PHOTOVOLTAIC CABLE (SOLAR)

MAGNI TECH
SPECIALITY CABLES PVT. LTD.

The Eminent Solar PV cable range has been specifically designed by "Magni Tech Speciality Cables Pvt. Ltd." to withstand the most demanding conditions. Its excellent properties make it the best cable for all Low Voltage installations. Given their special properties, Eminent Solar PV cables constitute the ideal solution for connection between panels and connection boxes of a solar photovoltaic installation, being able to function at room temperature up to 90ºC. Moreover, photovoltaic installations tend to be exposed to all possible atmospheric weather and in all their intensity, especially to ultraviolet radiation, humidity and sudden changes in temperature. For this reason, photovoltaic cables must have a specific weather resistance guarantee that guarantees their operation in time. The materials of the Eminent Solar PV cable have been especially designed to withstand the most demanding weather conditions without suffering important changes in their mechanical and electrical characteristics. To offer an adequate protection against attacks by rodents, and additional to any mechanical aggression.

APPLICATIONS :

These cables are designed for connecting photovoltaic power supply systems. These cables can be used indoor & outdoor for flexible & fixed installations with high mechanical strength in extreme weather conditions.

STANDARDS :

As per TUV Rheinland specification: 2 Pfg 1169/08.2007.

CONSTRUCTION DETAILS:

Conductor	Electrolytic Multi Stranded Tinned Copper conductor flexible as per IEC 60228 or IS :8130 / 84 Class 5
Insulation	Crosslinked Halogen Free & Flame Retardant
Insulation Colour	Natural
Sheath	Crosslinked Halogen Free & Flame Retardant
Sheath Colour	Black , Red & Blue

ELECTRICAL CHARACTERISTICS :

- Rated AC Voltage: 0.6/1.0 kV
- Rated DC Voltage : 1.5 kV
- Maximum permitted AC Voltage : 0.7/1.2 kV
- Maximum permitted DC Voltage : 1.8 Kv (Conductor/conductor, non earthed system, circuit not under load)
- Working Voltage: DC 1000 V
- Insulation Resistance:1000 M Ohm-Km
- Spark Test: 6000 Vac (8400 Vdc)
- Voltage Withstand: 6500 V as per EN50395 for 5 Min.
- Ampacity : According to requirements of cables for PV systems

THERMAL CHARACTERISTICS :

- Operating Temperature : -40°C to +90°C
- Maximum Temperature at conductor: 120°C
- Short Circuit Temperature : 250°C
- 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 1000hrs at 90°C with 85% humidity

MECHANICAL CHARACTERISTICS :

- Minimum Bending Radius : For Fixed Installation - 6 x OD of cable & Occasional Flexing - 15 x OD of cable
- Tensile Strength: 6.5 N/mm² for Insulation & 8.0 N/mm² for sheathing – according to EN 60811
- Elongation :125% for Insulation & sheathing – according to EN 60811
- Dynamic Penetration : According to requirement of cables for PV Systems 2 Pfg 1169/08.2007 Annex. G
- Notch Propagation : According to 2 Pfg 1169/08.2007 Annex. G
- Shrinkage: 2% at 120°C according to EN60811-1-3
- Anticipated Period of use: 25 years

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CHEMICAL CHARACTERISTICS :

- Mineral Oil Resistance: according to EN 60811-2-1
- Ozone Resistance : according to EN 50396 part 8.1.3 Method B
- Weathering-UV Resistance : according to HD605/A1 DIN 53367
- Ammonia resistance: 30 days in saturated ammonia atmosphere (internal testing)
- Very good resistance to Oil and chemicals
- High wear and robust, abrasion resistant
- Acid & Alkaline Resistance: according to EN 60811-2-1 (Oxal acid & sodium hydroxide)

FIRE PERFORMANCE :

- Flame retardant : according to EN 60332-1-2
- Low Smoke Emission : < 20% as per ASTM D-2843
- Halogen Free: according to EN 50267-2-1/-2, IEC 60754-2
- Acid gas emission : <0.5% as per IEC 60754-1, p H minimum 4.3 as per IEC 60754-2, conductivity maximum 10 as per IEC 60754-2
- Toxicity according to EN 50305, ITC-index <3

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TYPE 1 :

DIMENTATIONS & CURRENT CARRYING CAPACITY OF SOLAR DC CABLES FROM PV MODULE TO ARRAY JUNCTION BOX
AS PER TUV Specification-2 Pfg 1169/08.2007

Single Core Size (Sq mm)	Wire Diameter Max. (mm)	XL-LOSH Insulation Thickness Nominal (mm)	XL- LOSH Sheath Thickness Nominal (mm)	Overall diameter Nominal (mm)	Conductor Resistance Max. (Tinned Copper) Ohm/Km	Current Carrying Capacity of DC Solar Cable with XL- LOSH Insulation & XL-LOSH Sheathing at 60 Deg.C		
						Single Cable in Air (Amp.)	Single Cable on Surface (Amp.)	Two adjacent Cable on Surface (Amp.)
1.5 Sq mm	0.26	0.7	0.9	5.0 ±1.0	13.70	30	29	24
2.5 Sq mm	0.26	0.7	0.9	5.5 ±1.0	8.21	41	39	33
4.0 Sq mm	0.31	0.7	0.9	6.0 ±1.0	5.09	55	52	44
6.0 Sq mm	0.31	0.7	0.9	6.5 ±1.0	3.39	70	67	57
ARRAY JUNCTION BOX TO MAIN JUNCTION BOX & MIB TO INVERTER AS PER TUV Specification 2 Pfg 1169/08.2007								
10 Sq mm	0.41	0.7	0.9	7.5 ±1.0	1.95	98	93	79
16 Sq mm	0.41	0.7	0.9	8.5 ±1.0	1.24	132	125	107
25 Sq mm	0.41	0.9	1.0	10.5 ±1.0	0.795	176	167	142
35 Sq mm	0.41	0.9	1.1	12.0 ±1.0	0.565	218	207	176
50 Sq mm	0.41	1.0	1.2	14.0 ±1.0	0.393	274	260	219
70 Sq mm	0.51	1.1	1.3	16.0 ±1.5	0.277	406	386	325
95 Sq mm	0.51	1.1	1.5	18.5 ±1.5	0.210	491	467	393
120 Sq mm	0.51	1.2	1.6	20.0 ±1.5	0.164	576	547	461
150 Sq mm	0.51	1.4	1.7	22.5 ±1.5	0.132	670	637	536
185 Sq mm	0.51	1.6	1.9	25.5 ±1.5	0.108	784	745	627
240 Sq mm	0.51	1.7	2.1	29.5 ±1.5	0.0817	944	897	755

TYPE 2 :

DIMENTATIONS OF SOLAR DC CABLES FROM PV MODULE TO ARRAY JUNCTION BOX
(AS PER IS 694 & IS 1554 Part1 guideline)

Single Core Size (Sq mm)	Wire Diameter Max. (mm)	HR105° C Insulation Thickness Nominal (mm)	UV-HR 105° C Sheath Thickness Nominal (mm)	Overall diameter Nominal (mm)	Conductor Resistance Max. (Bare Copper) Ohm/Km	**FROM JUNCTION BOX TO INVERTER** Current Carrying Capacity of DC Solar Cable with HR 105°C Insulation & UV stabilized HR 105°C Sheathing at 40°C		
						Single Cable in Air (Amp.)	Single Cable on Surface (Amp.)	Two adjacent Cable on Surface (Amp.)
1.5 Sq mm	0.26	0.6	0.9	5.0 ±1.0	13.30	28	26	22
2.5 Sq mm	0.26	0.7	0.9	5.5 ±1.0	7.98	39	37	31
4.0 Sq mm	0.31	0.8	0.9	6.0 ±1.0	4.95	50	48	40
6.0 Sq mm	0.31	0.8	0.9	6.5 ±1.0	3.30	64	61	51

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TYPE 2 :

ARRAY JUNCTION BOX TO MAIN JUNCTION BOX & MIB TO INVERTER
(AS PER IS 694 & IS 1554 Part1 guideline)

Single Core Size (Sq mm)	Wire Diameter Max. (mm)	HR105° C Insulation Thickness Nominal (mm)	UV-HR 105° C Sheath Thickness Nominal (mm)	Overall diameter Nominal (mm)	Conductor Resistance Max. (Bare Copper) Ohm/Km	FROM JUNCTION BOX TO INVERTER		
						Current Carrying Capacity of DC Solar Cable with HR 105°C Insulation & UV stabilized HR 105°C Sheathing at 40°C		
						Single Cable in Air (Amp.)	Single Cable on Surface (Amp.)	Two adjacent Cable on Surface (Amp.)
10 Sqmm	0.41	1.0	0.9	8.0 ±1.0	1.91	89	84	71
16 Sq mm	0.41	1.0	0.9	9.5 ±1.0	1.21	119	113	95
25 Sq mm	0.41	1.2	1.0	11.0 ±1.0	0.780	150	143	120
35 Sq mm	0.41	1.2	1.1	12.5 ±1.0	0.554	191	182	153
50 Sq mm	0.41	1.4	1.3	15.0 ±1.0	0.386	253	240	202
70 Sq mm	0.51	1.4	1.4	17.0 ±1.5	0.272	374	355	299
95 Sq mm	0.51	1.6	1.5	19.5 ±1.5	0.206	451	429	361
120 Sq mm	0.51	1.6	1.6	21.0 ±1.5	0.161	530	504	424
150 Sq mm	0.51	1.8	1.8	23.5 ±1.5	0.129	618	587	494
185 Sq mm	0.51	2.0	1.9	26.5 ±1.5	0.106	721	685	577
240 Sq mm	0.51	2.2	2.2	30.5 ±1.5	0.0801	869	825	695

TYPE 3 :

DIMENTATIONS OF SOLAR DC CABLES FROM PV MODULE TO ARRAY JUNCTION BOX
(AS PER IS 7098 Part1 guideline)

Single Core Size (Sq mm)	Wire Diameter Max. (mm)	XLPE Insulation Thickness Nominal (mm)	UV-ST2 Sheath Thickness Nominal (mm)	Overall diameter Nominal (mm)	Conductor Resistance Max. (Bare Copper) Ohm/Km	FROM JUNCTION BOX TO INVERTER		
						Current Carrying Capacity of DC Solar Cable with XLPE Insulation & UV stabilized PVC ST2 Sheathing at 40°C		
						Single Cable in Air (Amp.)	Single Cable on Surface (Amp.)	Two adjacent Cable on Surface (Amp.)
1.5 Sq mm	0.26	0.7	0.9	5.0 ±1.0	13.30	25	24	20
2.5 Sq mm	0.26	0.7	0.9	5.5 ±1.0	7.98	35	33	28
4.0 Sq mm	0.31	0.7	0.9	6.0 ±1.0	4.95	45	43	36
6.0 Sq mm	0.31	0.7	0.9	6.5 ±1.0	3.30	58	55	46
ARRAY JUNCTION BOX TO MAIN JUNCTION BOX & MIB TO INVERTER (AS PER IS 7098 Part 1 guideline)								
10 Sq mm	0.41	0.7	0.9	7.5 ±1.0	1.91	80	76	64
16 Sq mm	0.41	0.7	0.9	8.5 ±1.0	1.21	106	101	85
25 Sq mm	0.41	0.9	1.0	10.5 ±1.0	0.780	135	128	108
35 Sq mm	0.41	0.9	1.1	12.0 ±1.0	0.554	173	164	138
50 Sq mm	0.41	1.0	1.2	14.0 ±1.0	0.386	226	215	181
70 Sq mm	0.51	1.1	1.3	16.0 ±1.5	0.272	336	319	269
95 Sq mm	0.51	1.1	1.5	18.5 ±1.5	0.206	406	386	325
120 Sq mm	0.51	1.2	1.6	21.0 ±1.5	0.161	476	452	381
150 Sq mm	0.51	1.4	1.7	23.5 ±1.5	0.129	555	527	444
185 Sq mm	0.51	1.6	1.9	25.5 ±1.5	0.106	649	616	519
240 Sq mm	0.51	1.7	2.1	29.5 ±1.5	0.0801	781	742	625