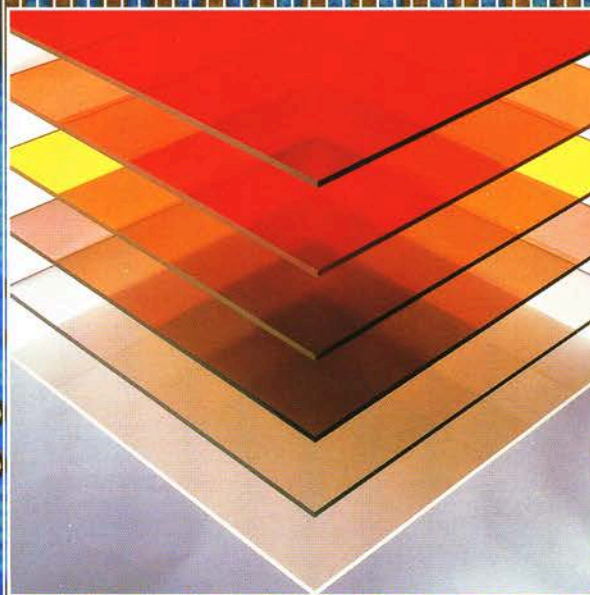




Static Dissipative Plastics Plate

ND Series

PVC
C-PVC
Polycarbonate
PET
TAKIMETAL



Dust collected by static electricity, however microscopic, may pose a serious problem. A “clean environment” is increasingly required in manufacturing and research & development facilities all over the world. The use of Static Dissipative materials has become indispensable in many industrial fields, such as semiconductor, liquid crystal display, electronics, medical, pharmaceutical, food processing, precision machinery, and biotechnology.

To meet this demand, Takiron has developed a series of high performance Static Dissipative Plate Products, the TAKIRON ND SERIES.

This catalogue describes the features of the Takiron ND Series which covers a wide range of products of high performance Static Dissipative Plates. We hope this will help you consider our Takiron ND Series products when designing and constructing a clean environment.

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Clean Room partitions

Takiron offers the most abundant product lineup of static dissipative plastics plates in the world.

Takiron ND Series use various plastics as their substrates, and they feature transparency, a range of service temperatures, high impact resistant characteristics, workability, and economical efficiency that are inherent in respective substrate plastics.

In addition, for other types of static dissipative plastic plates that employ the same substrate, they are available in various grades: a grade focusing on workability, a grade focusing on wear resistance, and a grade focusing on reduced cost, thus enabling a choice of adequate products according to your applications. The following comparison table can be a reference for your selection.

Takiron Static

Transparent Materials	
Group	Substrate
Surface Resistivity	
Scratch Resistance	
Light Transmission	
Service Temperature	
Impact Strength	
Chemical Resistance	
Fabrication	
Bonding	
Welding	
Heat Bending	
Flame Retardancy	
Transparent	
Orange Tinted	
Yellow Tinted	
Gray Smoke Tinted	
Brown Smoke Tinted	
Ivory Opaque	
UL94	
Note	

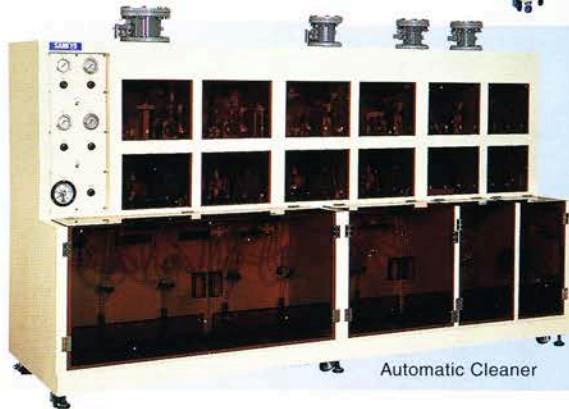
Product Range Overview



Fully automatic etching Cleaner



Grove box



Automatic Cleaner



RIA automatic Cleaner

Dissipative Plastics Plate — ND Series —

☆☆☆☆ Excellent ☆☆☆ Good ☆☆ Limited ☆ Poor

	TND	ETSND MR	FMND	PETND	PETND MR	PCNDL	PCND
	PVC	PVC	C-PVC	PETG	A PET/PETG	Polycarbonate	Polycarbonate
	$10^6 \sim 10^8 \Omega$						
	☆☆	☆☆☆	☆☆	☆☆☆	☆☆	☆☆☆	☆☆
	77% (TND77665)	64%	51%(FMND7600) 63%(FMND7605)	60%	80%	74% (PETND MRA60)	83% 35%
	☆☆	☆☆	☆☆☆	☆☆☆	☆☆	☆☆☆☆	☆☆☆☆
	☆☆☆	☆☆☆	☆☆☆	☆☆☆	☆☆☆	☆☆☆☆	☆☆☆☆
	☆☆☆☆	☆☆☆	☆☆☆	☆☆☆	☆☆	☆☆	☆☆
	☆☆☆☆	☆	☆☆☆	☆	☆☆	☆☆	☆☆☆
	applicable	not applicable	applicable	not applicable	limited	not applicable	limited
	applicable	not applicable	applicable	not applicable	not applicable	not applicable	applicable
	applicable	not applicable	limited	not applicable	not applicable	not applicable	limited
	☆☆☆	☆☆☆	☆☆☆☆	☆☆☆	☆☆	☆☆	☆☆
	77665	MR100	7600·7605	MR760	76600	MRA60	78610
	77285	MR120	7305	MR730		MRG20	
	77385					MRG30	
	77002						77910
	77885/77001					MRG80	77810
	77345						
	V-0	V-0	V-0(FMND7600)	—	HB	HB	HB
			FM4910	FM4910		Up to 5mm	

The above comparison table has been prepared by internally evaluating Takiron products and placing them in order in a simplified way.
As for respective quality test results, please refer to the separate pages.

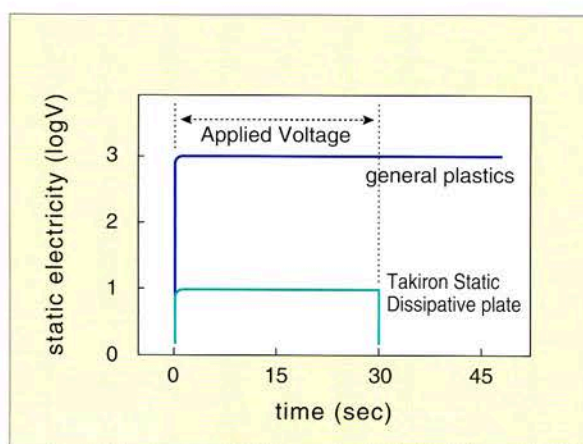
The Chemical Resistance shall be subject to evaluations on inorganic chemicals including general acids and alkalis.

Electrical Characteristics

The Takiron ND Series has a very low saturated charge voltage, indicating that it scarcely picks up an electrical charge. This characteristic is stable and remains unaffected by changes in temperature or humidity.

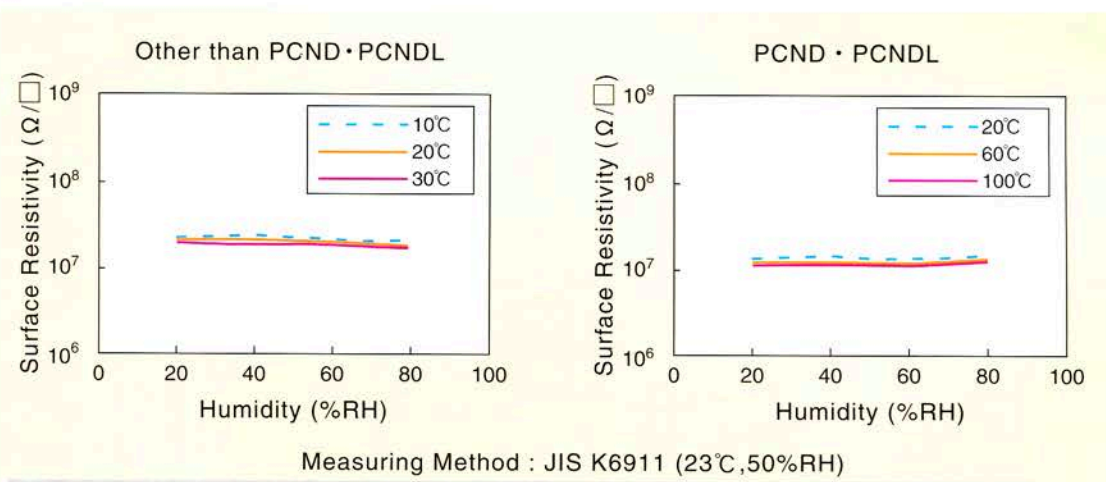
Item	Unit	Takiron Static Dissipative Plate	General Plastics	Measuring Method
Surface Resistivity	Ω/\square	$10^6 \sim 10^8$	10^{16} and more	JIS K6911
Volume Resistivity	$\Omega \cdot m$	$10^{17} \sim 10^{18}$	10^{18} and more	JIS K6911
Saturated Charge Voltage	V	Less than 10	3,000	**
Half Life	sec	Less than 1	Long	**

**Measured with the static honest meter
Applied voltage : 10,000 V for 30 sec
Distance from the specimen and the point of voltage application
Condition : 23°C 50% RH : 20mm



1 Temperature and Humidity Effects

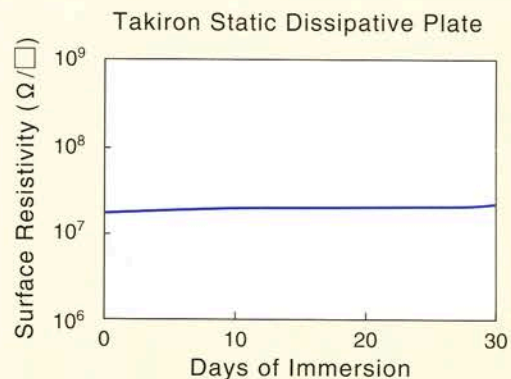
Even when temperature or humidity varies, Takiron ND Series' static dissipative properties exhibit almost no change, and this excellent feature is stable over the long period.



2 Water Effect

Exposing ND Series to water produces virtually no change

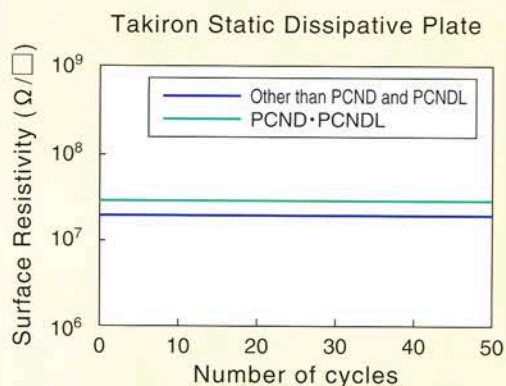
Test Condition : Immersion and Static
Measuring Method : JIS K6911 (23°C, 50%RH)



3 Heat Cycle Effect

Static Dissipative property hardly declines even when the material is exposed to severe temperature variations.

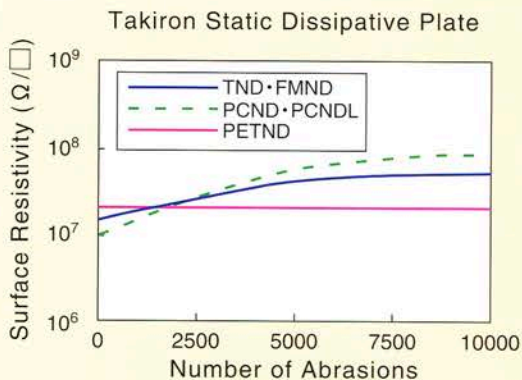
Test Condition :
PCND/PCNDL -20°C (30min) → +120°C (30min)
Other product range : -20°C (30min) → +60°C (30min)
Measuring Method : JIS K6911 (23°C, 50%RH)



4 Abrasion Effect

The effect of surface abrasion is very small.

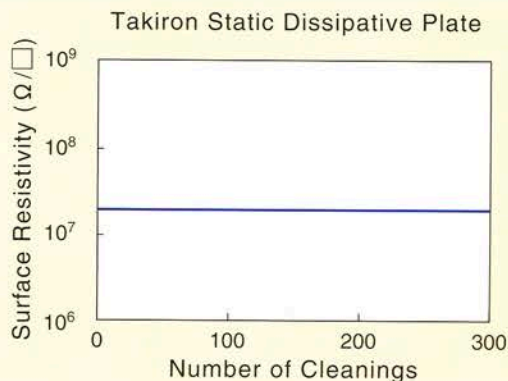
Test Condition :
Scrubbing with Nylon fabric at a load of 500 grams
Measuring Method : JIS K6911 (23°C, 50%RH)



5 Effect of IPA Cleaning

Static Dissipative characteristic of ND Series remains unchanged after hundreds of IPA cleanings.

Measuring Method
JIS K6911 (23°C, 50%RH)



Optical Characteristics

1 Light Transmittance

TND

code	color / item	Total Light Transmittance (%)	Haze (%)
77665	Transparent	77	2.3
77285	orange tinted	33	7.3
77385	yellow tinted	63	10.4
77885	brown smoke tinted	33	9.7
77001	smoke tinted	33	7.3
77002	gray smoke tinted	19	16.8
77003*	blue smoke tinted	60	7.1

* is a made-to-order item.

ETSND MR

code	color / item	Total Light Transmittance (%)	Haze (%)
MR100	Transparent	64	5.2
MR120	orange tinted	37	4.5

FMND

code	color / item	Total Light Transmittance (%)	Haze (%)
7600	Transparent	51	8.2
7605	Transparent	63	4.2
MR760	Transparent	60	4.1

PCND・PCNDL

code	color / item	Total Light Transmittance (%)	Haze (%)
78610	Transparent	83	1.8
77810	brown smoke tinted	35	6.5
77910	gray smoke tinted	35	8.4

PETND

code	color / item	Total Light Transmittance (%)	Haze (%)
MRA60	Transparent	74	3.9
MRG20	orange tinted	38	1.3
MRG30	yellow tinted	48	1.0
MRG80	brown smoke tinted	26	3.0
76600	Transparent	80	1.8

Ultraviolet Screening Products

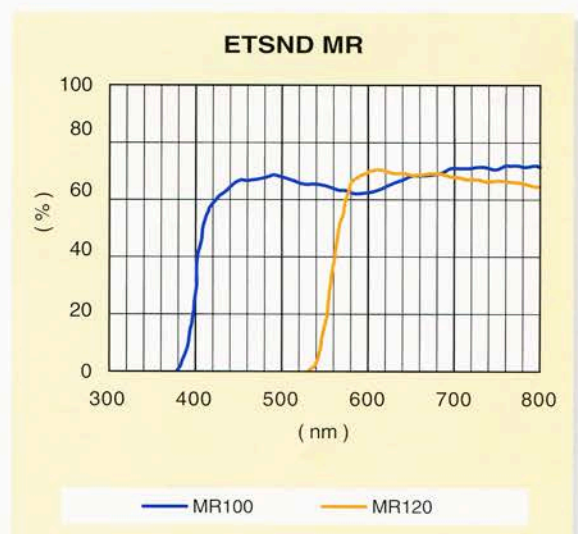
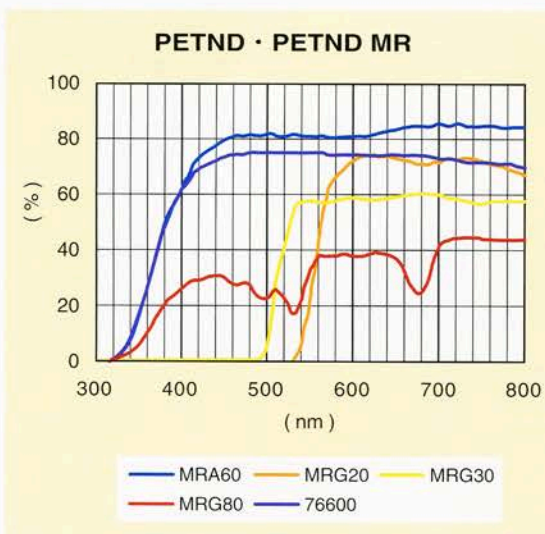
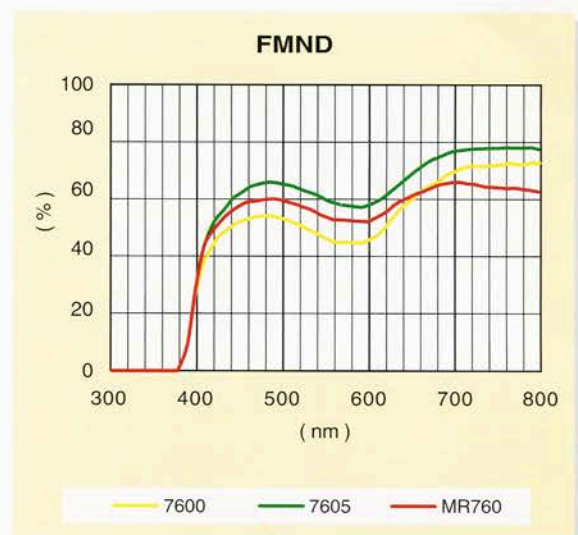
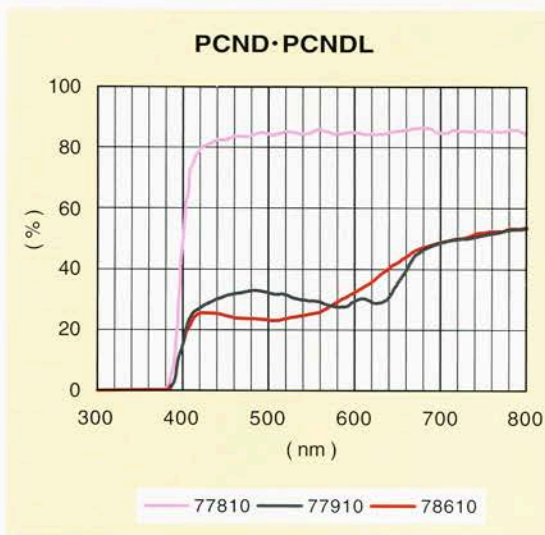
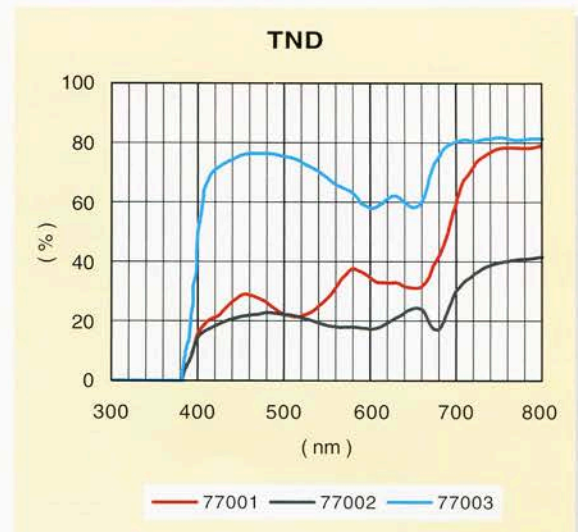
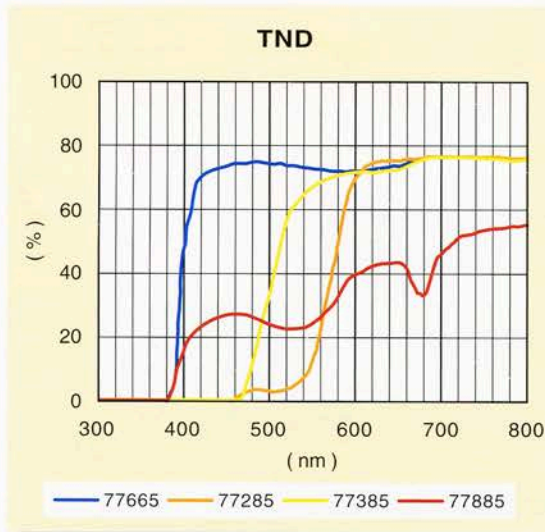
group	code	color	Screening wavelength
TND	77285	orange tinted	450 or below
	77385	yellow tinted	460 or below
ETSND	MR120	yellow tinted	520 or below
PETND	MRG20	orange tinted	520 or below
	MRG30	yellow tinted	460 or below

The use of the UV-cut type will provide potential effects in preventing the drawing in of photophilic insects.

*The above data are a series of test results with 5mm thick specimen and given here without guarantee.

2

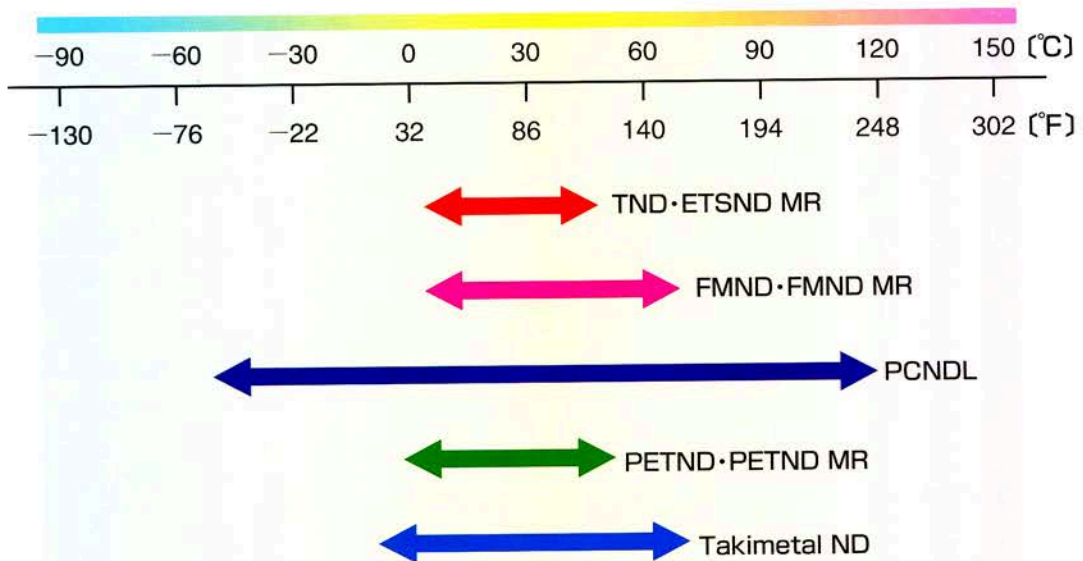
Transmittance Curve by Wavelength



※The above data are a series of test results with 5mm thick specimen and given here without guarantee.

Working Temperature

Working temperature



Actual usable temperatures are subject to conditions of the chemicals used and the status of the application of stress, etc.

Chemical Contact Behavior

The following table shows the behaviors of the Takiron ND Series when in contact with chemicals.

Each chemical was mounted on the specimen for 24 hours.

Surface Resistivity and Appearance were observed after the contact.

	Chemical formula	Concentration	Electrical Characteristics						Appearance					
			TND	FMND	FMND MR	PCNDL	PETND MR	PETND	TND	FMND	FMND MR	PCNDL	PETND MR	PETND
Acid and Alkaline	HCl	36%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		20%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	H ₂ SO ₄	97%	✓	✓	✓	NG	NG	NG	✓	NG	NG	NG	NG	NG
		60%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NG	NG
	HNO ₃	60%	✓	✓	✓	✓	NG	NG	✓	✓	✓	NG	NG	NG
		40%	✓	✓	✓	✓	✓	✓	✓	✓	✓	NG	NG	NG
	H ₃ PO ₄	85%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	CH ₃ COOH	95%	✓	✓	✓	✓	✓	✓	✓	✓	✓	NG	✓	✓
	HF	46%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NG	NG
		10%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	H ₂ O ₂	10%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	NaOH	50%	✓	✓	✓	✓	✓	✓	✓	NG	✓	✓	NG	NG
	NH ₄ OH	25%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Organic solvents	Methyl alcohol	100%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Ethyl alcohol	100%	✓	✓	✓	✓	✓	✓	✓	✓	✓	SC	✓	✓
	Isopropyl alcohol	100%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Buthyl alcohol	100%	✓	✓	✓	✓	✓	✓	✓	✓	✓	SC	✓	✓
	Ethylene glucohol	100%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Acetone	100%	✓	NG	✓	✓	✓	✓	NG	NG	NG	NG	NG	NG
	Toluene	100%	✓	NG	✓	✓	✓	✓	NG	NG	NG	NG	NG	NG
Others	NaCl-aquaos	30%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Ammonium fluoride	50%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	KCl	10%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Mild detergent	10%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ Not Affected
SC Slightly Affected
NG Affected

The above test results are a series of our test results for a limited contact period. For longer times and repetitive contact the products may behave differently from the above results. Our experience indicates that the cleaning of PCND and PCNDL with alcohols does not affect the appearance of the products.

Flame Retardancy

There are various methods to evaluate the flame retardancy of plastics. The following table summarizes the fire retardant classification according to UL standards, FM4910, the JIS, and the oxygen index.

Standard	TND	FMND	PCNDL	PETND
UL94	94V-0	94V-0	94HB	94HB
FM4910	not listed	listed	not listed	not listed
JIS	Self Extinguishing	Self Extinguishing	Self Extinguishing	Self Extinguishing
Classification by Oxygen Index	Flame Retardant	Flame Retardant	Self-Extinguishing	Self-Extinguishing

FM4910 is a test protocol that stipulates the allowable quantity of smoke produced by the burning of plastics, and the flame retardancy level of plastics used in clean rooms as established by FM Approvals. The standard is closely related to that of loss prevention in the case of a fire in semiconductor and LCD manufacturing facilities and to the demands of fire insurance companies. Criteria of the FM4910 standard is much higher than that of the UL94 standard. Takiron FM Plate FMND7600,MR760 is the world's only Static Dissipative Plate product listed to the standard.

Physical Property Data

Testing Items	group	PVC			C-PVC			Poly-carbonate	A-PET	PETG	Test Methods
	color	Transparent	ivory	Transparent	FM Transparent	FM Transparent	FM Transparent	Transparent	Transparent	Transparent	
	unit	TND	TND	ETSND MR	FMND	FMND	FMND	PCNDL	PETND MR	PETND	
	code	77665	77345	MR100	7600	7605	MR760	77810	MRA60	76600	
Lead Free		Yes	No	Yes	Yes	Yes	Yes	-	-	-	
Specific Gravity		1.40	1.45	1.40	1.44	1.46	1.46	1.20	1.34	1.27	JIS K 7112 (MOD ISO 1183)
Tensile Stress at Yield	MPa	74	61	70	68	72	74	65	62	52	JIS K 7162-1B/50 (IDT ISO 527-2)
Nominal Tensile Strain at Break	%	7	10	6	17	15	12	83	22	28	JIS K 7162-1B/50 (IDT ISO 527-2)
Modulus of Elasticity in Tension	MPa	3,300	3,300	3,100	2,900	3,000	3,000	2,300	2,300	2,000	JIS K 7162-1B/1 (IDT ISO 527-2)
Charpy Impact Strength (Notched)	kJ/m ²	2.3	3.5	1.7	2.7	1.7	1.6	15.0	3.1	6.4	JIS K 7111-IepA (IDT ISO 179)
Flexural Stress	MPa	98	87	90	91	93	98	90	83	71	JIS K 7171 (IDT ISO 178)
Flexural Modulus	MPa	3,400	3,200	3,200	3,000	3,000	3,200	2,300	2,400	2,000	JIS K 7171 (IDT ISO 178)
Temperature of Deflection under Load	°C (1.80MPa)	65	75	63	87	85	85	140	69	69	JIS K 7191
Vicat Softening Temperature	°C (method B)	72	81	70	97	94	94	148	74	74	JIS K 7206 (MOD ISO 306)
Dimensional Change on Heating	% (longitudinal)	-6	-4	-3	-5	-5	-5	-	-	-3	JIS K 7133 (IDT ISO 11501)
	% (latitudinal)	-1	-2	1	-2	-2	-2	-	-	-0.5	
Surface Resistivity	Ω/□	10 ^{6~8}									JIS K 6911
Volume Resistivity	Ω · m	10 ¹⁷ and higher									JIS K 6911

The above data are a series of test results with 5mm thick specimen and given here without guarantee.
Total Light Transmittance data of PCND and MND are of clear specimen.

Fabrication

Processing Methods

1 Machining

Machining, such as cutting and drilling, etc., of each static dissipative plate type should be performed in the same way as conducted for substrate plastics (PVC, PC, PET).

2 Jointing

(a) Hot-air Welding

Welding is not possible for hard-coated items since cracks may be caused in areas where hot air is applied. Also, PCNDL and PETND 76600 cannot be welded since practical strength cannot be ensured.

Plate Type	TND	ETSND	FMND	PCND	PCNDL	PETND		
						MRA	MRG	76600
Welding	Applicable ○	N/A ×	Applicable ○	Applicable ○	N/A ×	N/A ×	N/A ×	N/A ×

N/A = Not Applicable

《Notes》

Welding rods for static dissipative plates do not have static dissipative (antistatic properties). The welding rods for the FMND are not the FM4910 listed products.

(b) Adhesive Bonding

The following adhesive agents are recommended in terms of the bonding strength and workability. It should be noted that, due to the affects of the static dissipative surface treatment, the strength of the perpendicular bonding is about 80% of the bonding strength of respective plastics used as substrates.

Plate Type		Adhesive Agent	Remarks
TND • FMND		Takibond 200	A mix of MEK and THF. Adhesive agent for PVC (a smooth, water-clear liquid)
ETSND		N/A	Takibond 200 will work after removing the surface coating.
PCND • PCNDL		Methylene chloride	Industrial chemicals (Also referred to as dichloromethane , or methylene chloride.)
PETND	MRA	N/A	No solvents that elicit practical strength on A-PET are available.

《Notes》

- The surface-to-surface bonding is not recommended since the bonded surfaces will be disfigured due to eluted static dissipative surface treatment into the solvent.
- Before using the PCNDL, be sure to check if suitable strength for the application has been ensured, since its bonding strength is weak and is around 30% of that of general Polycarbonates.
- Be careful during the removal of the static dissipative layer of MND, since cracks are likely to occur due to the solvent.
- It should be noted that products other than the TND and the PCND are manufactured basically assuming the use of single panel glazing.

3

Bending

(a) Perpendicular bending; Using a pipe heater ; Conditions obtained with a 5 mm specimen

Plate Type		Reference Conditions
TND		130°C; 3 to 4 min.; single- side heating When the temperature is too high, there will be deterioration in surface appearance. Therefore, bending should be done immediately when the plate is ready for bending at a relatively low temperature.
FMND		Bending with a small curvature radius is not recommended since the bending area is disfigured (becomes clouded). The curvature radius should be 15 mmR or over.
ETSND		Thermal processing is not possible, since it will cause cracks on the surface.
PCND		Stretching side 170°C/Compressing side 130°C-3 min.; double-sided heating Double-sided heating is recommended since single-side heating will result in a slightly fused surface by the time the plate is softened. Please understand that the appearance of the bent portion will be slightly clouded.
PCNDL		Bending is not recommended, since capability and appearance may be deteriorated.
PETND	MRA	Thermal processing is not possible, since it will cause cracks on the surface.
	MRG	
	76600	Bending is not recommended, since capability and appearance may be deteriorated.



(b) R-bending; Using a gear oven; Product thickness 5 mm

Plate Type		Reference Conditions
TND		130°C; 3 to 4 min. When the temperature is too high, there will be deterioration in surface appearance. Therefore, bending should be done immediately when the plate is ready for bending at a relatively low temperature. When heating is applied for a long period of time, the appearance and static dissipation capability will be deteriorated.
FMND		150°C; 6 to 7 min. Since the softening temperature is higher than that of the TND, a longer thermal application is required.
ETSND		Thermal processing is not possible, since it will cause cracks on the surface.
PCND		180°C; 9 to 10 min. (with preliminary drying) Since the surface is slightly fused, it is preferable to apply heating with the plate lifted by using clamps. In addition, be careful that the use of flannels, etc. on the mold surface may cause the transcription print of flannel.
PCNDL		Bending is not recommended, since the appearance may be deteriorated (clouding on the surface) when heated.
PETND	MRA	Thermal processing is not possible, since it will cause cracks on the surface.
	MRG	
	76600	Bending is not recommended, since the appearance may be deteriorated (clouding on the surface) when heated.

(Notes)

- The above-stated conditions are not absolute. Ensure adequate conditions before proceeding with the work. If the size is large, bending may not be successfully done due to uneven heating.
- As for perpendicular bending, the surface coating status will change due to localized stretching. Consequently, the static dissipative capability tends to deteriorate on the stretched side. Usually, however, since the area is small, almost no electrostatic charge is noted in practice. For applications in which the antistatic capability is particularly important, apply an "ND treatment liquid" to the area.

4 Finishing and Cleaning of Processed Products (box, chamber, etc.)

The use of air blowing is recommended for finishing and cleaning the processed products. To clean greasy smears, use neutral detergents diluted in water by a factor of 200, or alcohols such as ethanol and isopropyl alcohol (IPA).

《Notes》

Regarding the PCND and PCNDL, if they are used under a pressurized condition, as in the case of cold bending with a large curvature radius (to be forcibly bent along the curvature), do not apply cleaning with alcohols since cracks may be caused.

5 Protection Film of Product

If you are to peel off the masking film affixed on products, and another type of film is used as a protection film, be sure to use the type that employs EVA (ethylene-vinyl acetate copolymer) for the adhesion layer called co-extrusion. With types that use soft vinyl or adhesive agents, generation of cracks on the surface or degradation of the static dissipative effect is noted, and if the worst happens, the film cannot be peeled off.

Product Schedule

	Group	Code	Color	Lead Free	Size/Thickness(mm)	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	15.0	20.0
Static Dissipative PVC Plate	TND	77665	Transparent	Yes	1,000×2,000		⑥	④	③	③	②	①	①			
					1,212×2,424			③	②	②	②	①	①			
		77285	Orange tinted	Yes	1,000×2,000			④		③						
					1,000×2,000			④		③						
		77385	Yellow tinted	Yes	1,000×2,000					③						
					1,212×2,424					②						
		77885	Brown smoke tinted	Yes	1,000×2,000			④		③						
					1,000×2,000			④		③		①	①			
		77345**	Ivory	No	1,000×2,000			④		③						
					1,212×2,424			③		②			①			
	ETSND MR	77001	Smoke tinted	Yes	1,000×2,000			④		③		①	①			
					1,212×2,424					②						
PVC antistatic/impact-resistant Plate	TND	77002	Grey smoke tinted	Yes	1,000×2,000			④		③						
					1,000×2,000					*						
Conductive Plate	TSP	MR100	Transparent	Yes	1,000×2,000			*		*						
					1,212×2,424			*		*						
FM Static Dissipative PCV Plate	FMND	77391	Ivory	No	1,000×2,000					*			*			
					1,000×2,000											
		CV930	Black	Yes	1,000×2,000	⑫	⑥	④		③		①	①			
					1,000×2,000											
					1,000×2,000											
Static Dissipative PC Plate	PCND	7600	Transparent	Yes	1,000×2,000					③		*	*			
					1,212×2,424					②						
		7605	Transparent	Yes	1,000×2,000			④		③		①	①			
					1,212×2,424			③		②		①	①			
					1,212×2,424			③		②						
PET Static Dissipative Plate	PETND	77810	Brown smoke tinted	-	1,000×2,000			④		③						
					1,000×2,000			④		③						
		77910	Grey smoke tinted	-	1,000×2,000			④		③						
					1,000×2,000			④		③						
					1,220×2,440			④		③						
Aluminum Composite Static Dissipative Plate	Takimetal AND	78610	Transparent	-	1,000×2,000			④		③						
					1,220×2,440			④		③						
		76600	Transparent	-	1,000×2,000			④		③		①		①		
					1,220×2,440			③	②	②	②					
					1,000×2,000			④		③						
Inflammable static dissipative plate (Aluminum+Plastics Composite)	Takimetal N	MRA60	Transparent	-	1,000×2,000			④		③						
					1,000×2,000			④		③						
		MRG20	Orange tinted	-	1,000×2,000			※		※						
					1,000×2,000			④		③						
					1,000×2,000			※		※						
Inflammable static dissipative plate (Aluminum+Plastics Composite)	Takimetal N	MRG30	Yellow tinted	-	1,000×2,000			④		③						
					1,000×2,000			④		③						
		MRG80	Brown smoke tinted	-	1,000×2,000			※		※						
					1,000×2,000			※		※						
					1,000×2,000			※		※						
Aluminum Composite Static Dissipative Plate	Takimetal AND	370A	Ivory	-	1,212×2,424			③		②						
					1,212×2,424			③		②						
		37FND	Ivory	-	1,212×2,424											
					1,212×2,424											
					1,212×2,424											

○ “*” is a made-to-order item.

Primary lot for an order 80 3-mm sheets 50 5-mm sheets 25 10-mm sheets For other items, contact us for further information.

○ “※” is a made-to-order item. (Be sure to confirm the minimum lot for each product.)

○ “**” is a made-to-order item. Primary lot for an order 500m²

○ “***” Lead Free type of TND 77345 is a made-to-order item. Please contact US.

Limitation of Warranty

Values of physical properties herein are presented as typical test results in Takiron Co., Ltd., and are considered accurate to the best of our knowledges. It is offered solely for your consideration, examination and verification, and is not to be construed as a representation or warranty expressed or implied, for which Takiron Co., Ltd. assumes any legal responsibility. Our warranties are limited to those expressly stated in the formal contracts or in conditions of sale on our invoices and order acceptances. Conditions and methods of use may vary and are beyond the control of Takiron Co., Ltd., therefore, Takiron Co., Ltd. disclaims any liability incurred as a result of the use of Takiron Static Dissipative Plates in accordance with the values of physical properties herein.

No information herein shall be construed as an offer of indemnity for infringement or as a recommendation to use Takiron Static Dissipative Plates in such a manner as to infringe any patent, utility model and design, domestic or foreign. The values of physical properties of Takiron Static Dissipative Plates cannot be automatically used when engineering finished fabricated components; and the fabricator or end user is responsible for insuring the suitability of Takiron Static Dissipative Plates for their specific application or end use.

THERE ARE NO WARRANTIES AS TO TAKIRON STATIC DISSIPATIVE PLATES DESCRIBED HEREIN. EITHER EXPRESSED OR IMPLIED. INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.



Notes on Handling Takiron Static Dissipative Plates

① Notes on usage

- 1-1. For the best suitable selection of Takiron Static Dissipative Plates, ensure to carefully check temperature, chemicals, ultra violet effect, external stress and other actual conditions on which Takiron Static Dissipative Plates are to be used.
- 1-2. In your design, it is important to consider not only the theory of strength calculation but also your experiences related to the fabricating conditions and methods.
- 1-3. Figures of physical properties and other aspects are typical test values, not guaranteed performances.
- 1-4. According to your intended use, ensure to select suitable Takiron Static Dissipative Plates.
- 1-5. Ensure that Takiron Static Dissipative Plates are not in contact with materials that may contain harmful substances to the plates, such as flexible PVC and rubber.

② Notes on fabricating

- 2-1. During your fabricating of Takiron Static Dissipative Plates, ensure to wear the protections such as gloves and goggles according to necessity and use appropriate machines and tools.
- 2-2. During your cutting and welding of Takiron Static Dissipative Plates, gas may be generated. Ensure that the fabricating room is adequately ventilated.
- 2-3. When you use adhesives and solvents, there is a risk of gas poisoning, fire, gas explosion and other accidents. Be careful of fire, and ensure there is adequate ventilation. Take the correct precautions according to the notes and indications on the materials to be used.

③ Notes on storage and transportation

- 3-1. During storing and transporting Takiron Static Dissipative Plates, ensure to keep the plates placed horizontally. If Takiron Static Dissipative Plates are stored and transported leaning against a wall, the plates may warp.
- 3-2. It should be noted that some masking materials protecting Takiron Static Dissipative Plates may not peel off, if the plates become wet.
- 3-3. Ensure that Takiron Static Dissipative Plates and their fabricated plates are not exposed to direct sunlight. Don't store and transport them in a high temperature environment.

④ Notes on disposal

- 4-1. If you dispose of Takiron Static Dissipative Plates, always dispose the plates as industrial waste in compliance with the relevant laws and regulations.



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