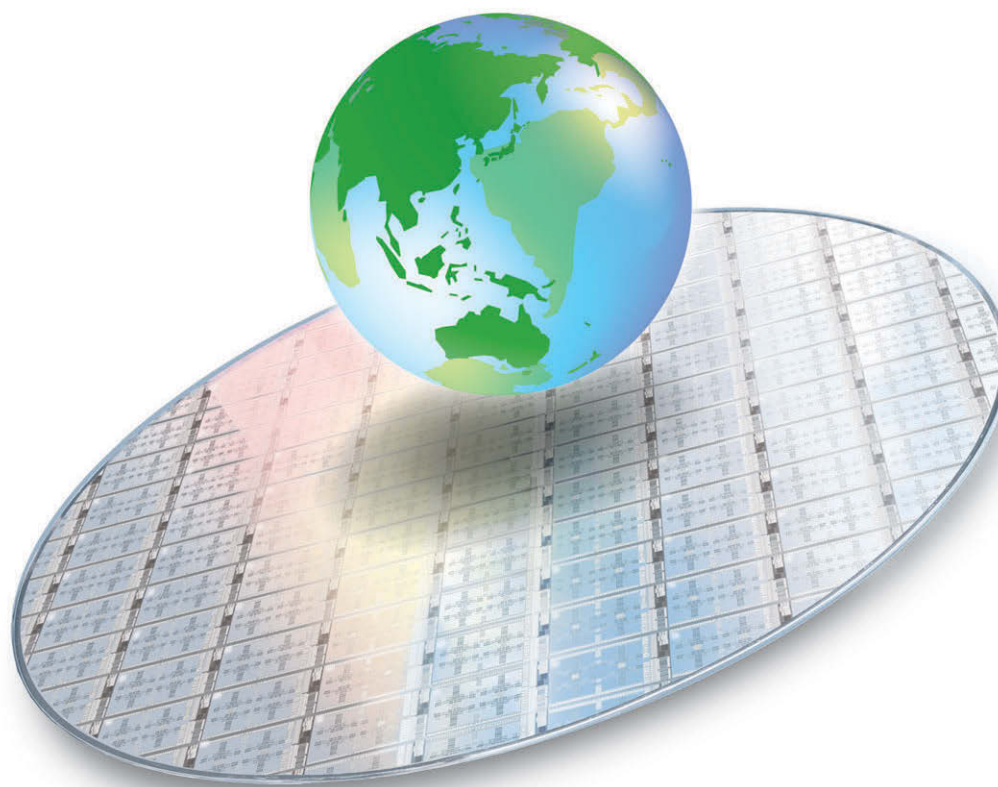


always with you... Achilles

**Achilles**

Materials & Products

# ANTI STATIC MATERIALS vol.12



# Thinking and creating with you... this is what Achilles' static control technology is all about.

## Appropriate static management and cleanliness measures That is Achilles' objective

For IC and electronics field that requires high level of submicron design rules, high density, and cleanliness level, it is essential to have measures for static control and cleaning. Achilles can support your company's target for yield improvement and quality assurance by means of both software and hardware aspects. It is Achilles' wish that we can develop static control products that has good cost-performance, provide services, and therefore can jointly create optimal solutions for static control and cleanliness of your products.

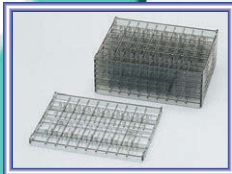
Static control with hardware approach



### Joint development



Achilles believes that it is important to have different static control method for different process and different application. We create static control products that offer good cost-performance.



### Conductive technology



Achilles supports you and your static control measures with our various conductive technologies.



### After care services

For static control, it is very important to keep watching the process after introducing the management plan. Achilles offers good after sales service to ensure your static control measures last long and stable.



### Process check

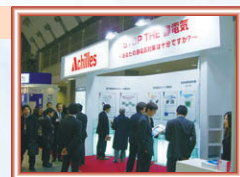


The most efficient way to increase process yield is to immediately identify the root cause of static disorder and execute necessary measures. Achilles offers improvement suggestions for your process with our rich know-how.



### Exhibition

Achilles believe that Exhibition is very good opportunity to exchange information and think together about static issues.



### Employee training Program

It is essential to have each one of operator has good understanding of static management. Achilles can help by providing the training program at your site.



Static control with software approach

# For the Future, For the World



**ACHILLES ADVANCED TECHNOLOGY CO.,LTD.**  
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 Hsinchu City 30069, TAIWAN  
 Tel.886-3-5737300 Fax.886-3-5737355



**ACHILLES HONG KONG CO.,LIMITED**  
 Unit A, 5/F., Winner Building, 36 Man Yue Street, Hung  
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 Tel.852-2362-8324 Fax.852-2764-1024



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 Room 1507, Shanghai International Trade Center,  
 2201 Yan An West Road, Shanghai. 200336 CHINA  
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**ACHILLES USA, INC.(HEADQUARTERS)**  
 1407, 80th Street, S.W., Everett, Washington 98203,  
 U.S.A.  
 Tel.1-425-353-7000 Fax.1-425-347-5785



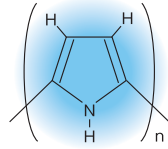
**ACHILLES USA, INC. (DETROIT Sales Office)**

## Conductive Polymer processing technology

Our company's conductive polymer layer is made with polypyrrole, a conductive polymer with an electronic conjugated system that provides uniform coating, compounding, and conductivity on surfaces of various materials and shapes of base materials.

### Conductive polymer construction

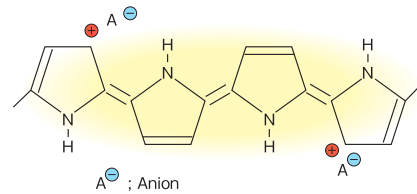
$1 \times 10^8 \Omega$   
Dissipative  
To  
Conductive  
 $1 \times 10^3 \Omega$



Polypyrrole

Conductive polymer that has an electronic conjugated system.

### Mechanism of electron conduction



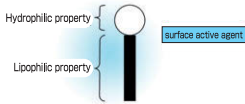
Bipolaron (Di-cation) on the polymerized complex move between main complex structure to carry electrons.

## Antistatic agents processing technology

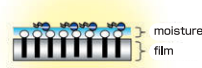
Antistatic additives are heavily used as antistatic processing agents. Achilles does not allow compromises in even antistatic additives.

$1 \times 10^{11} \Omega$   
Dissipative  
 $1 \times 10^9 \Omega$

### Surface active agent based antistatic agent



### Mechanism of antistatic agent



### Features of Achilles' antistatic agent

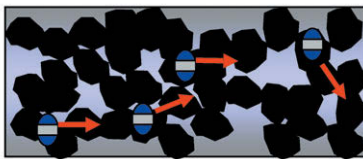
- Stable bleed out performance.
- Low level of pollution and decay.

## Carbon conductive processing technology

Carbon offers optimum stability for conductive processing technology. Taking advantage of this property, we at Achilles continue to develop various products according to purposes and material types.

$1 \times 10^6 \Omega$   
Conductive  
 $1 \times 10^4 \Omega$

### Mechanism of carbon conduction



### Features of Achilles' carbon

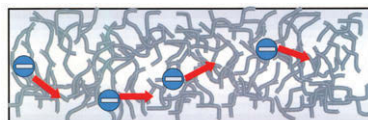
- Stable conductive performance.
- Allows appropriate compounding of carbon power and carbon fiber according to each purpose.

## Metal conductive processing technology

Metal has the highest conductive performance. Achilles develops various products using materials such as evaporated metal, plating, aluminum flakes, and stainless fiber.

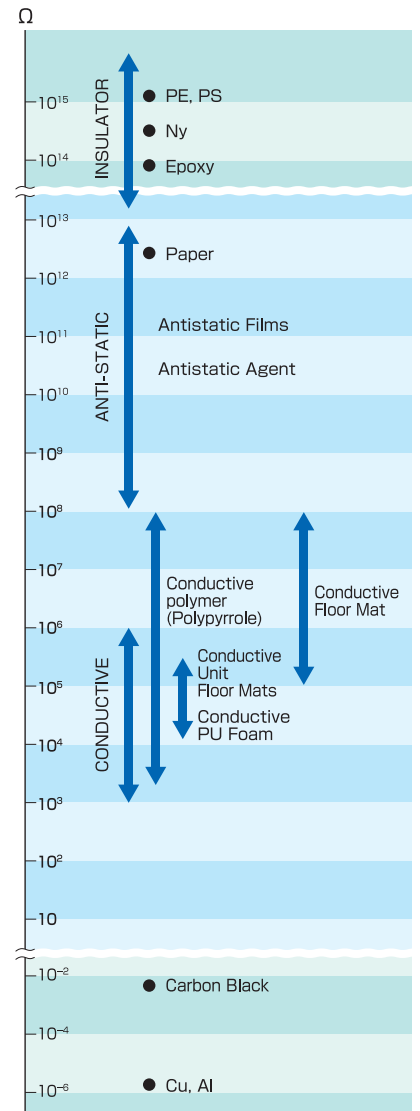
$1 \times 10^5 \Omega$   
Conductive  
 $1 \times 10^4 \Omega$

### Mechanism of metal conduction



### Features of Achilles' metal

- Stable conductive property
- Less particle





# Plating with the conductive polymer = Our company's Original conductive technology.

## Three C's with Conductive polymer (Polypyrrole)

### 1 Conductive

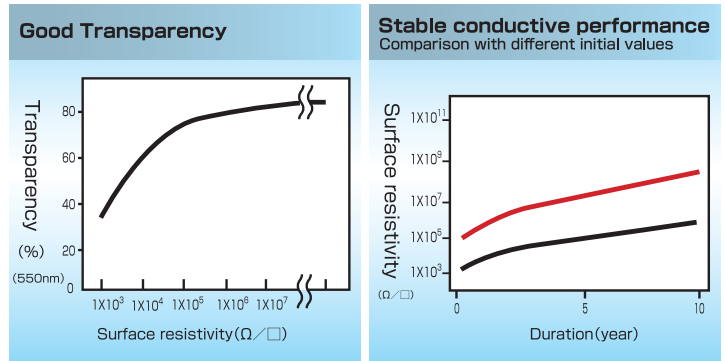
Conductive polymer has stable conductive performance because the Conductive Polymer polymerize to base materials by pyrrole.

### 2 Clear

Conductive polymer makes extremely thin films and transparent conductivity possible.

### 3 Clean

Clean and stable conductive performance with minimum bleeding and defluxion.  
Excellent chemical properties - low out-gas, low ion contamination silicon-free etc.



## Compared to other conductive technologies

Item	Conductive technologies Conductive polymer	Antistatic additives	Carbon	Metal
Conductivity	○	△	○	◎
Transparency	◎	◎	×	△
Cleanness	◎	○	×	○
Out Gas	◎	△	×	○
Contamination	◎	△	△	○
Durability	○	△	◎	○
Depend on humidity	◎	×	○	◎
Cost	○	◎	○	△

## Compatibility with base material

Material	Compatibility	Material	Compatibility
PET	◎	PA6	○
A-PET	◎	PA66	○
PE	○	PES	◎
PS	◎	PEEK	◎
PP	○	PEI	◎
POM	×	PI	◎
PC	◎	PVC	○
ABS	◎	LCP	△
PAN	◎	Glass	×
PMMA	×	Metal	×

◎: Excellent ○: Good △: Fair ×: Poor  
(※The above is one example)

- Highly flexible to accommodate a wide range of materials and forms.
- Accommodates various after-processing such as laminating, printing, adhesion processing etc.

## Warning

- Caution is required when using Conductive polymer in contact with alkaline materials.**  
Conductive polymer is comprised of highly chemical resistant macro molecules. Alkaline materials may adversely affect performance of Conductive polymer.
- Not suggested to use Conductive polymer devices that can generate strong friction.**  
The layer of Conductive polymer film, though rigid, may wear when used in locations with constant friction.
- Other notes**  
Exposure to strong UV light for long time may deteriorate its property.

## Applications

Conductive Polymer can be used in a wide variety of applications for antistatic properties.

### ● A two-way approach

- Achilles offers unique conductive materials and products.
- We can make your current devices and packing materials conductive.

### ● Applications in different categories

Applications	
Film	Protection film
	Spacer film
Sheet	Carrier tape base sheet
	Stationery
Molded plastic	HDD parts, copy machine parts
	Wafer carrier, Photo mask case
	IC tray, HDD tray
Electrical parts	FPC
Fiber / Thread	Cloth
	Wiper
Tooling	Resin tooling

# Wafer Carrier



**Product No. MA-4/5/6S/8S/12**

(Figures are wafer die, in inch)

**Features**

- Compact design to save transportation cost.
- Good airtight container.
- Industry standard wafer sizes available.
- Feasible design for automated handling machine.

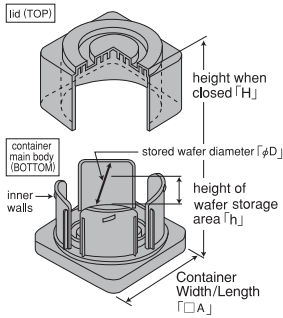
**Resistance** <math>1.0 \times 10^6 \Omega</math>

**Material** conductive PP

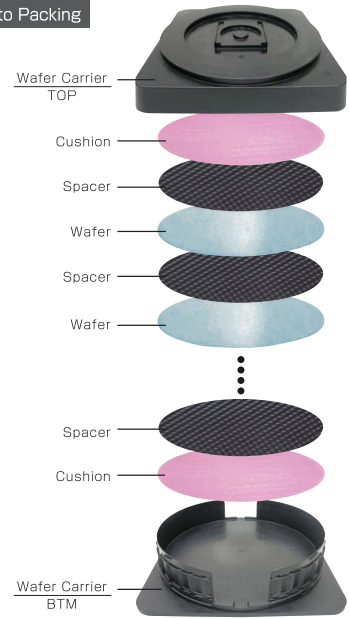
**Specification**

Product No.	[H] Container height	[h] Effective height	[D] Effective diameter	[A] Container Width/Length
MA-4	90mm	47.8mm	103±1mm	150mm
MA-5	90mm	50mm	128±1mm	150mm
MA-6S	63mm	38mm	153±1mm	175mm
MA-8S	65mm	38mm	203±1mm	226mm
MA-12	76mm	44mm	302±1mm	328mm

※MA-12→SEMI standard/SEMI G90



**How to Packing**



**Product No. NA-8M**

**Features**

- Snap-fit type for easy packaging.
- The ring spacer T-WSR200W(option) enables non-contact transfer.
- Excellent sealability.

**Resistance** <math>1.0 \times 10^6 \Omega</math>

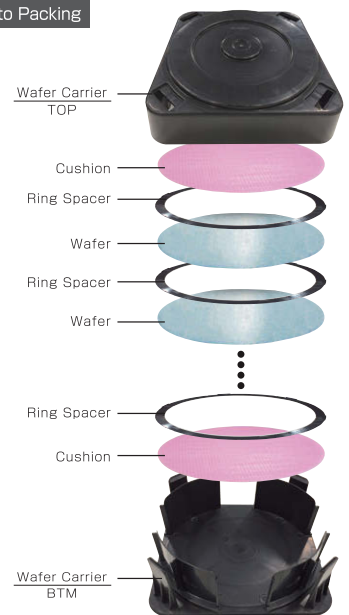
**Material** conductive PP

**Specification**

Product No.	[H] Container height	[h] Effective height	[D] Effective diameter	[A] Container Width/Length
NA-8M	93mm	69mm	202+1mm	226mm



**How to Packing**



# Wafer Inner Tray



**Product No. VFS-4-6R-65/VFS-6-8R-65**  
(for 4inch/for 6inch Compound Wafer)

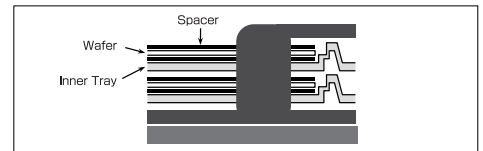
**Features**

- Can transfer/transport brittle compound wafers.
- Adopting clean conductive material
- Low particle level
- Low outgas generation
- High transparency

**Resistance** <math>1.0 \times 10^7 \Omega</math>

**Material** conductive A-PET

**Cross section**



# Wafer Carrier for Film Frame



ND-6/8



ND-12

**Product No.** ND-6/8/12

(Figures are wafer dia. in inch)

**Features**

- Compact design can reduce transportation costs.
- Can store dicing wafers together with frames attached to the wafers.
- Use in combination with Protos Frames enables light weight

**Resistance** ND-6,8: <math>1.0 \times 10^6 \Omega</math>  
ND-12 : <math>1.0 \times 10^{12} \Omega</math>

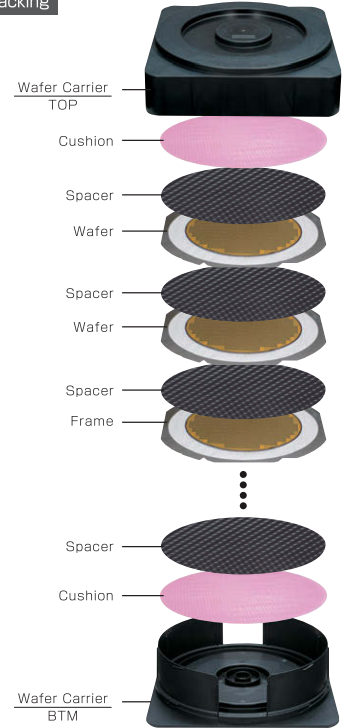
**Material** (ND-6/8) Conductive PP  
(ND-12) Antistatic PC/ABS

**Specification**

Product No.	[H]Container height	[h]Effective height	[D]Effective diameter	[A]Container Width/Length
ND-6	83mm	40mm	230±1mm	252mm
ND-8	92mm	57mm	299±1mm	322mm
ND-12	74mm	45mm	403±1mm	430mm

※ND-12→SEMI standard/SEMI G94

**How to Packing**



**Product No.** NDM-12

**Features**

- Snap-fit type for easy packaging.
- Enabling delivery of dicing frame-attached wafer.
- Reducing transport costs by compact design.

**Resistance** <math>1.0 \times 10^7 \Omega</math>

**Material** conductive PP

**Specification**

Product No.	[H]Container height	[h]Effective height	[D]Effective diameter	[A]Container Width/Length
NDM-12	72mm	34mm	402+0.5/-1.5mm	430mm

※SEMI standard/SEMI E57



**Product No.** FV-8S

**Features**

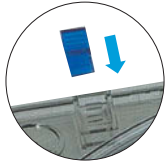
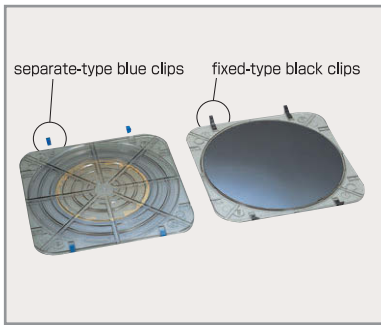
- The guide function reduces any shaking of the frame during transport.
- The lid fits in easily.
- The design to prevent wafers from contacting each other during transport.

**Material** PP

**Specification**

Product No.	Length	Width	Height	The storing of wafer
FV-8S	230.3mm	292.3mm	308mm	13 pcs

# Wafer Carrier for Single



separate-type



fixed-type

**Product No. MA-12/ONE-ST (Main Carrier)**

※Please use it after purchasing an option product

### Features

- Single piece of 12-inch wafer can be transferred/transported.
- Using clean conductive material (conductive polymer)
- Can be stacked during storage/transportation.
- Optimum for transporting test production wafers

Resistance <math>< 1.0 \times 10^7 \Omega</math>

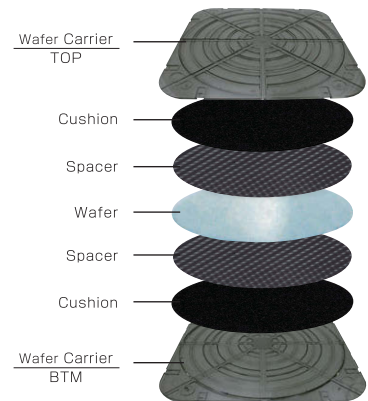
### Material

Wafer Case Conductive PC  
 Blue clip PC  
 Black clip PP

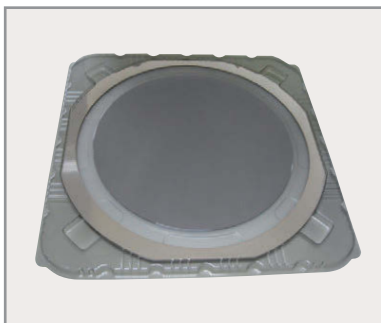
### Packing Unit

	Product No.	Detail	LOT
Standard	MA-12/ONE-ST	Main carrier	10
Option	MA-12/ONE-SPCL	Separate type clip	50
	MA-12/ONE-FXCL	Fix type clip	50
	PEA-12-350(Z1)	12inch Protos spacer (PEA)	30
	MA-12PESD-1	12inch PE cushion	20

### How to Packing



# Wafer Carrier for Single Film Frame



**Product No. VFP-6R-90FG (Carrier with Frame or Clipping for for 6inches)**

**VFP-ND-8R-90 (Carrier with the frame for 8inches)**

**VFP-ND-12R-90 (Carrier with the frame for 12inches)**

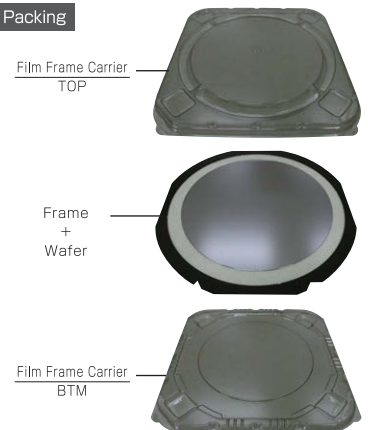
### Features

- Single piece of wafer with frame can be transferred/transported.
- As frame is used for fixing, there is no contact with wafer.
- Using clean conductive material (conductive polymer)
- Optimum for transporting test production wafers

Resistance <math>< 1.0 \times 10^7 \Omega</math>

Material conductive A-PET

### How to Packing



**Product No. 150/200LF-FF-AR**

**200/300LF-EP-AR**

(Figures are wafer dia. mm)

### Features

- Plastic frames allow reduction in transportation weight. (Frame weight can be reduced by 50% when compared with metal frame.)
- Made in accordance with SEMI standards(for 300mm)

### Specification

Product No.	O.D.	I.D.	Thickness	Weight	Remarks
150LF-FF-AR	228mm	194mm	1.5mm	28g	Full flat
200LF-FF-AR	296mm	250mm	1.5mm	45g	Full flat
200LF-EP-AR	296mm	250mm	2.0mm	60g	Label-capable
300LF-EP-AR	400mm	350mm	2.5mm	120g	Label-capable

※For Film Frames of other sizes than the above and those for ESD applications, we are ready to respond to your requirements. So please contact us.

※SEMI standard/SEMI G87



# Cushion

□=Wafer size in inch

## Antistatic multi-layer cushion (highly clean type)



Product No. **MA-□PEAS-1/3/5/6/10** (□:4/5/6/8/12inch)

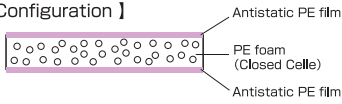
Features

- Stable antistatic performance
- Cleanliness(Independent foaming/ Surface film lamination)
- Good impact absorption
- Low contamination

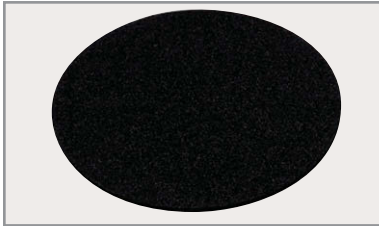
Resistance <math>< 1.0 \times 10^{12} \Omega</math>

Thickness 1/3/5/6/10mm

[ Configuration ]



## Conductive single-layer cushion



Product No. **MA-□PESD-1/3/5/10** (□:4/5/6/8/12inch)

Features

- Low contamination (Independent foaming)
- Low out gassing and Low out ioncontamination
- Good impact absorption
- Stable conductive performance

Resistance  $1.0 \times 10^5 \Omega < R < 1.0 \times 10^9 \Omega$

Thickness 1/3/5/10mm

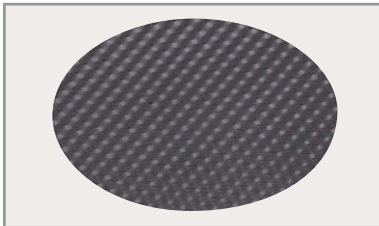
[ Configuration ]



# Spacer

□=Wafer size in inch

## Antistatic film spacer



Product No. **PEA-□-350(Z1)** (□:4/5/6/8/12inch)

Features

- Stable antistatic performance
- Low particle level
- Low ion contamination
- Both sides of spacer have the same surface pattern.

Resistance <math>< 1.0 \times 10^{12} \Omega</math>

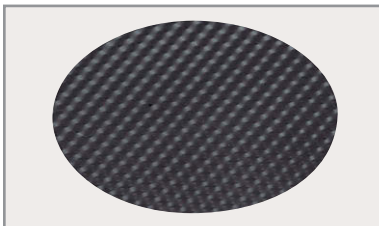
Emboss Thickness 350μm

Material Antistatic PE

[ Cross-section shape ]



## Conductive film spacer



Product No. **CPS-□-250(Z1)** (□:4/5/6/8/12inch)

Features

- Stable conductive performance
- Low particle level
- Low ion contamination
- Both sides of spacer have the same surface pattern.

Resistance <math>< 1.0 \times 10^9 \Omega</math>

Emboss Thickness 250μm

Material Conductive PE

[ Cross-section shape ]



## Conductive Ring spacer



Product No. **T-WSR200W**

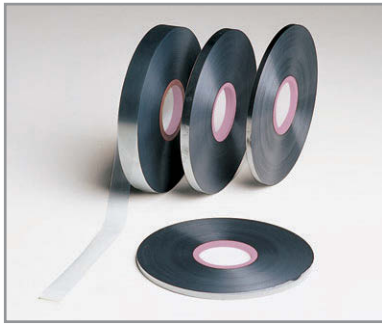
Features

- No contact with wafer for taransport
- Low particle level
- Low ion contamination
- Low out-gas

Resistance <math>< 1.0 \times 10^7 \Omega</math>

Material Conductive PC

# Heat seal Cover tape



Product No. **ST-931**

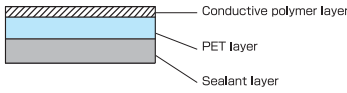
USE

Shipment use of the Semiconductor, MLCC

Features

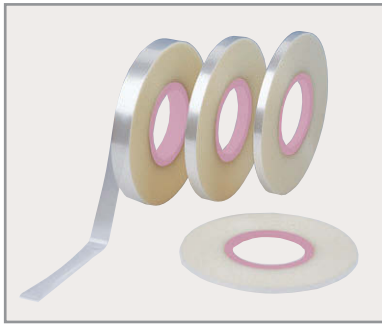
- Stable peeling property can keep small chips components secure and avoid jumping problems.
- High transparency with little haze enables recognition of IC chips even after they are taped to embossed carrier tape, facilitating efficiency for quality control purposes.
- Good ESD protection prevents electrification caused by peeling and friction which may lead to electrostatic damage or jumping to semiconductor parts. Conductive polymer layer for Tape; antistatic layer for AS cover tape makes this possible.

[ Configuration ]



Materials of an adaptive embossed carrier

Product No.	PS	PC
ST-931	○	○
AS-932	○	○



Product No. **AS-932**

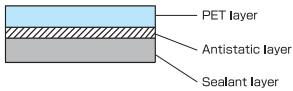
USE

Shipment use of the Mechanism part

Features

- Excellent strength, dimensional stability, and flatness owing to reinforced cloth.
- Specially treated surface reduces the reflection of light.
- In accordance with phthalate ester instructions, meets criteria 2005/84/EC

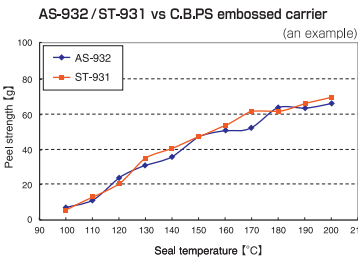
[ Configuration ]



[Peel properties of AS-932/ST-931]

Sample

Cover tape : AS-932 5.5mm width  
 : ST-931 5.5mm width  
 Embossed carrier tape : Carbon-mixed PS 8mm width



Specification

Item	Unit	ST-931, AS-932
Width	mm	5.5, 9.5, 13.5, 21.5
Length	m	300, 600
Core Diameter	Inch	3

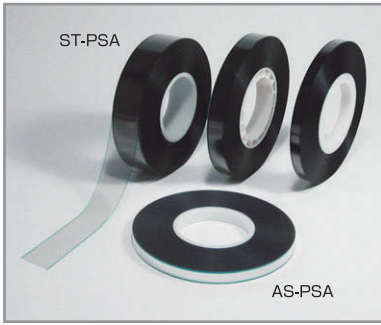
※Other size is available.

Condensed

Item	Unit	ST-931 (Conductive)	AS-932 (Antistatic)	Test Method
Overall Thickness	μm	46	46	micrometer
Tensile Strength (Width 9.5mm)	MPa	78.4	77.8	JIS K 6734
Tensile Elongation (Width 9.5mm)	%	196	143	JIS K 6734
Transparency	%	79.8	87.1	JIS K 7105
Haze	%	9.9	9.2	JIS K 7105
Decay Time (10%Decrement)	+	0.01	0.10	Sealant side
	-	0.01	0.10	
Surface Resistivity	PET side	$2.1 \times 10^5$	$1.0 \times 10^{14}$	JIS K 6911 (23°C × 60%RH)
	Sealant side	$1.0 \times 10^{14}$	$1.0 \times 10^{14}$	
Peel Electrification Voltage	V	10	80	Achilles Method *1

Achilles Method : I measure the electrostatic charge voltage between the cover tapes detachment side with the conductive embossed carrier tapes which a part is not in.  
 ※This is actual measured value not guaranteed value.

# Pressure Sensitive Adhesive Cover Tape



Product No. **ST-PSA / AS-PSA**

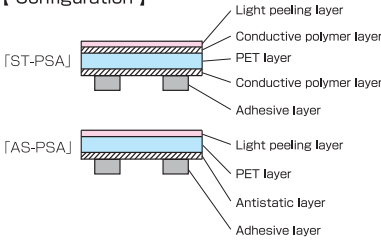
USE

Shipment use of the Semiconductor, Connector, LED

Features

- High ESD protection performance prevents electrostatic damage or jumping problems to semiconductors from occurring.
- Adhesive provides stable sealing properties for a wide variety of embossed carrier tape base materials. No need for thermo-compressing (possibly cut energy costs). Easy to peel & re-tape.
- Good transparency enables easy inspection after taping, facilitating efficiency for quality control purposes.

**[ Configuration ]**



**Materials of an adaptive embossed carrier**

Product No.	PS	PC	APET	PP	PVC
ST-PSA	○	○	○	○	○
AS-PSA	○	○	○	○	○

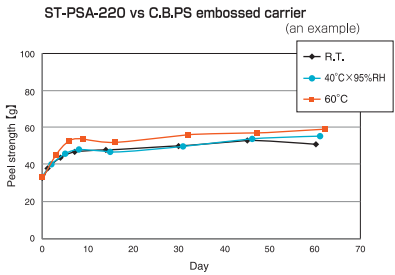
**Specification**

Item	Unit	ST-PSA / AS-PSA					
Width	mm	5.4	9.3	13.3	21.3	25.5	37.5
Length	m	300, 500					
Core Diameter	Inch	3					

※Other size is available.

**[Peel properties of ST-PSA-220]**

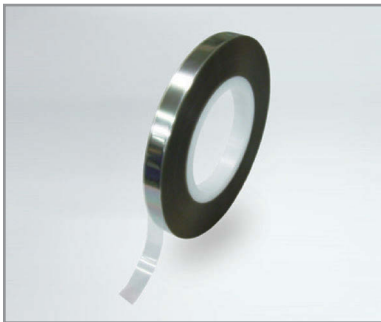
Sample  
Cover tape : ST-PSA-220 5.4mm width  
Embossed carrier tape : C.B.PS 8mm width ( for ST-PSA-220 )



**Condensed**

Item	Unit	ST-PSA (Conductive)	AS-PSA (Antistatic)	Test Method
Overall Thickness	PET side	38		micrometer
	Adhesive layer	20		
Tensile Strength	MPa	40.3		JIS C 2318
Transparency	%	80.2	91.9	JIS K 7105
Haze	%	4.7	3.3	JIS K 7105
Surface Resistivity	PET side	$1.6 \times 10^5$	$1.0 \times 10^{14} <$	High resistance measuring instrument (23°C×60%RH)
	Seal side	$2.6 \times 10^5$	$1.2 \times 10^9$	
Peel Electrification Voltage	V	<5	<100	Achilles Method
Adhesive Strength	Width: 5.4mm	0.3		170° Detachment examination (300mm/min)
	Width: 9.3/13.3mm	0.35		
	Width: 21.3/25.5/37.5mm	0.4		

Achilles Method : I measure the electrostatic charge voltage between the cover tapes detachment side with the conductive embossed carrier tapes which a part is not in.  
※This is actual measured value not guaranteed value.



Product No. **STN-PSA-R10**

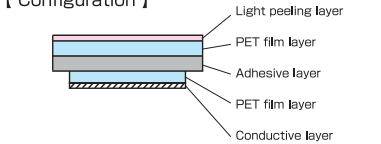
USE

Shipment use of the Semiconductor, Connector, LED

Features

- STN-PSA-R10 Cover Tape has good conductivity and stop attaching the parts to cover tape by static.
- STN-PSA-R10 Cover Tape can seal wide variety of embossed carrier material.
- There is not so much condition and control factor required for adhesion.
- It is easy peeling off and re-adhesion.
- STN-PSA-R10 Cover tape doesn't have so much haziness. It has very good clarity.
- Even after tape adhesived, it can be seen through the parts inside.

**[ Configuration ]**



**Materials of an adaptive embossed carrier**

Product No.	PS	PC	APET	PP	PVC
STN-PSA	○	○	○	○	○

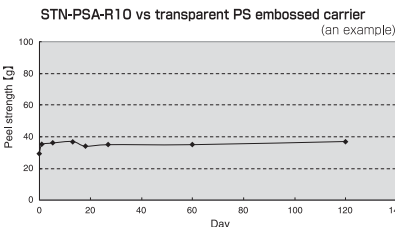
**Specification**

Item	Unit	STN-PSA-R10
Width	mm	9.3, 13.3, 17.3, 21.3, 25.5, 37.4, 49.4
Length	m	300, 500
Core Diameter	Inch	3

※Other size is available.

**[Peel properties of STN-PSA-R10]**

Sample  
Cover tape : STN-PSA-R10 13.3mm width  
embossed carrier tape : PS 16mm width  
Environment : Room temperature

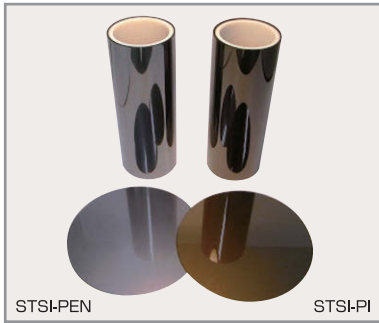


**Condensed**

Item	Unit	Measured Value STN-PSA-R10	Test Method
Tensile strength (※Width 13.3mm)	N	84	JIS C 2318
Degree of elongation (※Width 13.3mm)	%	120	JIS C 2318
Surface resistivity *STN layer side	Ω/cm	$2.8 \times 10^8$	High resistance meter
Light transmittance	%	85.4	Spectrophotometer
Haze	%	5.0	Spectrophotometer

※This is actual measured value not guaranteed value.

# Conductive Tape for Electrostatic Chuck



Product No. **STSI-PEN#25 (Base film: PEN)**  
**STSI-PI#25 (Base film: PI)**

### USE

CMOS Image Sensor (CIS), Glass Wafer, Crystal Wafer, etc...

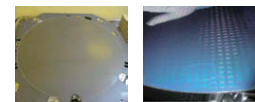
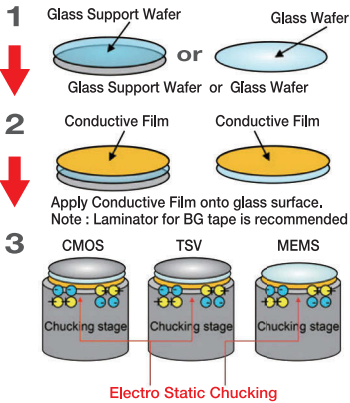
### Features

- Similar to conventional wafer processing, glass support processing and insulated MEMS wafer can be handled by Electrostatic Chucking in the system.
  - Existing semiconductor fabrication machines can be used; therefore, no new investment in facility is required.
  - Using PI as a base material, the devices can be protected from contamination and particles caused by solder balls melted during solder reflow process.
  - Low outgassing & Low ioncontamination
  - High chemical resistance, high heat resistance
- \*Before actual use, please check the feasibility for your machine.

### What is Conductive Tape for Electrostatic Chuck

ST-chucking Film is the adhesion film which processed the conductive polymer of the Achilles original conductive processing technique, and it is a conductivity film enabling that electrostatic chucking does the isolation material by sticking it on the isolation material.

## How to use ?



Note: Before use, thoroughly evaluate it.

### Specification

Product No.	Unit	STSI-PEN #25 S104LS	STSI-PI #25 S104LS	Measuring Method
Thickness Base film	μm	25±2	25±2	Micrometer
Thickness Base film+ Adhesive	μm	40±4	40±4	Micrometer
Width	mm	240±2(200mm) 330±2(300mm)	240±2(200mm) 330±2(300mm)	JIS level-1 Measure
Length	m	20, 80	20, 80	-

### Condensed

Item	Unit	STSI-PEN#25 S104LS	STSI-PI#25 S104LS	Measuring Method
Surface Resistivity (The surface of the matrix)	Ω/□	1.3×10 <sup>5</sup>	1.3×10 <sup>5</sup>	High resistivity meter
Surface Resistivity (The surface of the adhesive layer)	Ω/□	>1.0×10 <sup>13</sup>	>1.0×10 <sup>13</sup>	High resistivity meter
Static Decay Time	sec	<0.3	<0.3	FTM 101C-4046 (23°C×15%RH)
Adhesive Strength (vs glass)	g/25mm	18	18	Peeling Test@170°
Outgas	μg/g	34	43	170°C, 10min
Transparency	%	75	47	JIS K 7105

\*This is actual measured value not guaranteed value.

# Antistatic Protect Film



Product No. **ST-2**

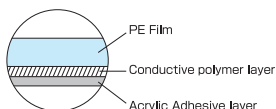
### USE

Surface protection of display units such as LCD; Optical films and panels.

### Features

- Excellent ESD protection prevents electrification due to peeling and friction and high conductive performance controls adhesion of particles to the film.
- High transparency maintains clear visibility of the FPD screen after the film is installed.
- No contamination of bleeding since no antistatic agent is contained in this film.

### [ Configuration ]



### Standard Sales Unit

Width	Length	Roll
50mm	100m	25
100mm		12
200mm		6
300mm		4
400mm		3
500mm		2
600mm		2
1,250mm		1

### Condensed

Item	Unit	ST-Protect film	Test Method
Thickness	Base film	μm	60
	Adhesive		10
Surface Resistance	PE Film	Ω	7.8×10 <sup>13</sup>
	Adhesive layer		3.5×10 <sup>10</sup>
Transparency	%	73	JIS K 7105*1
Peel Electrification Voltage	KV	< 0.6	Achilles Method *2
Adhesive power (vs glass)	N/25mm	0.69	JIS Z 0237*3

\*1. Wavelength: 550nm

\*2. The maximum detachment electrostatic charge voltage

Adherend : acrylic board

Peel rate : 100mm/sec

Dimensions of the test piece : 50mm×100mm

\*3. @180°(500mm/min)

\*This is actual value not guaranteed value.

# Anti-Static Masking Tape



Masking tape for painting

Product No. **RM-100**

USE

It is a masking tape for painting in which the tapes are united at both ends of the antistatic film which is difficult to adsorb dust.

Features

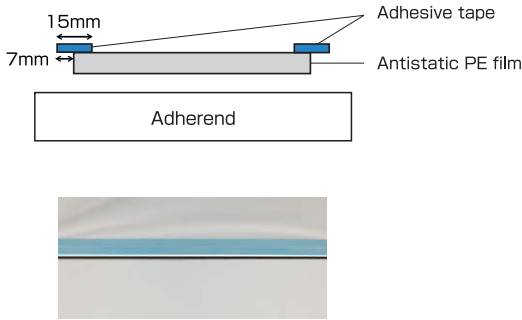
- Antistatic performance to prevent dust from adhering to the product.
- The customer can choose the adhesive.

Condensed

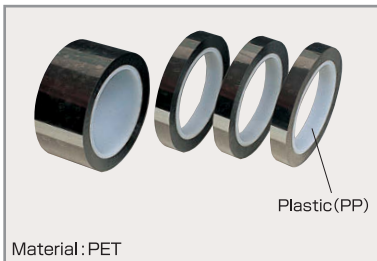
Item		Unit	Physical properties	Test Method	
Film	Surface Resistivity	Ω	5×10 <sup>9</sup>	High Resistance meter (22°C×40%RH)	
	Tensile Strength	MD	MPa	Tension Tester	
		TD			53.1
	Tensile Strength	MD	%		22.9
		TD			206
Tearing Strength	MD	g	355		
Tape	Adhesive Force Adherend: glass	N	5	180' (Width:15mm) The measurements that passed after a seal for one hour.	

※This is actual measured value not guaranteed value.

[ Configuration ]



# Antistatic Adhesive Tapes



Material: PET

Product No. **ST-6**

USE

Packing tape for semiconductor devices.

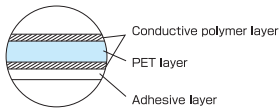
Features

- Good antistatic property
- Clean material; Neither carbon materials nor contamination-causing agents are used.
- Good ESD protection minimizes electrification caused by peeling of tape.
- High Transparency

Specification

Width	Length	Shipping unit
15mm	50m/roll	40rolls/carton
50mm	50m/roll	12rolls/carton

[ Configuration ]



Surface Resistance

≤1.0×10<sup>9</sup>Ω (conductive side)

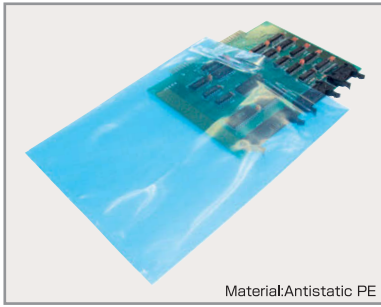
Condensed

Item		Unit	IC Tape	Test Method
Thickness	Base film	μm	38	—
	Adhesive		31	—
Adhesive Power		N/10mm Width	7.64±0.98 9.70	Adherend: SUS Cohesive fracture 120°C×2hr
Rewinding Power		N/10mm Width	0.98	—
Holding Power		mm	0.9	Gap Width 120°C×30min×200g
Peel Electrification Voltage		V	<10	—

※This is actual measured value not guaranteed value.



# Transparent Antistatic Bags



Product No. **SKY-1**  
(No Zipper/With Zipper)

**USE**  
For packaging of electronic parts.

**Features**

- Antistatic
- Transparent

**Surface Resistance**  
 $\leq 1.0 \times 10^{12} \Omega$  (23°C, 60%RH)

Condensed

Item	Unit	50 $\mu$ m	100 $\mu$ m	Test Method
Tensile Strength	MD	39.9	41.4	JIS Z 1702
	TD	38.7	38.1	
Elongation	MD	645	746	JIS Z 1702
	TD	725	729	
Tear Strength	MD	1.52	5.06	JIS K 7128-2
	TD	15.3	23.9	
Surface Resistivity	$\Omega$	$4.35 \times 10^{10}$	$5.31 \times 10^{10}$	JIS K 6911
Static Decay Time	0% (5kV-0V)	1.59	1.62	FTMS 101C-4046
	10% (5kV-500V)	0.62	0.42	
	50% (5kV-2500V)	0.14	0.08	

※These are not guaranteed figures

Packing

Standard Size	No Zipper												With Zipper						
	Width (mm)		100		150		200		250		300		350		450		100	160	200
Sales Unit	Thickness	Length (mm)		150		200		250		300		350		450		150	200	300	450
				50 $\mu$ m	More than 10,000pcs		More than 3,000pcs		More than 1,000pcs		More than 1,000pcs		More than 1,000pcs		More than 1,000pcs		More than 12,000pcs	More than 10,000pcs	More than 3,000pcs

※Other size is available.

# Transparent moisture-barrier Bag



Product No. **AS-TED** (Custom-made item)

**USE**  
Wafer carrier, Package for electric components

**Features**

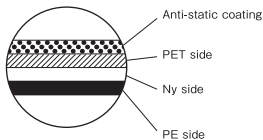
- Good moisture-proof performance
- High transparency
- Available for specially ordered sizes.

**Composition**

PET Layer	12 $\mu$ m			
Ny Layer	15 $\mu$ m	25 $\mu$ m	35 $\mu$ m	
PE Layer	40 $\mu$ m	60 $\mu$ m	80 $\mu$ m	100 $\mu$ m

※Inside antistatic coating is available.  
※Other size is available.

[ Configuration ]



Condensed

Configuration : ASPET 12 $\mu$ m / Ny15 $\mu$ m / polyethylene 40 $\mu$ m

Item	Unit	AS-TED	Test Method
Oxygen Transmission rate	cc/m <sup>2</sup> ·24hr·atm	0.04	JIS K 7126
Water Vapor Transmission rate	g/m <sup>2</sup> /24h	0.1	JIS K 7129
Resistance to Thrust Strength	N	15.5	JIS K 7127
Heat-Seal Strength	N/15mm	81.3	JIS Z 1707
Tensile Strength	MD	100	JIS Z 7127
	TD	101	
Elongation	MD	133	JIS Z 7127
	TD	125	
Tear Strength	MD	—	JIS K 7128-2
	TD	—	
Transparency	%	90.12	JIS K 7105
Haze	%	9.8	JIS K 7105
Surface Resistance	$\Omega$	Outside: $3.2 \times 10^9$	EIA-541
Frictional Electric Charge	V	<50	Achilles Method
Decay Time	sec	—	FTMS 101C-4046 (±5kV→±50V attenuation)

※This is actual measured value not guaranteed value.

# Transparent Antistatic Films



Product No. **SKY-4**

**USE**  
For packaging of electronic parts.

**Features**

- Antistatic property with transparency

**Surface Resistance**  $\leq 1.0 \times 10^{12} \Omega$  (23°C, 60%RH)

Specification

Thickness	Width	Length	Packing Unit
50 $\mu$ m	1,200mm	200m/roll	1roll
100 $\mu$ m	1,200mm	100m/roll	1roll

Condensed

Item	Unit	50 $\mu$ m	100 $\mu$ m	Test Method
Specific Gravity	—	0.90	0.90	JIS K 7112
Tensile Strength	MD	24.7	28.8	JIS Z 1702
	TD	26.4	26.0	
Elongation	MD	375	659	JIS Z 1702
	TD	679	850	
Tear Strength	MD	0.95	2.14	JIS K 7128-2
	TD	7.81	14.98	
Surface Resistivity	$\Omega$	$2.35 \times 10^9$	$8.58 \times 10^9$	JIS K 6911 (23°C, 60%RH)
Electric Resistance	$\Omega$	$1.79 \times 10^{10}$	$1.70 \times 10^{11}$	JIS K 6911 (23°C, 60%RH)
Static Decay Time (Impressed Voltage $\pm 5kV$ )	0% (5kV-0V)	0.58	0.35	FTMS 101C-4046 23°C, 15%RH
	10% (5kV-500V)	0.02	0.02	
	50% (5kV-2500V)	0.02	0.02	

※This is actual measured value not guaranteed value

# Conductive PU Foam



Material:Conductive Polyurethane Foam

Product No. **A-400**

USE

For electronic Component, electronic equipment

Features

- Our polyurethane foam is processed for conductivity so that by simply pressing the IC into the foam, all the terminals are at the same electric potential and electrostatic damage is prevented. We offer both hard foam (H type) and soft foam (S type) for insertion of IC products.

Surface Resistance  $\leq 1.0 \times 10^6 \Omega$

Condensed

Item	Unit	H type (10mm)	S type (10mm)	Test Method
Density	kg/m <sup>3</sup>	54.10	29.6	JIS K 6400
Hardness	N	274.40	93.1	JIS K 6400
Tensile Strength	Mpa	0.12	0.10	JIS K 6400
Elongation	%	60.0	193.0	JIS K 6400
Tear Strength	N/cm	6.1	7.8	JIS K 6400
Modulus of repulsion elasticity	%	3.0	33.3	JIS K 6400
Compression set	%	18.1	4.3	JIS K 6400
Surface Resistivity	$\Omega$	$6.4 \times 10^4$	$2.3 \times 10^4$	JIS K 6911
Electric Resistance	$\Omega$	$2.6 \times 10^4$	$8.5 \times 10^3$	JIS K 6911
Static Decay Time (Impressed Voltage $\pm 5kV$ )	0% (5kV→0V)	0.03	0.04	FTMS 101C-4046 (5kV→500V)
	10% (5kV→500V)	0.02	0.02	
	50% (5kV→2500V)	—	—	

※These are not guaranteed figures

Specification

H-type

	Thickness	Width	Length	Packing Unit
H-5S	5mm	500mm	500mm	100 pcs/case
H-10S	10mm	500mm	500mm	50 pcs/case
H-5L	5mm	1,000mm	1,000mm	40 pcs/case
H-10L	10mm	1,000mm	1,000mm	20 pcs/case

S-type

	Thickness	Width	Length	Packing Unit
S-5	5mm	1,000mm	50m/roll	1 roll
S-10	10mm	1,000mm	50m/roll	1 roll
S-20	20mm	1,000mm	25m/roll	1 roll

# Antistatic Cushion



Material:Surface layer/Antistatic PE, Intermediate layer/PE foam

Product No. **PEAS-3/6**

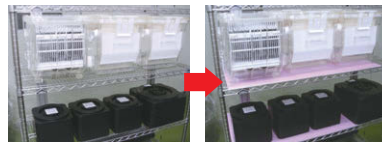
Features

- Low cost/Stable antistatic pformance
- Cleanliness (Independent foaming/Surface film lamination)
- Good impact absorption

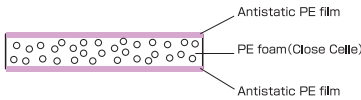
Surface Resistance  $< 1.0 \times 10^{12} \Omega$

Specification 450mm×950mm×3/6mmt

EX:



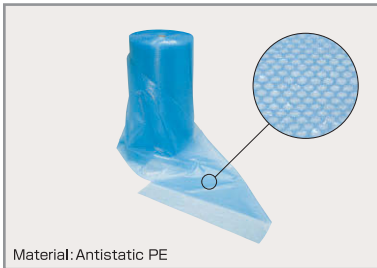
[ Configuration ]



Condensed

Item	Unit	PEAS-6	Test Method
Thickness	mm	6	—
Wear Rate	g/1000times	0.0022	JIS K 7204 Teper abrasion CS-10
Surface Resistivity	$\Omega$	$3.08E+10$	JIS A 1454

Test atmosphere: 25°C×50%RH



Material:Antistatic PE

Product No. **SKY-2**

USE

Packing of electronic equipment and electronic parts.

Features

- Antistatic
- Transparent

Surface Resistance  $\leq 1.0 \times 10^{11} \Omega$  (Flat surface 23°C, 60%RH)

Specification

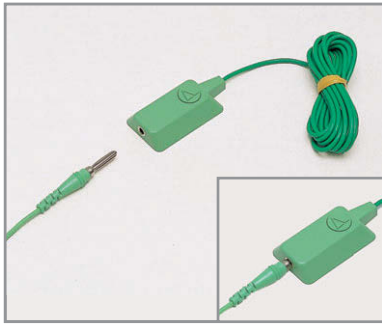
Thickness	Width	Length	Packing Unit
4mm	1,200mm	100m/roll	1 roll

Condensed

Item	Unit	Skypoly Cushion	Test Method
Specific Gravity	—	0.044	JIS K 7112
Tensile Strength	MD	0.07	JIS Z 1702
	TD	0.04	
Elongation	MD	154	JIS Z 1702
	TD	252	
Tear Strength	MD	8.1	JIS K 7128-2
	TD	2.9	
Surface Resistivity	$\Omega$	$1.0 \times 10^9$	JIS K 6911 (23°C,60%RH)
Electric Resistance	$\Omega$	$1.7 \times 10^{11}$	JIS K 6911 (23°C,60%RH)
Static Decay Time (Impressed Voltage $\pm 5kV$ )	0% (5kV→0V)	0.38	FTMS 101C-4046 23°C,15%RH
	10% (5kV→500V)	1.56	
	50% (5kV→2500V)	0.19	

※This is actualmeasured value not guaranteed value

# Ground wires



Main body : Sustained Antistatic ABS resin / I have resistance of 1MΩ built-in

Product No. **D-070**

USE

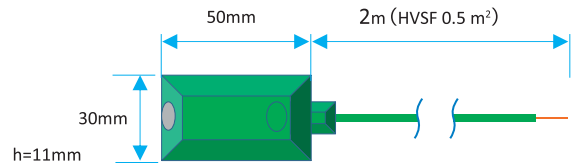
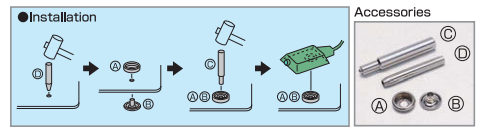
Ground-wire for conductive mat

Features

- Can ground both the antistatic table mat and wrist strap at the same time.
- Can connect to the wrist strap with banana plug through banana jack.

Specification

Length	Packing Unit	Accessories
2m	10pcs/carton	A snap hook(female) 10 pcs B snap hook(male) 10 pcs C hitting rod 2 pcs D punch 2 pcs



# Ground Wires



Product No. **SKY-8E**

USE

For grounding conductive mats and floor material

Features

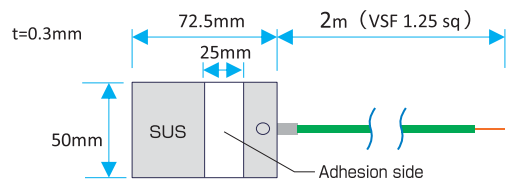
- Easy to ground

Packing Unit

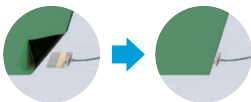
10 pcs/case

Specification

Lead wire with stainless steel plate



Method of application usage



# Conductive Plate



Product No. **SKY-8T**

USE

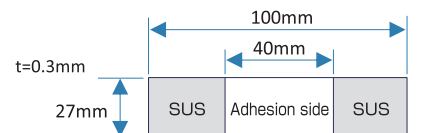
For conduction of joint parts for installation of conductive floor materials.

Packing Unit

20 pcs/case

Specification

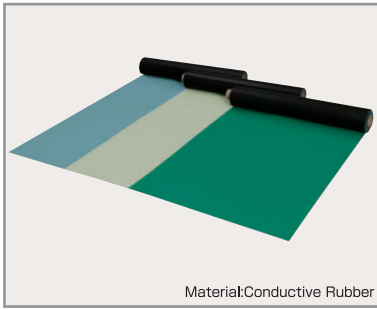
Stainless steel tape with adhesive.



Method of application usage



# Conductive Table Mats



Material:Conductive Rubber

Product No. **SKY-50**

Features

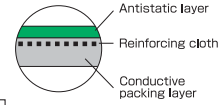
- Excellent strength, dimensional stability, and flatness owing to reinforced cloth.
- Specially treated surface reduces the reflection of light.
- In accordance with phthalate ester instructions, meets criteria 2005/84/EC

EPA grounding resistance

$1.0 \times 10^6 \Omega \leq R \leq 1.0 \times 10^9 \Omega$   
(Conforming with IEC61340-5-1/5-2)



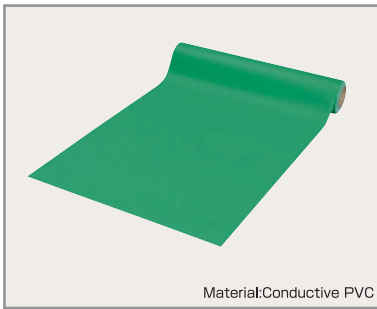
[ Configuration ]



Specification

Thickness	Width	Length	Packing Unit	Accessories
1.5mm	1,000mm	10m/roll	1 roll	SKY-8E/Grounding-wire 2sets SKY-BT/Conductive plates 2pcs

**Caution** Use ground wire SKY-8E(sold separately). Ground the mat from back (black) side.



Material:Conductive PVC

Product No. **SKY-25A**

Features

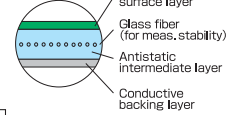
- It has a line-up with sizes that fits with your working table. It is made of reinforced glass fiber and offers good mechanical strength as well as tolerances.

EPA grounding resistance

$1.0 \times 10^6 \Omega \leq R \leq 1.0 \times 10^9 \Omega$   
(Conforming with IEC61340-5-1/5-2)



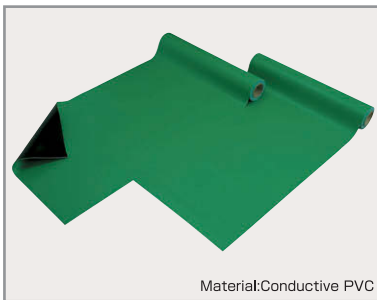
[ Configuration ]



Specification

Thickness	Width	Length	Packing Unit	Accessories
2mm	910mm	7.5m/roll	1 roll	SKY-8E/Grounding-wire 2sets SKY-BT/Conductive plates 2pcs

**Caution** Use ground wire SKY-8E(sold separately). Ground the mat from back (black) side.



Material:Conductive PVC

Product No. **SKY-40**

Features

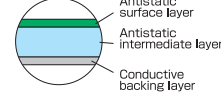
- Focused on cost effectiveness while maintaining high quality conductive mats.

EPA grounding resistance

$1.0 \times 10^6 \Omega \leq R \leq 1.0 \times 10^9 \Omega$   
(Conforming with IEC61340-5-1/5-2)



[ Configuration ]



Specification

Thickness	Width	Length	Packing Unit	Accessories
1.5mm	910mm	10m/roll	1 roll	SKY-8E/ Grounding-wire is other sale

**Caution** Use ground wire SKY-8E(sold separately). Ground the mat from back (black) side.

Condensed					
Item	Unit	SKY-50	SKY-25A	SKY-40	Test Method
Thickness	mm	1.5	2.0	1.5	—
Weight	kg/m <sup>2</sup>	1.9	3.3	2.1	—
Wear Rate	g/1000times	0.41	0.17	0.17	Taper abrasion S-33,500g
Heat resistance	—	○	△	△	※Achilles Method

※I drop the solder which melted from an altitude 60cm  
※These are not guaranteed figures

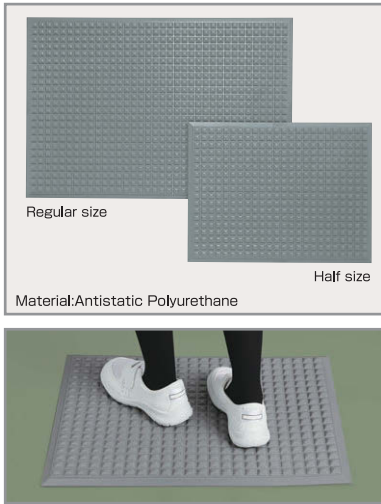
Electrical characteristic					
Item	Unit	SKY-50	SKY-25A	SKY-40	Test Method
Electric leaked resistant value	MΩ	1.6	2.0	2.0	JIS A 1454 25°C 50%RH
Surface Resistivity	MΩ	16.0	8.1	8.1	JIS A 1454 25°C 50%RH
Human Body Electrification Voltage	V	≦20	≦20	≦20	JIS L 1023 (Using conductive shoes)

※These are not guaranteed figures

Evaluation solvent	... Test Method : JIS A 1454								
	SKY-50			SKY-25A			SKY-40		
	Change in color of inanimate object	Change of the luster	Blistering	Change in color of inanimate object	Change of the luster	Blistering	Change in color of inanimate object	Change of the luster	Blistering
Soybean Oil	○	○	○	○	○	○	○	○	○
Lubrication Oil	○	○	○	○	○	○	○	○	○
5%Acetic Acid	○	○	○	○	○	○	○	○	○
5%Hydrochloric Acid	△	○	○	○	○	○	○	○	○
5%Hydrochloric Acid	×	△	○	○	○	○	○	○	○
5%Sulfuric Acid	△	△	○	○	○	○	○	○	○
2%Caustic Soda Water Solution	△	△	○	○	○	○	○	○	○
95%Ethanol	○	○	○	○	○	△	○	○	△
IPA	○	○	○	○	○	○	○	○	○
n-Hexane	○	○	○	○	○	△	○	○	△
Gasoline	○	○	○	○	○	△	○	○	△
Toluene	○	○	○	○	○	△	○	○	△
Ethyl Acetate	○	○	○	○	○	△	○	○	△
Acetone	○	○	○	○	○	×	○	○	×
MEK	○	○	○	○	○	×	○	○	×

○:Unchanged △:Slightly changed ×:Major changed  
※These are not guaranteed figures

# Antistatic Cushion Mats



Product No. **S-100 (Regular size)**  
**S-101 (Half size)**

### USE

For areas where workers work in a standing position, and for cold areas.

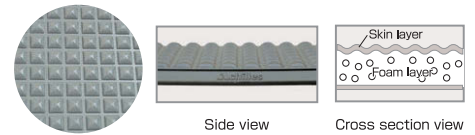
### Features

- Eases foot fatigue with adequate softness.
- Good heat insulation and prevents heat loss from cold floors.
- ESD protection

EPA grounding resistance  $5.0 \times 10^9 \Omega$  (Conforms with JIS A 1454)

Hardness  $70^\circ$  (C-type rubber hardness tester)

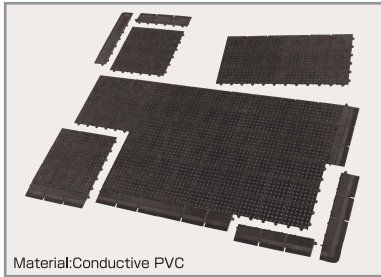
**Warning** For securing stable conductivity, use the mat on conductive flooring material which is granded.



### Specification

Product Code	Dimensions			Packing Unit
	Thickness	Width	Length	
S-100(Regular size)	18mm	618mm	910mm	5 pcs/carton
S-101(Half size)	16mm	473mm	618mm	5 pcs/carton

# Conductive Unit Floor Mats



Product No. **J-100**

### USE

For the preparation of clean room space and working/storage areas where a lot of relocation work is involved.

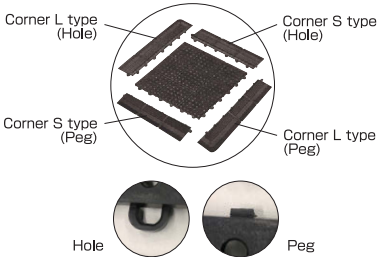
### Features

- Easy to join and rejoin the mats.
- Conforming with clean room of class 1000.

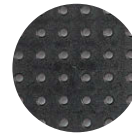
EPA grounding resistance  $R \leq 1.0 \times 10^9 \Omega$   
(Conforms with JIS A 1454)

**Caution** The floor must be connected to a ground cable.

**Warning** Because the floor presents low electrical resistance, there is a danger of electric shock if an operator touches a live wire while standing on the J-Floor.



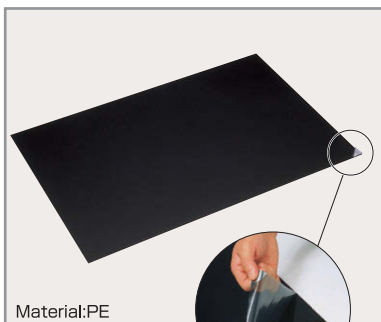
Peg in to the Hole



### Specification

Product Code	Dimensions			Packing Unit
	Thickness	Width	Length	
Body	10mm	300mm	300mm	36 pcs/carton
Corner Material: L type (Male, Female)	10mm	75mm	375mm	8 pcs/carton
Corner Material: S type (Male, Female)	10mm	75mm	300mm	20 pcs/carton

# Conductive Adhesive Mats



Product No. **ST-4**

### USE

Mat to remove dusts/dirts from shoes mainly in clean rooms.

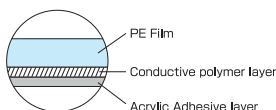
### Features

- Multi adhesive film layer
- Mat's base conductive polymer controls generation of static electricity, minimizing generation of dust when the PE film is removed.

### Specification

Width	Length	Layers	Packing Unit
600mm	900mm	40 layers/mat	5 mats / 1 carton

### [ Configuration ]



Multilayer structure (40 Adhesive film layers)

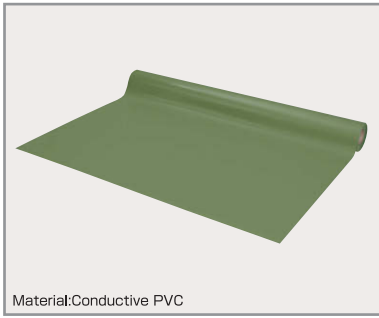
### Condensed

Item	Unit	※1 Value	Test method/Remarks
Thickness	$\mu\text{m}$	70	PE film layer : $60 \mu\text{m}$ Adhesive layer : $10 \mu\text{m}$
Surface Resistance	$\Omega$	$5.0 \times 10^{10}$	Measured the adhesive side. Used high resistance tester
Adhesive strength (against SUS)	N/25mm	1.47	JIS Z 0237
Backside peeling strength	N/25mm	2.00	JIS Z 0237
Ball tack	30degrees	2	JIS Z 0237
Peeling electrification	V	$\leq 20$	※2
Static decay time (Applied Voltage $\pm 5\text{V}$ )	sec	Less than 1	Adhesive side. FTMS-101C-4046 (20C 15%RH) ( $\pm 5\text{V} \rightarrow 0\text{V}$ )

※1 Representative value, not guarantee.  
※2 Use the sample at  $25^\circ\text{C} \times 40\% \text{RH}$ . Then measure static electricity generated after peeling it in 1~2 seconds



# Conductive Floor Mat



Product No. **SKY-20W**

USE

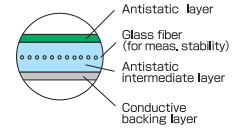
Flooring material for clean rooms or rooms for assembling of semiconductor/electronic components.

Features

- Conforming with clean room class of 100/SCC(F)
- Excels in abrasion resistance and load bearing capacity.
- Maintains stable leak resistance using high performance antistatic agents.

EPA grounding resistance  $1.0 \times 10^5 \Omega \leq R \leq 1.0 \times 10^8 \Omega$   
(Base on IEC 61340-4-1)

【 Configuration 】



Green (9725C)



Specification

Thickness	Width	Length	Packing Unit
2mm	1,820mm	10m/roll	1 roll

Chemical Resistant ... Test Method : JIS A 1454

Evaluation solvent	SKY-20W
Soybean Oil	○
Lubrication Oil	○
5%Acetic Acid	○
5%Hydrochloric Acid	○
5%Hntric Acid	○
5%Sulfuric Acid	○
2%Caustic Soda Water Solution	○
10% ammonia aqeous solution	○
99%Ethanol	○
95%Ethanol	○
IPA	○
n-Hexane	○
trichloroethylene	○
Gasoline	○
benzene	○
Toluene	○
Ethyl Acetate	△
Acetone	△
MEK	△

○: Unchanged △: Slightly changed ×: Major changed  
\*These are not guaranteed figures

Condensed

Item	Unit	SKY-20W	Test Method
Thickness	mm	2.0	JIS A 1454
Weight	kg/m <sup>2</sup>	2.9	—
Quantity of dent (20°C)	mm	0.57	JIS A 1454
Residual dent rate	%	11.0	JIS A 1454
Length rate of change by the heating	MD	-0.61	JIS A 1454
	TD		
Heating weight loss rate	%	0.29	JIS A 1454
Wear resistance	Abrasion index	g/1000times	0.24
	Tegmental wear resistance	times	5,000

\*These are not guaranteed figures

Electrical characteristic

Item	Unit	SKY-20W	Test Method
Electric leak-resistant value	MΩ	1.4	JIS A 1454
Surface Resistivity	MΩ	7.0	JIS A 1454
Human Body Electrification Voltage	V	≤ 20	JIS L 1023 (Using conductive shoes)

\*These are not guaranteed figures

# Flooring material building equipment



Product No. **SKY-14 I**

Welding Rod Product code	Diameter x Length	Product code	Color
20W-GR	4mmφ×50m/roll	9725C	Green

## ◆ Caution when floor covering

Please put a floor covering according to manual. A welding rod (SKY-14I), Ground wire (SKY-8E), and conduction plate (SKY-8T) required for installation are separately available. Order them when ordering Elefeel Floor.



Material

Construction

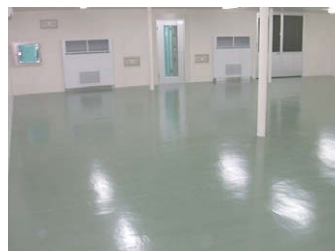
Check

The measurement of the electrical resistance level

## ◆ Workability of floor coverings after



After



Installation example of the Ground-Wire

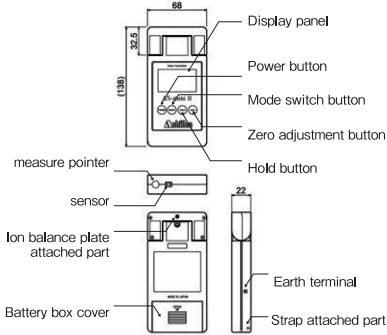


# Electrostatic Voltmeters



Ion balance plate (sold separately)

Electrostatic plate (sold separately)



Product No. **AS-20**

USE

Handheld electrostatic voltage measuring device

Features

- Contactless measuring instrument.
- Capable of checking offset voltage (ion balance) for ionizer by 1V with balance plate (sold separately)
- Rotary sensor head enables measurements in narrow spaces or from transfer lines.
- Bright and large LCD.

Packing Unit

1 unit / carton

Condensed

Item	Specification
Signal detection method	Oscillating chopper method
Display refresh frequency	0.5 seconds
Measurable potential range	Normal mode : 0.00 - ±19.99kV (resolution: 0.01 kV) I.B mode : 0.000 - ±1.999kV (resolution: 0.001 kV)
Continuous operating limit	Approximately 10 hours (with alkaline battery)
Measuring distance	30mm (between object being measured and sensor)
Measuring distance adjustment	Red LED beam focusing method
Sensor head rotation angle	180° (stops every 45°)
Display	LCD display with built-in backlight
Polarity display	+ polarity / - polarity display
Mode switching	Switch modes by pressing MODE button
Battery check	Remaining charge displayed in display panel
Battery	DC9V alkaline rectangular dry cell battery 006P
Operating temperature/humidity	0~+40°C, 20-70% RH, non-condensing 0~40°C
Dimensions	68×22×138mm (W×D×H)
Weight	Approximately 160g (including battery)

The proofreading that is periodical to measure it exactly is necessary. Please demand that you proofread it on this occasion

- Caution** This is a non-explosion proof instrument. Do not use where solvents, flammable gasses or powders are handled.
- Warning** Do not place it near a charged object to avoid electric discharge. It may lead to device failure.
- Warning** ※Please read an instruction manual by all means to use it safely definitely before using it.

# Ionized Air Blower



Product No. **RS-05**

Features

- Our ionizer can provide you slim, compact, and high-powered neutralization; self-controlled ion balancing function reliable neutralization as well as simple cleaning way of maintenance of electrode with a built-in cleaning brush.

Packing Unit

1 / carton

Accessories

AC adaptor, power cord (for AC 100V, 3m long), instruction manual, and filter

Neutralization Performance

	Air flow	Distance	Decay time (sec)	Ion balance
+1000V → +100V -1000V → -100V	MAX	30cm	0.6	±0
			0.5	
		60cm	1.1	-2~-1
			1.2	
		90cm	1.8	-2~-1
			2.4	
		120cm	2.8	±0
			3.3	

Note: The above figures are those actually measured and not for guarantee purposes

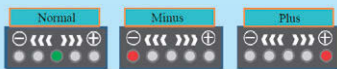
- ※ Measuring point: Front of the ionizer
- Charged Plate Monitor : 6in × 6in, 20P
- Filter-less
- Temperature and relative humidity : 22°C, 38%RH
- Maximum airflow (3.68m<sup>3</sup>/min)

Condensed

Item	Specification
Ion Neutralization Method	DC corona discharge method
Recommended effective distance	300~1,200mm
Material	Body : ABS/Guard: Stainless steel/Brush : PBT Stand : SECC (painting)/Discharging rod : Tungsten
Ambient temp. & humidity	Temp. : 10 to 40°C/Humidity: 35% RH to 65% RH
Consumption current	0.85A Max. (DC24V)
Input voltage	DC24V (AC Adapter included : AC100V to AC240V 50/60Hz) (Power supply cord included: For AC100V)
Input current	0.85A Max.
Airflow	0.89 ~ 3.68m <sup>3</sup> /min (Non-step)
Indication	5LED lamps in line
Ion balance	±10V
Alarm indication	Cleaning timing and abnormality in high voltage part
Ozone generation	0.003 PPM and lower (Measured at 10mm from air supply opening)
Dimensions	164mm (W) × 63mm (D) × 181.5mm (H)
Air supply opening	φ115mm
Weight	0.75kg

## Main functions

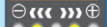
◇ Self-controlled ion balancing functions tells operating condition



◇ Built-in brush for cleaning electrode

Simplifies daily maintenance

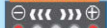
Tuning of cleaning



Two LED indicator lamps (orange) blink when cleaning is necessary

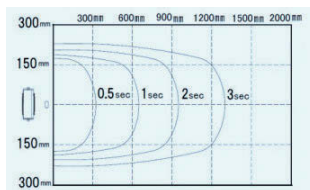
◇ Alarms functional disorder

Alarm display

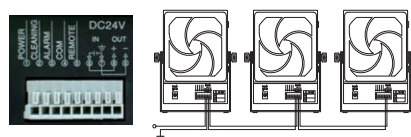


Two LED indicator lamps (red) blink when Functional disorder is detected in high-pressure section.

## Distribution map of neutralization range

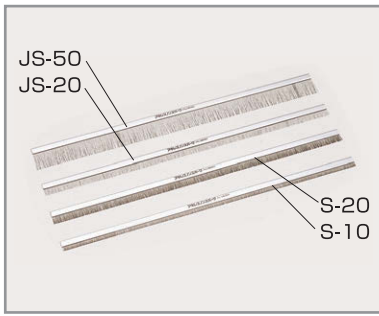


◇ Terminal board of DC24V is capable of operating a maximum of 3 ionizers in parallel.



- Caution** This product is for non-explosion proof applications. Do not use it in an environment where solvents, inflammable gasses or powders are handled.
- Warning** Connect the ground wires to category D. Non grounding may lead to an electric shock and may cause ion balance failure.
- Warning** ※Please read an instruction manual by all means to use it safely definitely before using it.

# Static Eliminator



Product No. **NSP 2S**

### USE

Static dissipating brush for printers or film/paper production (note that brush should be grounded when in use).

### Features

- Efficient static dissipation as the brush is self discharging type
- It's light in weight and strongly. You can attach them various places.
- JS series brush to be installed in upward direction because of a stiff electrode.

### Specification

Product Code	L mm	H mm	Packing Unit
2S- 800	800	10	10 pieces or more
2S-1000	1,000		
2S-1200	1,200	20	
2S-1500	1,500		
2S-1800	1,800	50	
2S-2100	2,100		

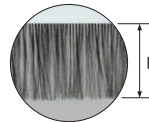
\* JS type is binded electrode

**Caution** Clean the brush regularly ,as dust accumulation may impair static dissipation capabilities.

## ◆ Type of electrode

Material: Stainless steel fiber

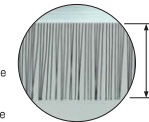
S-10  
S-20  
Electrode length  
Regular electrode



Soft type

- Bundles of 100 fibers are arranged in a line.
- Soft texture
- Electrode length specification: 10 mm and 20 mm
- This type has a higher static elimination effect than the bound type.

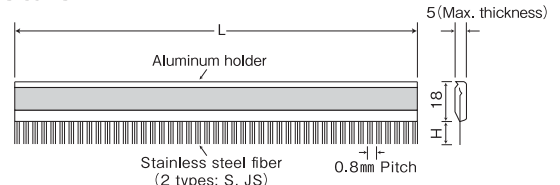
JS-20  
JS-50  
Electrode length  
Regular electrode



Hard type

- Bundles of 100 fibers are coated with resin.
- Slightly hard texture
- Prevents fiber from tangling.
- Prevents fibers from falling off.
- Electrode length specification: 20 mm and 50 mm
- This type can be mounted with fibers facing up.

## ◆ Structure



## ◆ Effective mounting position

It is important to mount the brush in a high-potential position.

### (1) Mounting position

If Static eliminator is mounted on the opposite side of a roll or a plywood or metallic mechanical part, the static elimination effect cannot be expected. Static eliminator can provide its full performance when mounted in a position marked with a circle (○) in the figure below.

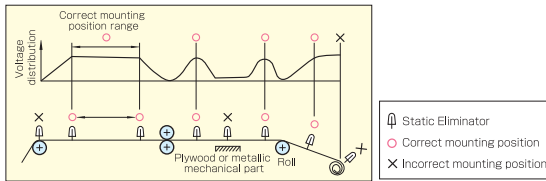


Figure 1: Mounting Positions

### (2) Influence of rolls and other parts on the static elimination effect

Mounting Static eliminator near a plywood or other part as shown in the figure below (where  $\alpha$  is the distance between paper, film or other material and the plywood) will result in a higher residual voltage. If the static elimination effect is small, relocate Static eliminator away from the plywood.

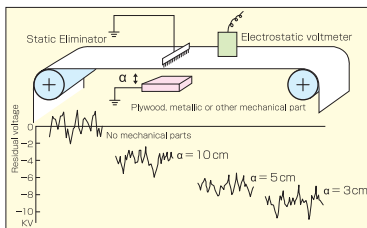


Figure 2: Static Elimination Effect due to a Nearby Grounded Part (When the Grounded Part Approaches the Mechanical Part)

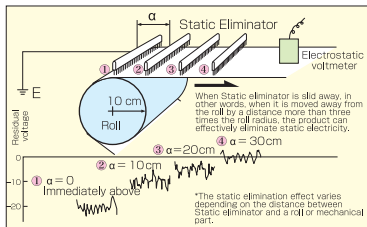


Figure 3: Static Elimination Effect due to a Roll

### (3) Mounting distance depending on the charged potential (guideline)

The static elimination effect varies depending on the distance between a charged body and the end of the static-dissipating brush. Check the withstand voltage before mounting the brush.

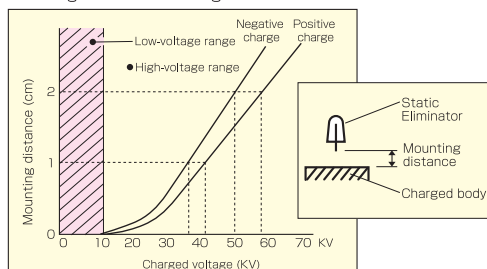


Figure 4: Charged Voltage and Mounting Distance

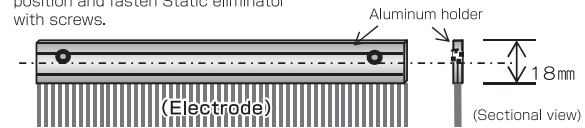
## ◆ How to mount Static Eliminator (example)

The grounding method varies depending on the material to which Static eliminator is mounted.

- 1) If Static eliminator is mounted to a metal or other grounded electric conductor : It is unnecessary to directly connect Static eliminator to the ground. If Static eliminator is mounted to an ungrounded electric conductor, it needs to be grounded.
- 2) If Static eliminator is mounted to a resin or other insulator : Ground Static eliminator by connecting a ground wire to it.

### ① How to mount (drilling)

Drill holes according to the mounting position and fasten Static eliminator with screws.



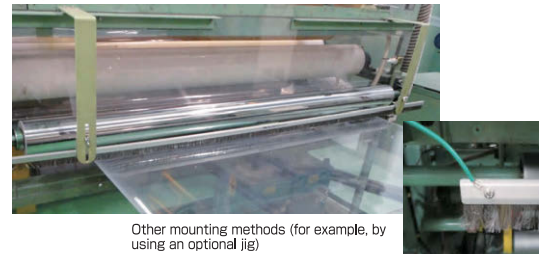
To avoid drilling the electrode, drilling positions must be on the opposite side to the electrode with regard to the centerline of the aluminum holder.

### ② Processing example to attach



Please use it after deflashing cut surface

### ③ Example of mounting



Other mounting methods (for example, by using an optional jig)

### Warning

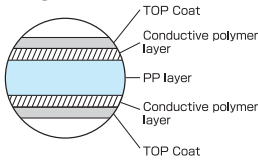
#### Handling Precautions \* Ground this product when using it.

- 1) Failure to effectively eliminate static electricity results in problems. Periodically check the static elimination effect.
- 2) Contaminated electrodes causes a decline in the static elimination performance. Periodically check the static elimination effect and check the electrode for contamination. If it is contaminated, clean it or replace it with a new one.
- 3) If Static eliminator is poorly grounded, it cannot provide the expected performance. Periodically check grounding.
- 4) After static electricity is eliminated from an object by using Static eliminator, the object will take charge again if it is brought into contact with another object and separated. Mount the static-dissipating brush to it as needed.

# Conductive Clear Files



**[ Configuration ]**



**Product No. STN-100**

USE

To store documents within ESD protected area.

Features

●Excellent conductive properties.

Surface Resistance

$\leq 1.0 \times 10^9 \Omega$

Transparency

60% (550nm)

Material

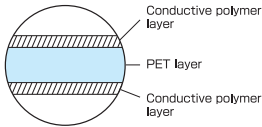
Conductive polymer/Conductive PP 0.2mmt

Specification · Packing Unit

Size	Packing Unit
A3	100pcs/carton
A4	100pcs/carton
B4	100pcs/carton
B5	100pcs/carton



**[ Configuration ]**



**Product No. ST-18**

USE

To store documents within ESD protected area.

Features

●These are conductive file folders designed to protect against static electricity generated in paper-based operational instructions and drawings.

Surface Resistance

$\leq 1.0 \times 10^6 \Omega$

Transparency

65% (550nm)

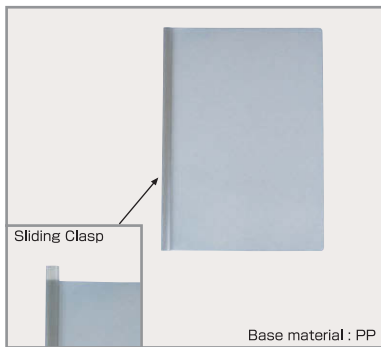
Material

Conductive polymer/Conductive PET 0.125mmt

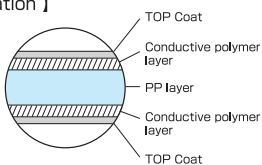
Specification · Packing Unit

Size	Packing Unit
A3	100pcs/carton
A4	100pcs/carton
A5	100pcs/carton

# Conductive Clear Folders



**[ Configuration ]**



**Product No. STN-120**

USE

To store documents within ESD protected area.

Features

●Excellent conductive property

Surface Resistance

$\leq 1.0 \times 10^9 \Omega$

Transparency

60% (550nm)

Material

Conductive polymer/Conductive PP 0.2mmt +  
Conductive polymer/Sliding PP Sprin Stic

Specification · Packing Unit

Size	Packing Unit
A4	50pcs/carton



# Antistatic Agent



Product No. **SL-10**

**Features**

- Dipping or wiping a surface with this antistatic fluid effectively protects against electric charges. (The duration varies according to conditions)

**Surface Resistance**

$\leq 1.0 \times 10^{11} \Omega$  (23°C, 60%RH/Coating side)

**Specification · Packing Unit**

Conister	Packing Unit	Accessories
5 ℓ	1 set	Two empty spray bottles
18 ℓ	1 can	—

**Caution**

Harmful if swallowed. May burn eyes, skin and mucous membranes on contact. First aid: give immediately. Eyes: rinse immediately with water. Remove contact lenses, then flush eyes with water for 15 minutes. If swallowed: rinse mouth. Drink a glass of milk or water. Do not induce vomiting. Skin: remove affected clothing. Flush skin with water for 15 min. Then call Poison Center physician or emergency room.

**Warning**

May be used in diluted form, but diluting is not recommended.

# Transparent Conductive Sheets



Product No. **ST-8**

**USE**

Static shield screen for CRT monitor, surface shield cover, room divider for clean room and equipment.

**Features**

- Suitable for clean room use; limited outgas, and ion contamination
- High transparency

**Surface Resistance**

$\leq 1.0 \times 10^7 \Omega$

**Specification**

Thickness	*Width	Length	Packing
0.25mm	1000mm (effective conductive width:960mm)	20m/roll	1 roll

\*The above shows typical example. Made-to-order films are also available.

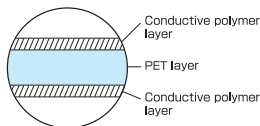
( It's possible to order special thickness  
EX: 0.025, 0.038, 0.050, 0.075, 0.100, 0.125, 0.188mm )

**Condensed**

Item	Unit	Value	Test Method
Thickness	mm	0.25	JIS C 2151
Breaking Strength	MD	176	JIS C 2151
	TD		
Breaking Elongation	MD	190	JIS C 2151
	TD		
Heat Shrinkage Rate	MD	0.9	JIS C 2151
	TD		
Transparency	%	65	JIS K 7105
Surface Resistivity	$\Omega$	$1 \times 10^5$	High resistivity meter

※These are not guaranteed figures

**[ Configuration ]**







<http://www.achilles-esd.com>

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INDUSTRIAL MATERIALS FACTORY

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