KINETIC POLYMERS

ANTI STATIC PRODUCTS

- ✓ ELECTRONIC INDUSTRIES
- ✓ CHEMICAL INDUSTRIES
- ✓ DEFENCE

CONDUCTIVE PRODUCTS

- ✓ CHEMICAL INDUSTRIES
- ✓ EXPLOSIVE INDUSTRIES
- ✓ DEFENCE

EMI/EMC SHIELDING GASKETS

- ✓ DEFENCE
- ✓ COMMUNICATION INDUSTRIES

ESD SAFE CLEAN ROOM PRODUCTS

- ✓ SEMI CONDUCTOR
- ✓ PHARMA INDUSTRIES
- ✓ HOSPITALS

VCI PRODUCTS TO STOP CORROSION

- ✓ METAL INDUSTRIES
- ✓ DEFENCE INDUSTRIES
- ✓ ELECTRONIC INDUSTRIES

MASTERBATCHES

- ✓ PLASTIC INDUSTRIES

PREMIUM QUALITY

ESD SAFE PROTECTION

CUSTOMIZED SOLUTIONS

TRUSTED BY INDUSTRIES

WIDE RANGE OF PRODUCTS

D-13/2, Road No. 3, Phase -1,
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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

- **AntistaticRolls&Bags**
- **ConductiveRolls& Bags**
- **StaticShieldingRolls&Bags**
- **AluminiumMoistureBarrierRolls&Bags**
- **AntistaticBubbleRolls&Bags**
- **WhiteBubbleRolls**
- **StaticShielingBagswithAntistaticBubbleandPlainBags**
- **VCIFilms& Bags**
- **VCIStretchFilms**
- **VCIPaper & VCI Oil**
- **AntistaticPUFoam**
- **ConductivePUFoam**
- **AntistaticEPE Foam**
- **AntistaticPVC3Layer Mat**
- **ConductivePVCMat**
- **AntistaticPVCTiles**
- **AntistaticRubberMat**
- **ConductiveRubberMat**
- **Antistatic Epoxy Floor**
- **Conductive Epoxy Floor**
- **ConductiveHardLaminateSheet**
- **StickyDoorMat**
- **ESDSafeFieldServiceKit**
- **ESDFloorCleaning Solutions**
- **AntistaticSprays**
- **AntistaticHealStraps**
- **AntistaticSlippers**
- **AntistaticLeatherShoes(Black)**
- **AntistaticShoes(WhiteColour)**
- **AntistaticShoe Covers**
- **Conductive Shoe Covers**
- **Non-wovenShoeCovers with Conductive Strip**
- **CleanRoomClogs**
- **ESDSafeVinylChairwith Arms**
- **ESDSafeVinylChairwithoutArms**
- **ESDSafeVinylChairwithArmsandfootrest**
- **ESD Stool**
- **ESD Trolleys**
- **ESDSafeMS&SSTables**
- **Conductive Pallets**
- **ConductiveChairWheel**
- **ConductiveTrolleyWheels**
- **ConductivePCBRack**
- **ConductiveLTypePCBRack**
- **AntistaticMagazineRack**
- **ESDSafeComponentOrganizer**
- **Conductive Crates & Trays**

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- **Conductive Bins**
- **Conductive Corrugated Sheets & Boxes**
- **Antistatic Tweezers**
- **Antistatic Finger Cots**
- **AntistaticAprons&Caps**
- **AntistaticWrist Bands**
- **GroundingWires**
- **AntistaticGloves**
- **AntistaticBrushes**
- **FloorMarkingTapes**
- **CautionTapes**
- **AntistaticGridTapes**
- **Copper Tapes**
- **AluminiumTapes**
- **AntistaticBucket5Liters**
- **AntistaticBuckets14Liters**
- **AntistaticMugs 1 Liter &1.5 Liters**
- **ConductiveBucket5 Liters**
- **ConductiveBucket14 liters**
- **ConductiveMug1Liter&1.5 Liters**
- **ConductiveTub**
- **Antistatic Brooms**
- **AntistaticCan20 Liters**
- **AntistaticCans 30 Liters**
- **AntistaticCan50 Liters**
- **ConductiveCans5 Liters**
- **ConductiveCans10 Liters**
- **ConductiveCan**
- **ConductiveDustBin**
- **ConductiveDustPan(Small & Big)**
- **AntistaticDrum200 Liters**
- **ConductiveDrum30,50, 80,100, 120Liters**
- **ConductiveHDPE HosePipe**
- **ConductiveRubber HosePipe**
- **Conductive Bows with Lid (Capacity – 1 Kg)**
- **Conductive Bows without Lid (Capacity – 1 Kg)**
- **Conductive Bottles (Capacity – 50 Grams to 1 Ltr)**
- **Conductive Spoon (Capacity – 2 / 5 / 20 / 50 Grams)**
- **Antistatic&ConductiveScrappers (Flat type & Bend Type)**
- **Antistatic&ConductiveScoops (Capacity – 1 Kg)**
- **Antistatic & Conductive Spatula (Small & Big)**
- **Antistatic Beakers with Handle (Capacity – 1 Ltr)**
- **Antistatic Beakers without Handle (Capacity – 25 ML / 200 ML / 500 ML / 1 LTR)**
- **Antistatic&ConductiveSamplers**
- **Antistatic & ConductiveFunnel (Small / Medium / Big)**
- **Conductive Hammer**
- **Conductive Choke Rod**
- **Dozing Plates**

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- **UHMWE Sheet**
- **Vent Caps**
- **Conductive Fabric Gaskets**
- **Conductive Paint**
- **Conductive Adhesive**
- **Copper Tapes**
- **Wire mesh on elastomer core gaskets**
- **Knitted wire mesh tapes**
- **Wire embedded Silicone Rubber Gaskets**
- **EMI / EMC Shielding Windows**
- **Honeycomb Air Vent Panels**
- **Composite EMI / Non-EMI Gaskets**
- **Conductive Elastomer Gaskets**
- **EMI / EMC Gaskets**
- **Silver Filled Silicone Gaskets**
- **Nickel Coated Graphite Silicone Gaskets**
- **Antistatic Masterbatch for PP / HDPE / LDPE & HIPS – ABS**
- **Conductive Master Batch Compound based on PP / LDPE / LLDPE / PVC / & EVA**
- **VCI Masterbatch – Nitrite based and Nitrite free for LDPE/ LLDPE / HDPE Film**
- **Antirodent Master batch for PVC / LDPE / & PP**
- **Slip + AntiblockMasterbatch for LLDPE & EVA**
- **Anti BlockMasterbatch for LLDPE & EVA**
- **Foaming Agent Masterbatch for PVC / & LDPE**
- **Nucleating Agent Masterbatch for HDPE & PP**
- **Purging Compound**
- **F R Masterbatch**
- **Antistatic & Conductive Touch me pad (Normal)**
- **Touch me pad with Indicator**
- **Surface Resistivity Meter (100V) with Rods**
- **Digital Surface Resistivity Meter**
- **Static Charge Meter (Digital)**
- **Intrinsically Safe Static Charge Meter**
- **Wrist Strap & Footwear Tester with footplate**
- **Combo Tester with Stand**
- **Combo Tester Controlled Entry System**
- **Personnel Static Tester (PST-01)**
- **Flame Proof Personnel Static Tester without Handle (PST-FLP)**
- **Flame Proof Personnel Static Tester with Handle (PST-FLPDS)**
- **Earth Clamp with Visual Indicator**
- **Tanker Earth Monitoring System Single Channel (KPN-EM01)**
- **Continuous Earth Monitoring System 10 Channels (KPN-EM10)**
- **Continuous Earth Monitoring System 20 Channels (KPN-EM20)**
- **Spiral Earth Clamps**
- **Crocodile Earth Clamps**
- **Earthing Wires**
- **Grounding Clips with Small / Medium / Big**
- **Earthing Reel System**

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Technical Specifications of Antistatic Transparent Rolls and Bags

Many ICs are static sensitive and can be damaged when you touch them because your body may have become charged with static electricity, from your clothes for example. Static sensitive ICs will be supplied in antistatic packaging with a warning label and they should be left in this packaging until you are ready to use them.

- Thickness – 100 +/- 10 Microns
- Polymers – Polyethylene
- Static Charge – Nil
- Permanently inhibits generation of harmful static charges
- Heat sealable
- Resealable Bags
- Tubing is ideal for making your own packaging
- Surface Resistance – $10^{9\text{-}11}$ Ohms / Sq
- Colour – White



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Technical Specifications of Conductive Rolls & Bags

- Material : PE + Conductive Carbon Black
- Thickness of bag : 90 +/- 10 Microns
- Colour : Black
- Weight : 130 Gms



ELECTRICAL PROPERTIES

- Surface Resistivity : 10^4 Ohms / Sq
- Electrostatic properties : The decay rate less than 2.0 seconds.
- Static Charge Generation : Nil

Uses: Used to pack static sensitive Items.





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Antistatic cum Static Shielding Bags Semitransparent – Metal in Type – Zip Lock and antistatic bubble bag an antistatic bag

Composition of Static Shielding Zip lock (Outer layer) :

- Colour : Silver colour
- Top Layer : Semi metalized Antistatic Polyester Layer
- Surface Resistivity : 10^{10} Ohms
- Thickness : 300 gauge (75 microns)
- Static Charge Generation : Nil

Composition of pink colour antistatic bubble bag (middle layer) :

- Color : Pink
- Thickness : 400 gauge (100 microns)
- Bubble diameter : 10 mm
- Surface Resistivity : 10^{11} Ohms
- Static Charge Generation : Nil

Composition of pink colour antistatic bag (inside layer) :

- Color : Pink
- Thickness : 400 gauge (100 microns)
- Surface Resistivity : 10^{11} Ohms
- Static Charge Generation : Nil

Measuring Instruments used :

1. Static Charge Meter DSM-01

2. Surface Resistivity Meter with probes (SRM-100V)



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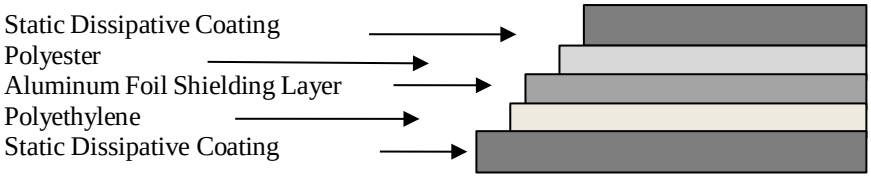
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Technical Data Sheet of Moisture Barrier Rolls & Bags

Structure



Physical Properties

Thickness	: 100 +/-10 Micron
Tensile Strength (ASTM D 1922-03)	
MD	: 390 kgf/Sq. Meters.
CD	: 400 kgf/ Sq. meters.
Elongation (ASTM D 1922-03)	
MD	: 93%
CD	: 98%
Seal Strength	: >4.0 kgf/25mm
MVTR	: 0.009 gm/sq. meters/24 hrs
(ASTM-E-96 at 38 Degree Cent. 90% RH)	
OTR	: 0.5 cc/sq. meters/24 hrs
(ASTM-D-1484 at 38 Degree Cent. 45% RH)	

Electrical Properties

Surface Resistance	
Inner Layer	: 10^9
Outer Layer	: 10^9
Charge Decay (ASTM D 4238-95)	
Inner Layer	: 1.12 Sec.
Outer Layer	: 1.72 Sec.



Chemical Properties

Polycarbonate Compability	: Yes
Silicone Oil	: Absent
N-Octanoic Acid	: Absent
Amides	: Absent

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Technical Specifications for Antistatic Bubble Roll & Bags

➢ Material	:	LDPE (Resin Source Reliance)
➢ Colour	:	Pink
➢ Gauge	:	300 - 320 (75 – 80 Microns)
➢ Bubble Dia meter	:	10 mm +/- 1 mm
➢ Height of the Bubble	:	4 mm +/- 0.2 mm
➢ Surface Resistivity	:	$< 10^{11}$ Ohms
➢ Heat Sealbility	:	Yes
➢ Temp Resistance	:	60^0C
➢ Acid / Alkali / Water Resistance	:	Yes
➢ Size of the roll	:	1.5 mtr x 100 mtrs



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Technical Specifications for White Bubble Roll & Bags

➢ Material	:	LDPE (Resin Source Reliance)
➢ Colour	:	Natural
➢ Gauge	:	300 - 320 (75 – 80 Microns)
➢ Bubble Dia meter	:	10 mm +/- 1 mm
➢ Height of the Bubble	:	4 mm +/- 0.2 mm
➢ Surface Resistivity	:	$\geq 10^{12}$ Ohms
➢ Heat Sealbility	:	Yes
➢ Temp Resistance	:	60^0C
➢ Acid / Alkali / Water Resistance	:	Yes
➢ Size of the roll	:	1.5 mtr x 100 mtrs



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Technical Specification of VCI Paper

- **Material** : **VCI Paper**
- **Colour** : **Brown**
- **GSM** : **60 / 80 / 100 GSM**
- **VCI Coating** : **0.75 to 1.5 g VCI/Sq ft**
- **PH Value** : **Neutral**
- **Expected Protection** : **6 months – 1 year**
- **Self life of VCI Paper** : **1 Year**
- **Std size** : **1 meter width Roll of min 400 meters**



Excellent for wrapping heavy or sharp objects, added paper weight provides tear resistance. Good choice for parts like gears, clutches or heavy steel.







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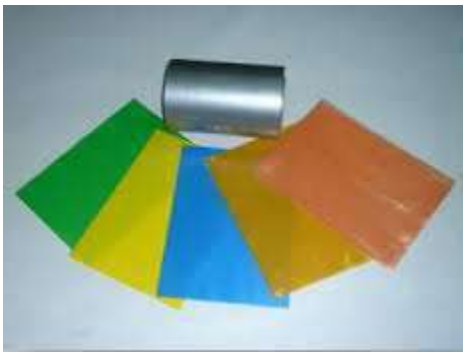
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Technical Specification of VCI Rolls and Bags

- **Thickness of Film : 100 microns**
- **Color of the Film : Transparent Yellow.**
- **Raw Material : PE**
- **Other Material : VCI**
- **Water Resistance : Excellent**
- **Sealing : Heat Sealing**
- **Shelf Life : One Year**









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Technical Specification of VCI Stretch Film

- **Thickness of Film** : **23 microns**
- **Color of the Film** : **Transparent Yellow.**
- **Base Material** : **PE**
- **Other Material** : **VCI & PIB**
- **Water Resistance** : **Excellent**
- **Sticking** : **Self Sticking / Clinging Property**











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Technical Specifications of Antistatic PU Foam

➢ Material	:	Antistatic PU Foam
➢ Colour	:	Pink / Orange
➢ Thickness	:	10 mm
➢ Density	:	24 kg / mt3
➢ Surface Resistance	:	$\leq 10^{11}$Ohms
➢ Static Charge Generation	:	$\leq$ 200 Volts
➢ Rate of Decay	:	$\leq$ 10 Sec





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Technical Specifications of Conductive PU Foam

- Material : Conductive PU Foam
- Colour : Black
- Thickness : 3 - 50 mm
- Min. width : 1000 mm
- Max. length : 2000 mm
- Density : 23 kg/ m^3 (± 15%)
- Temperature resistance: approx. 80° C (for a short time higher)
- Density : 24 kg / mt3
- Surface Resistance : 10^3 to 10^5 Ω
- Static Charge Generation : Nil
- Rate of Decay : < 0.2 seconds



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Technical Specifications of Antistatic EPE Pink Foam

➢ Base Material	:	Polyethylene
➢ Color	:	Pink
➢ Density	:	0.02 g/cc
➢ Temp Resistance	:	60^0C
➢ Foaming	:	Physical foaming agent based
➢ Type	:	Closed cell
➢ Thickness	:	10 mm and 25 mm
➢ Surface Resistivity	:	10^{11}Ohms
➢ Volume Resistivity	:	10^{11} Ohms
➢ Static Charge Generation	:	Nil
➢ Expected Antistatic life	:	6 months or 6 times usage

Instruments are used

- **Surface Resistivity Meter (100V) with Special probes**
- **Static Charge was tested using Static Charge meter (SCM 04)**
- **As per ANSI S20.20-2007 Standards surface resistance should be ≤ 10^{12} and static charge generation < 200 Volts**





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Technical Specification of Antistatic PVC 3 Layer Mat

1. Material	:	Homogeneous Antistatic composition with black Conductive layer sandwiched between Two antistatic layers.
2. Thickness	:	2 mm ± 0.1mm
3. Sound Reduction factor	:	3 db for 2 mm thickness
4. Inflammability	:	Self-extinguishing.
5. Water absorption	:	At room temperature for 24 hours is Less than 0.1%
6. Colour	:	Blue / Grey
7. Length of Roll	:	15 mtrs
8. Width of Roll	:	2 mtr





ELECTRICAL PROPERTIES:

1). Surface Resistivity	:	10^6–10^9 ohms/sq.
2). Decay Time	:	Less than 2 seconds



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Technical Specifications of Antistatic PVC Imported Tile

The damage of electrostatic discharge is much serious and many of the incidents including damage to super integrated circuits in semi-conductor production lines and loss of valuable data from malfunction of computer as well as inadvertent ignition of inflammable and explosions and contagions in hospital and post operation have been proven to be the results of electrostatic discahrge.The cause of electrostatic discharge damage is that when two objects with electrostatic charge come into contact or friction causing electron movement occur with electrification to positive and negative poles, which are stationary at the points of mutual contact. A direct action against these points causes instant electric discharge resulting in damage to products or pollution or malfunction by sticking to the surface of charged body of opposite polarity. In order to prevent the damaged caused by electrostatic discharge, both UL and NFPA strongly recommend the use of conductive floor.ESD Work Vinyl tile is a high tech material that satisfies their specification requirements completely and is necessary in the environment of up-to-date industries and living.

Technical Specification of PVC Imported Tile

Size	:	600 x 600 mm
Thickness	:	2 MM
Colour	:	White Granite finish
Surface Resistivity	:	10^6 to 10^8 ohms / Sq
Volume Resistivity	:	10^6 to 10^8 ohms / Sq
Rate of Decay	:	< 0.02 Seconds
Hardness	:	< 85 shore ‘D’
Static Generation	:	< 100 Volts
Flammability	:	Self Extinguishing



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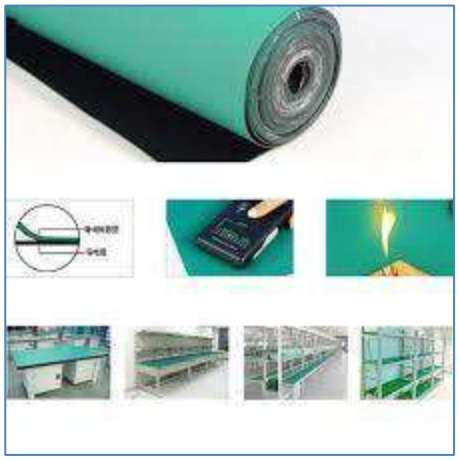
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Technical Specifications of Antistatic 2 Layer Rubber mat

- Material - 2 Layer Rubber Mat top layer Antistatic Green colour and Black colour Conductive under layer
- Thickness - 1 mtr x 10 mtrs x 2mm / 1.2 mtr x 10 mtrs x 2 mm
- Hardness - 50 to 60 shore 'A'
- Flexibility - Does not peel, chip or curi.
- Surface Resistance - 10^6 to 10^8 Ohms Green colour Antistatic layer
- Volume Resistance - 10^6 to 10^9 ohms
- Surface Resistance - 10^3 to 10^5 Ohms Black colour Conductive layer





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Technical Specification of Conductive Rubber Mat

➢ **Material**	:	**Conductive Rubber Mat**
➢ **Size**	:	**W 1 mtr x L 10 mtr**
➢ **Thickness**	:	**3 mm**
➢ **Surface**	:	**Smooth**
➢ **Colour**	:	**Black**
➢ **Hardness**	:	**80 +/- 10 Shore 'A'**
➢ **Surface Resistivity**	:	**< 50 Kilo Ohms as per STEC 7**
➢ **Volume Resistivity**	:	**< 50 Kilo Ohms as per STEC 7**
➢ **Surface to Ground Resistance**	:	**< 50 Kilo Ohms as per STEC 7**
➢ **UV Resistance**	:	**Yes**
➢ **Resistance to Alkalis**	:	**Yes**
➢ **Resistance to Acid**	:	**Yes**
➢ **Abrasion Resistance**	:	**Very good**
➢ **Static Charge Generation**	:	**Nil**
➢ **Rate of Decay**	:	**≤ 2 Sec**







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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specification of Conductive Hard Laminate Sheet

- **Material** : **Conductive Hard Laminate Sheet**
- **Size** : **1 meter x 2 meter**
- **Thickness** : **2 - 50 mm**
- **Colour** : **Black**
- **Hardness** : **≥ 80 Shore 'D'**
- **Surface Resistivity** : **< 50 Kilo Ohms as per STEC-7 (<10^5 Ω / Sq)**
- **Surface to Ground Resistance** : **< 50 Kilo Ohms as per STEC-7 (<10^5 Ω / Sq)**
- **Static Charge Generation** : **Nil**





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Technical Specifications of ESD Safe Epoxy flooring		
S No	**Properties**	**ESD Safe Epoxy Flooring**
1	Static Charge Generation	< 200 Volts
2	Surface Resistivity	$> 10^5, < 10^{10}$
3	Rate of Decay	<=2 Sec.
4	Effect of Humidity	No
5	Temperature Resistance	$<= 100^0$ C
6	Dimension Stability	Excellent
7	Curling Effect	No
8	Colour	Black / Grey
9	Permanent Anti Static Property	Yes
10	Maintenance Required	No
11	Expected Life	10 Years
12	Tear Resistance	Excellent
13	Thickness	0.5 mm to 2 mm
14	Compressive strength,MPa	Excellent
15	Flexural strength,MPa	Excellent
16	Abrasion resistance,mg (loss)	Excellent
17	Resistance to Solvents	Excellent
18	Size	Continues
19	Surface Finish	Highly Glossy
20	Joints	No Joints
21	Shrinkage	No
22	Appearance of the Surface	Glossy and Improved
23	Samples Enclosed	Yes



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Technical Specification of Conductive Epoxy Flooring

- **Material : Antistatic / Conductive Epoxy**
- **Colour : Green / Grey**
- **Thickness : 2 mm / 3mm**
- **Surface : Smooth / Joint less**
- **Type : Clean room compatible**
- **Antistatic Property : Permanent**
- **Surface Resistance : $\leq 10^8$ Ohms / Sq**
- **Rate of Decay : ≤ 10 Seconds**



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Technical Specification of Sticky Door Mat

Technology improvements in the field of Electronics, Pharmaceutical, Precision and Food processing have made the cleanliness more demanding. Static clean room Zoning is effective only when entrance of particles and dust into the clean room is fully prevented. Though experience and various test it has been confirmed that only one strap or two of uncleaned shoe soles are enough to bring thousand of harmful particles and dust into the clean room Areas / Shoes, slippers etc., which pass over the DISPOSABLE STICKY MAT surface are cleaned of dust particles sticky mat can be supplied with ESD properties also.

APPLICATIONS :

- Electronics precision industry
- Pharmaceutical industry
- Computer room
- Semiconductor assembly room
- Hospital operation theatre
- Chemical and medical laboratories
- 1 Set = 30 Pieces
- Size : 2' x 3'



FEATURES :

1. The strong adhesive picks up and collects dust from soles when they pass over the mat.
2. Dust particles collected on the mat do not spread.
3. Each sheet can be peeled away easily to reveal a fresh surface.
4. The adhesive does not stain the floor.
5. Bacteria-Laden dust particles collected on the sheet do not develop further contamination
6. Mat is composed of 30 layers disposable sheets with numberings.
7. Mat has good chemical & biological resistance.
8. Mat has adequate flexibility tender & smooth surface to reduce the friction generated.

INSTALLATION :

a) Clean and dry before placing the mat.
b) Peel off the protective paper from the mat and place it on the floor.
c) Press protective mat surface firmly to the floor and peel off the protective surface.
d) Start using and when the surface is saturated with dust particles, peel of the sheet by pulling the number indicator

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Technical Specifications of Antistatic Floor Cleaning Solutions

Antistatic Flooring and Table Top attracts dust and contamination. Can be the Cause for ESD failure. Antistatic solution, when applied would create a conductive path on that inaccessible surface discharging the static charges temporarily affecting for approximately 48 hours depending on the usage. This solution has got a detergent action also so that the surface gets clean apart from improving the antistatic properties.

DILUTE THIS SOLUTION WITH WATER IN RATIO OF 1: 20

(1 LITER SOLN: 10 LITER WATER.) and then use it. It will cover area of 250 Sqft

- **For clean room of class 10 , class 100 & class 10000**
- **Low Potassium content (In ppb)**
- **Low Ionic, no foam formulation**
- **No static charge generation**
- **Particle free solutions, filter to 0.1 microns**
- **Soluble in DI Water & Distil water**



Do's

1) Always clean the floor with antistatic floor cleaning solutions.
2) Only mopping is necessary.
3) Regular check the antistatic values of the flooring using SRM meter with probes.

Don't

1) Use Ordinary Water / Soap water / Mild acid / liquid soap to clean the floor.
2) Pour the solution on the floor at once as it will be difficult to clean.
3) Use of heavy metal trolleys with metal wheels, it will damage the flooring.

Note : Validity period will be Six Months

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Technical Specifications of Antistatic (ESD) Heal Strap

Designed for use in electronic shop floor with conductive heel and elastic fastener for use on any footwear worn by the operator. Provides grounding path for dissipation of Static Charges



Surface Resistivity Values

- **Conductive Rubber : 10^4 –10^6 ohm/sq**
- **Conductive Strip : 10^4 –10^6 ohm/sq**
- **Surface to ground Resistance : <50 Meg ohm**
- **Discrete Resistance : Built-in 1 meg ohm, ¼ watt.**

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Technical Specifications of Antistatic Slippers

Antistatic footwear are essential to drain out the human body static electricity safely to the ground. Antistatic Slippers prevent the accumulation of Static electricity and remove any existing static electricity from the body.

These footwear are made Rubber, with light weight, Permanent Antistatic, Black Color, Non PVC Material meeting the ANSI/ESD S20.20-2007 standards.

Various sizes are available, and are very easy to wear.

According to the standard ANSI/ESD S20.20-2007 should have the following.

Colour	**:**	**Blue**
Sizes	**:**	**6” to 10”are available**
Surface Resistivity	**:**	**≤ 10^9 Ohms**
Volume Resistivity	**:**	**0.75 to 100 Mega Ohms**
Static Generation	**:**	**Nil**





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Technical Specification of Antistatic Leather Shoes

- Sole : Antistatic PU
- Top : Leather
- Resistance of the Sole : 10^6 ohms
- Resistance to ground : 10^6 ohms
- Colour : Black
- Toe : Steel toe / Fiber toe
- Sizes : 6, 7, 8, 9 & 10.
- Slip on & Lace type, both models available.
- Static Charge generation : Nil
- Used in chemical industries to drain body static voltage.

Note: Normal shoes are insulator, these are not recommended as they don't drain static voltage from human body.





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Technical Specifications of Antistatic Shoe Cover



Type : Disposable type

- Material : P.E (Polyethylene)
- Colour : Blue
- Size : Standard size of 8” x 15” to meet all sizes of shoes
- Surface Resistance : $10^{11 - 12}$ Ohms / Sq cm
- Static Charge Generation : ≤ 200 Volts





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Technical Specifications of Non Woven Shoe Cover with Conductive Strip

➢ **Material**	**:**	**Non Woven**
➢ **Colour**	**:**	**Blue with Black Conductive Strip**
➢ **Size**	**:**	**8" x 16"**
➢ **Nature**	**:**	**Conductive Shoe Cover (Antistatic)**
➢ **Surface Resistance**	**:**	**10^5 Ohms / Sqinch**
➢ **Volume Resistance**	**:**	**10^5 Ohms – cm**
➢ **Rate of Decay**	**:**	**≤ 2 Sec**
➢ **Static Charge Generation**	**:**	**Nil**
➢ **Antistatic Property**	**:**	**Permanent**



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Technical Specifications of Seamless PU Auto – Clavable Shoes

- **Clean room / OT Shoes**
- **Antistatic Seamless Polyurethane Clogs**
- **Anti Skid**
- **Auto Clavable**
- **Colour - Blue / White**
- **More Comfortable**
- **Unisex**
- **All Sizes available**



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Technical Specification of Antistatic Vinyl Chair

ESD safe chair is essentially designed for discharging the accumulated electrical charges for the operator during critical electronic assembly.

- Height Adjustable
- Without Arms
- Seat Size : 18" x 18"
- Back Rest Size : 17" x 19"
- Seat height from the floor min : 19"
- Seat height from the floor max : 24"
- Seat and backrest upholstered with ESD PVC leather which is low in maintenance and clean
- Colour of seat and backrest – black
- Seat type : Smooth revolving
- Cushion : 2" seat and backrest
- Structure of chair : Tubular M.S. with chrome plating
- Chair base : Chrome plated 5 stars M.S.Base with 1 ESD Castor & 4 Normal castors. Drag included in center of base.
- Height adjustable seat : Using Hydraulic Mechanism
- Tilting back seat : The back can be locked in vertical positioning and can be tilted by unlocking.

Electrical Properties :

1). Seat & Backrest Surface Point to Point surface resistance : $< 10^7$ Ohms

2). Seat to Castor and Seat to Chair Base Grounding chain resistance : $< 10^7$ Ohms

- Antistatic Chair : Surface Resistivity of seat & back to the Ground $10^6 – 10^8$ Ohms
- Meets the ANSI ESD S20.20-2007 and EIA 625 Standards





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Technical Specification of Antistatic Vinyl Chair with Arms and Footring



ESD safe chair is essentially designed for discharging the accumulated electrical charges for the operator during critical electronic assembly.

- Height Adjustable
- With Arms and with footring
- Seat Size : 19" x 18"
- Back Rest Size : 19" x 22"
- Seat height from the floor min : 19"
- Seat height from the floor max : 24"
- Seat and backrest upholstered with ESD PVC leather which is low in maintenance and clean
- Colour of seat and backrest – black
- Seat type : Smooth revolving
- Cushion : 2" seat and backrest
- Structure of chair : Tubular M.S. with chrome plating
- Chair base : Chrome plated 5 stars M.S.Base with 1 ESD Castor & 4 Normal castors. Drag included in center of base.
- Height adjustable seat : Using Hydraulic Mechanism
- Tilting back seat: The back can be locked in vertical positioning and can be tilted by unlocking.

Electrical Properties:

1). Seat & Backrest Surface Point to Point surface resistance : < 10^7 Ohms

2). Seat to Castor and Seat to Chair Base Grounding chain resistance : < 10^7 Ohms



- Antistatic Chair : Surface Resistivity of seat & back to the Ground $10^6 – 10^8$ Ohms
- Meets the ANSI ESD S20.20-2007 and EIA 625 Standards

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Technical Specification of Antistatic Vinyl Chair

ESD safe chair is essentially designed for discharging the accumulated electrical charges for the operator during critical electronic assembly.

- Height Adjustable
- With Arms
- Seat Size : 19” x 18”
- Back Rest Size : 19” x 22”
- Seat height from the floor min : 19”
- Seat height from the floor max : 24”
- Seat and backrest upholstered with ESD PVC leather which is low in maintenance and clean
- Colour of seat and backrest – black
- Seat type : Smooth revolving
- Cushion : 2” seat and backrest
- Structure of chair : Tubular M.S. with chrome plating
- Chair base : Chrome plated 5 stars M.S.Base with 1 ESD Castor & 4 Normal castors. Drag included in center of base.
- Height adjustable seat : Using Hydraulic Mechanism
- Tilting back seat: The back can be locked in vertical positioning and can be tilted by unlocking.

Electrical Properties:

1). Seat & Backrest Surface Point to Point surface resistance : $< 10^7$ Ohms

2). Seat to Castor and Seat to Chair Base Grounding chain resistance : $< 10^7$ Ohms

- Antistatic Chair : Surface Resistivity of seat & back to the Ground $10^6 – 10^8$ Ohms
- Meets the ANSI ESD S20.20-2007 and EIA 625 Standards





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Technical Specifications of ESD Safe Stool

Electrical Properties :

- Seat Surface Resistance : 10^6 Ohms
- Seat Resistance to Ground : < 10^9

Features :

- ESD Stool.
- 19 mm Dia. Chrome plated M.S Pipe structure used.
- Seat made of ESD PVC.
- Foot ring provided.
- 3 Legs with PVC bush / base & 1 Leg with metal bush.



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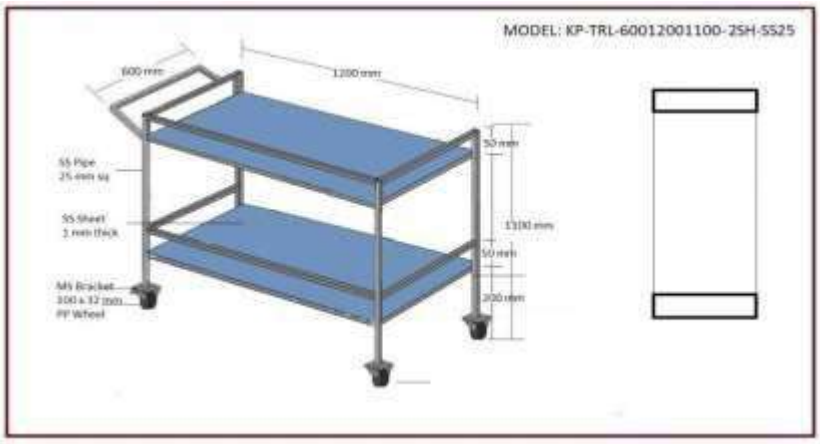
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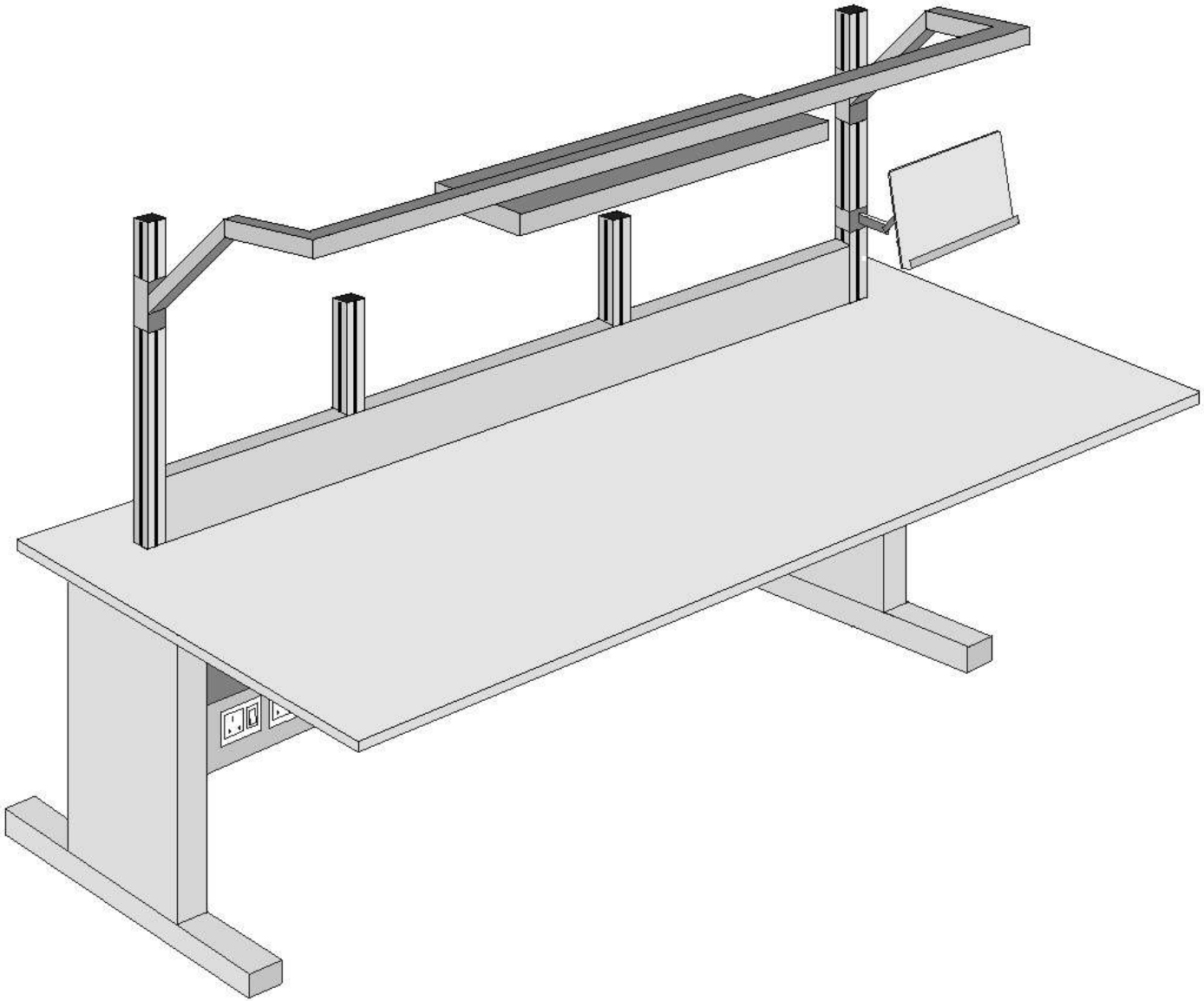
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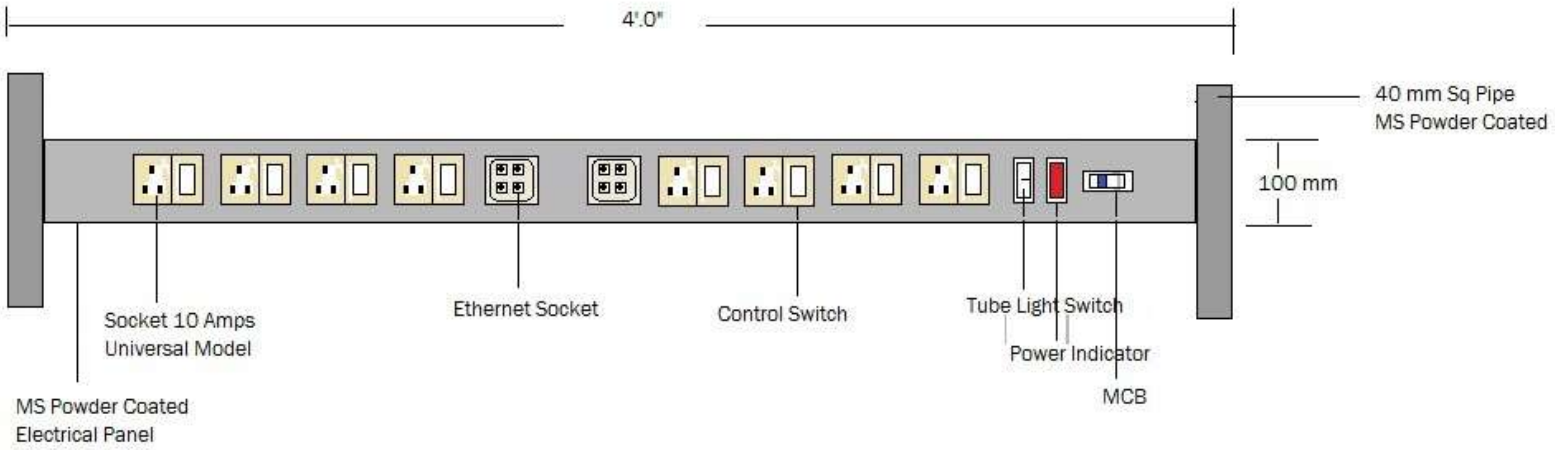
Technical Specifications of Antistatic (ESD) / Conductive Trolleys





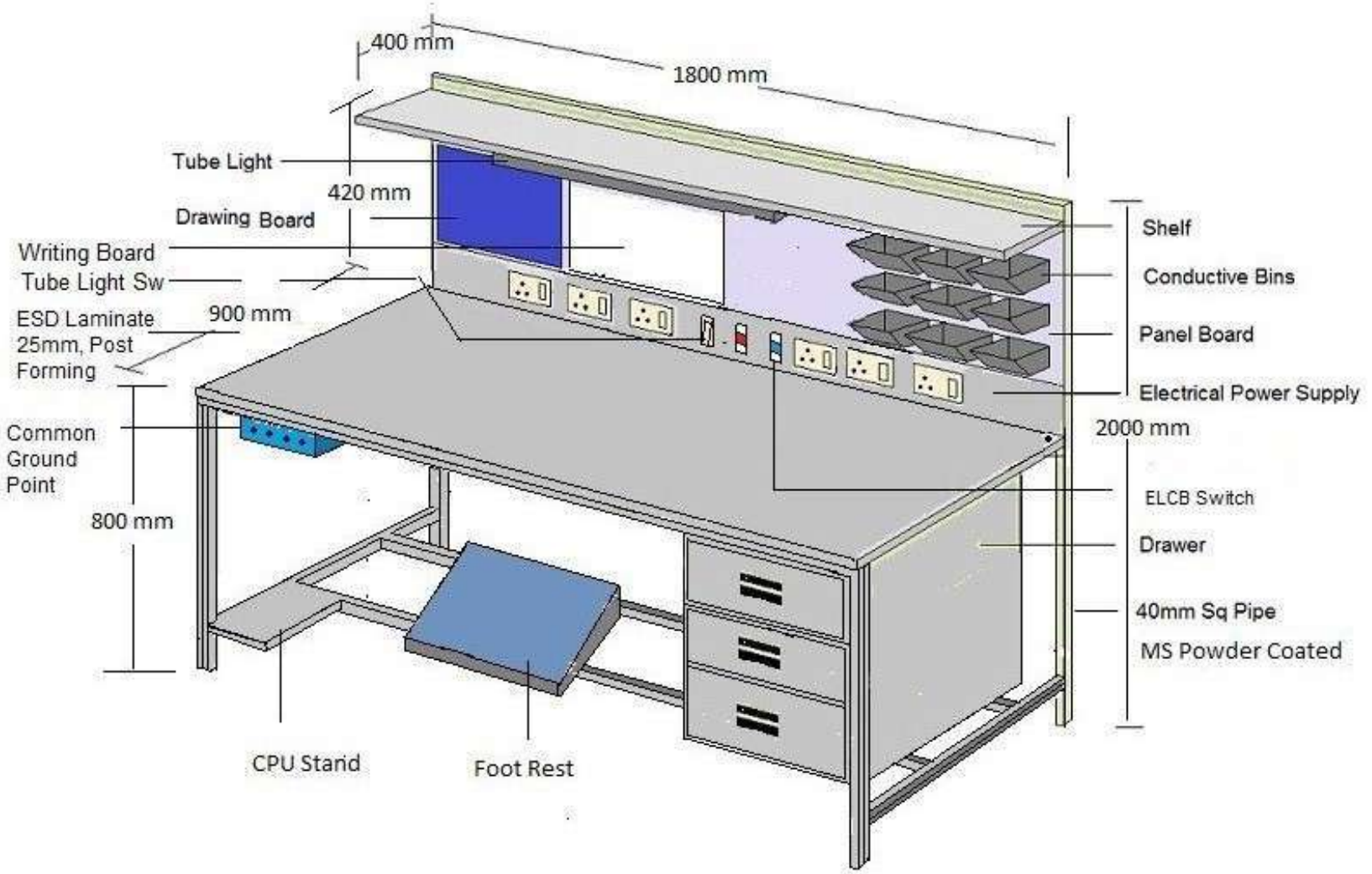





4'.0"
40 mm Sq Pipe
MS Powder Coated
100 mm
Socket 10 Amps
Universal Model
Ethernet Socket
Control Switch
Tube Light Switch
Power Indicator
MCB
MS Powder Coated
Electrical Panel

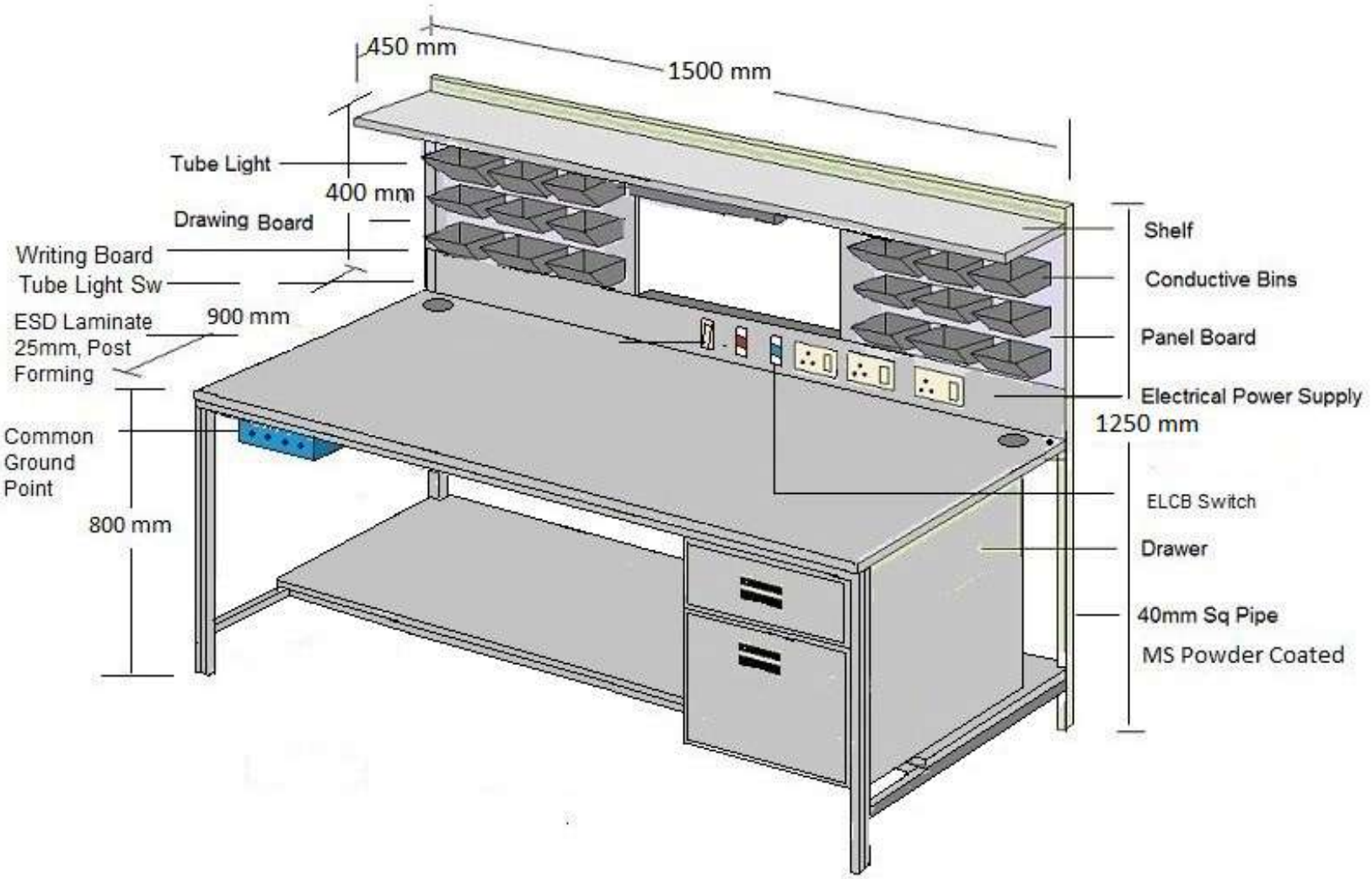
ESD SAFE WORK STATION

Model: KP-TBL-01



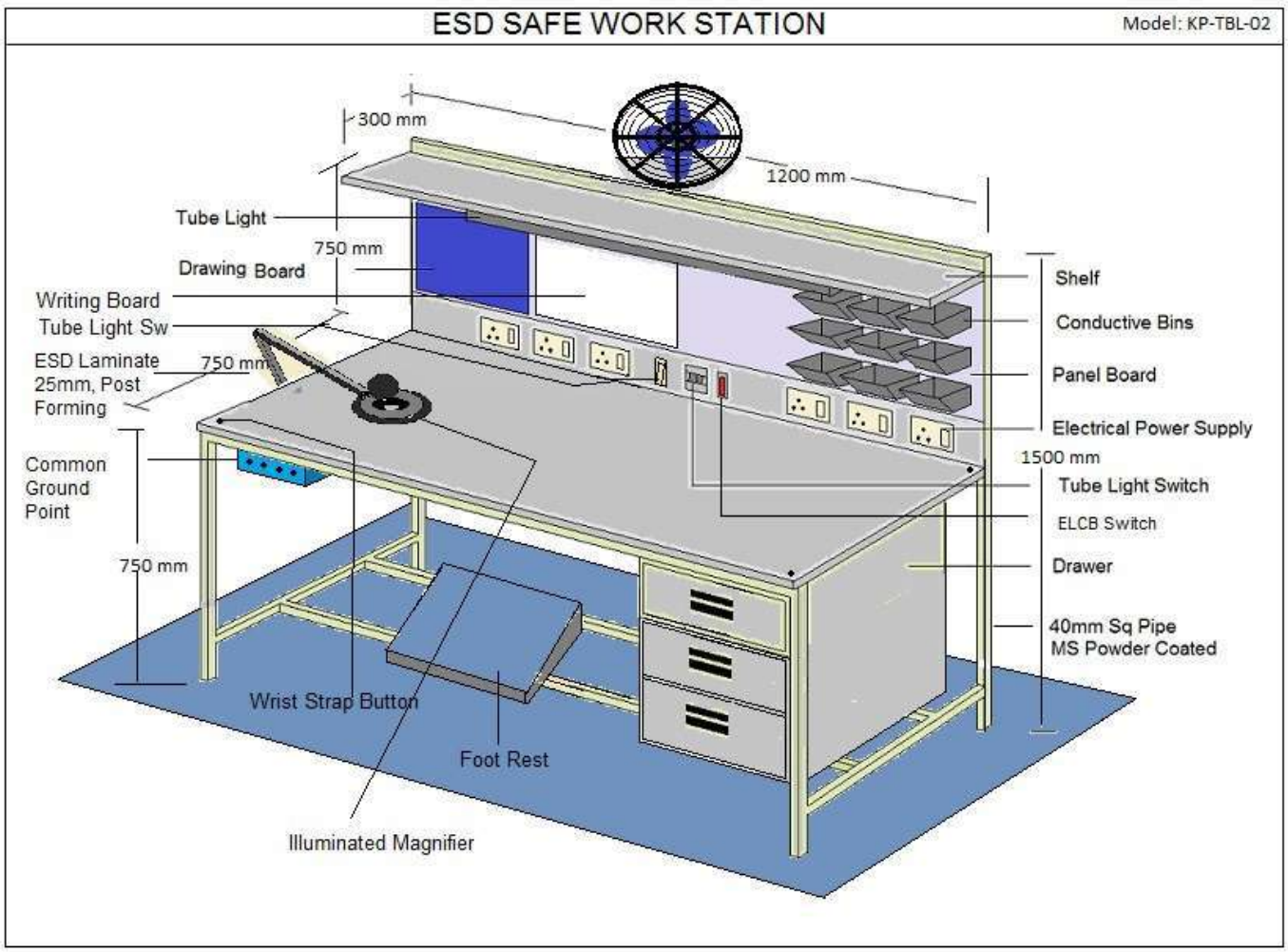
ESD SAFE WORK STATION

Model: KP-TBL-01-1



ESD SAFE WORK STATION

Model: KP-TBL-02



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Technical Specifications of Conductive Pallets

- Material : Antistatic Conductive Pallet
- Colour : Black
- Size : 1000 x 1000 x 165 mm approximately
- Load bearing Capacity : 1200 Kgs
- Antistatic Properties : Permanent
- Suraface Resistance : $\leq 10^5$ Ohms / Sq
- Volume Resistance : $\leq 10^5$ Ohms -cm
- Static Charge Generation : Nil
- Testing Method : As per BS 2050 Standards

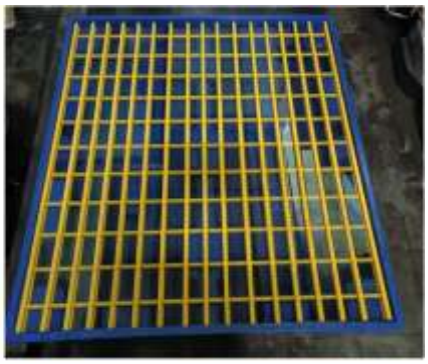












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Technical Specification of ESD Chair Wheels

- Conductive Castors suitable for ESD Chair wheels, it should be packaged with the ESD Chair.

Electrical Properties:

1). Surface Point to Point surface resistance : < 10^9 Ohms
2). Chair Base Grounding chain resistance : < 10^7 Ohms

- Antistatic Chair Wheel : Surface Resistivity of wheel 10^6 – 10^8 Ohms
- Meets the ANSI ESD S20.20-2007 and EIA 625 Standards





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Technical Specifications of Conductive Wheel

➢	Material	:	Conductive Polymer
➢	Colour	:	Black
➢	Size	:	3" to 8" With bush bearing
➢	Density	:	1.2 +/- 0.1 gms / cm^3
➢	Surface Resistance	:	$\leq 10^6$ Ohms
➢	Volume Resistance	:	$\leq 10^6$ Ohms - Cm
➢	Static Generation	:	Nil
➢	Antistatic Properties	:	Permanent
➢	Load bearing capacity	:	500 Kgs for 4 Wheels

➢ Excellent abrasion, excellent chemical resistance and can with stand till 100^0 C

➢ Used for trolley wheels

Additional features : Self lubricating properties



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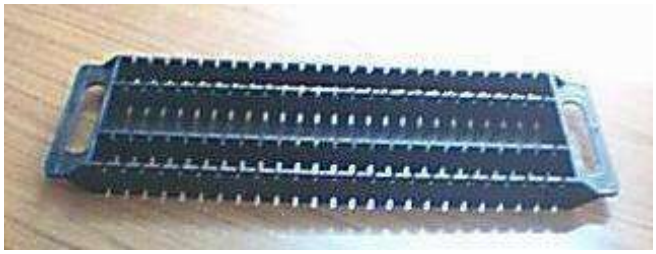
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Technical Specification of Antistatic PCB Plastic Rack



- **Material : Conductive Plastic**
- **Total Size : 450 mm x 130 mm (Approximately)**
- **Colour : Black**
- **No of PCBs : 25 Nos**
- **Surface Resistance : 10^4 to 10^6 Ohms / Sq**

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Antistatic L-Type PCB Rack

Fixed PCB Carriers

We offer fixed PCB carriers L type by ALKON. It is a two side support PCB carrier of conductive or non conductive material and used for stronger card holding. Conductive fixed PCB carriers L type are considered excellent carriers for work benches. These fixed PCB carriers L type are easy to handle and does not occupy much space. The electrically conductive model is earthed only by placing on an earthed table. Our L type PCB carriers have following

Features:

- Holds boards on two contiguous edges
- Nestable when not in use
- Conductive PCB carrier in Black colour
- Non conductive PCB carriers in Grey colour
- 25 grooves, 9mm Pitch, 3mm width



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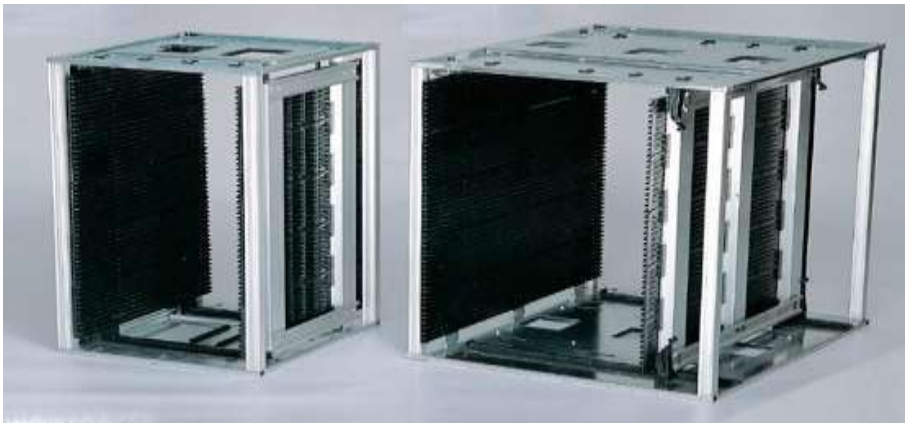
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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Conductive Magazine Rack

- **Surface Resistance : 10^4 to 10^6 Ohms**
- **Over all size: 355 x 320 x 563 mm**
- **Max. Storage: 50 PCBs**
- **Suitable PCB Size: 350 x (50 – 250) mm**
- **Side Guide slot: D 3.5 mm x W 5 mm x P 10 mm**
- **The Top & Bottom boards are made of plastic / metal**
- **Gear track type easy to operation**



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Technical Specification of Conductive Component Organizer

➢ Material	:	Component Organizer
➢ Size	:	L 400 mm x W 160 mm x H 250 mm
➢ Drawer Size	:	L 150 mm x W 75 mm x H 35 mm
➢ Colour	:	Black
➢ Draws	:	25 Nos
➢ Draw Size	:	W 70 mm x L 150 mm (Approximately)
➢ Surface Resistance	:	$\leq 10^5$ Ohms
➢ Static Charge Generation	:	Nil





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Technical Specification of Conductive Crates / Trays

- Material : Conductive Polymer
- Surface Resistivity : $< 10^5$ Ohms/Sq.
- Volume Resistivity : $< 10^5$ Ohms

To store all types Electronic Sensitive components or Devices
at work places & in stores to protect from Static Charges. The stackable design will occupy less space in stores.











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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Conductive Dust Bin

- **Material : Injection Moulded P.P., (Conductive Dust Bin)**
- **Colour : Black**
- **Surface Resistance : 10^5 Ohms**
- **Static Voltage : ≤ 10 Volts**
- **Temp Resistance : 80^0C**
- **Chemical / Acid Resistance : Yes**
- **Uses to carry solvents / transfer for one place to other place.**

Note: Normal HDPE / PP Dust Bin generates 5 – 10 KV Static Voltage & has surface resistivity of 10^{13} Ohms / Sqcm





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Technical Specifications of Antistatic PP Corrugated Box

- Made with 3 mm black / blue / white colour, antistatic PP corrugated sheet ESD Property material.
- Stackable
- Light wieght
- Inert to Chemicals / Water / Acid / Alakli
- Temperature Resistance : 90^0C
- Low cost
- Smooth surface inside and ourside



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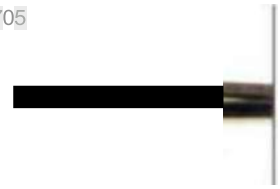
ESD afi , Conductive Pl tic Twe

702A



A 1/ 11 mm-8 oa·2 Omm•CO • 10mm

705



A. 1/2" 15mm B o· O nm-CO .025" 0.6rTlrll

707



A 4 1/2" 115mm-B 0.0 0.5mm-C0.0• 1 mm

707A



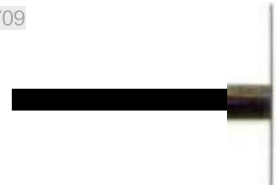
A 12• 1 5mm•B O O r:• 0 ,mm CO , 0

708



4 112" 15mm BO02· 0.5n m
CO 004" 1 Or m-0 0 035 0 101- 4•

709



A 4 12• 1t Sn 8 O O13· 111m-C0 0

710



A 1 rr 1 5mm-F30 03· 7 7mm•CO 02" 0 5 m



rbofib 70,AC UIC
70 CF,70 w I

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GSTJN: 36.AARJFK91S7S1ZU | MSME No, TS20A0014-409 | UDYAM-TS-02-0024846

Anti-Electrostatic Brush is hand tra t- ent holder Anti-Electrostatic Brush which made by special electric-plastic mat. It. The Brush is used for cloilnsing all kinds of components. The Plastic Brushes do not brake the components.

Surface Resistance: 10⁶ - 10⁹

CT-1149/1850/1851/1852/1853/1854

Anti-Electrostatic Brush







CT-1856/1158/1859/18&0/1857/1855

Anti-Electrostatic Brush









CT-1860

CT 8 7



CT-1855

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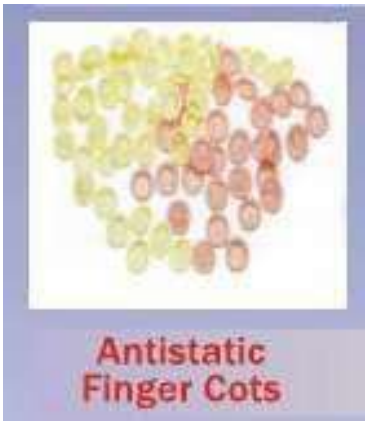
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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Antistatic Low Powder Finger Cots

- **Antistatic property is consistently maintained**
- **Washed under a controlled process to remove particles and reactive ions such as Na+, K+, Ca2, Mg2, Nz2+, Cl, SO42**
- **Surface resistivity : 109 – 1011 Ohms / Sq., Suitable for handling of Class II, Category B (100V) ESD.**
- **Suggested for Class II (2000 – 3999 Volts) static sensitive devices**
- **Ultra – Low powder cot surfaces minimizes particulate contamination**
- **Ultra – Low levels of extractable and residual ions prevent product failure**
- **Packing done in clean environment**





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Email : kineticpolymers@gmail.com / Website : www.kineticpolymers.com

Technical Specification of Antistatic Apron & Caps	
Composition	Polyester filament yarn with Conductive filament yarn
Wrap (Polyester filament yarn) Wrap (Polyester filament yarn)	75d / 36f 100d / 48f
Wrap (Conductive yarn) Wrap (Conductive yarn)	97d / 25f 97d / 25f
Weaving Structure (twill	2up / 1 down
Density (wrap x weft / inch)	192 x 92
Weight (gr / yd)	155
Conductive yarn's interval	5 x 5 mm
Material	100 % Poly
Electro Conductive Yarn	Carbon
Air Permeability (cc / cm2 / sec)	9.3
Moisture Permeability (gr / m2 / 24hrs)	7,156
Tearing Strength (gr) Warp Weft	2,992 2,448
Acid Resistance (50 wash)	Good
Fractional Static Charge (V) Wrap Weft	90 110
Surface Resistivity (Ohm /Sq)	$10^5 – 10^9$
Particle Efficiency (%) 0.3 0.5	81 85
Colour	White / Blue
Uses – In Pharma area / clean room	



Note: Normal apron made with cotton rich material are having lints. Which are not advisable in pharma / powder handling area.

Pure polyester cloth is one which can generate heavy static, because of insulating material. Hence not recommended in clean room / pharma area.

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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Wrist Bands







SPECIFICATIONS:

Resistance	:	1 Meg ohm
Resistor	:	¼ watt, 1 Meg ohm carbon film
Insulation	:	PVC

WRIST BAND

22 CMS Conductive Fiber Woven elastic band with Velcro fasteners. Contact plate through 316 grade stainless steel, adjustable.

GROUNDING CORD:

Wire Dia	:	3 mm +/-0.1mm
Coil Dia	:	8 mm +/-10%
Insulation	:	PVC
Banana Plug Dia	:	4 mm

Moulded contact Button,
Banana Plug + Crocodile Clip

Length	:	2 Mtr in expanded state

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Technical Specifications of Grounding Wires

Table mat to Floor mat Grounding Cord :

- Model : KPGC-01
- Length : 2 meters
- Wire Dia : 3 mm
- Conductor : 18 strands annealed bar copper of 0.1 mm dia
- Connectors : Molded cup type with female button on both ends.

Floor mat to earth Grounding Cord :

- Model : KPGC-02 / 05
- Length : 2 meters
- Wire Dia : 3 mm
- Conductor : 18 strands annealed bare copper of 0.1 mm dia
- Connectors : Moulded cup type with 1 Meg Ohm resistance / Female button on one end and crocodile clip on the other end.





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Technical Specifications of Antistatic Gloves

- **Material : Antistatic Gloves**
- **Anti Static non-slip gloves**
- **Made from 100% polyester, continuous less-linting filament knitted with carbon fiber and PVC dots on palm for better grip on precision components and parts,**
- **PU coating on palm side ensures better grip**
- **Back of glove made from low linting polyester with carbon fiber for ESD protection**
- **Excellent sweat absorbency and good ventilation**





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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Anti-Electrostatic Brush is the straight-bent holder Anti-Electrostatic Brush which made by special electric-plastic material. The Brush is used for cleansing all kinds of components. The Plastic Brush do not break the components.

Surface Resistance: $10^5 \sim 10^9 \Omega$

CT-1849/1850/1851/1852/1853/1854

Anti–Electrostatic Brush



CT–1849 CT–1850 CT–1851

CT–1852 CT–1853 CT–1854

CT-1856/1858/1859/1860/1857/1855

Anti–Electrostatic Brush



CT–1856 CT–1858 CT–1859

CT–1860 CT–1857 CT–1855

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Floor Marking Tapes



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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Caution Tape

➢ **Material**	**:**	**Floor Marking Caution Tape**
➢ **Colour**	**:**	**Yellow**
➢ **Printing**	**:**	**Black**
➢ **Width**	**:**	**2”**
➢ **Length**	**:**	**50 Yards**
➢ **Material**	**:**	**OPP**
➢ **Thickness**	**:**	**150 Microns**
➢ **Adhesive**	**:**	**Synthetic Rubber Base & Hot melt adhesive**
➢ **Type of Printing**	**:**	**Roto**
➢ **Ink**	**:**	**Black colour, Polyester base meets ROHS**



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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Antistatic Grid Tape

- Size : 12 mm / 24 mm Width
- Thickness : 50 Microns
- Length : 36 Mtrs
- Surface Resistance : ≤ 10^6 Ohms
- Static Charge Generation : ≤ 200 Volts
- Property : Antistatic
- These type are useful to pack the materials being antistatic properties. These type does not generate static charges (normal type generate 5000 – 7000 volts) which might lead to accident.



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Technical Specifications of Copper Tape

Many EMI problems can be solved easily by the use of copper foil tape. Copper foil and tape can be produced with or without (conductive) self-adhesive and an optional insulation layer.

If coverage of large surfaces is needed, it would most likely be better to use tape with a conductive self-adhesive in combination with foil. This solution is much cheaper.

When you need to cover bigger surfaces you can contact our engineers because than you can possible better use this tape in combination with copper foil with a non-conductive adhesive. This is a much cheaper solution.





Applications



- Material – Copper Foil
- Electrical connection between surfaces (sheets / foils)
- Adhesive system – Acrylic
- Tensile Strength (kg/cm) – 4
- Adhesion to steel (gms/cm) - 350
- Die-cuts
- Mounting transparent foils, windows
- Cable shielding
- Temporary shielding during tests
- Antistatic floor
- Width – 25 mm
- Length – 25 mtrs
- Backing material thickness – 0.035 mm
- Total Thickness – 0.075 mm
- Grounding and static charge draining

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Technical Specifications of Aluminium Tape

- **Material : Aluminium Tape**
- **Colour : Silver / Aluminium**
- **Width : 1” & 2”**
- **Thickness : 0.5 to 0.9 mm**
- **Length : 20 mtrs**





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Technical Specifications of Antistatic Buckets

- **Material : Injection Moulded P.P., (Antistatic Bucket)**
- **Top Dia : 11”**
- **Bottom Dia : 7.5”**
- **Height : 10.5”**
- **Capacity : 14 Ltrs**
- **Colour : White**
- **Surface Resistance : $10^{11 - 12}$ Ohms**
- **Static Voltage : ≤ 200 Volts**
- **Temp Resistance : 80^{0}C**
- **Chemical / Acid Resistance : Yes**
- **Uses to carry solvents / transfer for one place to other place.**



Note: Normal HDPE / PP Bucket generates 5 – 10 KV Static Voltage & has surface resistivity of 10^{13} Ohms / Sqcm

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Technical Specifications of Antistatic Buckets

- **Material : Injection Moulded P.P., (Antistatic Bucket)**
- **Capacity : 5 Liters**
- **Colour : White**
- **Surface Resistance : $10^{11 - 12}$ Ohms**
- **Static Voltage : ≤ 200 Volts**
- **Temp Resistance : 80^0C**
- **Chemical / Acid Resistance : Yes**
- **Uses to carry solvents / transfer for one place to other place.**



Note: Normal HDPE / PP Bucket generates 5 – 10 KV Static Voltage & has surface resistivity of 10^{13} Ohms / Sqcm

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Technical Specifications of Antistatic Mug

- **Material : Injection Moulded P.P., (Antistatic Mug)**
- **Top Dia : 5”**
- **Bottom Dia : 4.5”**
- **Height : 5.5”**
- **Capacity : 1 Liter & 1.5 Liters**
- **Colour : White**
- **Surface Resistance : $10^{11 - 12}$ Ohms**
- **Static Voltage : ≤ 100 Volts**
- **Temp Resistance : 80^{0}C**
- **Chemical / Acid Resistance : Yes**



- **Uses to carry solvents / transfer for one place to other place.**

Note: Normal HDPE / PP Mug generates 5 – 10 KV Static Voltage & has surface resistivity of 10^{13} Ohms / Sqcm

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Technical Specifications of Conductive Buckets

- **Material : Injection Moulded P.P., (Conductive Bucket)**
- **Top Dia : 11”**
- **Bottom Dia : 7.5”**
- **Height : 10.5”**
- **Capacity : 14 Ltrs**
- **Colour : Black**
- **Surface Resistance : 10^5 Ohms**
- **Static Voltage : ≤ 10 Volts**
- **Temp Resistance : 80^0C**
- **Chemical / Acid Resistance : Yes**
- **Uses to carry solvents / transfer for one place to other place.**



Note: Normal HDPE / PP Bucket generates 5 – 10 KV Static Voltage & has surface resistivity of 10^{13} Ohms / Sqcm

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Technical Specifications of Conductive Buckets

- **Material : Injection Moulded P.P., (Conductive Bucket)**
- **Top Dia : 5.5”**
- **Bottom Dia : 8”**
- **Height : 7.5”**
- **Capacity : 5 Ltrs**
- **Colour : Black**
- **Surface Resistance : 10^5 Ohms**
- **Static Voltage : ≤ 10 Volts**
- **Temp Resistance : 80^0C**
- **Chemical / Acid Resistance : Yes**
- **Uses to carry solvents / transfer for one place to other place.**



Note: Normal HDPE / PP Bucket generates 5 – 10 KV Static Voltage & has surface resistivity of 10^{13} Ohms / Sqcm

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Technical Specifications of Conductive Mug

- **Material : Injection Moulded P.P., (Conductive Mug)**
- **Top Dia : 5”**
- **Bottom Dia : 4.5”**
- **Height : 5.5”**
- **Capacity : 1 Ltr**
- **Colour : Black**
- **Surface Resistance : 10^5 Ohms**
- **Static Voltage : ≤ 10 Volts**
- **Temp Resistance : 80^0C**
- **Chemical / Acid Resistance : Yes**
- **Uses to carry solvents / transfer for one place to other place.**



Note: Normal HDPE / PP Mug generates 5 – 10 KV Static Voltage & has surface resistivity of 10^{13} Ohms / Sqcm

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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Conductive Tub

- **Material : Conductive PP**
- **Colour : Black**
- **Surface Resistance Value : < 10^5 Ohms**
- **Actual Value : < 10^5 Ohms**
- **Recommended Value : 10^6 Ohms**
- **Temperature Resistance : -20^0C to 120^0C**



Conductive Tub



Conductive Tub

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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Antistatic Brooms

➢ Product	:	Antistatic Brooms
➢ Material	:	Polypropylene / SS
➢ Colour	:	Yellow
➢ Surface Resistance	:	$< 10^{10}$Ohms
➢ Static Charge	:	≤ 100 Volts



Antistatic BROOM



Measuring instruments used :

- **Surface Resistivity was Tested Using SRM – 100V probes of 65 mm diameter and 5 pounds weight of with special each probes.**
- **Static Charge Meter (DSM-01)**

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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Antistatic Can 20 Liters

- Material : HDPE + Antistatic additives
- Method of Manufacturing : Blow Moulding
- Capacity : 20 Liters
- Color : White
- Cap : Antistatic
- Type : Narrow Mouth/Open Mouth
- Surface Resistance : $\leq 10^{11}$ Ohms/Sqcm
- Volume Resistance : $\leq 10^{11}$ Ohms- cm
- Static Charge Generation : ≤ 500 Volts
- Antistatic Properties : Life around 1-2 years
- Rate of Decay : ≤ 30 sec
- U.V. Stability : Good
- Humidity is must to get this property
- Antistatic property works on migration technology









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Technical Specifications of Antistatic Can 30 Liters

- Material : HDPE + Antistatic additives
- Method of Manufacturing : Blow Moulding
- Capacity : 30 Liters
- Color : White / Blue
- Cap : Antistatic
- Type : Narrow Mouth/Open Mouth
- Surface Resistance : $\leq 10^{11}$ Ohms/Sqcm
- Volume Resistance : $\leq 10^{11}$ Ohms- cm
- Static Charge Generation : $\leq$ 500 Volts
- Antistatic Properties : Life around 1-2 years
- Rate of Decay : $\leq$ 30 sec
- U.V. Stability : Good
- Humidity is must to get this property
- Antistatic property works on migration technology



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Technical Specifications of Antistatic Can 50 Liters

- Material : HDPE + Antistatic additives
- Method of Manufacturing : Blow Moulding
- Capacity : 50 Liters
- Color : White / Blue
- Cap : Antistatic
- Type : Narrow Mouth/Open Mouth
- Surface Resistance : $\leq 10^{11}$ Ohms/Sqcm
- Volume Resistance : $\leq 10^{11}$ Ohms- cm
- Static Charge Generation : ≤ 500 Volts
- Antistatic Properties : Life around 1-2 years
- Rate of Decay : ≤ 30 sec
- U.V. Stability : Good



- Humidity is must to get this property
- Antistatic property works on migration technology





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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Conductive Can

- **Material : Injection Moulded P.P., (Conductive Can)**
- **Capacity : 10 Liter**
- **Colour : Black**
- **Surface Resistance : 10^5 Ohms**
- **Static Voltage : ≤ 10 Volts**
- **Temp Resistance : 80^0C**
- **Chemical / Acid Resistance : Yes**
- **Uses to carry solvents / transfer for one place to other place.**

Note: Normal HDPE / PP Can generates 5 – 10 KV Static Voltage & has surface resistivity of 10^{13} Ohms / Sqcm



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Technical Specifications of Conductive Can

- **Material : Injection Moulded P.P., (Conductive Can)**
- **Capacity : 5 Liter**
- **Colour : Black**
- **Surface Resistance : 10^5 Ohms**
- **Static Voltage : ≤ 10 Volts**
- **Temp Resistance : 80^0C**
- **Chemical / Acid Resistance : Yes**
- **Uses to carry solvents / transfer for one place to other place.**



Note: Normal HDPE / PP Can generates 5 – 10 KV Static Voltage & has surface resistivity of 10^{13} Ohms / Sqcm

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Technical Specifications of Conductive Dust Bin

- **Material : Injection Moulded P.P., (Conductive Dust Bin)**
- **Colour : Black**
- **Surface Resistance : 10^5 Ohms**
- **Static Voltage : ≤ 10 Volts**
- **Temp Resistance : 80^0C**
- **Chemical / Acid Resistance : Yes**
- **Uses to carry solvents / transfer for one place to other place.**

Note: Normal HDPE / PP Dust Bin generates 5 – 10 KV Static Voltage & has surface resistivity of 10^{13} Ohms / Sqcm





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Technical Specifications of Antistatic and Conductive Dustpan (Big)





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Technical Specifications of Antistatic and Conductive Dustpan (Small)







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Technical Specification of Conductive HDPE Hose Pipe

- **Material : Conductive HDPE Hose Pipe**
- **Colour : Black**
- **Excellent solvent resistance**
- **Temperature Resistance : 80^0C**
- **Permanent Antistatic Property**
- **Chemical Resistance : Almost all Acids, Alkali, Solvents at room temp**
- **Surface Resistivity : $\leq 10^6$ Ohms**
- **Static Generation : Nil**



Measuring instruments used :

- **Surface Resistivity Meter (SRM – 100V)**
- **Static charge meter (DSM-01)**

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Technical Specifications for Conductive Rubber Hose Pipe Flexible

- **Material - Antistatic Nitrile Rubber**
- **Drainage of static voltage – by grounding**
- **Size - I.D. 1" / 2"**
- **Colour - Black,**
- **Operating Temp - 80^0C**
- **Resistance to acid/alkali/water solvent – Very Good**
- **Smooth surface on outside & inside**
- **Permanent antistatic & Conductive property**
- **Static Charge Generation - Nil**
- **Surface Resistance - $\leq 10^5$ Ohms / Sq cm**

Note: Normal Rubber hose pipes are insulators, having Surface Resistivity of 10^{12} ohms / Sq and they generate static voltage and also grounding does not help to drain of static voltage





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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Conductive Bowl

➢	Material	:	Conductive Rubber & FRP
➢	Colour	:	Black
➢	Surface	:	Smooth on both the sides
➢	Hardness	:	Shore 'A'
➢	Temperature Resistance	:	-20^0C to 120^0C
➢	Surface Resistance	:	$< 10^4$ Ohms
➢	Volume Resistance	:	$< 10^4$ Ohms
➢	Static Generation	:	Nil











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Technical Specifications of Conductive Bottle

- Material : Synthetic Rubber & Conductive Carbon Black
- Colour : Black
- Shore Hardness : > 90 Shore "A"
- Surface : Smooth on both the sides
- Surface Resistance : $< 10^3$ Ohms
- Volume Resistance : $< 10^3$ Ohms - Cm
- Static Generation : Nil

Material	ASA Bottle	ASA Bottle	ASA Bottle	ASA Bottle	ASA Bottle	ASA Bottle
Capacity	25 ML	45 ML	180 ML	225 ML	450 ML	900 ML
Top Inner Dia	31.77 mm	31.89 mm	53.08 mm	52.55 mm	68.27 mm	93.19 mm
Top Outer Dia	42 mm	41.9 mm	68.47 mm	68.58 mm	81.48 mm	107.93 mm
Bottom Inner Dia	27.52 mm	29.72 mm	49.53 mm	53.39 mm	78.33 mm	79.58 mm
Bottom Outer Dia	34.14 mm	33.91 mm	61.40 mm	63.07 mm	81.19 mm	101.11 mm
Height of the bottle Outside	33.16 mm	62.86 mm	90.41 mm	113.98 mm	125.46 mm	175 mm
Height of the bottle Inner side	30.96 mm	59.21 mm	82.87 mm	107.32 mm	120.27 mm	150 mm
Weight of the bottle without Lid	11.78 gms	19.23 gms	140.16 gms	183.16 gms	317.80 gms	516.89 gms



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Technical Specifications of Antistatic / Conductive Spoon



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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Antistatic Scrapper

- Product : Antistatic Scrapper
- Material : Polypropylene Co Polymers
- Anti Static Additives : GMS
- Dosage : 1%
- PPCP : 99%
- Temp Resistance : 100^0 C
- Surface Resistance : 10^{11} Ohms
- Static Charge : up to 500 Volts
- Inert to most of the solvent and chemical.



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Technical Specifications of Conductive Scrapper

- Product : Conductive Scrapper
- Material : Polypropylene Black
- PP : 75%
- Conductive Carbon : 25%
- Temp Resistance : 100^0 C
- Surface Resistance : 10^5 Ohms
- Static Charge : Nil
- Inert to most of the solvent and chemical.



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Technical Specifications of Conductive Scoop



- Colour : Black
- Material : Conductive HDPE
- Temperature Resistance : 90^0 C
- Surface : Smooth on both the sides
- Surface Resistance : 10^3 to 10^5 Ohms
- Static Generation : Nil

Technical Specifications of Antistatic Scoop



- Material : Antistatic HDPE
- Colour : White
- Temperature Resistance : 90^0 C
- Surface : Smooth on both the sides
- Surface Resistance : 10^{11} Ohms
- Static Generation : $\leq$ 200 Volts





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Technical Specifications of Antistatic / Conductive Spatula

- **Material : Conductive Polymer**
- **Colour : Black**
- **Width (Top) : 25 mm**
- **Width (Bottom) : 55 mm**
- **Length : 250 mm**
- **Temperature Resistance : 80^0 C**
- **Surface : Smooth on both the sides**
- **Surface Resistance : < 10^5 Ohms**
- **Volume Resistance : < 10^5 Ohms - Cm**
- **Static Generation : Nil**

Uses: **Used for mixing high static sensitive items.**



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Conductive Beakers

specifications :

Material Name : Conductive Beakers	**Surface resistance Value : 10 $^{5}\Omega$**
Material : Conductive pp	**Actual Value** : 10 $^{5}\Omega$
Color : black color	**Recommend Value** : $10^{6}\Omega$
Sizes : 25 , 100 , 500 & 1000 ml	**Static Generation Value** : Nill
	Temperature Resistance : **-20°C to 120°C**



Conductive Beaker
Capacity 25 ml



Conductive Beaker
100 ml capacity



Conductive Beaker
Capacity 500 ml



Conductive Beaker
Capacity 1000 ml

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Technical Specifications of Conductive Beakers

- Material : Conductive PP
- Colour : Black
- Capacity : 25, 100, 500 & 1000 ml
- Surface Resistance Value : $< 10^5$ Ohms
- Actual Recommended Value : $< 10^5$ Ohms
- Recommended Value : $< 10^6$ Ohms
- Static Charge Generation : Nil
- Temperature Resistance : -20^0C to 120^0C



Conductive Beaker
Capacity 25 ml



Conductive Beaker
100 ml capacity



Conductive Beaker
Capacity 500 ml



Conductive Beaker
Capacity 1000 ml

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Technical Specifications of Antistatic / Conductive Sampler

- **Material : HDPE**
- **Colour : Black**
- **Type : Permanent Antistatic**
- **Temp. Resistance : 80^0C**
- **Size : 2 meter length**
- **Sampler size : 50 ml capacity**
- **Surface Resistance : 10^6 Ohms**
- **Static Charge Generation : ≤ 20 Volts**





Uses: Used to take sampler from reactors can be used for both SS & GLS type reactors.

Note: Normal sampler are made with SS are not recommended in GLS & PVC grey colour are insulators, which generates static electricity and has surface resistance ≥ 10^{12} ohms / sq cm

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Technical Specifications of Antistatic and Conductive Funnel









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Small Funnel



Medium Funnel



Big Funnel



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Technical Specifications for Conductive Hammer

- **Diameter of the Handle : 25 +/- 2 mm**
- **Length of the Handle : 250 +/- 10 mm**
- **Diameter of the top portion of the hammer : 50 +/- 5 mm**
- **Length of the top portion of the hammer : 100 +/- 10 mm**
- **Colour : Black**
- **ESD Property : Permanent**
- **Resistance to acid / alkali**
- **Temperature : 20^0 C to 80^0 C**
- **Surface Resistance : $\leq 10^8$ Ohms**
- **Static Generation : Nil**



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Technical Specifications of Conductive Choke Rod

➢ Material	:	PP
➢ Colour	:	Black
➢ Type	:	Permanent Conductive
➢ Temp. Resistance	:	80^0C
➢ Surface Resistance	:	10^5Ohms
➢ Static Charge Generation	:	≤ 20 Volts



Uses: Used to take sampler from reactors can be used for both SS & GLS type reactors.

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Technical Specifications of DOZING PLATE

➢ **Material**	**:**	**Synthetic (Conductive Carbon + Adhesive)**
➢ **Colour**	**:**	**Black**
➢ **Size**	**:**	**300 x 300 mm**
➢ **Thickness**	**:**	**8 mm +/- 1 mm**
➢ **Hardness**	**:**	**90 +/- 10 Shore'A'**
➢ **Surface Resistance**	**:**	**10^5 Ω / Sq**



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Technical Specifications of Vent Caps

- Cap Material : PP
- Colour : Red /Yellow/White
- Vented : Through Special Filter
- Filter Material : PTFE- Sinter
- Filter Colour : White
- Temp. Resistance of filter : -50^{O}C to 250^{O}C
- Specification of the PTFE filter is enclosed





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EMI / EMC Fabric Foam Gaskets

Make	: Kinetic Polymers
Model	: KP-EMI-Fabric-01
IP 66	: Yes
Material	: Fabric on PU foam with Self Adhesive High shielding performance Low closure force ,deflection 50 % UL 94V Flame resistant, Chemical resistant, Temp range upto 220 Deg C
Attenuation	: 1 Mhz = 90 dB 10 Mhz = 90 dB 500 Mhz = 95 dB 1 Ghz = 95 dB 10 Ghz = 95 dB
Sizes	: 10 mm x 2 mm x 1 mtr 10 mm x 4 mm x 1 mtr 20 mm x 4 mm x 1 mtr 7 mm x 4mm x 1 mtr



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Technical Specifications of Conductive Paint

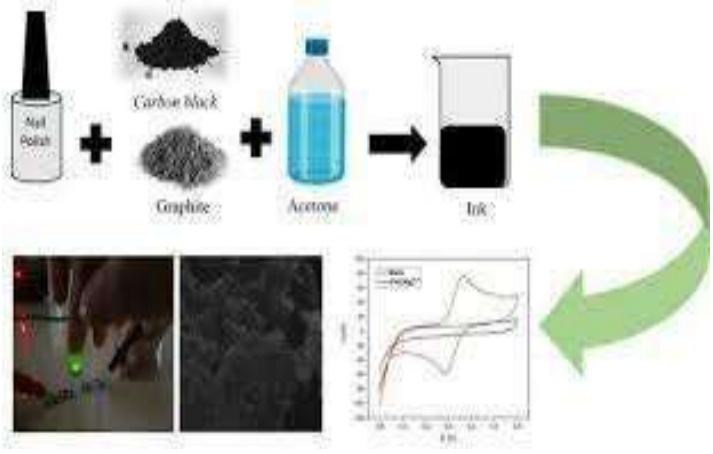
Type - 1

- Conductive Black Paint
- Colour - Black
- Adhesive - Acrylic
- Conductive Material - Conductive Carbon
- Surface Resistance Value - 10^3 to 10^5 Ohms
- After single Coating - 10^5 Ohms

Type - 2

- Conductive Black Paint
- Colour - Black
- Adhesive – PU 2 component System
- Drying time : 4 - 6 hours
- Surface Resistance Value - 10^5 Ohms on Single Coating
  10^4 Ohms on Double Coating





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Technical Specifications of Conductive Adhesive

- **Material (2 component system) : Conductive Epoxy Resin + Hardner**
- **Colour : Grey**
- **Filler : Pure Silver**
- **Mixing Ratio : 1 : 1**
- **Drying Time : 4 –6 Hours**
- **Surface Resistance : < 1 ohm**
- **Static Charge Generation : Nil**







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Technical Specifications of Copper Tape

Many EMI problems can be solved easily by the use of copper foil tape. Copper foil and tape can be produced with or without (conductive) self-adhesive and an optional insulation layer.

If coverage of large surfaces is needed, it would most likely be better to use tape with a conductive self-adhesive in combination with foil. This solution is much cheaper.

When you need to cover bigger surfaces you can contact our engineers because than you can possible better use this tape in combination with copper foil with a non-conductive adhesive. This is a much cheaper solution.





Applications



- Material – Copper Foil
- Electrical connection between surfaces (sheets / foils)
- Adhesive system – Acrylic
- Tensile Strength (kg/cm) – 4
- Adhesion to steel (gms/cm) - 350
- Die-cuts
- Mounting transparent foils, windows
- Cable shielding
- Temporary shielding during tests
- Antistatic floor
- Width – 25 mm
- Length – 25 mtrs
- Backing material thickness – 0.035 mm
- Total Thickness – 0.075 mm
- Grounding and static charge draining

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Technical Specifications of Knitted Wire Mesh Tapes

Knitted wire mesh is made by monel or **Sn/Cu/Fe ,TCS** or **Stainless steel wire mesh**. It has good shielding effectiveness , A wide range of wire mesh profiles in solid round, square, flat bandage - knitted meshes are available in the form of Sleeves. These could be used as sleeves for Elastomer or Rubber core wires, for EMI/EMC Shielding.

Type	Mesh material	Shape	Rubber	Size
Full metal	MONEL Sn/Cu/Fe Phosphor Bronze Ag plated Cu	Round Rectangular		Dia 1.6-12.7mm
With foam core	MONEL Sn/Cu/Fe Phosphor Bronze Ag plated Cu	Round Rectangular	Neoprene foam Silicon foam	Dia 1.6-12.7mm
Combination EMC gasket	MONEL Sn/Cu/Fe Phosphor Bronze Ag plated Cu	Rectangular	Neoprene foam Silicon foam	Rubber size (1.6-6.35)*(6.35*15.88) Mesh size: (1.6-6.35)*(3.18-6.35)
Knitted Wire mesh washer	Monel Stainless steel	Round		Any size
Knitted wire mesh tape	MONEL Sn/Cu/Fe Phosphor Bronze Ag plated Cu	Flat		6.35-25.4





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Technical Specifications of Wire Embedded Silicone Rubber Gasket

The **conductive Wire Embedded silicone elastomer Gaskets** are made by metal mesh, metal powder powder and silicon. They have excellent EMI shielding effectiveness and environment sealing and long life time. The conductive fillers are **nickel graphite, silver glass, silver aluminum, silver copper.**

These Wire embedded Gaskets are an extension of regular EMI shielding materials of silicone rubber. They are similar to Conductive Silicone Gaskets but often used in applications where close contact with the surface is vital.





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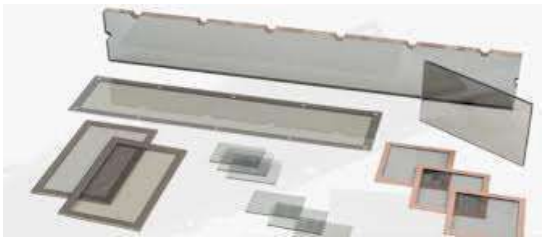
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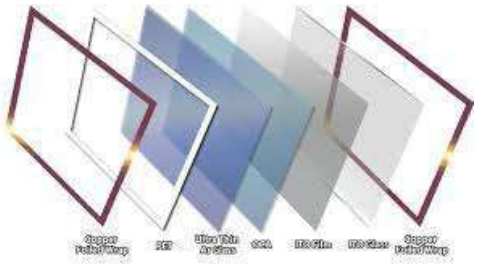
Technical Specifications of EMI / RFI Transparent Window

These are Transparent Windows, usually -made to order, to meet special design requirements.

These Windows comprise of a Conductive Mesh sandwiched between two Polycarbonate sheets. This assembly is held together by a metal frame or simply an adhesive Copper Tape.

The Conducive mesh is highly conductive. The mesh design enables a clear view of the instrument. It is ideally used for large displays or Front doors of equipment.







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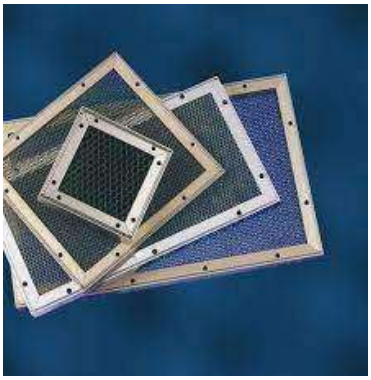
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Technical Specifications of Aluminium Honeycomb

- Light weight, Aluminium Alloy 3003
- High shielding performance
- Low air-flow resistance
- Reduction of turbulence
- Cell sizes 6.3 /3.2
- Thicknesses 6mm, 10 mm, 12. mm, or 18 mm, 22 mm.25mm
- **Expected Shielding effectiveness data- Frequency vs Attenuation (dB)**

Frequency /Thickness	6mm thick	10 & 12mm thick	22 & 25 mm thick
30 MHz	60 dB	60 dB	60 dB
100 MHz	40	60	60
300 MHz	40	50	60
1 GHz	30	40	50
3 GHz	30	40	50
10 GHz	--	40	50
!8 GHz	--	30	40





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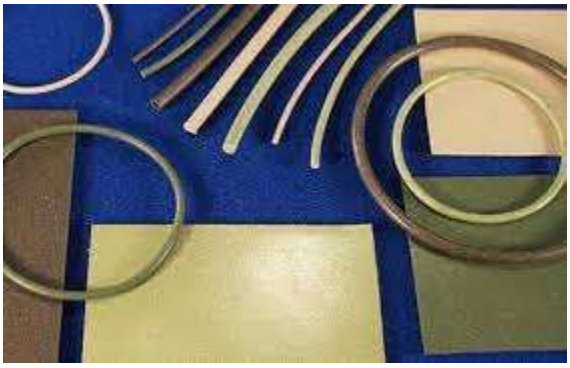
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Technical Specifications of Composite EMI Non EMI Gaskets

Composite gaskets consist of **two or more materials.** These are formed together into a single piece for use with any part like. say a connector. The Inner core material is any conductive material like Silver, Aluminium Silver, Copper Silver etc. The outer side of the gasket is usually a non conductive rubber like Silicone or Rubber. The purpose of using a composite gasket is, achieving both EMI Shielding as well as Environmental sealing with a single Gasket**.**



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Technical Specifications of Wire Mesh on Elastomer Core Gasket

Knitted wire mesh gasket is made by monel or **Sn/Cu/Fe ,TCS** or **Stainless steel wire mesh**. It has good shielding effectiveness , A vast range of wire mesh profiles comprising **knitted mesh gaskets** in solid round, square, flat bandage - knitted meshes over elastomeric cores, normally silicone or neoprene sponge or tube, knitted mesh gaskets bonded to environmental gasket materials, to provide EMC Shielding.

- Vibration & Shock Absorption
- Air & Liquid Filtration
- Noise Suppression
- Gasketing & Sealing
- Heat Transfer & Insulation
- EMI/RFI Shielding
- Mist Elimination & Process Separation
- Flame Arrestors
- Engine Catalysts



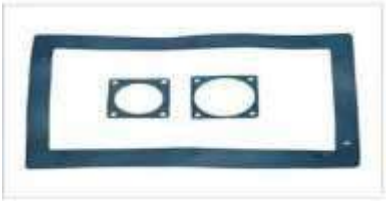


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CONDUCTIVE SILICONE RUBBER GASKETS - KINETIC POLYMERS

Grounding of Connectors to an enclosure bulkhead in a manner that will reduce the ingress or egress of EMI/RFI interference can be accomplished through the use of the following connector gaskets.
Features / Material Choice: Connector gaskets materials can be selected to meet environmental and mechanical requirements of the package to be shielded.
Standardization: Die-cut connector gaskets are available for standard type connectors.
Low Cost: connector gaskets offer optimum RF grounding of connectors at minimal cost.
EMI Shield and Moisture Seal: The elastomer embedded product both an EMI shield and moisture seal in a minimum thickness, thus not requiring extended protrusion from surface of enclosures

The conductive elastomer are made by metal powder and silicon. They have excellent EMI shielding effectiveness and environment sealing and long lifetime. The conductive fillers are Pure Silver, Nickel graphite, Silver aluminum, Silver copper.
We have standard size and shapes, we could offer extruded, molded and die-cut any shapes or size as the customer design and requirements.



Specifications

Operating Temperature
Min (ºC) -55 -55 -55 -55 -55 -55 -55
Max (ºC) 175 200 200 180 200 125 160

Specific Gravity 1.2 1.95 1.8 4 2 3.5 1.7

Hardness (Shore A) Durometer
70 70 65 75 65 65/75/85 45

Compression Deflection (%min)
3.5 3.8

Tensile Strength (lbs/sq-in) 450 150 200

Elongation (%) 3.5 3.5 3.5 3.5 3.5 3.5 8

Volume Resistivity (ohm-cm) 8 0.1 0.05 0.008

Shielding Effectiveness
(20mhz-10ghz) - 40 60 80 100 dB



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Technical Specifications of Silver Filled Silicone Gasket

- Material : Pure Silver + Silicone rubber
- Diameter : 1.5 +/- 0.1 mm
- Colour : Grey
- Cord Value : ≤ 0.5 ohms
- Expected db level : ≥ 80
- Hardness : 70 +/- 10 Shore ‘A’



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Technical Specifications of Nickel Coated Graphite Silicone

➢ Material	:	Silicone
➢ Conductive Filler	:	Nickel Graphite
➢ Colour	:	Black / Grey
➢ Size	:	1.5 mm
➢ Tolerance	:	± 0.03 mm
➢ Resistance values	:	0.1 Ohms - cm
➢ Hardness	:	65 ± 10 Shore ‘A’
➢ Gravity	:	2.0
➢ Tensile Strength	:	> 1 mpa
➢ Elongation (%)	:	70
➢ Working Temp	:	-55^0C to 160^0C
➢ Shielding Performance	:	Good









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Masterbatches Product List

- Anti Static Masterbatch for PP / HDPE / LDPE & HIPS – ABS
- Conductive Master Batch Compound based on PP / LDPE / LLDPE / PVC / & EVA
- VCI Masterbatch – Nitrite based and Nitrite free for LDPE/ LLDPE / & HDPE Fim
- Antirodent Master batch for PVC / LDPE / & PP
- Slip + Antiblock Masterbatch for LLDPE & EVA
- Anti Block Masterbatch for LLDPE & EVA
- Foaming Agent Masterbatch for PVC / & LDPE
- Nucleating Agent Masterbatch for HDPE & PP
- Purging Compound
- F R Masterbatch

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Technical Specification for Conductive Touch me Pad

All persons who accumulate static electricity because of the friction or induction should touch the pad for 10 Seconds, the accumulated static electricity will drain safely. On one end of the mat 10 mm button will be provided along with the grounding wire to be connected to the ground or earth to drain the static electricity safely.

Material	:	Static Dissipative Single Layer Synthetic Polymer
Surface resistance	:	$\leq 10^6$ Ohms (Black Colour)
Antistatic Property	:	Permanent
Static Generation	:	Nil
Rate of Decay	:	$\leq$ 10 Sec
Resistance to Weather	:	Yes
Size	:	1' x 1' (Thickness along with board will be 4.5 mm +/- 0.5 mm, with two clips to hang and wire to ground)





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Technical Specifications of Touchme Pad with Indicator

- **Input Voltage: 9V DC**
- **Pass Indication: Green LED**
- **Pass Range: 10 Meg Ohms**
- **Accuracy: +/- 10%**
- **Dissipation Time: 5 Seconds**



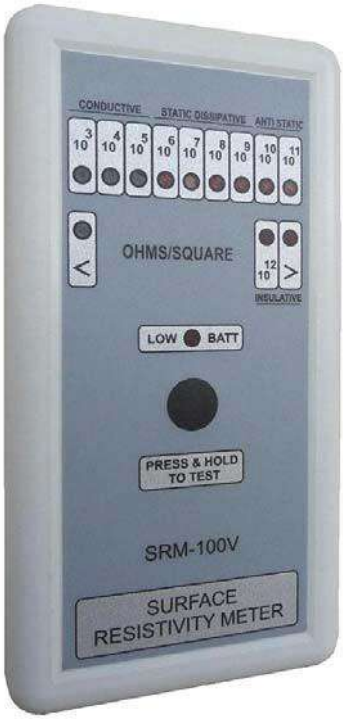
DATA SHEET

SURFACE RESISTIVITY METER

(Model: SRM-100V)

The model SRM-100V is a precession, low cost, hand held, battery operated instrument designed to measure Surface Resistivity, Surface to Ground and Resistance between two points is accordance with EOS/ESD Association standards S-11.11.

The SRM-100V meter (Including EXTERNAL ELECTRODES) is designed to make Surface to Ground and Resistance between to point's measurements.



SRM-100V SPECIFICATIONS:

Measurement Range	: <10E3 to >10E12 Ohms (or) Ohms/Sq
Measurement Accuracy	: Half decade
Resolution	: One decade
Probes test voltage	: 100V (+/-5V)
Indications	: Different color LED's
Test actuation	: Press & Hold to TEST
Power supply	: 9V Battery
Low battery indication	: Flashes by "LOW-BAT" LED
Dimensions	: 135 x 70 x 25 mm
Weight	: 160 gms (with battery)
Calibration	: Recommended every 12 months
Calibration traceability	: To NATIONAL STANDARDS
Warranty	: 12 Months
Accessories	: External cords & Carry case
Optional	: 1 Set of 5 Pound External Electrodes.

Users manual

SURFACE RESISTIVITY METER
(Model: SRM-100V)

In the electronic semiconductor industry, products such as packing materials, component storage trays and boxes, workstation surfaces, floor mats, conveyor belts, aprons, seating, etc., have resistance value, which need to confirm to stringent specifications, more over these resistance values are expected to fall within specified limits.

The model SRM-100V is a precession, low cost, hand held, battery operated instrument designed to measure surface Resistivity, surface to ground and resistance between two points is accordance with EOS/ESD Association standard S-11.11.

The SRM-100V meter (including EXTERNAL ELECTRODES) is designed to make surface to ground and resistance between two point's measurements

SURFACE RESISTIVITY MEASUREMENT: Place the meter on the desired surface to be tested. PRESS & HOLD the TEST button, the meter will display the surface resistivity. When using the built in probes, the meter's test value for surface resistivity are in OHMS/SQ. Here, when the Instrument is used to measure in the conductive range, the instrument tests at 10 volts, and when the instrument measures the static dissipative ranges the instrument tests at 100 volts, and the Decades values are given below.

10^3	= 1 kilo ohm	10^8	= 100 Meg ohms
10^4	= 10 kilo ohms	10^9	= 1 Giga ohm
10^5	= 100 kilo ohms	10^10	= 10 Giga ohms
10^6	= 1 Meg ohm	10^11	= 100 Giga ohms
10^7	= 10 Meg ohms	10^12	= 1 Tera Ohm

SURFACE TO GROUND MEASUREMENT: Connect the external cords to the instruments. Connect one end of the external cord to ground, and connect another end of the external cord to EXTERNAL ELECTRODE. Place the electrode on the desired surface to be tested. PRESS & HOLD the TEST button, the meter will display the surface to ground resistance. When using the external electrode, the meter's test values for surface to ground are in OHMS.

POINT TO POINT MEASUREMENT: Connect the external cords to the instruments. Connect end of the external cords to the EXTERNAL ELECTRODES: place the electrodes on the desired surface to be tested. PRESS & HOLD the TEST button, the meter will display the point to point surface resistance. When using the external electrodes, the meter's test values for point to point are in OHMS.

SPECIFICATIONS:

Measurement Range	: <10^3 to >10^12 Ohms (or) Ohms/sq
Measurement Accuracy	: Half decade
Resolution	: One decade
Open Circuit Voltage	: 100V (+/-5V)
Indication	: Different Color LED's
Test actuation	: Press & Hold to Test
Power supply	: 9 Volt Battery
Low Battery Indication	: Flashes by LOW-BATT Led
Dimensions	: 135 x 70 x 25mm
Weight	: 160 gms (with battery)
Calibration	: Recommended every 12 months
Warranty	: 12 Months
Accessories	: External cords & Carry Case
Optional	: External Electrodes.

MAINTENANCE: Apart from routine battery replacement, this SRM-100V meter is designed to be completely maintenance free. There are no parts inside which can be replaced by the user himself. In case of malfunction, kindly refer to manufacturer or his authorized personnel. Ensure that the surface to be tested and the bottom of the instrument internal electrodes & External Electrodes are clean because any dust or contaminates on either surface will lead to erroneous reading.

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Technical Specifications of Digital Surface Resistivity Meter

Measures Surface Resistivity or Resistance between 2 points. Products such as packaging materials, component storage bags and trays, work bench surfaces, table and floor mats, etc., have resistance values which need to confirm to stringent specifications. The material characteristics - Conductive, Dissipative and Insulative are conveniently displayed.

The additional features are surface -to-ground measurement, ambient Temperature measurement and Data Hold function, all indicated on a large backlit LCD display.

Measurements can also be made using external probes

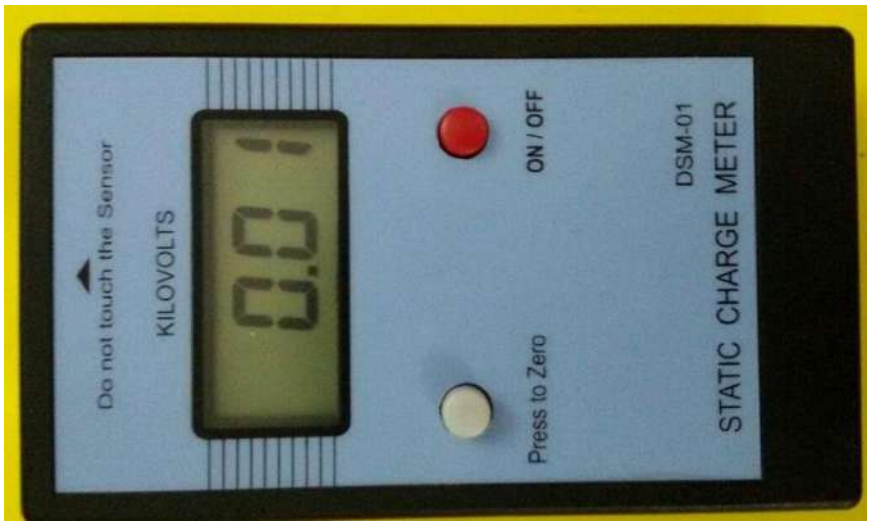
Specifications:

Measurement Range	:	10^3 to 10^{11} Ohms / Sq, 0-50C
Measurement accuracy	:	Resistance 10%, Temp +/- 2C
Indication	:	LCD backlit display
Power Supply	:	9 Volt DC Battery
Battery Conditions	:	Indication on LCD Display
Dimensions in mm	:	125 x 62 x 35 mm
Weight	:	160 grams
Traceability	:	To national standards
Warranty	:	12 months
Accessories included	:	1 m Grounding Cord & Carrying case





STATIC CHARGE METER (DIGITAL) DSM-01



The **Static Charge Meter DSM-01** is a non-contact, light weight **digital** instrument designed to measure static voltages on objects & surfaces. It features a large LCD display to indicate the magnitude and polarity of the electrostatic charge directly in Kilovolts.

The special circuitry enables repeated and drift-free measurements without continual re-zeroing. The instrument has good directional sensitivity and is ideal for measuring electric charges encountered in critical electronic assembly and storage areas as well as Antistatic Work Stations. It can also be used for Plastics, Paper, Textiles, Food, Explosives and Pharmaceutical Industries.

The unit gives direct readings of electrostatic potentials on any surface, when held at a distance of 5 cms. However, higher electrostatic potentials can be measured by proportionately increasing the distance from the meter to the charged object.

The use of very low current circuitry results in a long battery life of over 6 months under normal use.

SPECIFICATIONS

Indicating range	: ± 10 KV at 5 cms from object.
Display	: 3 1/2 digit LCD with polarity indication
Resolution	: LSB 10V
Accuracy	: ±10% of Reading
Test Actuation	: Push On push Off switch
Power Supply	: 9 V battery.
Low battery	: Warning at 7.0 V on display
Dimensions in mm	: 125 x 75 x 29
Weight	: 200 gms.
Calibration	: Recommended once every 12 months.
Traceability	: To national standards
Warranty	: One year.
Accessories	: Carrying case

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Technical Specifications of Intrinsically Safe Static Charge Meter



The EX715 Static Meter has been developed to investigate industrial static electricity problems and ahs been certified for use in hazardous areas.

The EX715 meter can show where and how the static is generated. It's magnitude and it's polarity. This gives the engineer a scientific basis for analysis.

PERFORMANCE:

- **The EX-715 measures static electricity on the surface of a material or body at a distance of 100 mm.**
- **The meter can show where and how the static is generated, its magnitude and its polarity.**
- **It can measure static electricity levels from 10 V up to 200,000 V.**

ESSENTIAL QUALITIES:

- **The EX-715 is ATEX and IECEx certified for use in hazardous areas.**
- **Two ranges which are selected automatically:**
  - 0 - 20 kV with a resolution of 10 V.
  - 20 - 200 kV with a resolution of 100 V.
- **There is a hold facility to freeze the reading on the display.**
- **Comes complete with carrying case, battery and earth cord.**

APPLICATION:

- **Static electricity is a difficult area to investigate without a method of measurement.**
- **The EX-715 is an important quality and safety tool for hazardous areas. It enables the engineer to investigate static problems, monitor the effectiveness of solutions and set standards for acceptable levels - whether in the process or on the product.**

SPECIFICATION:

- **Construction:** Anodised aluminium case with recessed stainless steel sensing plate for maximum integrity and accuracy.
- **Range / Resolution:** 0 V - 20 kV / 10 V increments and 20 kV - 200 kV / 100 V increments.
- Automatic range selection. Measurement at 100 mm.
- **Drift:** <0.1 % in 10 seconds.

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- **Calibration:** On a 150 mm x 150 mm charge plate. Can be calibrated on other charge plate sizes to meet country standards, e.g 450 mm x 450 mm for China.
- **Operation:** Click button to zero. Click button again to 'hold' the reading. Third press reactivates reading. Automatic switch-off after 60 seconds. Low volt indicator shows condition of battery.
- **Equipment:** Supplied with carrying case, battery, earth lead and certificate of calibration.

- **Environnemental:** 70 % rH non-condensing max.

Certification: In addition to ATEX and IECEx, EN-500081-1 (EMC) and BS7506-2 (Construction).

ATEX AND IECEX CERTIFICATION

ATEX is the European certification. IECEx is the unified international certification.

II 2G

Ex iA IIB T4/T5 (see schedule)

Baseefa07ATEX0159 / IECEx BAS07.0042

See Operating Instructions for details of ba tte operational matters.





DATA SHEET

WRIST STRAP & FOOTWEAR TESTER

(Model: WSFT-01)

The potential for damage caused by a static charge build-up on personnel involved in the handling of semiconductor devices. ESD wrist strap, heel strap, toe-strap and foot wears are most commonly used protective devices which prevent the build-up of electrostatic charge on personnel. The random failure of wrist strap or foot wears compromises the protection. Thus, it is important to test every wrist strap / footwear regularly.



The Model: WSFT-01, wrist strap & footwear tester is a precession instrument that check the specified limit of all types of wrist straps, foot wears and other similar personnel grounding devices under actual operating conditions with the strap on the wrist or foot wear on the foot. It clearly indicates whether LOW-FAIL or PASS or HIGH-FAIL the maximum wrist strap resistance should not be more than 10 Meg ohms and foot wears resistance should not be more than 100 Meg ohms. On the other end, the resistance should not be less than 0.75 Meg ohms as protection to the wearer from dangerous level of the voltage and current flow.

The instrument circuits is specially designed for the drift less readings (i.e., it displays only one result accurately) and it is very quick and convenient method to check personnel groundings.

OPTIONAL: Customized resistance limits can be provided to meet special user requirements.

…continued

Users manual

WRIST STRAP AND FOOTWEAR TESTER
(Model: WSFT-01)

The potential for damage caused by a static charge build-up on personnel involved in the handling of semiconductor devices. ESD wrist strap, heel strap, toe-strap and foot wears are most commonly used protective devices which prevent the build-up of electrostatic charge on personnel. The random failure of wrist strap or foot wears compromises the protection. Thus, it is important to test every wrist strap / footwear regularly.

The Model: WSFT-01, wrist strap & footwear tester is a precession instrument that check the specified limit of all types of wrist straps, foot wears and other similar personnel grounding devices under actual operating conditions with the strap on the wrist or foot wear on the foot. It clearly indicates whether LOW-FAIL or PASS or HIGH-FAIL the maximum wrist strap resistance should not be more than 10 M ohms and foot wears resistance should not be more than 100 M ohms. On the other end, the resistance should not be less than 0.75 M ohms as protection to the wearer from dangerous level of the voltage and current flow.

The instrument circuits is specially designed for the drift less readings (i.e., it displays only one result accurately) and it is very quick and convenient method to check personnel groundings.

FOR CHECKING WRIST STRAP: Connect the wrist strap jack to the instrument and with the strap on the wrist, change over the Switch to Wrist Strap range and press & hold the metal sensor on the instrument. The instrument will check whether the resistance of the wrist strap falls within the acceptable range (0.75 – 10 Meg ohms). This is indicated by the GREEN Led.

FOR CHECKING FOOTWEAR: Connect the foot plate jack to the instrument and keep one foot with footwear on the foot plate, change over the Switch to Footwear range and press & hold the metal sensor. The instrument will check whether the resistance of the footwear falls within the acceptable range (0.75 - 100 Meg ohms). This is indicated by the GREEN Led. Repeat the same with another foot.

SPEFIFICATIONS:

Range	: Wrist strap 0.75 to 10 Meg ohms Foot Wear 0.75 to 100 Meg ohms
Range Selection	: By Toggle Switch
Indications	: LOW-FAIL (Indicates Less than 0.75 Meg Ohms) PASS (Indicates 0.75 to 10/100 Meg ohms) HIGH-FAIL (indicates More than 10/100 Meg Ohms) (Audible Alarm for Fail modes)
Test actuation	: By Press & Hold the Metal sensor plate.
Accuracy	: +/- 10%
Power supply	: 9 Volt Battery
Battery Status	: By dual color LED (Red-Low Bat & Green-Ok).
Dimensions	: 135 x 70 x 25 mm
Weight	: 150 gms (with battery)
Calibration	: Recommended every 12 months
Warranty	: 12 Months
Accessories	: Carry Case.
Optional	: Foot Plate & User Instruction Board.

MAINTENANCE: Apart from routine battery replacement, this Wrist strap & Foot wear Tester is designed to be completely maintenance free. There are no parts inside which can be replaced by the user himself. In case of malfunction, kindly refer to manufacturer or his authorised personnel. The instrument can be cleaned with a damp cloth. Never use solvent as they may damage the plastic case.

User manual

COMBO TESTER
(Model: CT-01)

The potential for damage caused by a static charge build-up on personnel involved in the handling of semiconductor devices. ESD wrist strap, heel strap, toe-strap and foot wears are most commonly used protective devices which prevent the build-up of electrostatic charge on personnel. The random failure of wrist strap or foot wears compromises the protection. Thus, it is important to test every wrist strap / footwear regularly.

The CT-01 is a friendly user, precession engineered combination tester, and it measures the electrical resistance of LEFT FOOT, RIGHT FOOT and WRIST STRAP individually under actual operating conditions. The tester reduces the testing time by half, and offers the operator a visual and audible measurement of PASS or FAIL of personnel groundings before entering the EPA.

The tester has special circuits for drift less readings (i.e., it displays only one result accurately). Moreover the tester works with 9V DC adopter or 9V Battery. So, no need of charging or replacing the battery frequently. It is very quick and convenient method to check personnel groundings.

FOR CHECKING WRIST STRAP: Connect the wrist strap jack to the instrument and with the strap on the wrist, press & hold the metal sensor on the wrist strap tester. The instrument will check whether the resistance of the wrist strap falls within the acceptable range (0.75 – 10 Meg ohms). This is indicated by the GREEN Led.

FOR CHECKING FOOTWEARS: Simply stand on the two stainless steel footprints with footwear on the foot plate, press & hold the metal sensor on the foot wear tester. The instrument will check individually in one test whether the resistance of the footwear's falls within the acceptable range of (0.75 – 100 Meg ohms). This is indicated by the Left & right foot GREEN led's.

SPEFIFICATIONS:

Range	: Wrist strap 0.75 to 10 Meg ohms Left footwear 0.75 to 100 Meg ohms Right footwear 0.75 to 100 Meg ohms
Indications	: Pass - GREEN LED Low & High fail - RED LED with Buzzer sound
Test actuation	: By press & hold the respective sensor plates
Accuracy	: +/- 10%
Power supply	: 9V DC Adopter or 9V Battery
Power supply status	: By Dual Color LED.
Dimensions in MM	: Instrument: 180 X 100 X 45, Foot plate: 485 x 380 & Height: 980 mm
Weight	: 5.75 Kg (with foot plate & stand)
Calibration	: Recommended every 12 months
Warranty	: 12 Months only for Instrument
Accessories	: 9V DC Adopter.

MAINTENANCE:

If the tester operated in battery, as soon as gets low replace it. Apart from this, the Combo Tester is designed to be completely maintenance free. There are no parts inside which can be replaced by the user himself. In case of malfunction, kindly refer to manufacturer or his authorised personnel. The instrument and foot plate can be cleaned with a damp cloth. Never use solvent as they may damage the instrument plastic case.

DATA SHEET

COMBO TESTER

(Model: CT-01)

The potential for damage caused by a static charge build-up on personnel involved in the handling of semiconductor devices. ESD wrist strap, heel strap, toe-strap and foot wears are most commonly used protective devices which prevent the build-up of electrostatic charge on personnel. The random failure of wrist strap or foot wears compromises the protection. Thus, it is important to test every wrist strap / footwear regularly.

The CT-01 is a friendly user, precession engineered combination tester, and it measures the electrical resistance of LEFT FOOT, RIGHT FOOT and WRIST STRAP individually under actual operating conditions. The tester reduces the testing time by half, and offers the operator a visual and audible measurement of PASS or FAIL of personnel groundings before entering the EPA.





Front view of TESTER

The tester has special circuits for drift less readings (i.e., it displays only one result accurately). Moreover the tester works with 9V DC adopter or 9V Battery. So, no need of charging or replacing the battery frequently. It is very quick and convenient method to check personnel groundings.

DATA SHEET

COMBO TESTER CONTROLLED ENTRY SYSTEM

(Model: CT-03)

The potential for damage caused by a static charge build-up on personnel involved in the handling of semiconductor devices. ESD wrist strap, heel strap, toe-strap and foot wears are most commonly used protective devices which prevent the build-up of electrostatic charge on personnel. The random failure of wrist strap or foot wears compromises the protection. Thus, it is important to test every wrist strap / footwear regularly.

The model CT-03 Combo Tester Controlled Entry Systems is designed to control of personnel into ESD safe area by measuring foot wears or wrist strap resistance. If the measured resistance is within limits and access is approved, the turnstile unlocks permitting passage. Also the tester offers the operator a visual and audible measurement of PASS or FAIL of the personnel groundings. It is good security system for entry of personnel into the restricted ESD safe area.



Users manual

PERSONNEL STATIC TESTER

(Model: PST-01)

The Model PST-01 is designed to measure the static Voltages carried on a personnel. It is a precession instrument to verify whether Personnel entering an ESD safe area are carrying any hazardous charges on themselves.

It is very simple to use and only requires the personnel under test to touch the plate on the instrument and directly read the charge level in volts on the meter. Apart from the measuring the voltages, it can also be used to safely drain away the charges from the personnel. The instrument has a special feature of visual and audible "HAZARD" indication when it measures more than +/-100V. It is very quick and convenient method to check personnel voltages.

IMPORTANT NOTE: The instrument must always be connected to ground. Not grounding the unit can result in inconsistent results. The circuit will only become responsive when you offer a path to ground.

OPERATION: Place the finger on the 'TOUCH TO TEST' plate on the tester. Watch the display, depending on the humidity and types of shoes/slippons, indication between 000 to +/- 1999 Volts of static charge may be displayed. If the person is carrying more than 100Volts, it indicates "HAZARD" led indication with buzzer sound.

To Discharge the Body Voltage to the ground, continuously touch the TOUCH TO TEST plate until the body voltages discharges to the ground. (Ie, until hazard alarm goes off). Again touch the "TOUCH TO TEST" Plate on the tester. Reading must be 000 Volts on the LCD.

However, it is quite normal the instrument to display a few volts due to stray electromagnetic or static fields and can be ignored. This in no way affects the accuracy of the instrument.

Moreover the tester will audit any potential static generator or dissipater, like. Wrist straps, heel grounders, toe straps, static safe shoes, floor mats, etc....

WRIST STRAP TEST: connect the wrist strap jack to the instrument with the strap on the wrist. Shuffle your foot while touching the "touch to test" plate. If the wrist strap and cord are okay the reading displayed on instrument will be "000" volts on the LCD. Disconnect the wrist strap from the cord and repeat the test while touching the plate by shuffling your foot again. Depending on the humidity and types of shoes, person static charge may be displayed.

FOOT WEAR TEST: Hold the instrument with thumb or fingers making contact with the "touch to test" plate. Wearing heel or toe grounders or appropriate footwear, shuffle your foot while still making contact with the rectangular plate. If you have properly grounded the floor, the reading on the LCD will be "000". Try the same test on a known Insulative floor with the same footwear, shuffle your foot again and see that even with perfectly good footwear a charge can be generated on an Insulative floor.

SPEFIFICATIONS:

Range	: +/-1999V
Hazard Indication	: Visual and audible alarm if voltage exceeds +/-100V
Indications	: 3 ½ Digit LCD display with polarity indication
Resolution	: 1 Volt
Accuracy	: +/- 10%
Test actuation	: Touch To Test
Power supply	: 9V DC Adopter or 9V Battery
Low battery	: indicates at < 7 V on Display
Dimensions	: 180 X 100 X 45 MM
Weight	: 300 Gms (with battery)
Calibration	: Recommended every 12 months
Warranty	: 12 Months
Accessories	: 9V DC Adopter, Instruction board, Grounding cord & Carry case.

DATA SHEET

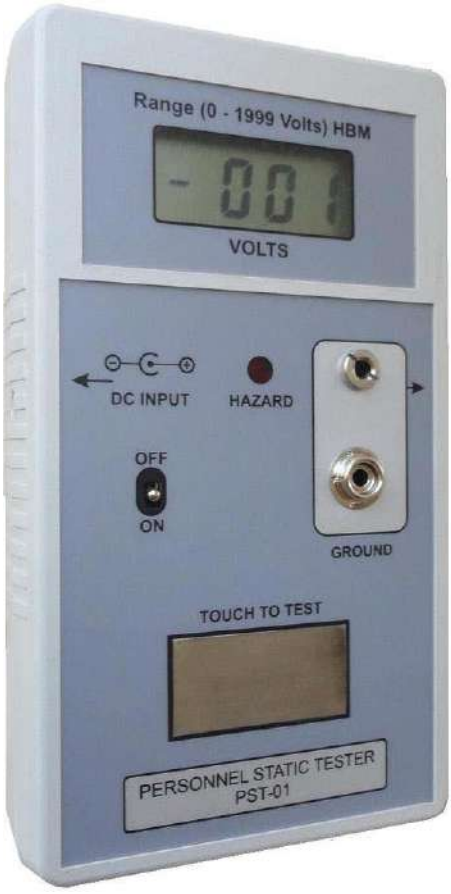
PERSONNEL STATIC TESTER

(Model: PST-01)

One of the most common causes of electrostatic damage is the direct transfer of electrostatic charge from the human body. When one walks across a floor, an electrostatic charge accumulates on the body. Simple contact of a finger allows the body to discharge, possibly causing device to damage.

The Model PST-01 is designed to measure the static Voltages carried on a personnel. It is a precession instrument to verify whether Personnel entering an ESD safe area are carrying any hazardous charges on themselves.

It is very simple to use and only requires the personnel under test to touch the plate on the instrument and directly read the charge level in volts on the meter. Apart from the measuring the voltages, it can also be used to safely drain away the charges from the personnel. The instrument has a special feature of visual and audible "HAZARD" indication when it measures more than +/-100V. It is very quick and convenient method to check personnel voltages.



Moreover the tester will audit any potential static generator or dissipater, like. Wrist straps, heel grounders, toe straps, static safe shoes, floor mats, etc....

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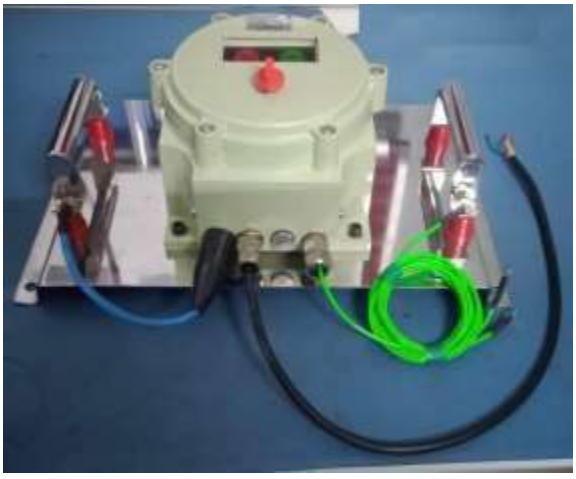
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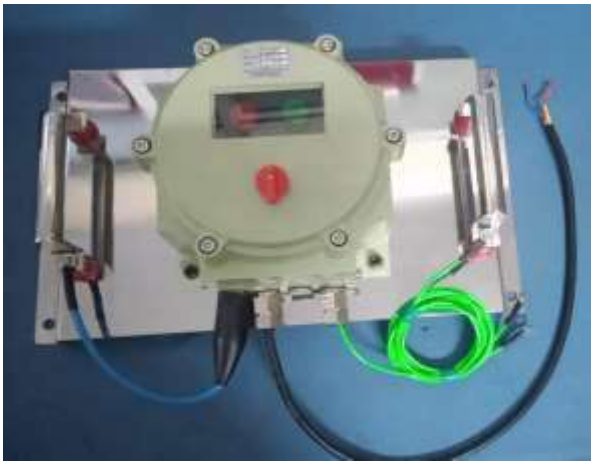
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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Flame Proof Human Body Static Voltage Checker with Handles (Personnel Static Tester, Model No. PST - FLPDS)

- **Model No. : PST – FLPDS**
- **Type : Micro - Controller based**
- **Principle : Human Body static dissipater provides complete solution, by measuring the Resistance of human body and providing conductive path for static charge dissipation to earth**
- **Display Range : 0 to 1 MEGA OHM**
- **Relay O/p : Two C/o (Potential Free Contacts)**
- **Control action : Relay will get energized when the body resistance is below 1 mega ohm the device display 'PASS' When the Resistance above 1 mega ohm, the device display's 'open' relay will get de-energized**
- **Power supply : 110 V / 230 V AC, 50 H2**
- **Protection : Enternal Fuses**
- **Execution : Explosion - Proof Ex 'd'**
- **Display Size : 16 x 2 Jumbo LCD Display**
- **Dimension : 250 x 250 x 140 mm**
- **IP Protection : IP65**
- **Mounting : Wall Mounting SS Plate**
- **Handle : Test Handle & Reference Ground Handle / power on/off Switch : 16 AMP**
- **Apperatus Standard : Ex 'd' - 15/IEC 60079-1:2014**
- **Temperature Class : T6 (85 deg. C)**
- **Area Classification : Zone 182**
- **Gas Groups : IIA / IIB, IIC & T6**
- **Cable Enteries : One bottom of Enclosure 3/4" ET**





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Technical Specifications of Continuous Earth Monitoring System 10 Channel



A key function of equipment earthing is to provide a controlled method to prevent the buildup of static electricity, thus reducing the risk of electro static discharge in potentially hazardous environments. The electrical resistance from the equipment to earth should be 10 ohms maximum, as for IS 7689. This electrical resistance values are to be maintained continuously.

The system KPN-EM10 monitors resistance value to earth and any fault will be indicated by RED LED and audio signal. The system monitors every equipment one after another with an interval of 5 seconds. The system draws the attention of the personnel to take remedial action should fault arise in equipment earthing.

KPN – EM10 has provision to monitor 10 no's of equipment's, and comes in flameproof enclosure. Equipment to earth loop is measured by intrinsically safe voltage & current and this precision source has micro controller based switching.

Continuous Earth Monitoring System is designed to Monitor Earthing of Pharma product process equipment, one after other for 5 seconds. Once installed the system scanning the earthing of 1 to 10 equipment all the 24 hrs. There is no daily operation of the system. In the event of equipment earthing fault (resistance more than 10 Ohms), the system detects it and indicates the equipment number in Red colour along with Audio Signal. At the same time, the faulty equipment number is registered in 1 to 10 Red Led array.

Technical Specifications:

The KPN – EM10, system consists of 2 units.

1). Safe Area Unit: Located in switch gear room / safe area.
Power Input: 230 Volts AC at less than 7 watts.
L T Transformer: windings for primary and secondary

2). A) Composite unit: FLP + Junction Box for Hazardous area installation
a) Power Input: 14 Volts A.C at 200 mA

B) Intrinsically Safe Earth loop Check Connections.
a). Voltage: 0.6 volts DC b) Current: 20 m. A Max D.C

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D) Operational Visual Indications:

1 to 20 equipment scanning two digits LED display Green Loop check OK for the equipment connected. Red Earth Loop resistance greater than 10 ohm also the number is registered in 1 to 20, 5m LED array. Buzzer blips for 5 seconds along with digital display in Red.





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Technical Specifications of Continuous Earth Monitoring System 20 Channel

A key function of equipment earthing is to provide a controlled method to prevent the buildup of static electricity, thus reducing the risk of electro static discharge in potentially hazardous environments. The electrical resistance from the equipment to earth should be 10 ohms maximum, as for IS 7689. This electrical resistance values are to be maintained continuously.

The system KPN-EM20 monitors resistance value to earth and any fault will be indicated by RED LED and audio signal. The system monitors every equipment one after another with an interval of 5 seconds. The system draws the attention of the personnel to take remedial action should fault arise in equipment earthing.

KPN – EM20 has provision to monitor 20 no's of equipment's, and comes in flameproof enclosure. Equipment to earth loop is measured by intrinsically safe voltage & current and this precision source has micro controller based switching.

Continuous Earth Monitoring System is designed to Monitor Earthing of Pharma product process equipment, one after other for 5 seconds. Once installed the system scanning the earthing of 1 to 20 equipment all the 24 hrs. There is no daily operation of the system. In the event of equipment earthing fault (resistance more than 10 Ohms), the system detects it and indicates the equipment number in Red colour along with Audio Signal. At the same time, the faulty equipment number is registered in 1 to 20 Red Led array.



Technical Specifications:

The KPN – EM20, system consists of 2 units.

1). Safe Area Unit: Located in switch gear room / safe area.
Power Input: 230 Volts AC at less than 7 watts.
L T Transformer: windings for primary and secondary

2). A) Composite unit: FLP + Junction Box for Hazardous area installation
a) Power Input: 14 Volts A.C at 200 mA

B) Intrinsically Safe Earth loop Check Connections.
a). Voltage: 0.6 volts DC b) Current: 20 m. A Max D.C

C) Operational Push Buttons:
1) Reset Switch
2) Hold Switch
3) Release Switch

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Technical Specifications of Earth Clamp with Visual Indicator

Heavy duty stainless steel earthing clamp for 205 litre drums, containers, plant equipment, road tankers etc. Clamp features twin Tungsten Carbide teeth for effective penetration of paint and contamination and come with 5.0 meters spiral cable

- Flame proof body for main instrument.
- Flame proof alarm.
- Stainless steel body with Visual Indication.
- Concealed electronic circuitry in SS tube.
- Concealed Flame proof Magnetic reed switch with 2 X1.5V(type 'A'A') batteries.

Clamp: L 200 mm x W 50 mm x Jaw opening 20.0 mm



Contact Points: 2 Nos of Tungsten Carbide Tips.

Electrical Properties:

- Power Source: 2 Nos Type 'AA' Battery Cells.
- Battery (Low) : Indicated by low Intensity in LEDS.
- Battery Replacement: To be Carried out in safe area only by removing the end screw cap.
- Electronic Circuit: Magnetically operated reed switch concealed in S.S tube.
- Safety : The entire unit is Intrinsically safe and flame proof.
- Contact Sensing Voltage Current : 1.2 Volts 2 mA
- Cable: 5.0 mt. 2 core 14 x 0.36 cable.

Switching: 1). Rotate Rotary Lever 180^{o} 2). Clockwise for ON & Reverse for OFF

Indication: Red LED indicates that the circuit is live and jaw and Terminal contacts either both or any one is open. Green LED indicates that the contacts are ok.





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Technical Specifications of Crocodile Earth Clamps

We have established ourselves as a renowned manufacturer and supplier of Earth Clamps. The offered range is manufactured using premium quality raw material, which is obtained from the trusted and reliable vendors of the market. Our quality experts test the finished range on various parameters to make sure a perfect range is delivered to clients. Owing to our vast distribution network, we have been able to serve the interests of numerous patrons situated across the globe.







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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Earthing Wires

We have established ourselves as a renowned manufacturer and supplier of Earth Clamps. The offered range is manufactured using premium quality raw material, which is obtained from the trusted and reliable vendors of the market. Our quality experts test the finished range on various parameters to make sure a perfect range is delivered to clients. Owing to our vast distribution network, we have been able to serve the interests of numerous patrons situated across the globe



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GSTIN : 36AARFK9187B1ZU | MSME No. TS20A0004409 | UDYAM-TS-02-0024846

Technical Specifications of Grounding Clips with Big Clip

We have established ourselves as a renowned manufacturer and supplier of Earth Clamps. The offered range is manufactured using premium quality raw material, which is obtained from the trusted and reliable vendors of the market. Our quality experts test the finished range on various parameters to make sure a perfect range is delivered to clients. Owing to our vast distribution network, we have been able to serve the interests of numerous patrons situated across the globe





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AIM: TO CHECK THE HUMAN BODY VOLTAGE

1). Connect the Green wire to the earth point.

2). Connect the Black wire to the power supply.

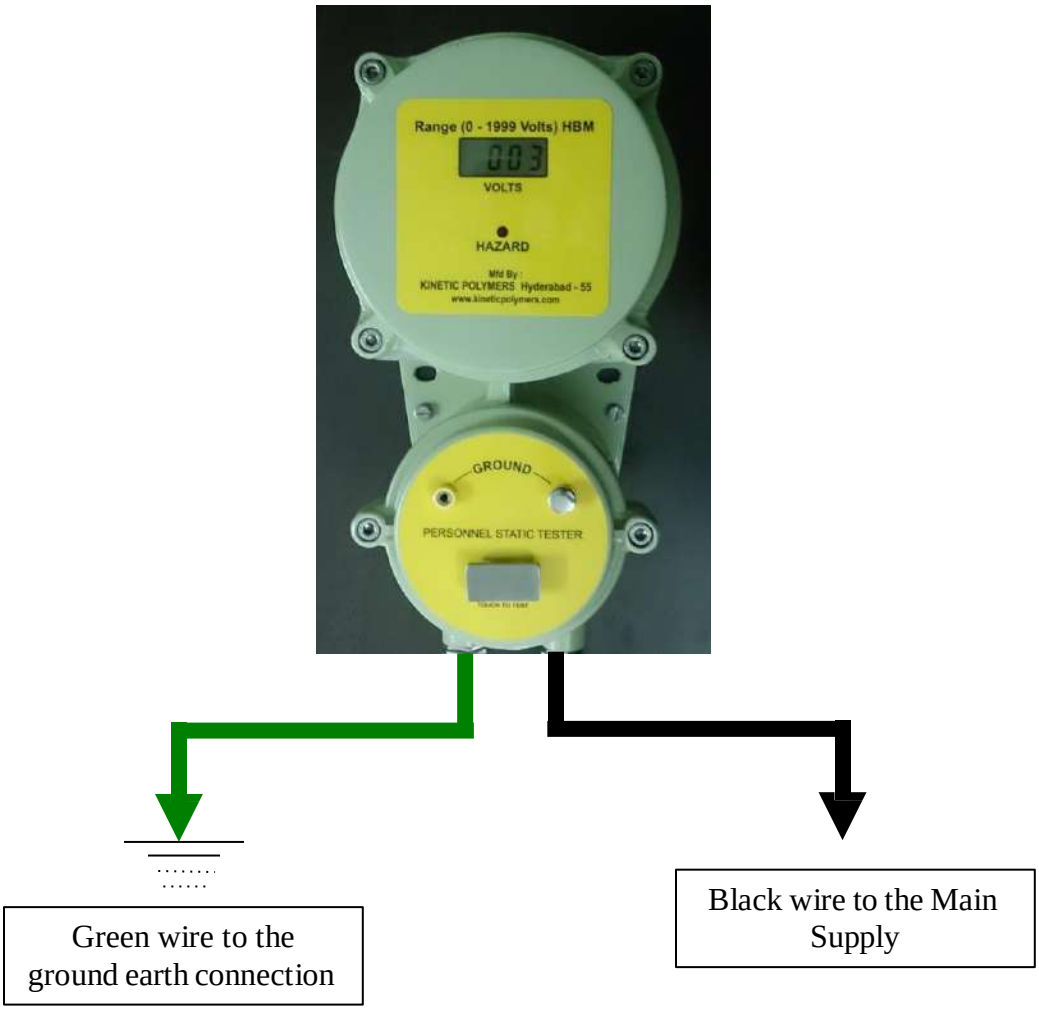
3). Once connected, you will then see the reading as 0.000 to 0.005 volts.

4). Persons whose body static voltage is to be measured, need to touch the touch plate.

5). A display shows the body voltage, also if voltage crosses more than 100 volts then alarm beep sound is heard.

6). Continue to touch the test plate, slowly the human body static charge gets drain to the ground.

7). An additional ground point is also provided to put the wrist band and also once touched with other finger to the round metallic ground point, a faster drain of charge will take place to the ground showing a value of 0.006 in < 30 Seconds indicating all this body voltage has been drained.



Users Manual

OVERHEAD IONIZER

(Model: OHI-4F)

Overhead Ionizer are useful in neutralizing generated electrostatic charges, which may cause Electrostatic Discharge, Electrostatic Attraction, as well as preventing equipment latch-up and safety related shock. The model OHI-4F is overhead unit designed to neutralize static charges from insulator surfaces in assembly areas, wave soldering lines, laboratories, storage racks, test stations and packing areas. The unit can be conveniently hung over the work place and the four fans covers larger area to neutralize the charges.

The overhead Ionizer works on the principle of high voltage corona discharge to produce the neutralizing ions, and it produces ions airflow that is rich in positive and negative ions directing the airflow on an object that has static electricity in order to neutralize the charges. It will be neutralized by attracting opposite polarity charges from the ionized air. More over the overhead Ionizer is designed with compact high voltage pulse circuitry for continuous trouble free operation.

OPERATION:

Switch on the "On/Off switch" for Activate the Overhead ionizer.

The unit produces an ionized air that covers a targeted area. The time required to neutralize a static charge on an item in the air-stream depends on distance from the charged object and the air velocity.

ION OUTPUT CHECK:

To test the unit for ion output, charged plate monitor is recommended. Discharge times can be measured and checked against the ion output. If a charged plate monitor is not available, the ion output may be checked with the following procedure. Take a piece of plastic and rub it with cloth until a static charge can be read with the STATIC FIELD METER. Turn on the overhead ionizer and Hold the plastic one-foot away from the ionized air outlet for 2-3 seconds. Take away the plastic from the ionized air stream and measure the static charge. The plastic should be neutralized.

SPECIFICATIONS:

Power supply	: 230V AC 50Hz
Power consumption	: 100 watts
Speed	: 2550 RPM
Air flow	: 2.24 m^3/min
Noise	: 55 dBA
Static pressure	: 6.4 mm H2O
Ionization voltage	: 6 - 8 KV
Ion balance	: under +/- 100 V
Construction	: Powder coated MS cabinet
Dimensions in mm	: 1095 x 165 x 85 mm
Weight	: 7.5 Kg (appx.)
Warranty	: One year

MAINTENANCE:

It is recommended that once in a year, the high voltage emitter pins should be cleaned with a soft cloth dipped in alcohol. Before doing this always switch off and unplug the unit. There are no user serviceable parts inside. In case malfunction, kindly refer servicing to manufacturer or authorised personnel.

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Explosive	Spark Energy mJ	How does it feel
Lead Styphnate	0.01	Can't feel it
Fast Delay Compositions, Red Lead/Silicon, $MoS_2/KclO_4$	0.1	Can't feel it
Ethyl Acetate, Fuse head lacquers	0.4 – 1.0	
Acetone	1.5 @ 4.5%	
Lead Azide (Dextrinated) Lead Azide (Crystalline)	3 0.004	Prickly
Lead Picrate	28	Muscle starts to twitch
Aluminium Flake	10	Prickly
HMX, PETN, TNT (Fine Dust, Through 100 mesh)	62	Muscle twitches
HMX, PETN, TNT (Coarse)	11,000	Fatal

DATA SHEET

OVERHEAD IONIZER

(Model: OHI-4F)

Overhead Ionizer are useful in neutralizing generated electrostatic charges, which may cause Electrostatic Discharge, Electrostatic Attraction, as well as preventing equipment latch-up and safety related shock. The model OHI-4F is overhead unit designed to neutralize static charges from insulator surfaces in assembly areas, wave soldering lines, laboratories, storage racks, test stations and packing areas. The unit can be conveniently hung over the work place and the four fans covers larger area to neutralize the charges.



The overhead Ionizer works on the principle of high voltage corona discharge to produce the neutralizing ions, and it produces ions airflow that is rich in positive and negative ions directing the airflow on an object that has static electricity in order to neutralize the charges. It will be neutralized by attracting opposite polarity charges from the ionized air. More over the overhead Ionizer is designed with compact high voltage pulse circuitry for continuous trouble free operation.

SPECIFICATIONS:

Power supply	: 230V AC 50Hz
Power consumption	: 100 watts
Speed	: 2550 RPM
Air flow	: 2.24 m^3/min
Noise	: 55 dBA
Static pressure	: 6.4 mm H2O
Ionization voltage	: 6 - 8 KV
Ion balance	: under +/- 100 V
Construction	: Powder coated MS cabinet
Dimensions in mm	: 1095 x 165 x 85 mm
Weight	: 7.5 Kg (appx.)
Warranty	: One year

Note: The specifications mentioned in this datasheet are subject to change without prior notice due to our continuous research of product development, Buyer or User should decide the suitability of the product for the intended application.

DATA SHEET

OVERHEAD IONIZER

(Model: OHI-2F)

Overhead Ionizer are useful in neutralizing generated electrostatic charges, which may cause Electrostatic Discharge, Electrostatic Attraction, as well as preventing equipment latch-up and safety related shock. The model OHI-2F is overhead unit designed to neutralize static charges from insulator surfaces in assembly areas, wave soldering lines, laboratories, storage racks, test stations and packing areas. The unit can be conveniently hung over the work place and the two fans covers larger area to neutralize the charges.



The overhead Ionizer works on the principle of high voltage corona discharge to produce the neutralizing ions, and it produces ions airflow that is rich in positive and negative ions directing the airflow on an object that has static electricity in order to neutralize the charges. It will be neutralized by attracting opposite polarity charges from the ionized air. More over the overhead Ionizer is designed with compact high voltage pulse circuitry for continuous trouble free operation.

SPECIFICATIONS:

Power supply	: 230V AC 50Hz
Power consumption	: 50 watts
Speed	: 2550 RPM
Air flow	: 2.24 m^3/min
Noise	: 50 dBA
Static pressure	: 6.4 mm H2O
Ionization voltage	: 6 - 8 KV
Ion balance	: under +/- 100 V
Construction	: Powder coated MS cabinet
Dimensions in mm	: 610 x 165 x 85 mm
Weight	: 4.8 Kg (appx.)
Warranty	: One year

Note: The specifications mentioned in this datasheet are subject to change without prior notice due to our continuous research of product development, Buyer or User should decide the suitability of the product for the intended application.

Users Manual

OVERHEAD IONIZER

(Model: OHI-2F)

Overhead Ionizer are useful in neutralizing generated electrostatic charges, which may cause Electrostatic Discharge, Electrostatic Attraction, as well as preventing equipment latch-up and safety related shock. The model OHI-2F is overhead unit designed to neutralize static charges from insulator surfaces in assembly areas, wave soldering lines, laboratories, storage racks, test stations and packing areas. The unit can be conveniently hung over the work place and the two fans covers larger area to neutralize the charges.

The overhead Ionizer works on the principle of high voltage corona discharge to produce the neutralizing ions, and it produces ions airflow that is rich in positive and negative ions directing the airflow on an object that has static electricity in order to neutralize the charges. It will be neutralized by attracting opposite polarity charges from the ionized air. More over the overhead Ionizer is designed with compact high voltage pulse circuitry for continuous trouble free operation.

OPERATION:

Switch on the "On/Off switch" for Activate the Overhead ionizer.

The unit produces an ionized air that covers a targeted area. The time required to neutralize a static charge on an item in the air-stream depends on distance from the charged object and the air velocity.

ION OUTPUT CHECK:

To test the unit for ion output, charged plate monitor is recommended. Discharge times can be measured and checked against the ion output. If a charged plate monitor is not available, the ion output may be checked with the following procedure. Take a piece of plastic and rub it with cloth until a static charge can be read with the FIELD METER. Turn on the overhead ionizer and Hold the plastic one-foot away from the ionized air outlet for 2 - 3 seconds. Take away the plastic from the ionized air stream and measure the static charge. The plastic should be neutralized.

SPECIFICATIONS:

Power supply	: 230V AC 50Hz
Power consumption	: 50 watts
Speed	: 2550 RPM
Air flow	: 2.24 m^3/min
Noise	: 45 dBA
Static pressure	: 6.4 mm H2O
Ionization voltage	: 6 - 8 KV
Ion balance	: under +/- 100 V
Construction	: Powder coated MS cabinet
Dimensions in mm	: 610 x 165 x 85 mm
Weight	: 4.8 Kg (appx.)
Warranty	: One year

MAINTENANCE: It is recommended that once in a year, the high voltage emitter pins should be cleaned with a soft cloth dipped in alcohol. Before doing this always switch off and unplug the unit. There are no user serviceable parts inside. In case malfunction, kindly refer servicing to manufacturer or authorised personnel.

DATA SHEET

WORKSTATION MONITOR

Model: WSM-02 / (For Two Operator)

In the electronics semiconductor industry ESD protected tables are used, which mainly consist of ESD mats or ESD laminates, and operators wear personnel groundings devices of ESD wrist straps. Both the items are most important for protection, and it is not possible to test the operators frequently in a day. As it will compromise the protection at any time the ESD damage can occur.

The model WSM-02 is a precession instrument to continuously monitor and give the indications by a visual & audible alarm to the operator of the ESD work surface grounding connections and operator's two wrist straps connections simultaneously & individually. It does what which wrist strap & foot wear tester, surface resistivity meter, Common Point Ground & earth bonding plug cannot do (i.e., continuous monitoring).



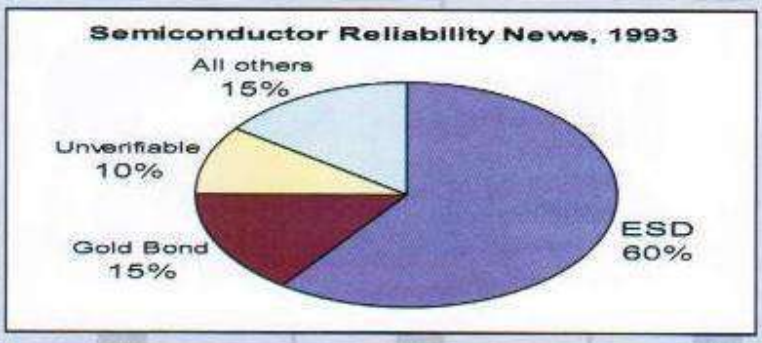
WRIST STRAP: This section continuously monitors the wrist straps to detect loss of continuity between operators and monitor simultaneously & individually. Conditions such as broken coils cords and improper contact with the skin are detected instantly to alert the operators. As there is no resistance return path from the wrist straps, it uses the "capacitive AC pulse principle" to check if the operators are adequately grounded.

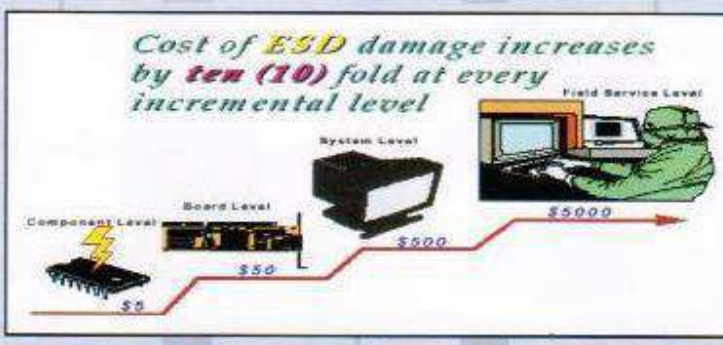
WORK SURFACE / GND: This section continuously monitors the work surface button to button resistance value, instrument to ground and work surface to ground connections simultaneously. This is monitored by a DC Resistive principle and a MAT/GND FAIL warning is given to the operator.

SPECIFICATIONS:

1. Wrist strap indications	: Pass – Green LED Fail – Flashing Red LED
2. Mat/Gnd indications	: Fail - Steady Red LED (Audible alarm For Fail modes)
3. Range	: 10 Meg ohms
4. Accuracy	: +/-10%
5. Input power	: DC 12V @ 300mA
6. Calibration	: Recommended every 12 months
7. Traceability	: To National Standards
8. Dimensions	: 135 x 110 x 30mm
9. Weight	: 450 gms
10. Warranty	: One year
11. Accessories	: Fixing clamp
12. Optional	: 12V DC Adopter & Grounding Cords.

KINETIC POLYMERS





Device Type	Threshold Susceptibility (Volts)	Device Type	Threshold Susceptibility (Volts)
MOSFET	10-100	SAW	150-500
VMOS	30-1800	OP-AMP	190-2500
NMOS	60-100	Schottky Diodes	300-2500
GaAsFET	60-2000	Film Resistors	300-3000
EPROM	100+	Bipolar Transistor	300-7000
CMOS	200-3000	ECL	500+
JEET	140-7000	SCR	500-1000
		Schottky TTL	500-2500

ANSI S20.20-2007 Standard

ESD Control Item	Test Method	Required Limit (s)[2]
Work Surface	ANSI/ESD S 4.1 and/or ANSI/ESD STM 4.2	< 1×10^9 ohms and/or < 200 volts
Wrist Strap Cord	ANSI/ESD S1.1	0.8×10^5 to 1.2×10^8 ohms
Footwear	ANSI/ESD STM 9.1	< 1×10^9 ohms
Foot Grounders	ESD SP9.2	< 1×10^9 ohms
Flooring	ANSI/ESD S7.1	< 1×10^9 ohms
Seating	ANSI/ESD STM 12.1	< 1×10^9 ohms
Garments	Static Control Garment (ANSI/ESD STM2.1)	< 1×10^{11} ohms
	Groundable Static Garment (ANSI/ESD STM2.1)	< 1×10^9 ohms
	Groundable Static Control Garment System (ANSI/ESD STM2.1)	< 3.5×10^7 ohms

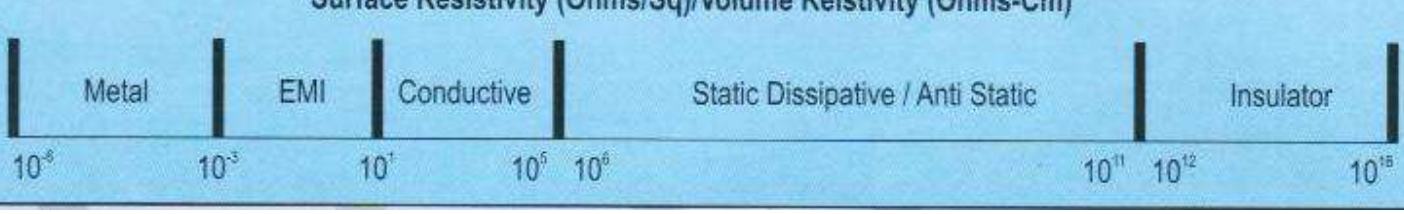
ESD Audit for Daily use

Product	Testing
Wrist Band	Daily
Shoe Grounder	Daily
Shoes	Daily
Work Surface	Monthly
Field Service Kit	Monthly
Flooring	Monthly
Chairs	Monthly
Ionizers	Monthly
ESD Safe Cloth	Semi Annual

Human Awareness Levels

We feel the discharge if it is greater than 3,500 volts. We hear the discharge if is greater than 5,000 volts. We see the discharge if it is greater than 8,000 volts. By comparison, integrated circuits that are used to make electronic circuit boards can be damaged by voltages as low as 100 to 1,000 volts.

Surface Resistivity (Ohms/Sq)/Volume Reistivity (Ohms-Cm)



Kinetic Polymers

(AN ISO 9001 - 2008 Certified Company)

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Phones : 7207078344, 7207008277, Telefax : 040-23093957

Email : kineticpolymers@gmail.com / Website : www.kineticpolymers.com

Facts about Static Electricity:

1) Every 3rd or 4th accident which occurs in chemical / pharma industries is caused by static electricity.

2) Every 10^{th} accidents caused in a chemical industry is due to dust explosion.

3) **75% of the accidents are caused in presence of solvent vapors.**

4) Most of the accidents are caused by Human errors.

5) **Ungrounded conductive object are responsible for 70% of the accident caused by static electricity.**

6) MIE of most of the Solvent Vapor are in the range of 0.15 to 1.5 mj (most common is 0.2 mj).

7) Normal polythene can discharge 0.9 mj of energy when it's statically charge and then grounded.

8) A Human body can discharge around 10 – 15 mj of energy in certain conditions when he develops static charge and get suddenly grounded.

9) A simple metal scoop can discharge an energy of 2 mj when suddenly grounded.

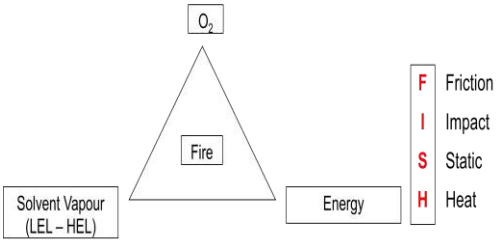
10) 100 Ltrs ungrounded metal drum can discharge 5mj of energy when suddenly grounded.

11) A Trolley made with metal and with a normal PU wheels can discharge 10 -15mj of energy.

12) A tanker has 50 mj of energy stored when it reaches your destination.

13) For a fire accident to happen the following are needed

- **Generation of Static Charge**
- **Accumulation of Static Charge**
- **Discharge of Static Charges**
- **Presence of Explosive atmosphere**
- **Discharge energy should be ≥ MIE of vapors.**



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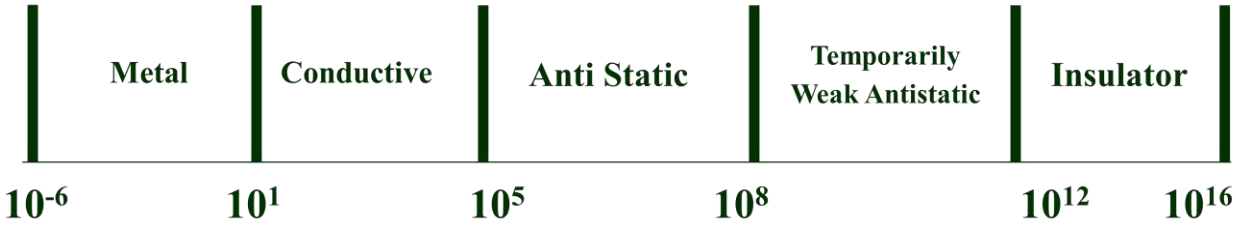
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Email : kineticpolymers@gmail.com / Website : www.kineticpolymers.com

Materials are classified as Anti-Static / Conductive / Insulator according to their surface resistivity

SURFACE RESISTIVITY (Ohms/Sq cm)



1) Insulator Generators Static Electricity during friction.

2) 60% - 70% of all chemicals used in our chemical industries are insulating in nature.

3) Grounding does not help much as they are insulator.

4) Any antistatic / conductive / metal which is closed by get this static charge induced in it.

5) If this antistatic / conductive / metal are ungrounded then the static charge get accumulation on it.

6) Sudden grounding of these material, get this static charges discharge, with energy as high as 10 – 50 mj.

7) Presence of Hydrocarbon vapor under this conditions lead to big fire accidents, as the MIE of various Solvent vapour are in the range of 0.15 – 0.5 mj.

Static Electricity on ungrounded Human body

$E = ½ Cv^2$ E = Energy C = Capacitance V =- Static Voltage

$E = ½ Cv^2 = 15mj$ $C = 300 \times 10^{-12}$ F V= 10KV

1) In order to solve the problem, one should get the values of 'V' less than 1000 volts.
2) Its possible only when:

- By using antistatic flooring.
- By using antistatic shoes.
- By using antistatic shoe covers.
- By using touch me pad.
- By using personnel static tester to check the static charge generated in our body, PST not only measures it also drain the static charge.

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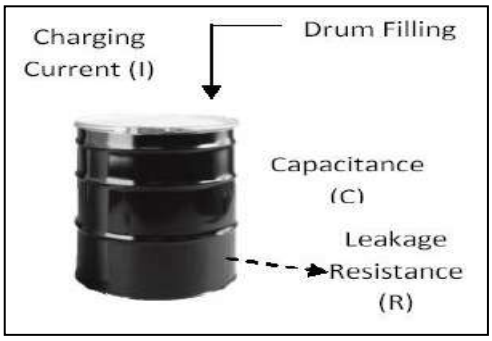
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S. No	Capacitance F	Voltage Volts	E Jouls	Limit	Danger
1.	300×10^{-12}	0	0	0.2 mj (2×10^{-4} j)	No
2.	300×10^{-12}	10	1.5×10^{-8}	2×10^{-4} j	No
3.	300×10^{-12}	100	1.5×10^{-6}	2×10^{-4} j	No
4.	300×10^{-12}	1000	1.5×10^{-4}	2×10^{-4} j	No
5.	300×10^{-12}	1200	2.1×10^{-4}	2×10^{-4} j	Danger
A human body if get charge to 1200 volts can be a danger person, responsible for fire accident.					

Example of ungrounded metal drum during filling:

- Typical capacitance (C) of drum: 100×10^{-12} Farads (F)
- Typical Charging current (I): 1×10^{-7} Amps (A)
- Typical leakage resistance (R): 1×10^{11} Ohms (Ω)
- Using Ohm's Law: V = I x R,
- The typical voltage (V): 10,000 Volts (V)
- Calculating stored energy, $E = 0.5\ CV^2$
- The typical energy available for spark discharge = 5mj



1) Only grounding / bonding, before filling the drum will remove the static electricity.
2) Use conductive pallets / proper grounding / using conductive hose pipe. Using conductive mug / bucket and bonding and grounding will help to reduce the static voltage.

Human Body Shocks: If human body gets ≥ 3000 volts, then he will get shock when the touch metal object.

- Use Human Body Voltage Checking Meter to know body voltage.
- Use Surface Resistivity Meter to know the resistance of material.
- Use Static Charge Meter to Identity the static charge.
- Use Touch pad to drain static charge.
- Use Conductive Shoes / Shoe Covers / Chairs / Aprons / Flooring to reduce the static electricity.
- Use Antistatic / Conductive PE bags for packaging chemicals / objects
- Use Safety Shield for lab work
- Use Flame proof torch
- Use Conductive waste bin / Bucket / Mug / Containers / Scoop / Spatula / Sampler, while handling chemicals.

ESD Association Standard

ANSI/ESD S20.20-2014

ANSI/ESD S20.20-2014
Revision of ANSI/ESD S20.20-2007

For the Development of an Electrostatic Discharge Control Program for –

Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)

Electrostatic Discharge Association
7900 Turin Road, Bldg. 3
Rome, NY 13440

An American National Standard
Approved July 31, 2014

Table 3. EPA ESD Control Items

Technical Requirement	ESD Control Item	Product Qualification[7]		Compliance Verification	
		Test Method	Required Limit(s)[8]	Test Method	Required Limit(s)
EPA	Worksurface[9,10] (Qualification can be done by either Test Method)	ANSI/ESD S4.1	Point to Point < 1 x 10^9 ohms	ESD TR53 Worksurface Section	Point to Ground < 1 x 10^9 ohms
			Point to Groundable Point < 1 x 10^9 ohms		
		ANSI/ESD STM4.2	< 200 volts		
	Wrist Strap	ANSI/ESD S1.1	0.8 x 10^6 to 1.2 x 10^6 ohms	For compliance verification of a Wrist Strap System, see Table 2.	
	Wristband	ANSI/ESD S1.1	Interior < 1 x 10^5 ohms		
			Exterior > 1 x 10^7 ohms		
	Personnel Ground wrist strap Connection (non-monitored)	ANSI/ESD S6.1	Point to Ground < 2 ohms	ESD TR53 Grounding Bonding Systems	Point to Ground < 2 ohms
	Footwear	ANSI/ESD STM9.1	Point to Groundable Point < 1 x 10^9 ohms	For compliance verification of Footwear / Flooring System, see Table 2.	
	Foot Grounders	ESD SP9.2	Point to Groundable Point < 1 x 10^9 ohms		
	Flooring	ANSI/ESD STM7.1	Point to Point < 1 x 10^9 ohms		
			Point to Groundable Point < 1 x 10^9 ohms		
	Seating	ANSI/ESD STM12.1	Point to Groundable Point < 1 x 10^9 ohms	ESD TR53 Seating Section	Point to Ground < 1 x 10^9 ohms

Table 3 continued on next page.

[7] Product qualification is normally conducted during the initial selection of ESD control products and materials. Any of the following methods can be used: product specification review, independent laboratory evaluation or internal laboratory evaluation.

[8] For standards that have multiple resistance test methods, these limits apply to all methods.

[9] Worksurfaces are defined as any surface on which an unprotected ESDS item is placed.

[10] Due to a wide variety of applications for worksurfaces, specific requirements that could be broadly applied are difficult to determine. If there is a concern for CDM failures, then a lower limit of 1x10^6 ohms for point to point and point to groundable point should be considered.

Technical Requirement	ESD Control Item	Product Qualification([7])		Compliance Verification	
		Test Method	Required Limit(s) ([8])	Test Method	Required Limit(s)
EPA	Ionization	ANSI/ESD STM3.1	Discharge Time User defined Offset Voltage $-35 < V_{offset} < 35$	ESD TR53[(11)] Ionization Section	Discharge Time User defined Offset Voltage $-35 < V_{offset} < 35$
	Shelving (When used to store unprotected ESDS)	ANSI/ESD S4.1	Point to Point $< 1 \times 10^9$ ohms Point to Groundable Point $< 1 \times 10^9$ ohms	ESD TR53 Worksurface Section	Point to Ground $< 1 \times 10^9$ ohms
	Mobile Equipment (Working Surfaces)	ANSI/ESD S4.1	Point to Point $< 1 \times 10^9$ ohms Point to Groundable Point $< 1 \times 10^9$ ohms	ESD TR53 Worksurface Section	Point to Ground $< 1 \times 10^9$ ohms
	Electrical Soldering / Desoldering Hand Tools	ANSI/ESD S13.1	Tip to Ground < 2.0 ohms Tip < 20 millivolts Tip Leakage < 10 milliamps	ESD TR53 Soldering Iron Section Or ANSI/ESD S13.1 Section 6.1	Tip to Ground < 10 ohms
	Continuous Monitors	User defined	User defined	ESD TR53 Continuous Monitors Section	Manufacturer defined
	Static Control Garment	ANSI/ESD STM2.1	Point to Point $< 1 \times 10^{11}$ ohms	ESD TR53 Garments Section	Resistance Point to Point $< 1 \times 10^{11}$ ohms
	Groundable Static Control Garment	ANSI/ESD STM2.1	Point to Groundable Point $< 1 \times 10^9$ ohms	ESD TR53 Garments Section	Resistance to Groundable Point $< 1 \times 10^9$ ohms
	Groundable Static Control Garment System	ANSI/ESD STM2.1	$< 3.5 \times 10^7$ ohms	ESD TR53 Personal Grounding with Garments Section	$< 3.5 \times 10^7$ ohms

8.4 Packaging

The organization shall define ESD protective packaging requirements, both inside and outside the EPA per ANSI/ESD S541 or in accordance with the contract, purchase order, drawing or other documentation necessary to meet customer requirements.

NOTE: When ESDS items are placed on packaging materials and the ESDS items have work being performed on them, then the packaging materials become worksurfaces. The worksurface requirements for resistance to ground apply.

[11] For additional information on periodic testing of Ionizers, see ANSI/ESD SP3.3.

BSI

total 8 Pages

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BS 2050 : 1978

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Specification for

Electrical resistance of conducting and antistatic products made from flexible polymeric material

Spécification de la résistance électrique des produits anti-électrostatiques fabriqués à partir des matériaux polymères souples

Spezifikation für den elektrischen Widerstand von leitfähigen und antistatischen Erzeugnissen aus biegsamen polymeren Werkstoffen

(2)

2050 : 1978

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Cooperating organizations	Back cover

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Foreword

This standard has been prepared under the direction of the Plastics Standards Committee and the Rubber Standards Committee. It was originally published in 1953 and was revised in 1958 and 1961. The early editions covered conducting and antistatic rubber products deriving their electrical conductivity from carbon black. The 1961 edition and the present document have been extended to cover all types of flexible polymers and to permit the electrical conductivity to be derived from substances other than carbon black.

This standard is based on the following three draft International Standards (ISO/DIS) amended in accordance with the United Kingdom comments submitted on these draft standards.

ISO/DIS 2878 Antistatic and conductive rubber products – Determination of electrical resistance

ISO/DIS 2882 Antistatic and conductive products for hospital use – Electrical resistance

ISO/DIS 2883 Antistatic and conductive products for industrial use – Electrical resistance

In this revision the electrical requirements for hospital products have been segregated from those for industrial products. The list of industrial products has been augmented by the addition of synchronous belts, textile cots and aprons and by the expansion of the requirements for tyres, solid and pneumatic, for various applications. In addition the distinction made in the definitions in the earlier editions between conductive and antistatic products has been found to be misleading and has therefore been omitted from this revision.

British Standard Specification for

Electrical resistance of conducting and antistatic products made from flexible polymeric material

0. Introduction

The elimination or reduction of static charges is important in many applications. While the antistatic properties of an article are influenced by the electrostatic charging characteristics, the only way to ensure that charges are never developed on an object is generally to provide suitable leakage paths. This British Standard deals exclusively with products which may form part of such leakage paths.

Polymeric compounds can be made into conductors of electricity by the incorporation in the compound of conducting particles, especially carbon black, or ionizable materials, or a combination of the two. The addition of carbon black to a polymer in sufficient quantities causes a conducting network of carbon particles to be formed within the mixture, and materials with a wide range of electrical conductivity can be produced. The carbon structure is sensitive to strain and the electrical resistance of the material depends on the degree of strain to which it has been subjected and the time and temperature history after strain.

Materials made conducting by the addition of ionizable materials are generally of a higher order of magnitude of resistivity than those containing carbon but do not change appreciably in resistivity with strain. Their resistivity decreases with increase in temperature.

During service the resistance of products made from both types of material may change significantly and it is therefore necessary to ensure that the product is capable of fulfilling its designed function of dissipating electrostatic charges and conducting electricity during the whole of its life. In general the resistance of new products should not exceed 10^7 Ω but in certain cases, or with certain materials, higher values may be permitted. Values lower than 5×10^4 may not give adequate protection against fire from ignition of the rubber and against dangerous electric shock where there is any risk of apparatus becoming defective when operating at a voltage of 250 V to earth.

A method for the measurement of the resistivity of specially prepared test pieces of antistatic and conducting rubber is described in BS 2044.

1. Scope and field of application

1.1 This British Standard specifies limits of electrical resistance for antistatic and conducting articles and products manufactured wholly or in part from natural or synthetic rubbers, from polyvinyl chloride, from other flexible polymeric materials or from mixtures of these. carbon black and/or other appropriate substances to the bulk of the material.

This British Standard does not apply to:

(a) articles, the relevant surfaces of which are composed of mixtures of insulating and conducting areas; or to

(b) articles with a substantial surface area of insulating material, except for

(1) hoses that have only a conductive lining or a conductive cover, and

(2) footwear, which does not normally have a conductive or antistatic upper.

The resistance values given have been found suitable for certain products for hospital and industrial uses and are given as a guide. When British Standard product specifications for individual products have been issued, test methods and resistance values given in the appropriate product specification should be used in preference to those given in this document.

1.2 This British Standard also describes methods of test to determine the electrical resistance of antistatic and conductive articles and products manufactured wholly or in part from a flexible polymeric material.

The tests are carried out on the finished product using a defined system of electrodes by a system suitable to factory inspection or service testing. These methods are not appropriate where the measured resistance is greater than 3×10^8 Ω.

NOTE. Only if their suitability has been established experimentally, should these methods of test be used for products not covered by this British Standard (e.g. products in which the electrical conductivity is not obtained by the addition of carbon black and/or other appropriate substances to the bulk material or which have a substantial area of insulating material).

2. References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

3. Methods of test

The product shall be tested by the appropriate method described in appendix A.

4. Requirements

The electrical resistance of the product, as supplied new, shall comply with the requirements given in table 1 or 2, as appropriate.

Table 2. Electrical requirements for industrial products (See 1.1.)

Item	Product	Electrical resistance, Ω		Method of test (reference to clause in appendix A)
		min.	max.	
1	Flooring for explosive handling areas	–	5×10^4	A.4.2
2	Flooring for antistatic purposes	5×10^4	10^8	A.4.1
3	Footwear, conducting (soles and heels), for explosive handling areas	–	1.5×10^5	A.4.15 (a)
4	Hose	3×10^3 per m	10^6 per m	A.4.5* A.4.6
5	Hose with conducting lining only	3×10^3 per m	10^6 per m	A.4.12
6	Hose with conducting cover only	3×10^3 per m	10^6 per m	A.4.13
7	Non-wire-reinforced hose with permanently attached metal end fittings	3×10^3 per m	10^6 per m	A.4.14
8	Tyres for explosives handling vehicles	–	5×10^5	A.4.3 or A.4.11
9	Antistatic tyres	10^4 †	10^7	A.4.3 or A.4.11
10	Textile cots and aprons	–	10^8	A.4.10
11	Sheeting and articles made from sheeting; both surfaces to be tested	–	10^6	A.4.1
12	Footwear, antistatic soles and heels	7.5×10^4	5×10^7	A.4.15 (a) and (b)
13	Transmission belting, flat‡, where L is dry distance between electrodes W is width of belt	–	$\frac{10^5 L}{8W}$	A.4.16
14	Wedge and V-belts‡, where L is dry distance between electrodes Z is sum of widths of the two driving surfaces of the belt	–	$\frac{5 \times 10^6 L}{8Z}$	As in BS 1440 and BS 3790
15	Conveyor belts for mining	–	3×10^8	As in BS 3289
16	Synchronous belts, where L is dry distance (measured in a straight line) between electrodes W is width of belt	–	$\frac{5 \times 10^6 L}{8W}$	A.4.17

*See, however, A.4.6 if this method is used.

†This minimum value applies to new tyres; in use the resistance increases rapidly during the first few flexings and this low limit is necessary to ensure the retention of antistatic properties during a reasonable service life.'

‡These values apply to belts made conductive by carbon black. They do not necessarily apply to belts made conductive in other ways.

Table 1. Electrical requirements for hospital products (See 1.1)

Item	Product	Electrical resistance, Ω		Method of test (reference to clause in appendix A)
		min.	max.	
1	Anaesthetic airways	–	10^6	A.4.5
2	Anaesthetic bellows	–	10^6	A.4.2
3	Anaesthetic face pieces	–	10^6	A.4.2, A.4.3
4	Anaesthetic tubing	3×10^4 per m	10^6 per m	A.4.4 A.4.5
5	Breathing bags		10^6	A.4.7, A.4.8
6	Flooring material	5×10^4	2×10^6	A.4.1
7	Footwear	7.5×10^4	5×10^7	A.4.15 (a) and (b)
8	Furniture buffers	–	10^6	A.4.10
9	Furniture feet	–	10^6	A.4.9
10	Hose	3×10^3 per m	10^6 per m	A.4.5* A.4.6
11	Mattresses and pads	10^4	10^6	A.4.2
12	Sheeting and articles made from sheeting (e.g. aprons) for hospital use: both surfaces to be tested	–	10^6	A.4.1
13	Tyres for castors and wheels for hospital furniture complying with the requirements of BS 2099	–	10^4	A.4.3
14	Non-wire-reinforced hose with permanently attached metal end fittings	3×10^3 per m	10^6 per m	A.4.14
15	Mouldings, small	–	10^6	A.4.2

*See, however, A.4.6 if this method is used.

NOTE. Safety codes for antistatic products for use in anaesthetizing areas for hospitals usually require that the resistance shall not exceed 10^8 Ω at any time during their useful life.

5. Marking

Marking shall be indelible and clearly visible but of the smallest practicable area to avoid the introduction of unnecessary insulating material. The position of the marking shall be such that it will not materially affect the electrical resistance of the discharge path. The marking of any sheeting or hose shall be applied throughout the length at intervals of not more than 0.3 m for hospital products, but of not more than 3 m for industrial products, and 9 m for conveyor belting.

NOTE. It is preferable that a floor should be marked with an installation test plate.

For hospital products each item shall be marked in lemon yellow colour and, where practicable, it shall include the word 'antistatic'. For industrial products each article without a lower limit specified for resistance shall be marked with the words 'electrically conducting', preferably in red.

6. Number of tests

The number of tests shall be decided in accordance with the following criteria, in order of preference:

(a) by reference to a British Standard for the particular product, if one exists;

(b) by reference to the appropriate part of the appendix, if given there;

(c) by applying the following principles:

(1) for small articles such as furniture feet and for articles used between defined contact points, one test shall be made;

(2) for other articles such as tyres, sheeting, belting and pads, at least five tests shall be made on different areas chosen so that the tests will be representative of the electrical properties of the whole article.

All the test results shall be within the specified limits.

Appendix A

Methods for the determination of electrical resistance

A.1 Apparatus

A.1.1 *Testing instruments.* The test shall be made with an instrument having a nominal open circuit voltage of 500 V d.c., preferably an insulation tester (ohm meter) or with any suitable instrument known to give comparable results.

The instrument shall be sufficiently accurate to determine the resistance to within 10 % and shall not dissipate more than 3 W in the test piece.

NOTE. The insulation tester has an inherent characteristic of limited power output and also the voltage which it applies to the test piece decreases below its open circuit voltage at low resistance values of the test piece. This is a useful characteristic as it reduces the risk of shock and also of overheating the test piece. Insulation testers of this type may have manually or power driven generators or may be battery or mains operated multi-range instruments with similar electrical characteristics.

The resistance values obtained vary with the applied voltage and errors may occur when low test voltages are involved. In cases of dispute, the voltage applied to the test piece shall not be less than 40 V, except where this conflicts with the requirement not to dissipate more than 3 W in the test piece.

A.1.2 *Electrodes and contacts.* Except where otherwise stated in A.4, electrodes shall be formed on the surface by means of a conductive silver lacquer, colloidal graphite or a conductive liquid. The conductive liquid shall consist of:

	Parts by mass
Anhydrous polyethylene glycol of molar mass 600	800
Water	200
Wetting agent	1
Potassium chloride	10

When a conductive liquid is used, the electrode contact area shall be completely wetted and shall remain so until the end of the test.

The conductive silver lacquer or colloidal graphite shall be of a type that dries in air at room temperature, and the surface resistivity of the dried film shall be below $10^2\ \Omega$.

Clean metal contacts shall be applied to the electrodes so that the contact area is approximately the same size but no greater than the electrodes, except where specified. With electrodes other than the liquid type and where specified below for the liquid electrodes, the product specification shall state the mass of the metal contacts.

The surface of the product shall not be deformed either during the application of the contacts or during the test, except as far as is necessary to insert the electrodes specified in A.4.7 and A.4.8. The product shall be supported on an insulating surface except when otherwise specified.

A.2 Conditions of test

A.2.1 *Time lapse requirements.* For all test purposes the minimum time between manufacture and testing shall be 16 h.

NOTE. Whenever possible, the time between manufacture and testing should not exceed three months. In other cases tests should be made within two months of the customer's date of receipt of the product.

If the articles are very large they shall be tested in the factory atmosphere and the temperature and humidity shall be recorded.

A.3 Procedure (general)

A.3.1 *Conditioning.* During the time lapse between manufacture and testing, or between receipt of the product and testing, subject the article to either of the following conditions.

(a) Maintain in the undeformed state at 23 ± 2 °C without mechanically straining in any way.

(b) Strain once to the maximum limit to which the product is to be subjected in normal use. Thereafter maintain in the unstrained state at 23 ± 2 °C for at least 24 h.

A.3.2 *Cleaning.* Clean the surface to be tested by rubbing with fuller's earth (magnesium aluminium silicate) and water, washing with distilled water and allowing to dry at a temperature of 23 ± 2 °C. The surfaces shall not be buffed or abraded, or cleaned with organic materials which attack or swell the materials to be tested.

NOTE In the case of hoses, dry fuller's earth should be used.

A.3.3 *Application of electrode.* Immediately apply the electrodes and metal contacts as appropriate to the article to be tested as described in A.4.

A.3.4 *Reconditioning.* Recondition the article for not less than 15 min or more than 2 h in the unstrained state at a temperature of 23 ± 2 °C and at a relative humidity of 50 ± 5 %.

A.3.5 *Testing.* Support the product on an electrically insulating surface except where otherwise specified. Apply the voltage in the manner appropriate to the article as described in A.4, taking the resistance reading 5 ± 1 s after the application of the voltage.

NOTE. As some materials are sensitive to moisture, great care should be taken to avoid breathing on the samples prior to and during the resistance test.

A.4 Procedural details applicable to different articles

A.4.1 *Tests on one surface.* Apply electrodes to two areas, each a square with sides approximately 25 mm, such that the distance between the facing edges is 50 ± 5 mm, located on the same surface of the article to be tested.

Apply the metal contacts to the electrodes and measure the resistance.

A.4.2 *Tests between two surfaces.* Apply electrodes to two areas, each approximately 25 mm square.

The test areas shall be so located that the results represent the electrical resistance of the normal discharge path in the working conditions anticipated. Specifications for particular products shall state the location of the test areas.

Apply the metal contacts to the electrodes and measure the resistance.

A.4.3 *Tests on products bonded or clamped to one metal part.* Apply an electrode to an area as nearly as possible 25 mm square on the working surface of the product. The area shall not extend to other surfaces.

Apply a metal contact to the electrode and measure the resistance from this contact to the bonded or clamped metal.

NOTE. For tyres for castors or wheels for hospital furniture, the test may be carried out by placing the tyre on an insulated wet

A.4.4 *Tests on products bonded or clamped to two metal parts.* Measure the resistance between the metal parts.

A.4.5 *Tests on hose and tubing.* Two tests shall be carried out:

(a) Apply electrodes on the inside surface at one end (A) of the tube and on the outside surface at the other end (B). The electrodes shall be 25 mm wide bands applied around the circumference of the hose or tubing.

Apply the metal contacts to the electrodes and measure the resistance.

(b) As (a), but with the electrodes situated on the inside surface at end (B) and outside surface at end (A) of the tube.

NOTE. Care should be taken to ensure that the hose or tubing is insulated from any leakage path in parallel with the length under test and that no electrically conducting contact takes place between successive coils along the length of the hose

A.4.6 *Tests on hose and tubing over 6 m in length on which tests are carried out on the ends only.* Apply electrodes on the inside surface at one end of the tube and on the outside surface at distances of 3 m and 6 m from the same end. The electrodes shall be 25 mm wide bands applied around or inside the circumference of the hose or tubing. Apply the metal contacts to the inside electrode and to the outside electrode at 3 m and measure the resistance.

NOTE. Care should be taken to ensure that the hose or tubing is insulated from any leakage path in parallel with the length under test and that no electrically conducting contact takes place between successive coils along the length of the hose.

Repeat the measurement between the inside and the electrode at 6 m. The difference between these resistance values shall be recorded as the resistance for 3 m of the hose. If any reading exceeds 10^7 Ω, thoroughly check all electrodes and repeat the test.

A.4.7 *Tests on anaesthetic breathing bags with one neck.* Apply one electrode 25 mm square to the middle of the outer surface and the other electrode inside the neck of the bag. The latter shall be a 25 mm wide band applied to the inner circumference of the neck of the bag. A metal tube, 5 % to 10 % larger in diameter than the neck, shall be inserted in the neck. Measure the resistance between the tube and the central electrode.

A.4.8 *Tests on anaesthetic breathing bags with two necks.* Two tests shall be carried out. Apply electrodes inside the necks of the bag and to an area as nearly as possible 25 mm square in the centre of the outside surface of the bag. The former electrodes shall be 25 mm wide bands applied to the inner circumference of the necks. Insert in the necks of the bag metal tubes 5 % to 10 % larger in diameter than the necks.

Apply the metal contacts to the central electrode and to one of the tubes. Measure this resistance. Measure the resistance from the central electrode to the other tube.

A.4.9 *Tests on furniture feet.* Apply electrodes to the whole of the bottom surface of the cavity into which the leg of the furniture fits and to the whole of the surface normally in contact with the floor.

Apply the metal contacts to the electrodes and measure the resistance.

A.4.10 *Tests on furniture buffers, textile cots and aprons.* Apply electrodes to the surfaces which would normally make contact to provide the electrical path so that the of the electrodes shall be as large as practicable but shall not extend beyond the contacting areas, and shall not exceed 25 mm square.

Apply the metal contacts to the electrodes and measure the resistance.

A.4.11 *Tests on detachable tyres having tread to rim conduction.* Apply electrodes to three areas each as nearly as possible 25 mm square. One test area shall be located on the external portion of each bead of the tyre which will be in contact with the flange of the rim, and the third on the centre line of the tread.

Apply a metal contact to the electrode on the centre line and to each of the others in turn and measure the resistances. Both readings shall fall within the specified limits.

A.4.12 *Tests on hose with conducting lining only.* Apply electrodes on the inside surface at each end of the hose. The wetted areas shall be 25 mm wide bands applied around circumference. Apply the metal contacts to the electrodes and measure the resistance.

A.4.13 *Tests on hose with conducting cover only.* Apply electrodes on the outside surfaces at each end of the hose. The electrodes shall be 25 mm wide bands applied around the circumference of the hose. Apply the metal contacts to the electrodes and measure the resistance.

NOTE. Care should be taken to ensure that the hose or tubing is insulated from any leakage path in parallel with the length under test and that no electrically conducting contact takes place between successive coils or loops along the length of the hose.

A.4.14 *Tests on non-wire-reinforced hose with permanently attached metal end fittings.* Measure the resistance between the fittings.

A.4.15 *Tests on footwear.* Antistatic footwear shall be tested by methods (a) and (b) below and conducting footwear by method (a) only.

(a) *Wet/wet electrode system.* With the footwear resting with the heel and sole in contact with a metal plate, wetted with tap water containing a small quantity of a wetting agent, apply a metal contact to a liquid electrode 25 mm × 25 mm inside the footwear in the sole area of the insole and measure the resistance. Repeat this procedure with the liquid electrode in the heel area and measure the resistance. It is permissible to place a thoroughly wetted fabric pad between the metal plate and the footwear.

For antistatic footwear take the lower reading as the minimum resistance value.

For conductive footwear take the lower reading as the maximum resistance value.

In the case of dispute the resistance shall be measured with a force of 45 N applied to the 25 mm square electrode and a similar force applied in the sole area when the electrode is in the heel area and vice versa, and for antistatic footwear only, the test voltage shall be not less than 200 V d.c.

NOTE. Combined electrodes consisting of a metal electrode enclosed in a moistened pad may be used in place of the internal liquid electrode/metal plate system.

(b) *Wet/dry electrode system.* With the footwear resting with heel and sole in contact with a dry metal plate apply a metal contact to a 25 mm × 25 mm liquid electrode inside the footwear in the sole area of the insole and

Take the lower reading as the maximum resistance value.

In the case of dispute the resistance shall be measured with a force of 45 N applied to the 25 mm square electrode and a similar force applied in the sole area when the electrode is in the heel area and vice versa.

NOTE. Combined electrodes consisting of a metal electrode enclosed in a moistened pad may be used in place of the internal liquid electrode/metal plate system.

A.4.16 *Tests on flat transmission belting.* Apply electrodes to two areas each 25 mm wide and extending across the full width of the belt and separated by a dry distance of 600 ± 12 mm on the face of the belt which will make contact with the pulley. Apply the contacts to the electrodes and measure the resistance.

For endless belting less than 3 m long the dry distance shall be reduced to 100 ± 5 mm.

A.4.17 *Tests on synchronous belts (toothed transmission belts).* Without cutting the belt, and using insulating clamps, lightly clamp flat a length of belt comprising at least 17 teeth (with the teeth uppermost) on to an insulating surface. Apply liquid electrodes to two areas on the toothed side of the belt and extending across the full width of the belt. The electrodes shall each cover the top surface of 3 adjacent teeth and the sides and bottoms of the 2 grooves between them and shall extend across the width of the belt. The dry distance between the electrodes shall span 7 grooves and 6 teeth. Apply to each electrode a flat metal contact which covers the top surfaces of the three teeth. Apply to these surfaces a pressure of between 10 kPa and 40 kPa.

Measure the resistance between the contacts.

A.5 Test report

The test report shall include the following particulars:

(a) full identification of the article tested;

(b) reference to the method of test used (e.g. BS 2050, A.4.11);

(c) whether or not mechanically strained (A.3.1(a) or (b));

(d) the electrode material and size;

(e) each individual test result;

(f) the average test result.

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Stec – 7 Standards

Equipment. Thus if material poured from one portable sized container to another, electrical contact between them and earth should be made before hand. If a composition has an ignition energy grater than 0.001 Joule, then conducting floors and bench tops will not be necessary. If the ignition energy is in the range of 0.001 Joule to 0.045 Joule,i.e., in the lower energy range of the intermediate class, then items of highly insulating materials may be considered but should not be used if they have surface areas grater than 100 cm^2 e.g. outer garments, screens and plastic bags. In this energy range, the minimum relative humidity required for second degree precautions is not necessary, and may not be desirable.

1) A warning notice should be displayed on buildings in which Antistatic precautions are necessary. A list of explosives which require maximum Antistatic precautions, to be taken when they are exposed or handled is given at Appendix 'E'

2) The basic difference between conducting and Antistatic flooring is its electric resistivity and the requirements are : -

Conducting grade	-	Resistance of floor surface to earth must be less than 50×10^3 Ohms
Antistatic grade	-	Resistance of floor surface to earth must be between 50×10^3 and 2×10^6 Ohms

When measured with a wet electrode in accordance with the following method :-

a) The surface of the floor is to be clean and dry. The application of fullers earth followed by wiping with distilled water is suitable method of cleaning.

b) Tests shall be carried out with an insulation tester having an open circuit voltage of 500 volts D.C. If explosives are present, an intrinsically safe and certified instrument must be employed. The instrument used shall not dissipate more than 3 watt in the flooring and the time of test shall not be longer than is necessary for obtaining a stable reading.

c) The electrode system shall consist of a smooth flat metal foil, a layer of rubber and a weight having an area of 25 cm^2. The metal foil shall be of tin or tin on lead approximately 0.025 mm thick and shall be backed by a layer of rubber approximately 6 mm thick and having a hardness not greater than 60 degree BS. The weight to rest on the rubber layer is to be approximately 0.91 kg.

d) The floor surface over an are equal to the area of the metal foil shall be wetted with a wetting agent (such as Teepole or similar detergent). The electrode shall be placed on the floor and the electrical resistance measured between the electrode and known earth connection.

e) Tests are to be carried out between each square meter of the floor and the known earth connection.

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3). Installation of conducting and Antistatic flooring is to be on a sub floor which should be protected by an effective damp proof membrane. Bonding strips are to be laid on the sub floor in the form of a grid under the flooring material. The spacing of the grid shall ensure that at least 2 earth paths are available to each tile or roll of flooring and the grid shall be connected to the electrical path of the building in 2 positions preferably at diametrically or diagonally opposite points of the floor. The grid material should either be brass or copper, or stainless steel of minimum thickness 0.1 mm. Where a non-electrically conducting adhesive is used great care is to be taken to prevent the adhesive impairing the conductance between the bonding strips and the undersurface of the flooring material.

4) Since the first principle of Antistatic precaution is to prevent ignition of explosives situations where maximum Antistatic precautions are required conducting flooring should be used. In areas where there may be a high degree of risk to personnel from electric shock such as research and testing laboratories and missile test areas it may be desirable to use Antistatic flooring as an additional precaution to the basic requirements given above.

5). The use of a personnel test meter for monitoring persons entering buildings fitted with conducting or Antistatic flooring is recommended. The test system needs to ensure that the total resistance or personnel wearing conductive foot-wear on a conducting flooring to earth should not exceed 10^6 Ohms and that the total resistance of a personnel wearing Antistatic footwear or an Antistatic floor should not exceed 10×10^6 Ohms. Where stores or compositions are segregated for investigation because of suspected micro joule sensitivity or damage then these must be examined under conducting conditions, i.e., with maximum personnel to earth resistance of 10^6 Ohms. Personnel test meters are to be maintained in accordance with the operating instructions.

6). The method to sitting of personnel test meter is important. Test meters should always be placed at the entrance to the building i.e., verandah / lobby and the earth electrode should be connected to the earthed grid of the conducting or Antistatic floor or the building. The use of brass earth plates as foot electrodes is not recommended as this does not check the actual conditions with in the building.

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Standards :

- **NFPA – 77**
- **Chilworth**
- **Dupont**
- **ESD Journal**
- **Journal of Electrostatic**
- **ISI Book (IS 7689 : 1989)**

- **www.esdjornal.com**
- **www.chilworth.com**
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- **www.esda.org**
- **www.csb.gov**
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