





## PROFILE

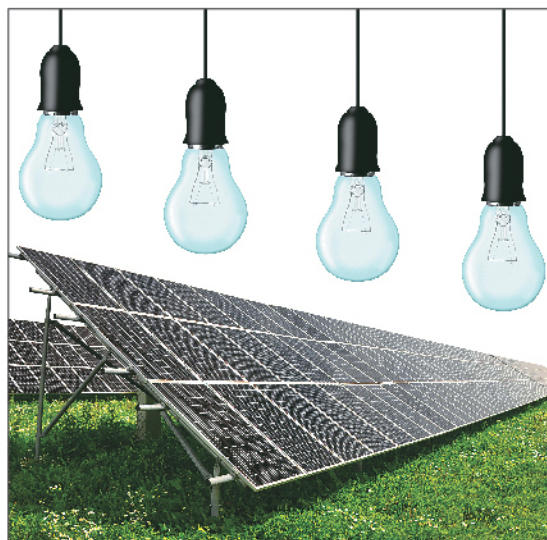
KEI has been at the forefront of India's wire and cable industry for the last forty years. We manufacture a range of specialized cables and are an important player in the domestic and retail segment. Our unblemished track record has earned us the patronage of leading industrial houses, project consultants and architects. In order to provide reliable and expedient services to our customers, we have created manufacturing facilities at Silvassa, Chopanki and Bhiwadi. KEI was established in 1968 as a partnership company in the domestic wire segment. Today, KEI is a one-stop-shop when it comes to meeting cabling requirements for the domestic, power and industrial sectors.

## SOLAR

Solar photovoltaics is now, after hydro and wind power, the third most important renewable energy source in terms of globally installed capacity. This results in the great demand for 'SOLAR CABLE'. Solar cable is the interconnection cable used in photovoltaic power generation. A solar cable interconnects solar panels and other electrical components in the photovoltaic system. Matching step with the environment friendly shift the Solar Cable has been made which performs highest standards of applications in its diverse usage.

## PROPERTIES

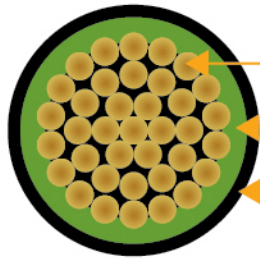
- A lifetime 'partner': lasts upto 30 years even under tough conditions
- Used in extreme weather conditions
- Equipped with UV Resistance
- Halogen-free: low smoke emission and low toxicity during fire
- Flame & Fire retardant
- Flexibility & stripability: for fast and easy installation
- Easily Recyclable: in accordance with new government norms
- Easy installation: with color identification
- Suitable to common connector types
- TUV, UTE and IMQ-certified
- One common factor for most of the photovoltaic power systems is outdoor use, characterized by high temperatures and high UV radiation



# CONSTRUCTION

KEI Solar Cables are manufactured with following material:

- Annealed tinned copper conductor
- Cross linked polyolefin compound
- Zero halogen polyolefin compound



Flexible tinned copper stranded class -5 conductors as per IEC-60228

Insulation - Cross linked Polyolefin, Natural Color

Outer sheath - Halogen free Polyolefin Black Colour\*

## Construction Data form for electric appliances

Type of appliance: Cable for Photovoltaic Systems

Standard: 2Pfg 1169/08.2007

Inscription: KEI PV1-F 0.6/1.0kVAC 1.8kVDC\_Cx\_Sq.mm 2012 TUV Rheinland 2 Pfg 1169/08.2007

Cross Section 2.5, 4, 6, 10, 16mm<sup>2</sup>

Rated Voltage 1.8 kV DC

Conductor According to class 5 of IEC 60228/ DIN VDE 0295

Lower ambient temperature: -40 deg C

Upper ambient temperature: +90 deg C

Max. temperature at conductor: 120deg C fur 20.000h (siehe auch angehangte/see also enclosed Arrhenius-Kurve/-curve)

Halogen-free: Yes

Insulation material: Thermosetting polyolefine zero halogen compound (ZHIN6)

Manufacturer spec. wall thickness insulation: As per TUV 2 Pfg 1169/08.2007

Sheath material: Thermosetting polyolefine zero halogen compound (ZHIN6)

Manufacturer spec. wall thickness sheath: As per TUV 2 Pfg 1169/08.2007

(optional) accessories: -

## Product Construction:

### Conductor:

2.5mm<sup>2</sup> thru 240mm<sup>2</sup> fully annealed flexible stranded tinned copper with class 5 standing as per EN 60228 (IEC 60228)

### Insulation:

Zero-Halogen Cross-linked XLPO, Low smoke, zero-Halogen Cross-Linked Polyolefin (LSZH XLPO)

### Application:

TUV 2 pfg 1169/08.2007: Single conductor, sunlight-resistant photovoltaic wire -40 deg C to +90 deg C, maximum temperature of conductor 120 deg C for 20,000 hrs

Rated Voltage: AC Uo/U 0.6/1 kV max voltage 1.8 kV DC (conductor – conductor earthed system, circuit not under load)

Photovoltaic wire rated 90 deg C wet or dry, 2000 V for use in Photovoltaic system

# REQUIRED FEATURES OF SOLAR CABLE

Size cross sectional area	Maximum conductor DC resistance at 20 deg C	Average diameter of conductor	Thickness of Insulation	Thickness of Sheath	Minimum Bending Radius	Current rating under continuous operation 90 deg C and ambient teperature at 40 deg C	Short circuit current rating for 1 sec duration
sqmm	ohm/km	mm	mm	mm	mm	A	KA
1	13.7	1.46	-	-	19	22	0.189
2.5	8.21	1.88	0.60	0.80	21	30	0.315
4	5.09	2.39	0.60	0.80	23	42	0.504
6	3.39	2.93	0.60	0.80	25	52	0.756
10	1.95	3.86	0.70	0.80	31	76	1.25
16	1.24	5.39	0.70	0.80	37	95	2.02
25	0.795	6.73	0.80	0.90	45	125	3.15
35	0.565	8.08	0.80	0.90	50	159	4.41
50	0.393	9.69	0.90	1.00	56	185	6.3
70	0.277	11.54	1.00	1.10	64	239	8.82
95	0.21	13.25	1.00	1.10	71	290	11.97
120	0.164	15	1.20	1.30	78	335	15.12
150	0.132	16.77	1.30	1.40	89	385	18.9
185	0.108	18.54	1.40	1.50	98	440	23.31
240	0.0817	21.33	1.50	1.60	110	520	30.24

## TEST & RATINGS



Maximum Conductor Temperature 120°C 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



Design Life Time 30 Years IEC 60216



Impact Resistance IEC 60811-1-4



Abrasion Resistance EN 50305



Tear Resistance IEC 61034-2



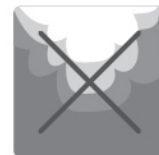
Environment-Friendly



Halogen Free IEC 60754-1



Low Corrosive Gas Emission IEC 60754-2



Low Smoke Opacity IEC EN 61034-2



Non Fire Propagation IEC 60332-2



# FEATURES

### Chemical Features:

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

### Thermal Features:

- Ambient Temperature: -40°C ~ +90°C
- Maximum Temperature at Conductor: 120°C (20000h)
- Short Circuit Temperature: 200°C at conductor (max. 5sec)
- Thermal Endurance Test: According to EN 60216-2 (temperature index +120°C)
- High Temperature Pressure: Test according to EN 60811-3-1
- Damp - Heat Test: According to EN 60068-2-78, 1000 hrs. at 90°C with 85% humidity

### Electrical Features:

- Rated Voltage: 0.6/1 kV AC
- Rated DC Voltage: 1.5 kV
- Maximum Permitted DC Voltage: 1.8 kV (conductor/ conductor, non earthed system, circuit not under load)
- Maximum Permitted AC Voltage: 0.7/1.2 kV
- Working Voltage: DC 1000 V
- Insulation Resistance: 1000 MW-km
- Spark Test: 6000 Vac (8400 Vdc)
- Voltage Withstand: 6500 V as per EN50395 for 5 min
- Ampacity: According to requirements for cables for PV systems

### Mechanical features:

- Resistant to Impact, tear and abrasion
- Minimum bending radius is 4 times the diameter
- Safe pulling force -50 N/sqmm
- Mineral Oil Resistance will be according to EN 60811-2-1
- Ozone Resistance will be according to EN 50396 part 8.1.3
- Weathering-UV Resistance: according to HD 605/A1 or DIN 53367
- Ammonia resistant is done for 30 days in saturated ammonia atmosphere (internal testing)
- Very good resistance to oil and chemicals
- Acid & Alkaline Resistance will be according to EN 60811-2-1 (Oxal acid and sodium hydroxide)

# APPROVALS

Zertifikat	Certificate	
Zustellen an: Customer No. R. 60021433	Sheet Page 0004	TUV Rheinland
Ersteller: Client Reference Mater. Katalog Art. Nr. 0001 - 07 20125 001	Ver. / Ergänzung 12.04.2013	Gepr. von: 07/04/13
Geprüfter Hersteller: Kabelwerke NEC INCORPORATED P.O. Box 6, 522 10 VEDD. KRISHNA AL. HYDR. PLAKAT (C) - HYDRALD 502119 INDIA	Hersteller / Herstellername NEC INCORPORATED P.O. Box 6, 522 10 VEDD. KRISHNA AL. HYDR. PLAKAT (C) - HYDRALD 502119 INDIA	
Zertifizierte Produkte: Code / Name PV-Kabel	Normen / Spezifikationen IEC 60227-1, IEC 60227-2	Leistungsfähigkeit / Klasse Zonen: PV-1
Normen / Spezifikationen Code / Name PV-Kabel	Normen / Spezifikationen IEC 60227-1, IEC 60227-2	Leistungsfähigkeit / Klasse Zonen: PV-1
Max. conductor length 1,000 m	Rated voltage 1,000 V AC / 1,500 V DC	Max. conductor length 1,000 m
Rated voltage 1,000 V AC / 1,500 V DC	Rated voltage 1,000 V AC / 1,500 V DC	Rated voltage 1,000 V AC / 1,500 V DC
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Rated voltage 1,000 V AC / 1,500 V DC	Rated voltage 1,000 V AC / 1,500 V DC	Rated voltage 1,000 V AC / 1,500 V DC

**VDE Prüf- und Zertifizierungsinstitut**

**ZEBHENGENEHMIGUNG  
MARKS APPROVAL**

NEC Industries Limited  
519-620 SP RICO Industrial Area  
Phase 3, Bhuvad, Dist. Alwar  
301100 RAJASTHAN  
INDIA

ist berechtigt, für ihr Produkt /  
is authorized to use for their product  
**Flexible Latching  
Cord and flexible cable**

Ein für elektrische metallisch geschützte Zonen  
für die in Blatt 2 aufgeführter Typen zu benutzen /  
The legally protected marks are shown below for the types referred to on page 2 of

**VDE**  **reiner**  **reiner**

Geprüft und zertifiziert nach /  
Tested and certified according to  
DIN VDE 0181-1 (IEC 60332) Teil 1: 2004-10; IEC 60332

Autorenref. No. 20 0480-0-00-000-1 - 2010  
Prüf-Nr. Ausweis-Nr. 40128163 Blatt 1  
VDE Prüf- und Zertifizierungsinstitut  
Zur Hauptgeschäftsstelle: Göttingen  
Offenbach, 21.10.2010

**EC Declaration of Conformity**

Issue's name and address: KBI Industries Limited  
519-620 SP RICO Industrial Area  
Phase 3, Bhuvad, Dist. Alwar  
301100 RAJASTHAN  
INDIA

Product: Cord and flexible cable

Type designation: H07RN-F 3 x 5 x 0.75, 2.5 mm<sup>2</sup>; H07RN-F 3 x 4 x 4, 6 mm<sup>2</sup>; H07RN-F 2 x 5 x 1.0, 2.5 mm<sup>2</sup>; H07RN-F 1 x 1.5, 400 mm<sup>2</sup>; H07RN-F 3 x 35, 300 mm<sup>2</sup>; H07RN-F 4 x 35, 240 mm<sup>2</sup>

The designated product is in conformity with the European Directive:  
**2006/95/EC**  
"Council Directive on the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits".

The technical documentation and full compliance with the standards listed below prove the conformity of the product with the requirements of the above-mentioned EC Directive:  
Last two digits of the year in which the CE marking was affixed:  
06

DIN VDE 620-4 (VDE 0280 Teil 62000-02); HD 22.4 44204

The VDE Testing and Certification Institute GmbH (EU Identification No. 0566), Merianstr. 26, 63064 Offenbach (Germany), has tested and certified the product.

Certificate No. 40029803  
File Reference: 5010460-5150-0004 / 129310 P042 / STR

Place, Date: Offenbach, 21.10.2010  
Equally binding signature of the issuer

# KEI Industries Limited

## Registered and Corporate Office:

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## Manufacturing Units

### Bhiwadi Unit

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### Chopanki Unit

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