AgNW Transparent Conductive Film

(Product Model：CSG-TCF-R2040)

1.Applicable Range

This specification is applicable to the silver nanowires transparent conductive film (AgNW TCF) produced by COATING SUISSE Ltd.

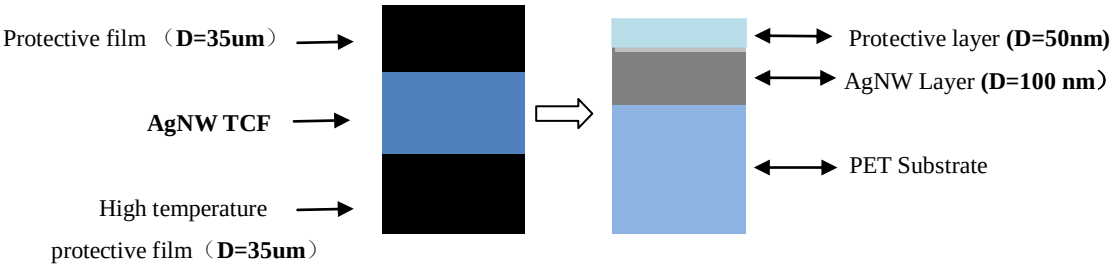
2. Product Introduction

2.1 Production Process

With PET as the substrate, AgNW sol as the conductive material, and oxide sol as the protective material, AgNW sol is uniformly dispersed on the PET film, and then the protective material is evenly spread on the nano-silver conductive layer, and finally the transparent conductive film is formed after baking and curing.

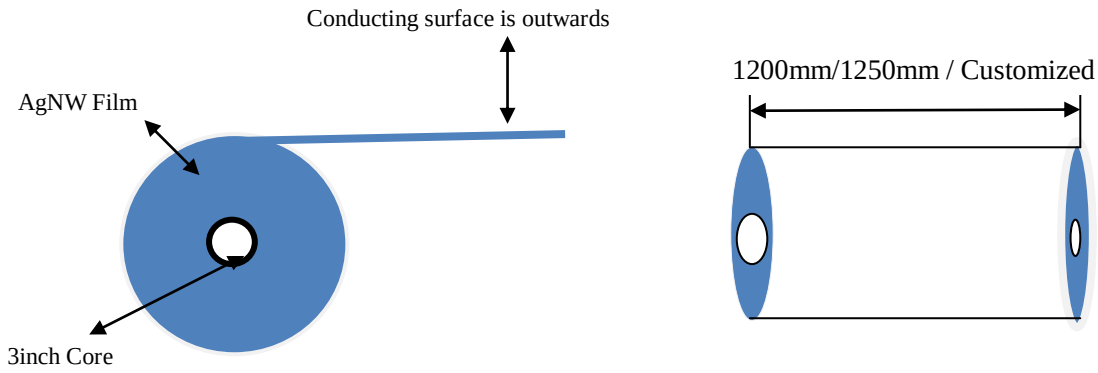
2.2 Product Structure

2.2.1 Sectional Drawing



(Remarks : D=Thickness)

2.2.2 Film Roll Structure



2.3 Performance Parameters

Items			Unit	Measuring Method/ Instrument		Test Result
Substrate	Thickness (excluding protective film)		μm	Micrometer		125±1.2%
Optical properties	Haze		%	WGT-S		＜1.80
	Transmittance		%	WGT-S		≥89
	b* Value		-	Chromatic meter		＜2.0
Electrical properties	Sheet Resistance		Ω/sq	Four-probe meter		20-40
	Uniformity	MD	Ω/sq	|Max-Min|		5
		TD	Ω/sq			5
Physical properties	Adhesion Strength		-	GBT9286-1998		5B
	Shrinkage	MD	%	150℃，30min		1
		TD	%			0.5
	Film Stability	Thermal stability	%	150℃，30min	$\frac{R_1-R_0}{R_0}$ *100%	±10
			%	85℃，240H		±10
		High Temp. and humidity resistance	%	85℃、85％RH、240H		±10
		Low temp. resistance	%	-40℃，120H		±10
		Xenon lamp	%	TP finished product，1.1W@420nm，50W@300-400nm，Environmental temp. 45℃， Blackboard temp. 69℃，Humidity 50%，Test time:360H		±15
	Heating Crimpness		%	150℃、30min		≤10
	Flexibility		%	Min. Crimp Radius 5mm	$\frac{R_1-R_0}{R_0}$ *100%	＜3
Chemical resistance	Ethanol		%	$\frac{R_1-R_0}{R_0}$ * 100%		-20~+20
	Acetone		%	$\frac{R_1-R_0}{R_0}$ * 100%		-40~+40
	Toluene		%			-20~+20

* Chemical resistance: AgNW film was placed in an organic solvent and soaked at 25℃ for 10 minutes, or the organic solution was dampened with a dust cloth and wiped off the conductive layer with 1Kg force.

2.4 Standard for Appearance

Item	Quality Requirements		Remarks
Foreign matter, speckle, pit, pinhole, etc	0.3＜ø＜0.6	≤1 / M^2 OK	Visual and scale microscope determination
	0.2＜ø≤0.3mm	≤3 / M^2 OK	
	0.1≤ø≤0.2mm	≤8 / M^2 OK	
	ø＜0.1mm	OK	
Scratch	W＜0.1 & L≤1mm	OK	
	W＜0.02 & L＜20mm	OK	
	0.02≤W＜0.1 & 1＜L≤5mm	≤5 处/ M^2 OK	
	0.02≤W≤0.05 & 5＜L＜10mm	≤5 处/ M^2 OK	
	0.05＜W＜0.1 & 5＜L＜10mm	≤3 处/ M^2 OK	
	0.02≤W＜0.1 & 10≤L＜20mm	≤1 处/ M^2 OK	
	W≥0.1mm or L≥20mm	NG	
Fracture, Crack	The middle part has no fracture and crack		
*Among them ø=（L+W）/2 * The product is generally placed under a fluorescent lamp for visual inspection			

2.4.1 Sampling Methods

Item	Sampling methods	Remarks
Substrate thickness	One piece of 30mmx30mm sample was selected from the left, middle and right parts of the first end of the large roll [1] after coating	
Optical properties	One piece of 30mmx30mm sample was taken from the middle of each end of the small roll [2]	Test the transmittance and haze
Electrical properties	One piece of 1200mmx300mm sample was taken from the middle of each end of the small roll [2]	Test the sheet resistance before and after heating and test the uniformity of sheet resistance
Shrinkage	One piece of 200mmx300mm sample was selected from the left, middle and right parts of the first end of the incoming coil [1]	
Heating Crimpness	One piece of 200mmx300mm sample was selected from the left, middle and right parts of the first end of	

	the large roll [1] after coating	
Film adhesion Strength	One piece of 30mmx30mm sample was selected from the left, middle and right parts of the first end of the large roll [1] after coating	
Film stability	Four pieces of 20mmx30mm samples were selected from the left, middle and right parts of the first end of the large roll [1] after coating	Test the film's resistance to high temperature, high humidity, low temperature and thermal stability
Chemical resistance	Three pieces of 30mmx50mm samples were selected from the left, middle and right parts of the first end of the large roll [1] after coating	The properties of resistance to ethanol, acetone and toluene were tested

3、Packing Way

3.1 Packing specification

Item		Unit	Standard Value	
Roll type	Thickness	μm	Original Substrate 125±1.2%	After covered with protective films 195±2%
	Width	mm	±1	
	Length	M	30/50/100	
	Joint Number	PCS	0	

3.2 Principle of length compensation

3.2.1 Defects within the range of 0.5 meter, compensate 0.5 meter ;

3.2.2 Defects range from 0.5 to 1 meter, compensate 1 meter ;

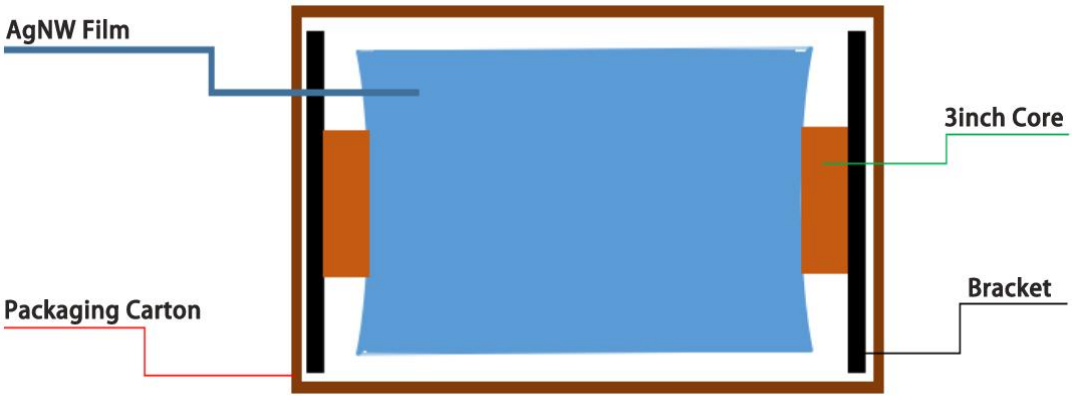
3.2.3 Defect range from 1 to 20meters, compensate by the number of defect, each roll defect length does not exceed 5meters ;

3.2.4 The joint of the protective film, compensate 0.5 meter ;

3.2.5 The PET joint, compensate 1 meter;

3.2.6 The innermost circle and the outermost circle do not count in the shipping length.

3.3 Package Drawing



4、Handling and Storage

4.1 In the process of handling, the product should be handled with care to avoid collision or extrusion on the Film layer. The product should be placed horizontally and not placed vertically to prevent surface damage caused by relative slide of the film.

4.2 After opening the package, in order to prevent contamination of the product, bare hands are not allowed to touch the conductive surface of the film.

4.3 Product Shelf Life: The storage period shall not exceed 6 months from the date of delivery. Products should be stored in a cool and dry environment, avoid direct sunlight, storage temperature at 5~30℃, humidity at less than 60%.

5、Method of Use

5.1 Before use, remove the protective film of the AgNW coated surface and conduct the aging treatment for the AgNW film (bake at 120℃ for 30min).

5.2 The suggested minimum width of the etching pattern is 50μm or more for this AgNW film.

5.3 In the process of use should avoid conductive surface and sharp objects touch, can not rub with hard objects, so as not to scratch and cause wrinkles.

5.4 If you touch the conductive surface to leave fingerprints, or there are other foreign bodies, you can use a dust cloth dipped in alcohol to wipe gently.

5.5 Regarding the AgNW film, if there is any change for the use methods, in order to avoid adverse situations, please consult our company in advance, and request your company to evaluate the use methods before using it.

6、Prior Consultation

In the process of production and processing, if the manufacturing conditions or product specifications are changed, we must contact you in advance and obtain your consent before we can change.

7、Disposal of nonconforming products：

If your company finds unqualified products in the process of incoming material inspection or defective products in the process of production, you shall inform our company to deal with them by agreement.

8、Instructions：

8.1 The technical parameters in this manual are for technical reference only.

8.2 The contents of this manual are subject to change without prior notice.

Disclaimer: The information provided in this Technical Data Sheet (TDS) is compiled in good faith and obtained using procedures performed at COATING SUISSE Ltd. and to the best of our knowledge. The information on this TDS has been updated on the date printed, and latest versions can be obtained upon request. The customer is responsible for conducting tests to determine whether our products are compatible with the customer's process and specific applications. .

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