

# Solar Cables



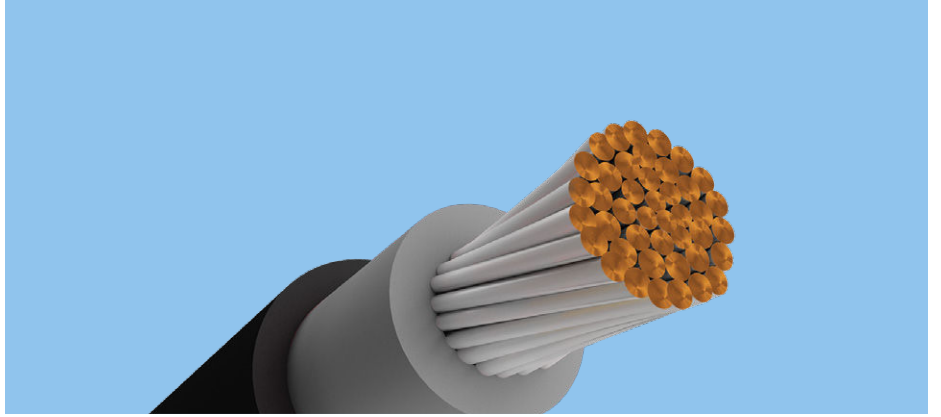
Cable for Photovoltaic Modules & Solar Power Plants

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**Introduction**

Solar photovoltaic industry gets more attention as the most promising environment- friendly industry, and it is expected to have the significant role in resolving the earth's energy problem. As production costs diminish, users increasingly view these energy sources as clean, cheap and reliable. In this background, the demand for "SOLAR CABLE", which is the current transmission medium of solar energy power generation, is expected to increase with the expansion of market.

**Special Properties of Solar Cables**

- **Lifetime reliability:** lasts up to 30 years even under tough external conditions.
- **Outdoor durability:** resists extreme temperatures (-40°C to 120°C maximum at the core) and ozone resistant.
- **UV resistance:** full protection against ultraviolet rays.
- **Halogen-free:** Low Smoke Emission & Low Toxicity/Corrosivity during fire.
- **Properties against fire:** flame retardant, fire retardant.
- **Flexibility and stripability:** for fast and easy installation.
- **Fully recyclable:** in accordance with new environmental regulations.
- **Easy installation** with color identification (blue, red).
- **Suitable to common connector types.**
- TÜV certified.

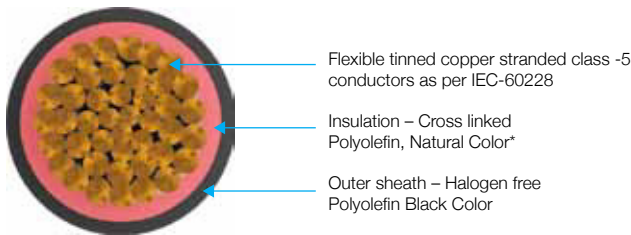


**Constituents**

Maxima solar cables are manufactured with the following materials.

1. Annealed Tinned Copper Conductor
2. Cross Linked Polyolefin Compound
3. Zero Halogen Polyolefin Compound

**Construction of solar cable**



Flexible tinned copper stranded class -5 conductors as per IEC-60228  
 Insulation – Cross linked Polyolefin, Natural Color\*  
 Outer sheath – Halogen free Polyolefin Black Color

\*can be manufactured with Red/Black colour

**Required Features of Solar cable**

**CHEMICAL FEATURES**

- Weather resistant
- Resistant to mineral oils
- Resistant to acids & alkaline

**THERMAL FEATURES**

- Maximum conductor temperature of operation-120° C during 20000 hours.
- Minimum operating temperature : - 40° C

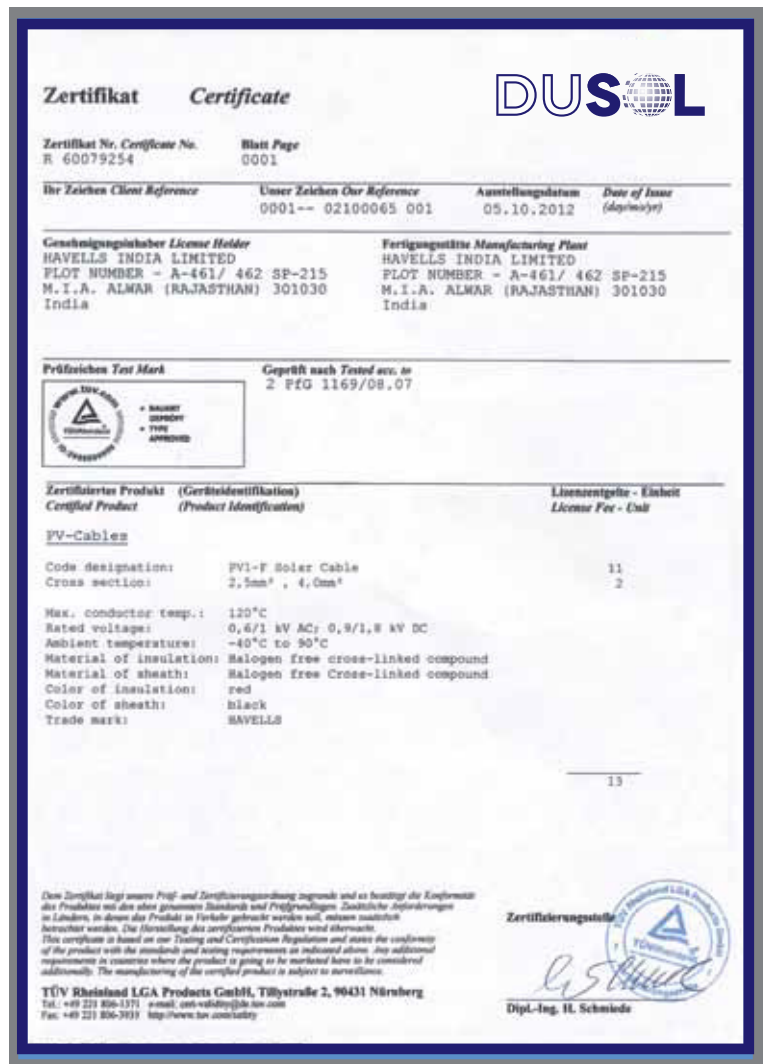
**ELECTRICAL FEATURES**

- Voltage rating : 1.5 (1.8) KV DC / 0.6/1.0 (1.2) KV AC
- High voltage test: 6.5 KV DC for 5 minutes.

**MECHANICAL FEATURES**

- Resistant to Impact , tear & abrasion
- Minimum bending radius – 4 times of overall diameter.
- Safe pulling force -50 N/sqmm.

**TUV Certificate**



**Required Features of Solar cable (TUV certified -2Pfg 1169)**

SIZE cross-sectional area in (sqmm)	Max. Conductor D.C. Resistance at 20 °C in ohm/(km)	Average Diameter of Conductor (in mm)	Approx. Overall Diameter of cable (in mm)	Approximate Overall weight (in kg/km)	Minimum Bending radius (in mm)	Current rating under continuous operation 90°C and ambient temperature 40°C (in A)	Short circuit current rating for 1 sec. duration (in KA)	
1.5	13.7	1.46	4.46	4.86	35	19	22	0.189
2.5	8.21	1.88	4.88	5.28	46	21	30	0.315
4.0	5.09	2.39	5.39	5.79	64	23	42	0.504
6.0	3.39	2.93	5.93	6.33	84	25	52	0.756
10	1.95	3.86	7.26	7.66	133	31	76	1.26
16	1.24	5.39	8.79	9.19	195	37	95	2.02
25	0.795	6.73	10.53	11.13	290	45	124	3.15
35	0.565	8.08	11.88	12.48	390	50	159	4.41
50	0.393	9.69	13.49	14.09	530	56	185	6.30
70	0.277	11.54	15.34	15.94	715	64	239	8.82
95	0.210	13.25	17.05	17.85	920	71	290	11.97
120	0.164	15.00	18.80	19.60	1150	78	335	15.12
150	0.132	16.77	21.37	22.37	1460	89	385	18.90
185	0.108	18.54	23.54	24.54	1770	98	440	23.31
240	0.0817	21.33	26.33	27.33	2300	110	520	30.24

**Tests & Ratings of solar cables**

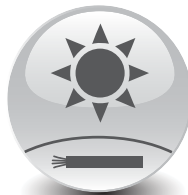
Severe Weather Resistance



Maximum Conductor Temperature  
120° C<sup>II</sup> IEC 60216



Resistance to Extreme Temperatures  
Minimum:-40° C IEC 60811-1-4



Resistance to Ultraviolet  
Rays (UV) UL 1581



Resistance to Ozone  
IEC 60811-2-1



Resistance to Water Absorption  
IEC 60811-1-3

Life Expectancy



Design Life Time 30 Years  
IEC 60216

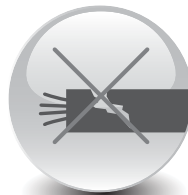


Impact Resistance  
IEC 60811-1-4

Mechanical Resistance



Abrasion Resistance  
EN 50305



Tear Resistance  
IEC 61034-2

Severe Weather Resistance



Environment-Friendly



Halogen Free  
IEC 60754-1



Low Corrosive Gas Emission  
IEC 60754-2



Low Smoke Opacity  
IEC EN 61034-2



Non Fire Propagation  
IEC 60332-3



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**1** Connection between photovoltaic modules and panels

**1.8 kV DC-0.6/1 kV AC**

Standard Cross-section from 1x2.5 to 1x35mm<sup>2</sup> - Up to 240 mm<sup>2</sup> upon customer request - TÜV certificate

**2** LV DC installation between panels and connection boxes

**1.8 kV DC-0.6/1 kV AC**

Standard cross-section from 1x2.5 to 1x35mm<sup>2</sup> - Upto 240 mm<sup>2</sup> upon customer request - TÜV certificate

**3** LV DC installation between the connection boxes and the inverter

**(AS) 1.8 kV DC-0.6/1 kV AC**

In accordance with the AENOR EA0038 standard - Cross-Sections from 1x16 to 1x300mm<sup>2</sup> - Armoured Cable



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Installation Type

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