



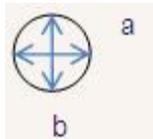
## ITO Conductive PET Film

Application	Structure
<ul style="list-style-type: none"> <li>- Touch screens components</li> <li>- Electroluminescent (EL) lamps</li> <li>- Transparent Heating Elements</li> <li>- Electrophoretic displays</li> <li>- Sensors position</li> <li>- Liquid crystal devices</li> <li>- Membrane Switches</li> <li>- EMI shielding</li> <li>- Smart windows</li> </ul>	Transparent Electroconductive Film   ITO (Indium - Tin Oxide) PET Film 125 $\mu$ m (+/-5)

Item	Unit	EMI-ITO 60	Test Method
Thickness	$\mu$ m	125 $\mu$ m (+/-5)	Micrometer
Width	mm	297mm (+/-2)	Measurement Tape
Length	mm	210mm(+/-2)	Measurement Tape
<b>Base Film Quality</b>			
Transmittance	%	$\leq 86$	ASTM D1003
Haze	%	1.5 (+/-1)	ASTM D1003
Thermal	MD%	$\leq 1.2$	JIS C2318:1997
Shrinkage	TD %	$\leq 1.2$	JIS C2318:1997
Hard Coat Hardness	H	-	JIS K5400
<b>Specification</b>			
Surface Resistance	$\Omega$ /sq.	60 (+/-5)	4cmx4cm, 3 point average
ITO Coated Thickness	1,400 $\pm$ 150Å		Parallel Elctrode
Transmittance	%	$\geq 80\sim 81$	ASTM D1003 (550nm)
Haze	%	1.5 (+/-1)	ASTM D1003
ITO Adhesion	%	100 / 100	Cross cut test JIS K5400
Thermal	MD%	$\leq 1.2$	JIS C2318:1997
Shrinkage	TD %	$\leq 1.2$	150°Cx30min.
<b>Environmental Character</b>			
High Temperature Test	R/Ro	1.0 (+/-0.25)	150°Cx60min.
High Temperature Storage	R/Ro	1.0 (+/-0.25)	80°Cx250hrs

High Temperature Moisture	R/Ro	1.0 (+/-0.25)	60°Cx95%RH x 250hrs	
<b>Chemical Character</b>				
Ethanol	R/Ro	1.0 (+/-0.25)	R.T 30 min	
Acetone	R/Ro	1.0 (+/-0.25)	R.T 30 min	
Toluene	R/Ro	1.0 (+/-0.25)	R.T 30 min	
<b>SAppearance</b>				
<b>Scratch / Linear Defects</b>				
Method	Size	Length	Spec.	Remark
Visual Inspection	$W > 0.05\text{mm}$	$L > 2\text{mm}$	NG	In case scratch / smudge are more
	$0.02 < W \leq 0.05\text{mm}$	$L \leq 2\text{mm}$	$\leq 20$	than 2, distance between the <sup>2</sup>
	$W \leq 0.02\text{mm}$		OK	should not be less than $10\text{mm}/\text{m}^2$
<b>Particle, Bubble, Smudge</b>				
Method	Size	Length	Spec.	Remark
Visual Inspection	$0.3\text{mm} < \emptyset$	-	NG	Not exceed $\text{m}^{2< \text{spot, (black}>$
	$0.2\text{mm} < \emptyset \leq 0.3\text{mm}$	-	$\leq 10$	spot, sparkling spot, ITO coating
	$\emptyset \leq 0.2\text{mm}$	-	OK	peeling off.
Visual Inspection				Dimp, Dent, Hole

Particle size  $\emptyset = (a + b) / 2$



### Electrical Uniformity

All products feature electrical uniformity of 10% within any one square foot area, defined as the maximum difference from the average ohms per square value within that area. However, touch screen manufacturers typically achieve < 1% resistance linearity by orienting their sensors (busbars) so that the electrical current path is always in the direction of the length of the film roll.

### Handling

Vacuum deposited ITO coatings are very thin and are easily scratched or cracked if handled improperly. When removing film from a roll, care should be taken not to bend or crease it. It is important never to allow the ITO coated side to come in contact with a surface, such as a table, during processing operations. Sliding ITO coating over a surface will scratch the coating, resulting in elevated surface resistance and visible defects. Please note that all ITO PET film product supplied in sheet form is supplied with protective liner on all surfaces.

