



TRUSTED NOT TO COMPROMISE

SOLAR DC CABLES

CABLE FOR PHOTOVOLTAIC (PV)
MODULES & SOLAR POWER
PLANTS (H1Z2Z2-K)

ABOUT US

Pakistan Cables, is regarded as the pioneer within the cable industry owing to its rich heritage, expertise and commitment to deliver world class products and services to its valued customers both at home and abroad. The Company is ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007 certified and has had several of its cables type tested by the world renowned KEMA Laboratory in Netherlands. With the latest award of KEMA Gold Type-test certificates, the company now holds eight KEMA certificates in total.



SOLAR CABLES

Solar Power gets attention due to being the most promising environment-friendly source, and is expected to have a significant role in mitigating Earth's bulging energy problem. Allowing energy production decentralization, having no moving parts (all other sources involve a mechanical process leading to wear & tear), improved efficiencies through innovation, and declining CapEx costs are just some of the factors favoring SOLAR. Hence the demand for SOLAR CABLES is expected to increase.

APPLICATIONS

Single Core Solar PV cable intended for the interconnection within photovoltaic systems such as solar panel arrays. This versatile single-conductor cable is designed to meet the varying needs of the solar industry. Highly flexible cable, compatible with all major connectors. Suitable for wet, damp and humid locations as well as installations where fire, smoke emissions and toxic fumes create a potential risk to life and equipment.

CERTIFICATIONS

Solar DC Cables manufactured by Pakistan Cables have been tested from TUV Austria to meet complete compliance as set out in EN 50618 and qualifying for H1Z2Z2-K.

FEATURES



ESTIMATED LIFETIME

30 years based on EN 60216-2



OUTDOOR DURABILITY

Wide thermal range [-40°C to +120°C] and ozone resistant



ULTRA VIOLET (UV) RESISTANCE

Full protection as per EN 50618



HALOGEN-FREE

Low Smoke Emission & Low Toxicity/Corrosivity during fire



PROPERTIES AGAINST FIRE

Flame retardant to IEC 60332-1-2



FLEXIBILITY AND STRIPABILITY

To set up a quick connection



EASY INSTALLATION

With color identification (as required by customer)



CONNECTORS

Compatible with all types of common connectors.

CHARACTERISTICS



ELECTRICAL

Voltage Rating (U₀/U):

AC 600/1000 V / DC 1500/1500 V

Max Voltage:

1.8 kV DC conductor/conductor, non-earthed system, circuit not under load

Test Voltage:

6.5 kV AC / 15 kV DC for 5 minutes



TEMPERATURE

Fixed: -40°C to +90°C

Permissible Normal Operating: +90°C

Max Conductor Temperature:

+120°C (for 20,000 hours) at a max. ambient temperature of 90°C



MINIMUM BENDING RADIUS

Fixed: 4 x overall diameter

Flexing: 5 x overall diameter



MECHANICAL

Resistant to impact, tear and abrasion

Safe pulling force -50 N/mm²

PAKISTAN CABLES LIMITED H1Z2Z2-K

CONSTRUCTION

Conductor

Class 5 (flexible) tinned copper, based on IEC 60228

Insulation

Cross Linked, Halogen-Free, Flame-Retardant Polyolefin (XLPO) Compound

Sheath

Cross Linked, Halogen-Free, Flame-Retardant Polyolefin (XLPO) Compound

CABLE STANDARDS

Solar DC Cables manufactured by Pakistan Cables have been tested from TUV Austria to meet complete compliance as set out in EN 50618 and qualifying for H1Z2Z2-K. Solar DC cables includes manufacturing of Tinned Flexible Copper / XLPO insulation / XLPO outer sheath DC rated to 1500V.

GENERALLY	EN 50618, IEC 62930, TUV-2 PFG 1169	2015
LIFE EXPECTANCY	IEC 60216	Estimated design lifetime 30 years
WEATHER RESISTANCE	IEC 60811-1-3 IEC 60811-2-1 EN 50618 / UL 1581 IEC 60811-1-4 IEC 60216	Resistance to weather absorption Resistance to Ozone Resistance to UV rays Minimum service temperature -40°C Maximum conductor temperature +120°C (20,000 hours)
MECHANICAL RESISTANCE	IEC 60811-1-4 EN 50305 IEC 61034-2	Impact Resistance Abrasion resistance Tear resistance
FIRE AND FLAME RETARDANT	IEC 60754-1 IEC 60754-2 IEC 61034-2 IEC 60332-1-2	Low Smoke Zero Halogen (LSZH) Low Corrosive Gas Emission Low Smoke Emission (light transmittance >= 60%) Vertical flame propagation on complete cable
CHEMICAL	EN 60811-2-1	Resistant to chemicals, oils, grease, mineral oils, acids and alkaline

DIMENSIONAL AND INSULATION RESISTANCE VALUES

Table 1

NUMBER AND NOMINAL CROSS SECTIONAL AREA OF CONDUCTORS	THICKNESS OF INSULATION SPECIFIED VALUE	THICKNESS OF SHEATH SPECIFIED VALUE	MEAN OVERALL DIAMETER UPPER LIMIT INFORMATIVE VALUE	MINIMUM INSULATION RESISTANCE AT 20°C	MINIMUM INSULATION RESISTANCE AT 90°C
mm²	mm	mm	mm	MΩ.km	MΩ.km
1 x 1.5	0.7	0.8	5.4	860	0.86
1 x 2.5	0.7	0.8	5.9	690	0.69
1 x 4	0.7	0.8	6.6	580	0.58
1 x 6	0.7	0.8	7.4	500	0.50
1 x 10	0.7	0.8	8.8	420	0.42
1 x 16	0.7	0.9	10.1	340	0.34
1 x 25	0.9	1.0	12.5	340	0.34
1 x 35	0.9	1.1	14.0	290	0.29
1 x 50	1.0	1.2	16.3	270	0.27
1 x 70	1.1	1.2	18.7	250	0.25
1 x 95	1.1	1.3	20.8	220	0.22
1 x 120	1.2	1.3	22.8	210	0.21
1 x 150	1.4	1.4	25.5	210	0.21
1 x 185	1.6	1.6	28.5	200	0.20
1 x 240	1.7	1.7	32.1	200	0.20

ELECTRICAL CHARACTERISTICS

Table 2

NOMINAL CROSS-SECTIONAL AREA	MAXIMUM DIAMETER OF WIRES IN CONDUCTOR	MAXIMUM RESISTANCE OF METAL-COATED CONDUCTOR AT 20°C	*SHORT CIRCUIT CURRENT RATING FOR 1 SEC. DURATION
mm²	mm	Ω/km	KA
1.5	0.26	13.7	0.189
2.5	0.26	8.21	0.315
4	0.31	5.09	0.504
6	0.31	3.39	0.756
10	0.41	1.95	1.260
16	0.41	1.24	2.016
25	0.41	0.795	3.150
35	0.41	0.565	4.410
50	0.41	0.393	6.300
70	0.51	0.277	8.820
95	0.51	0.210	11.970
120	0.51	0.164	15.120
150	0.51	0.132	18.900
185	0.51	0.108	23.310
240	0.51	0.0817	30.240

*The Short circuit rating is calculated based on the initial conductor operating temperature 120°C and maximum temperature 250°C

CURRENT CARRYING CAPACITY OF PV CABLES

Table 3

NOMINAL CROSS SECTIONAL AREA	CURRENT CARRYING CAPACITY ACCORDING TO METHOD OF INSTALLATION		
	SINGLE CABLE FREE IN AIR	SINGLE CABLE ON A SURFACE	TWO LOADED CABLES TOUCHING, ON A SURFACE
mm ²	A	A	A
1.5	30	29	24
2.5	41	39	33
4	55	52	44
6	70	67	57
10	98	93	79
16	132	125	107
25	176	167	142
35	218	207	176
50	276	262	221
70	347	330	278
95	416	395	333
120	488	464	390
150	566	538	453
185	644	612	515
240	775	736	620

Ambient temperature: 60°C (see Table 4 for other ambient temperatures) Max. conductor temperature: 120°C

NOTE: The expected period of use at a max. Conductor Temperature of 120°C and at a max. Ambient temperature of 90°C is limited to 20,000 hours.

CURRENT RATING CONVERSION FACTORS FOR DIFFERENT AMBIENT TEMPERATURES

Table 4

AMBIENT TEMPERATURE	CONVERSION FACTOR
C°	
up to 60	1.00
70	0.92
80	0.84
90	0.75

Head Office

Arif Habib Center, 1st Floor,
23, MT Khan Road, Karachi.

UAN

+9221-111-CABLES (222-537)

Fax

+92-21 32462111

Email

info@pakistancables.com
sales@pakistancables.com
export@pakistancables.com



www.pakistancables.com