges at critical locations are very crucial because these charges can cause a number of problems:

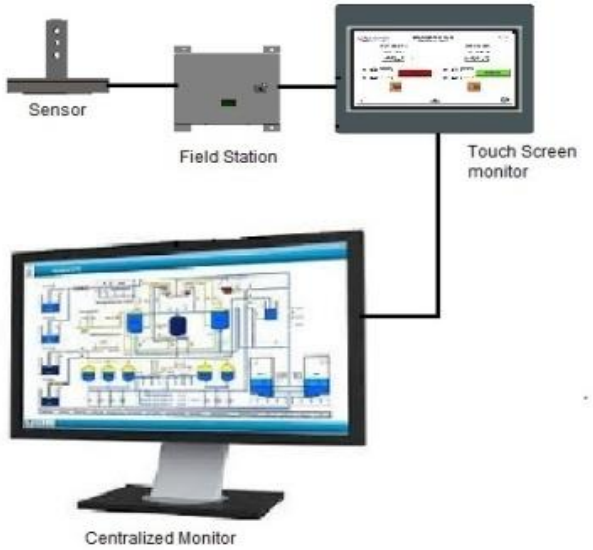
- **Reduced productivity** due to breaks and jams, low speeds, improper stacking, frequent stoppages, web wander etc.
- **Quality issues** due to dust & residue attraction, improper ink/ coat/ paint spread, improper sealing etc.
- Risks of **shocks and sparks**
- **Discomfort shocks** to person
- Unwanted **electrical interference/noise (sensors etc.)**

Products for measuring & monitoring static charges

1.

Static charge meter

2.



Static charge monitoring system

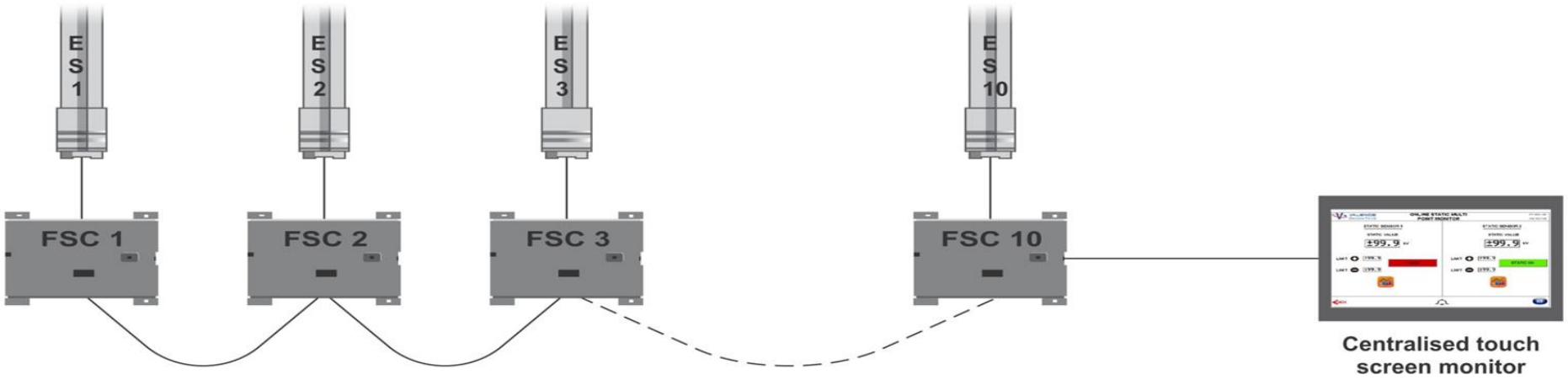
Valstat® 205 Static charge meter

The Valstat® V205 static charge meter is a compact digital electrostatic surface voltmeter, designed to locate and measure surface voltage on stationary, moving objects and equipments.

This static charge meter has very high sensitivity and its resolution is 1 volt at the standard measurement distance of 2” (5cm). The meter is designed to effectively measure the magnitude and polarity of the surface voltage with greater clarity and speed than what has been possible before.

The V205 is ideal for measuring electrostatic charges in plastic, paper, packaging,, textile, food, pharmaceutical, electronic and other industries.

Real-time electrostatic charge monitoring system



- Continually measures, displays and records surface voltage on charged moving objects
- Extremely useful safety and preventive maintenance device that finds use in many industrial applications
- Displays electrostatic charge readings from multiple sensors in real-time
- User set value for alarms
- Normal/high static charge level indication

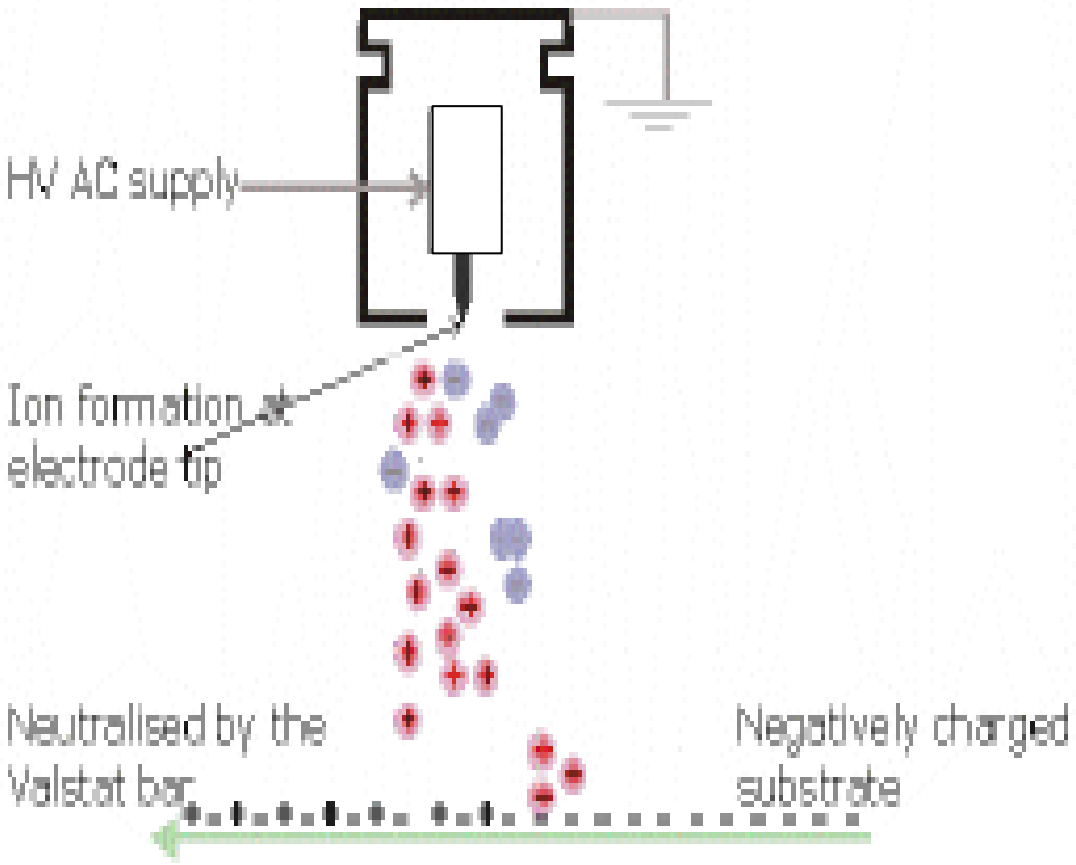
How static charges can be eliminated….

Active method

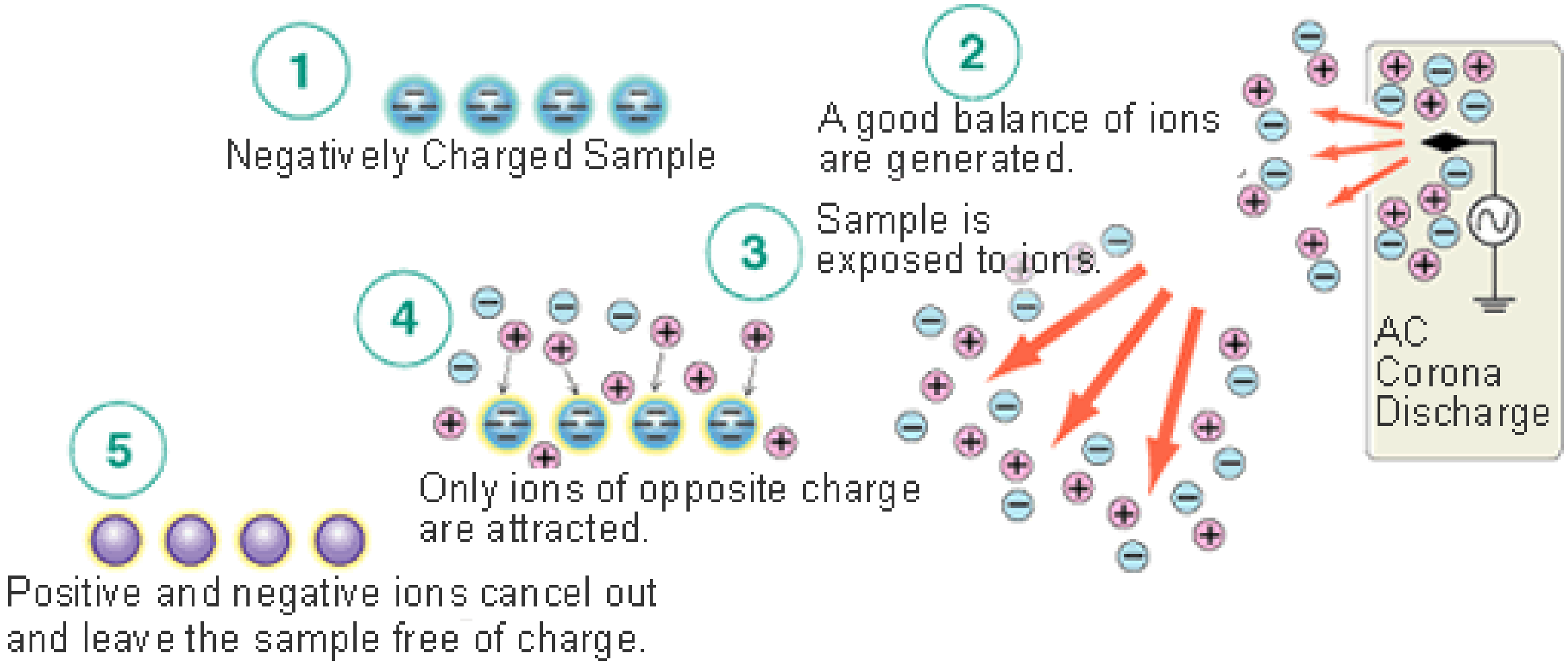
We aim to neutralize the electrostatic charges from the substrate by emitting both polarity (positive & negative) ions on to it.

A row of electrodes provided along the active length of the bar, generates ions of both polarities, ensuring either the positive or negative charges are quickly and effectively removed.

The bar is powered by high voltage AC/DC power source.



How static charges can be eliminated….



How static charges can be eliminated….

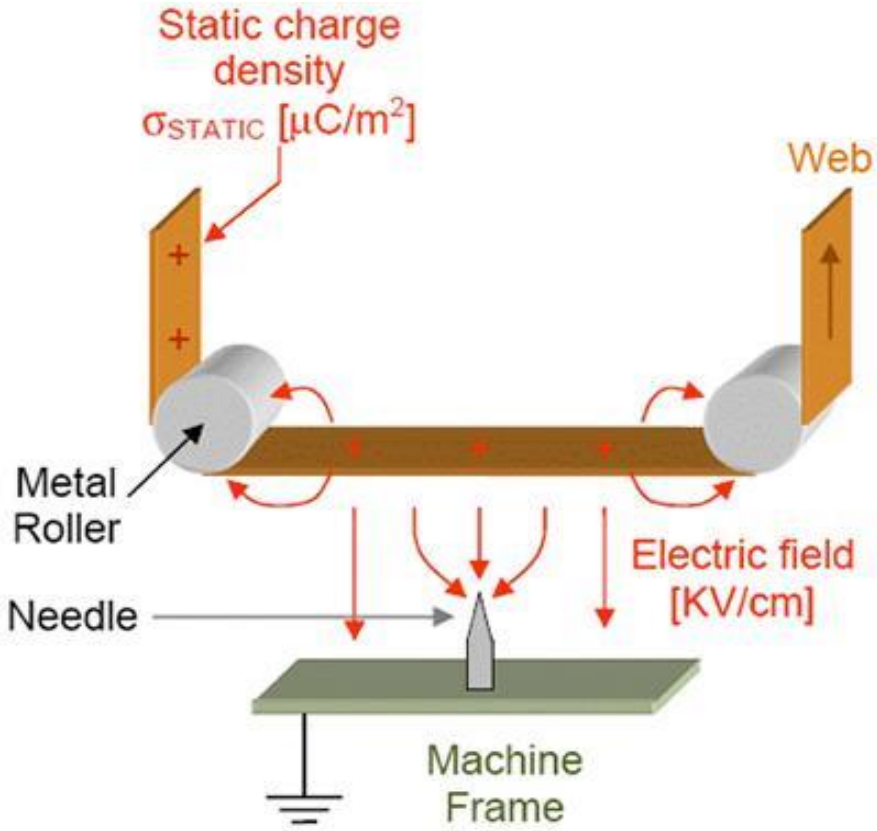
Passive method

Passive type dissipaters can be anything grounded static brushes, pin arrays, tinsel, ionizing cords etc.

A charged substrate (film or paper or fabric) creates an electric field between itself and the tip of the grounded passive dissipaters. Electric fields flow from static charges on webs to nearby grounded passive dissipaters.

However, near the sharp tip of the needle, the **electric fields are much stronger**.

Passive dissipaters do not completely discharge static charges from the substrate.



Valstat® Discharging products

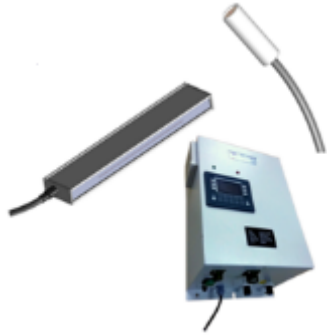
Electrostatic solutions for films, sheets, 3-D objects – moving and stationary

Static eliminating bar

Power source

Blower static eliminator

Bench top static eliminator

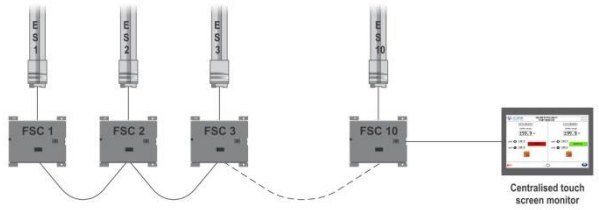


Static charging system

Ionising air gun

Antistatic touch pad

Passive brush



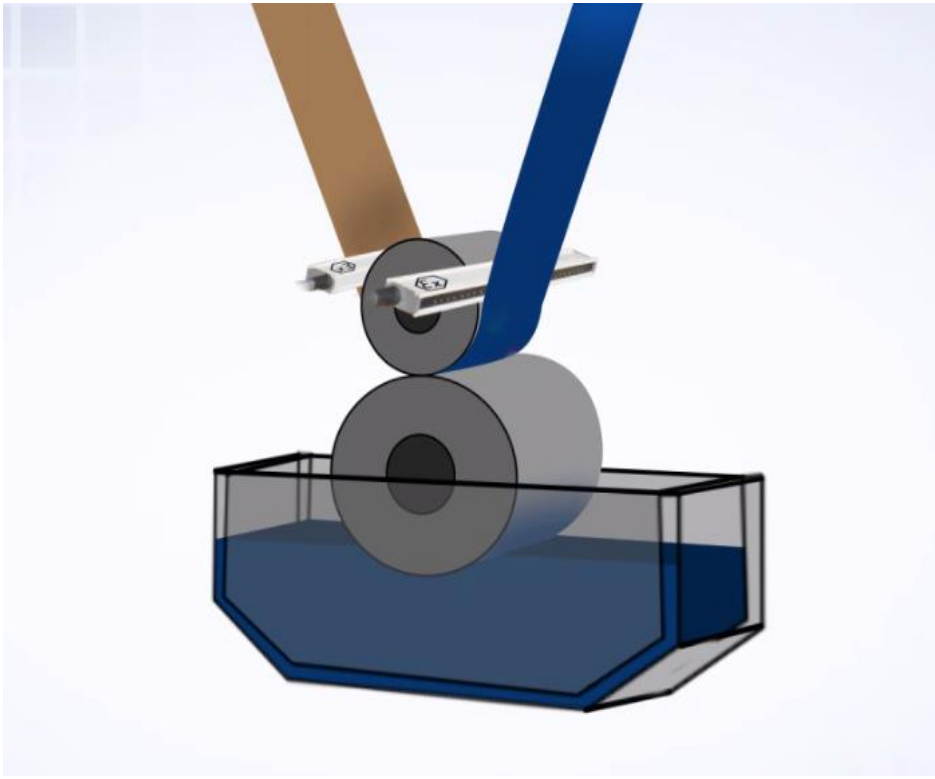
Static charge monitoring system

Static charge meter

Benefits of discharging static charges

Maximise safety on solvent-based print and coating stations

- Reduced risk of fire
- Reduced operator hazard
- Improve safety



Increased productivity due to

- Consistent speeds of the moving web
- Proper stacking
- Minimal stoppages, web wander etc

Improved Quality due to

- Minimal dust & residue attraction
- Uniform ink/ coat/ paint transfer on the web
- Proper sealing etc.

Minimal electrical interference to sensors.

Need of ATEX certification

- Flexographic, Rotogravure printing, Coating are applications that make heavy use of solvents.
- The solvent vapours can get concentrated at certain areas, which makes these zones prone to explosions.
- Static charge eliminators need to be positioned in such explosion prone areas.
- ATEX certification is necessary for products that are intended for use in potentially explosive atmospheres and are sold in the European Union (EU).
- There is no equivalent certification in India for ATEX

ATEX
Atmosphère
Explosible

ATEX certified Ex-proof Valstat ® VR20X

- Ideal for use in explosion-prone environments
- Valstat VR20X is a highly efficient static charge eliminator.
- Neutralises electrostatic charges from fast-moving plastic films, paper and other non-conductive substrates.
- A row of electrodes, provided along the active length of the bar, generate ions of both polarities, ensuring that positive and negative charges are quickly and effectively removed from the target.

Valence is the first Indian manufacturer to launch ATEX certified static charge eliminators

VR20X - Features

- Certified for use in hazardous environments.
- Shock-less and spark-free; no shock when touched and no sparks if accidently earthed.
- Safe even when power supply is off; by passive discharging through electrodes.
- Ease of installation through sliding brackets for mounting.
- No maintenance, except periodic cleaning

HV Power source - Valstat® PS60C

- High voltage power supply system for VR20X static charge eliminating bars.
- Has to be positioned outside the explosion prone area.
- One PS60C power source powers up to three VR20X static eliminating bars.

Features

- Very low power consumption (less than 40VA)
- 230 V, 50/60 Hz, single phase input
- Stable HV output, with inbuilt current limit
- Easy installation and commissioning
- Mild steel fabricated, powder coated enclosure
- Compact, dust proof and rugged construction

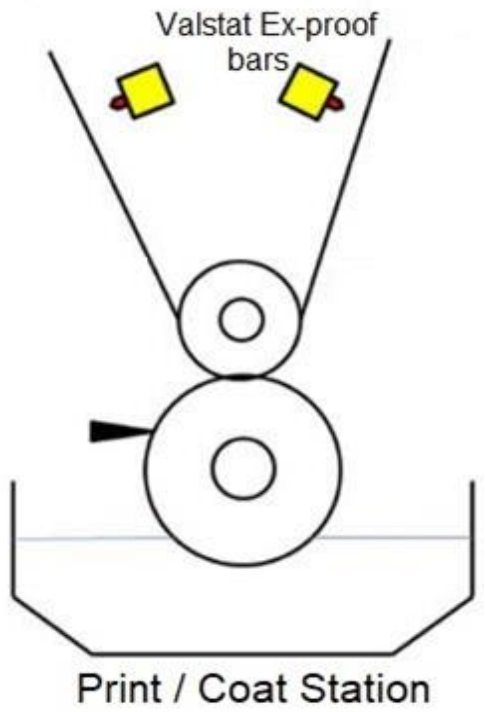
Application – Ex-proof VR20X + PS60C

Challenge

- On solvent-based rotogravure printing machines, the moving web develops electrostatic charges as it passes through rollers, or enters and exits dryers, etc.
- High charges on the web could lead to an electrostatic discharge in a solvent vapour laden area and potentially cause a fire or an explosion.

Solution

- For effective static charge elimination, install ATEX-certified, ex-proof Valstat® VR20X static charge elimination bars before and after every print station.
- As zones close to printing stations are prone to explosions, using certified, ex-proof static charge eliminators is a necessity.
- Valstat® VR20X static charge elimination bars are powered by Valstat® PS60C high voltage (HV) AC power sources.
- The VR20X bars are mounted in explosion prone areas, and the PS60C power source is mounted outside the zone.



Videos - Static electricity

A video clip showing static charges generated on a moving film.

A video clip showing static charge induced due to friction on a stationery reels

A video clip showing static charge induced in the human body.

Application areas of Valstat® static eliminators

Packaging	Wrapping, stretch & shrink wrapping, blister packing, form-fill-seal, canning and bottling.
Converting	Roto & flexo printing, coating, laminating, slitting, inspection, doctoring, sheeting, pouch and bag making.
Paper and board	Pope reel, calendaring, slitting, winding, sheeting and corrugation.
Plastic films	Cast & blown film lines, slitting and sheeting.
Printing	Gravure, flexo, offset, screen, notebook printing, binding & folding
Labels	Label stock coating, printing, slitting and sheeting
Textiles	Carding, warping, stenter
Plastic moulding	Thermofoaming, vacuum forming, roto, injection, blow moulding, GRP, extruded plastics, sections
Electronics	Assembly, testing, ESD work stations
Medical	Bottle cleaning, tablet wrapping, form-fill-seal, sterile packing
Auto & durables	Painting, spraying and parts cleaning

Technical specifications of various static eliminators & power sources

PARAMETERS	AC TYPE STATIC ELIMINATOR				DC TYPE STATIC ELIMINATOR
	VS20	**VR20X (Ex Proof)**	**VR30/VR30C**	**VR32/VR32C**	**VR90 with replaceable pins**
Discharge range	10mm to 40mm from substrate	10mm to 50mm from substrate	10mm to 75mm from substrate	10mm to 75mm from substrate	≥100 to ≤ 400mm from substrate
Max. speed	Max.350 mpm	Max.1000 mpm	Max.1000 mpm	Max. 400 mpm	Max.1000 mpm
Weight	approx. 1.0KG per metre	approx. 1.0KG per metre	approx.1.5KG per metre	approx.1.5KG per metre	approx.1.6KG per metre
Power source	Valstat® PS74U	Valstat® PS60C	Valstat® PS74U/ PS70C	Valstat® PS74U/ PS60C	Valstat® PS91D
Eliminator image					

POWER SOURCE	Valstat® PS7U/PS70C	Valstat® PS72	Valstat® PS60C	Valstat® PS91D power source
Input supply	230V AC ± 10%, 50 Hz ± 5%, single phase. Earth connection is mandatory	230V AC ± 10%, 50 Hz ± 5%, single phase. Earth connection is mandatory	230V AC ± 10%, 50 Hz ± 5%, single phase. Earth connection is mandatory	24V DC, 0.5A Max
Power consumption	40 VA	40 VA	40 VA	10W maximum
Mains power supply cable	2 meters, 3 core (L-N-E) cable	2 meters, 3 core (L-N-E) cable	used with European certified power cable (3core 0.75Sq.mm). Plug and appliance coupler suitable for C14 type appliance inlet.	24VDC; 2 meters, 3 core with connector input cable.
Input fuse	Replaceable 20 mm glass fuse, 2A / 250 VAC	Replaceable 20 mm glass fuse, 2A / 250 VAC	Replaceable 20 mm glass fuse, 2A / 250 VAC	Replaceable 20 mm glass fuse, 2A / 250 VAC
Output connections	4 nos. plug in type HV connections	3 nos. plug in type HV connections	3 nos. plug in type HV connections	2 nos. plug in type HV connections
Loading capability	Max. 4 VS20 static eliminating bars can be connected. Total length of connected bars plus HV cable should not exceed 15 m.	Max.3 VR30 static eliminating bars can be connected. Total length of connected bars plus HV cable should not exceed 15 m.	Max.3 VR20X static eliminating bars can be connected. Total length of connected bars plus HV cable should not exceed 15 m.	With 2 VR90 DC static eliminating bar can be connected. Total bar length should not exceed 3.0 metre. Cable length can be 5 m

POWER SOURCE	Valstat® PS74U/PS70C	Valstat® PS72	Valstat® PS60C	Valstat® PS91D power source
Nominal output voltage	7KV AC	7KV AC	6KV AC	9KV DC
Output current	4 mA short circuit current	4 mA short circuit current	4 mA short circuit current	0.25mA max
Enclosure	Sheet metal, powder coated	Sheet metal, powder coated	Sheet metal, powder coated	Sheet metal, powder coated
Weight	Approx. 3.3 kg	Approx. 3.5 kg	Approx. 3.3 kg	Approx. 3.3 kg
Earth	External ground terminal provided on housing	External ground terminal provided on housing	External ground terminal provided on housing	
Static eliminators	VS20, VR30,VR32, VR30C,VR32C static eliminating bars, Blowstat, Centristat, ionizing air gun and nozzles	VS20,VR10,VR30,VR32 static eliminating bars, Blowstat, Centristat, ionizing air gun and nozzles	VR20X (Ex Proof) static eliminating bars	VR90 DC static eliminating bars only

Contact us

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THANK YOU