

SEWON

PS D/Plate Specification

PS Diffuser Plate

1. Material : GPPS (General Purpose Polystyrene; Optical Grade)

2. Product Name : PS Diffuser Plate (PS D/Plate)

3. Mechanical Properties

Item	Unit	Method	Result
Specific Gravity	-	ASTM D792	1.058
Tensile Strength	MPa	ASTM D638	46.0
Elongation	%	ASTM D638	2.0
Flexural Strength	MPa	ASTM D790	98.9
Flexural Modulus	GPa	ASTM D790	3.78
Impact Strength	J/m	ASTM D785	12.5
Rockwell Hardness	-	ASTM D785	105
Heat Distortion Temperature	℃	ASTM D648	88
Vicat Softening Temperature	℃	ASTM D1525	100

* REMARKS : The listed values should be used for referential purposed only

PS Diffuser Plate

4. PS Diffuser Plate Line-up Information

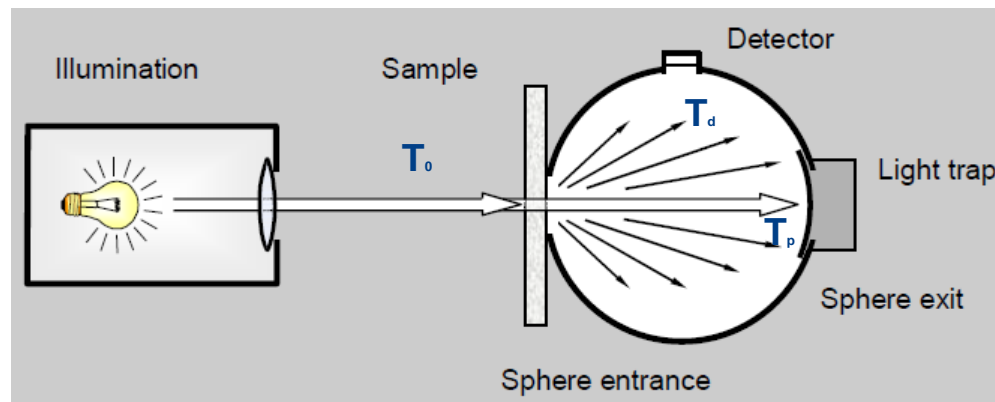
Div.	Total Transmittance (%)							
Thickness (mm)	58%	62.5%	65%	70%	75%	80%	90%	93%
1.2			MP					
1.5	MP	MP		MP	MP	MP	MP	MP
2.0		MP						
3.0		MP						

* MP : Mass Production

PS Diffuser Plate

5. Optical Properties – Total Transmittance, Haze

Item	PS Diffuser Plate						
Thickness	1.5mm						
Total Transmittance	58%	62.5%	70%	75%	80%	90%	93%
Haze	97% ↑					95% ↑	87% ↑



$$\text{Total Transmittance} = \frac{(T_d + T_p)}{T_0} \times 100\%$$

$$\text{Haze} = \frac{T_d}{(T_d + T_p)} \times 100\%$$

PS Diffuser Plate

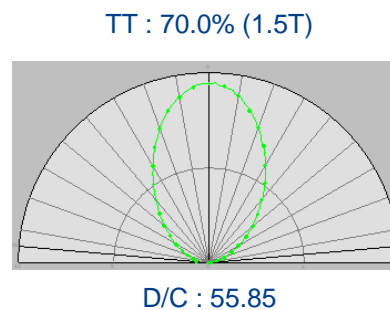
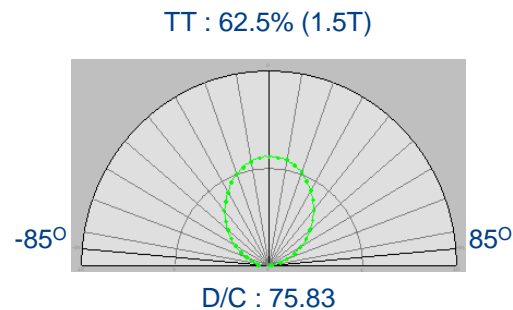
6. Optical Properties – Diffusion Coefficient

Item	PS Diffuser Plate						
Thickness	1.5mm						
Total Transmittance	58%	62.5%	70%	75%	80%	90%	93%
Diffusion Coefficient	>80	>70	>50	>45	>40	>15	>1

DIFFUSION COEFFICIENT =

$$\frac{(20^\circ \text{measurement} / \cos(20) + 70^\circ \text{measurement} / \cos(70))}{5^\circ \text{measurement} / \cos(5)}$$

For Example



PS Diffuser Plate

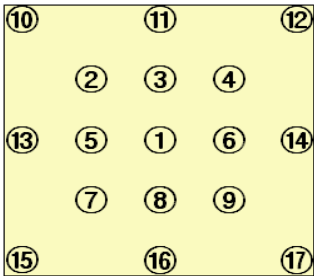
7. Optical Properties – Luminance

Item	PS Diffuser Plate						
Thickness	1.5mm						
Total Transmittance	58%	62.5%	70%	75%	80%	90%	93%
Luminance (17Point Average)	4,306	4,358	4,388	4,431	4,479	4,585	4,259

◆ CONDITION

- Light Source : LED (600x600mm, Direct)
- Output : 33W
 - Dimming : Max
 - Aging Time : 1hr
- Equipment : CA-2000
- Lens Type : Wide
 - Lens Position : 1m
- Temperature : Room Temp.
- Sample Aging Time : 30min

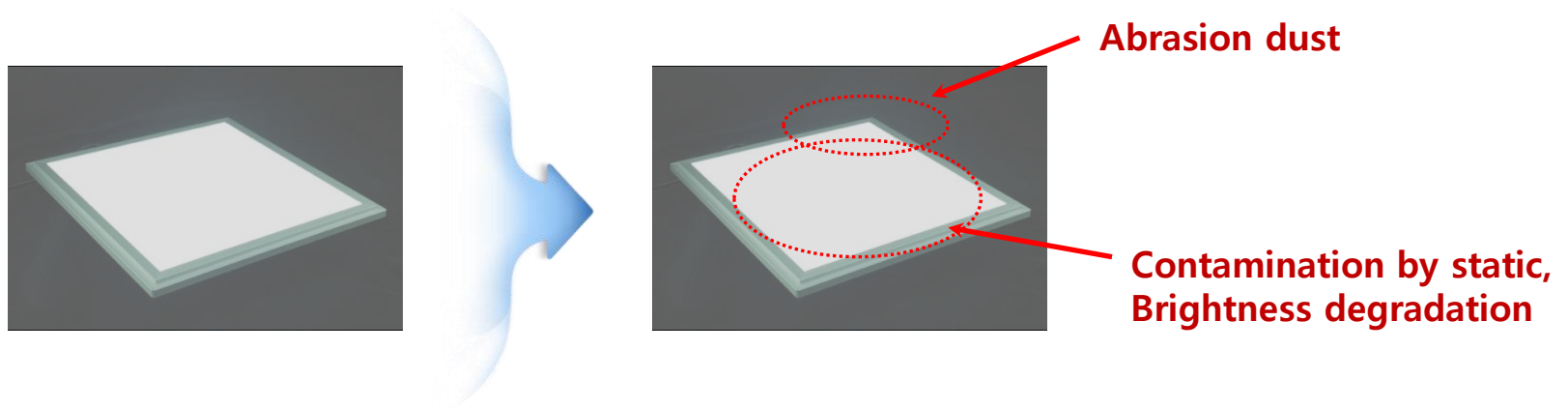
◆ Measurement Position



Futures of product

■ Anti-static treatment

- ▶ Needs to solve electrically insulating surface charge (static electricity) from plastic materials
- ▶ Adhesion of particle caused by static electricity from the surface charge → Contamination
 - Display application : Picture quality degradation
 - Lighting application : Brightness degradation, hindrance of exterior
- ▶ Removal of contaminants → Needs to clean physically
 - Display application : Impossible to clean
 - Lighting application : Clean regularly

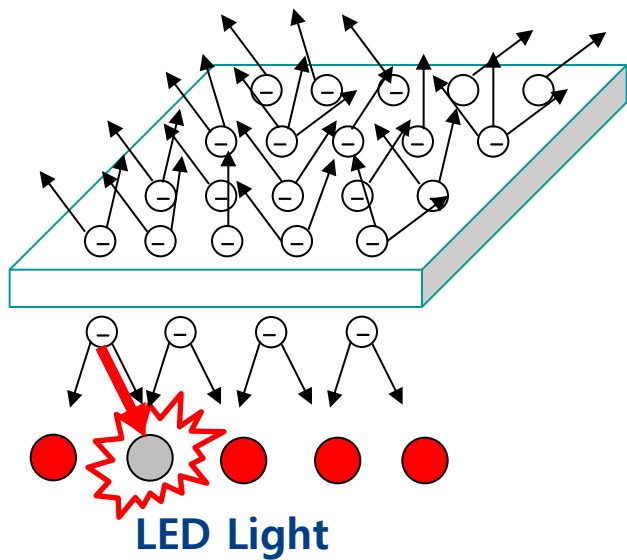


▶ Solution

Anti-static treatment → Decrease surface resistance → Revert contamination

Futures of product

Free static problems with great Anti-static treatment



Prevent damage of LED lighting by static
Enhancement of long term reliability of LED Lighting

Requirement of Anti-static for application of Display and its effect

	Normal PS diffuser (without Anti-static treatment)	BLU requirement Spec.	SEWON Spec. (with Anti-static treatment)
surface resistance (Ω/\square)	$>10^{15}$	$<10^{11}$	$<10^9$
Contamination	Contamination	Some Contamination	No contamination