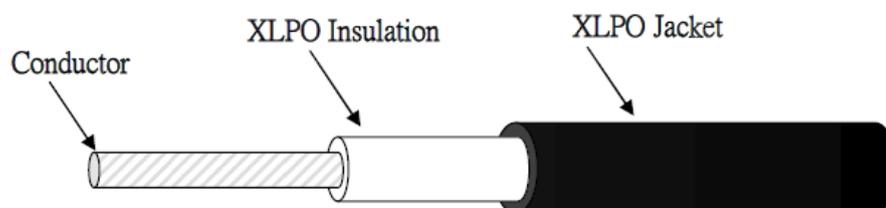


# Specification for Approval

## Photovoltaic Wire (UL) 600 V

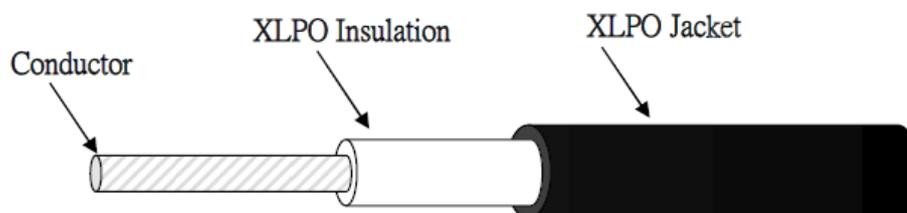


Type	Conductor (Tinned Copper)			Insulation		Jacket		Max Conductor Resistance at 20°C (Ω/km)
	mm <sup>2</sup>	No./mm	Diameter (mm)	Material	Diameter (mm)	Material	Diameter (mm)	
UL 4	4	52/0.3	2.5	XLPO	5.0	XLPO	6.8	5.09
UL 6	6	78/0.3	3.1		6.4		8.2	3.39
UL 10	10	75/0.4	4		7.3		9.1	1.95

- Application standard : UL Subject 4703
- Certificate No : File E331556
- Application : The PV wire for interconnection wiring of grounded and ungrounded photovoltaic power systems as described in Wiring Systems.
- Conductor : Flexible Tinned copper , IEC 60228 , Class 5
- Insulation : White XLPO
- Sheath : Black XLPO
- Rated Voltage: 90°C Dry and Wet, 600 Volts
- Character : -40°C, Sunlight resistance

# Specification for Approval

## Photovoltaic Wire (UL) 1000 / 2000 V



Type	Conductor (Tinned Copper)			Insulation		Jacket		Max Conductor Resistance at 20°C (Ω/km)
	mm <sup>2</sup>	No./mm	Diameter (mm)	Material	Diameter (mm)	Material	Diameter (mm)	
UL 4	4	52/0.3	2.5	XLPO	5.8	XLPO	7.6	5.09
UL 6	6	78/0.3	3.1		6.8		8.6	3.39
UL 10	10	75/0.4	4		7.7		9.5	1.95

■ Application standard : UL Subject 4703

■ Certificate No : File E331556

■ Application : The PV wire for interconnection wiring of grounded and ungrounded photovoltaic power systems as described in Wiring Systems.

■ Conductor : Flexible Tinned copper , IEC 60228 , Class 5

■ Insulation : White XLPO

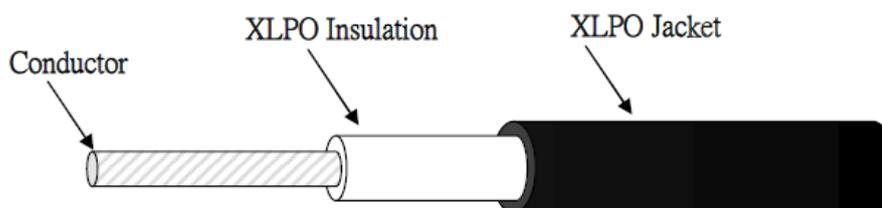
■ Sheath : Black XLPO

■ Rated Voltage: 90°C Dry and Wet, 1000 / 2000Volts

■ Character : -40°C, Sunlight resistance

# Specification for Approval

## Photovoltaic Wire (EU)



Type	Conductor (Tinned Copper)			Insulation		Jacket		Max Conductor Resistance at 20°C (Ω/km)
	mm <sup>2</sup>	No./mm	Diameter (mm)	Material	Diameter (mm)	Material	Diameter (mm)	
EU 4	4	52/0.3	2.5	XLPO	4.1	XLPO	6.0	5.09
EU 6	6	78/0.3	3.1		4.7		6.6	3.39
EU 10	10	75/0.4	4		5.6		7.5	1.95

■ Application standard : TUV 2PFG 1169/08.07

■ Certificate No : R 50229332

■ Application : The PV cable for use in photovoltaic (PV) system, in particular for installation at the Direct Current ( d.c.) side

■ Conductor : Flexible Tinned copper , IEC 60228 , Class 5

■ Insulation : White XLPO

■ Sheath : Black XLPO

■ Rated Voltage: AC 0.6/1kV ; DC 1.8kV

DC 1.8KV (conductor-conductor, non earthed system, circuit not under load)

DC 0.9kV (single phase earthed system)

■ Max. Temperature at Conductor at 120°C

■ Ambient Temperature : -40~90°C

■ Character : Flexibility, UV resistance, Halogen free

File E321556  
Project 09CA32940

December 18, 2009

REPORT

on

PHOTOVOLTAIC WIRE

I Sheng Electric Wire & Cable Co., Ltd.  
Taoyuan Hsien, Taiwan

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File E331556

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Sec. 2  
and Report

Page 1

Issued: 2009-12-18  
Revised: 2012-01-20

## DESCRIPTION

## PRODUCT COVERED:

Photovoltaic Wire, Type PV.

## GENERAL CHARACTER AND USE:

This is a single-conductor, non-integrally jacketed, sunlight resistant, photovoltaic wire rated 90°C wet or dry, 600, 1000 or 2000 V, for interconnection wiring of grounded and ungrounded photovoltaic power systems described in Section 690.31(A) and other applicable parts of the National Electrical Code (NEC), NFPA 70.

## CONSTRUCTION DETAILS:

Conductor - Stranded copper conductors, Size 18 AWG - 2000 kcmil, or stranded aluminum or copper-clad aluminum conductor, Size 12 AWG - 2000 kcmil, in accordance with Type RHW-2 in the Standard for Thermoset-Insulated Wires and Cables, UL 44, except that 18 and 16 AWG meet the requirements in Section 6 of the Standard for Fixture Wire, UL 66.

\* Insulation - XL Insulation Compound Pexidan X/T-UV2 manufactured by Saco Polymers, Inc., all color, except clear, with thickness in accordance with the following tables:

## 600 V Construction:

AWG Size of Conductor		mils	
Copper	Aluminum or copper-clad aluminum	Minimum Average Thickness	Minimum Thickness at any Point
18 - 10	12 - 10	45	40
8 - 2	9 - 2	60	54
1 - 4/0	1 - 4/0	80	72
250 - 500 kcmil	250 - 500 kcmil	95	86
550 - 1000	550 - 1000	110	99
1100 - 2000	1100 - 2000	125	112

## 1000/2000 V Construction:

AWG Size of Conductor		mils	
Copper	Aluminum or copper-clad aluminum	Minimum Average Thickness	Minimum Thickness at any Point
18 - 10	12 - 10	60	54
8 - 2	9 - 2	75	63
1 - 4/0	1 - 4/0	90	81
250 - 500 kcmil	250 - 500 kcmil	105	95
550 - 1000	550 - 1000	120	108
1100 - 2000	1100 - 2000	140	126

Jacket - XLPE compound Compound Pexidan X/T-UV2 manufactured by Saco Polymers, Inc., all color, except clear, 30 mils minimum average thickness, 24 mils minimum thickness at any point.

**Zertifikat****Certificate**

Zertifikat Nr. *Certificate No.*  
R 50229332

Blatt *Page*  
0001

Ihr Zeichen *Client Reference*  
12056327

Unser Zeichen *Our Reference*  
ZTW2-KLL- 11025217 001

Ausstellungsdatum *Date of Issue*  
30.05.2012  
(day/mo/yr)

**Genehmigungsinhaber *License Holder***

I-Sheng Electric Wire & Cable  
Co., Ltd.  
52,  
Tin Hwu Road, Ta Gann Village  
Gwai San Hsian, Tao Yuang Hsien  
Taiwan, R.O.C. 333

**Fertigungsstätte *Manufacturing Plant***

I-Sheng Electronics (Kunshan)  
Co., Ltd.  
No. 888, Tai Shan Rd.  
Kunshan Development Zone  
Kunshan, Jiangsu  
P.R. China

**Prüfzeichen *Test Mark***

Geprüft nach *Tested acc. to*  
2 PFG 1169/08.07

- BAUART  
GEPRÜFT
- TYPE  
APPROVED

Zertifiziertes Produkt (Geräteidentifikation)  
*Certified Product (Product Identification)*

Lizenzentgelte - Einheit  
*License Fee - Unit*

PV-Leitungen (Cables for Photovoltaic-Systems)

Bezeichnung : PV1-F 1X1,0...6,0mm<sup>2</sup>  
(Type Designation)

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Bemessungsspannung : AC U<sub>0</sub>/U 0,6/1 kV; DC 1,8kV  
(Rated Voltage) (Leiter-Leiter, nicht geerdetes System, unbelasteter Stromkreis)  
(conductor-conductor, non earthed system, circuit not under load)

Umgebungstemperatur : -40°C zu (to) +90°C  
(Ambient Temperature)

Max. Temperatur am Leiter: +120°C  
(Max. Temperature at Conductor)

Ursprungskennzeichnung : I-SHENG  
(Mark of Origin)



8

ANLAGE (Appendix): 1.0

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.

This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg  
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Zertifizierungsstelle

Dipl.-Ing. W. Feucker