



Dynamic Cables Limited



SOLAR CABLE

Standards compliance



Dynamic Cables Limited

COMPANY PROFILE

Dynamic cables was initially formed as a partnership company in 1986, as "Dynamic Engineers". We were manufacturing only Super Enamelled and DPC wires for the Transformer Industry till about 1995-96, whereupon we started manufacturing overheads conductors to cater to the requirements of the majority of electricity boards in India. With quality products and excellent customer service, we started getting queries about other related products also from the present customers as well as new prospective clients. This prompted us to plan a major expansion project in the year 2003, whereupon, we decided to enter into the cable segment, especially the aerial bunched cable. The unit was successfully established in the year 2006.



Planning forward, we started to work on our next expansion in the year 2007 and the third unit, spread over 100000 sq. ft. was established in Vishwakarma Industrial Area (Jaipur), to manufacture LV and HV cables up to 33 KV, using Sioplas technology. With increasing demand from the market, we planned our fourth unit. This unit had been planned in the year 2016 over an area of 2,70,000 sq. ft. and is established at Khatushyamji Industrial Area, Reengus, Rajasthan.

The Reengus plant has further increased the current production capacity and added the 66 KV high voltage cables into the existing range. Here we also manufacture the Railway signalling cables for RDSO. Apart from this, the company has an expansion plan also to get into the 220 KV Cables. Our range in cables itself has become comprehensive and with continuous advancement in technology, there are plans to extend this range further. Currently, the range includes - LV, HV & EHV Power cables, LV & HV aerial bunched cables, fire survival cable, LV Control Cables, Solar Cables, EV Charging Cables, ACSR/ AA/AAA/ AL59 conductors, Medium Voltage Covered Conductors (MVCC), HTLS Conductors, Bare and insulated copper conductors. The company is also manufacturing and supplying the AL 59 type of conductors. Our products are type tested &

approved by globally recognized NABL Accredited testing laboratories such as CPRI, ERDA, RTRC & TAG CORPORATION. Our production facilities are ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 certified & products are CE certified.

On the business front, we are further strengthening our position in the Indian Market. We have established 6 strategically located marketing offices across India in New Delhi, Mumbai, Vadodara, Hyderabad, Bangalore & Kolkata. We are now exporting to 40 Countries in the Asian subcontinent, Africa, the USA, and the Middle East. Dynamic Cables is continuously expanding its footprints in all sectors like - INDUSTRIAL, TURNKEY PROJECTS, POWER TRANSMISSION & DISTRIBUTION, INFRASTRUCTURE WORKS in India and abroad.

With 20% of the total turnover coming from exports, we are ever diligently working towards making investments in growing market segments in Europe and Latin America. Our major Indian Government clients include PGCIL, BHEL, BSES, Adani, Tata Power, Railways, Airport Authority of India, NTPC, MECON, IOCL, MSDDL, MSETCL, KPTCL, UGVCL, MGVL and majorly all state electricity boards in India. The notable overseas government clientele includes KPLC & REA - Kenya, TANESCO- Tanzania, EEP - Ethiopia, IDECO - Jordan, LEC - Liberia, EDM - Mozambique, NEA - Nepal, BPC- Bhutan & many more.

Our Indian EPC Clientele includes companies such as PEC Limited, Bajaj electrical, L&T, Transrail Lighting Limited, Voltas Ltd., Tata Projects, Hitachi, Adani ABB, Kalpataru power, Lucky Exports, Jaguar Overseas among many companies who are currently operating on projects in India & Overseas.



APPLICATIONS OF SOLAR CABLES

A solar cable is the interconnection cable used in photovoltaic power generation. Solar cables interconnect solar panels and other electrical components of a photovoltaic system. In PV system, one of the important parts is the solar cable connected on d.c. side of the system. These cables are suitable for outdoor long term installations which are under directly exposed to solar radiations and humidity. Hence, stringent requirements for insulation and sheath are set for these cables. These cables are designed to operate at a normal continuous conductor temperature of 90° C. The permissible period of use at a maximum conductor temperature of 120°C is limited to 20 000 h.

Dynamic can offer:

XLPO insulated and sheathed cables / XLPE Insulated PVC sheathed cables with copper or aluminium conductors, stranded compacted (Class-2) / flexible (Class-5) types, unarmoured or armoured types as per customer requirements to be used in Solar plants.

A. Inverter to the transformer primary

The three-phase AC output from the inverters is connected to the transformer primary through underground armoured cables.

B. Transformer secondary to RMU /switchyard

The three-phase AC output from the transformer secondary is connected to the RMU/switchyard through armoured cables.

C. RMU to Switchyard

A three-phase AC connection from the RMU is connected to the switchyard through armoured cables.

These are Copper or Aluminium XLPE insulated, AL/GS armoured, UV stabilized PVC ST-2 sheathed as per IS 7098.

Advantages of Electron Beam cross-linked XLPO

Continuous operating temperature 120°C, hence current carrying capacity is higher.

Better UV & Ozone resistance and improved weather resistance in adverse conditions.

Improved oil & chemical resistance, improved crack resistance.

Enhanced mechanical properties of the cables in high-temperature conditions.

Improved flammability properties, halogen free.

Solar DC Cables as per EN 50618 and IS 17293

TECHNICAL SPECIFICATION

Voltage rating: 1.0 KV (AC) / 1.5 KV (DC)

Temperature rating: -40°C up to 120° C

Ambient temperature: -40° C up to + 90° C

Max. short circuit temp: 200° C (for 5 Sec)

Oil & chemical resistance: IEC 60811-1

STANDARD/ MATERIAL PROPERTIES

Fire performance: EN 60332-1

Smoke emission: EN 61034-2 (light transmission > 60%)

Halogen free: IEC 60754-1 (HCL content < 0.5%)

Expected life of cable: > 25 years at 90°C

Conforming to EN 50618 / IS 17293

PHOTOVOLTAIC CABLE (SOLAR)

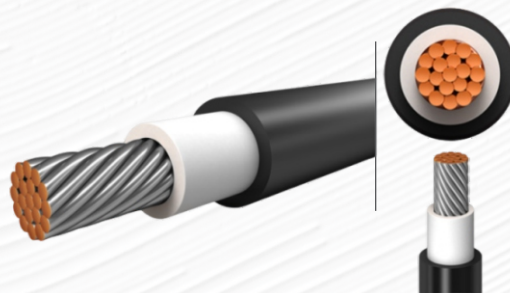


Table 1 — Dimensional and insulation resistance values (as per BSEN 50618)

1	2	3	4	5	6
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
mm ²	mm	mm	mm	(MΩ·km)	(MΩ·km)
1 × 1.5	0.7	0.8	5.4	860	0.86
1 × 2.5	0.7	0.8	5.9	690	0.69
1 × 4	0.7	0.8	6.6	580	0.58
1 × 6	0.7	0.8	7.4	500	0.5
1 × 10	0.7	0.8	8.8	420	0.42
1 × 16	0.7	0.9	10.1	340	0.34
1 × 25	0.9	1.0	12.5	340	0.34
1 × 35	0.9	1.1	14	290	0.29
1 × 50	1.0	1.2	16.3	270	0.27
1 × 70	1.1	1.2	18.7	250	0.25
1 × 95	1.1	1.3	20.8	220	0.22
1 × 120	1.2	1.3	22.8	210	0.21
1 × 150	1.4	1.4	25.5	210	0.21
1 × 185	1.6	1.6	28.5	200	0.2
1 × 240	1.7	1.7	32.1	200	0.2



Dynamic cables

PHOTOVOLTAIC CABLE (SOLAR)

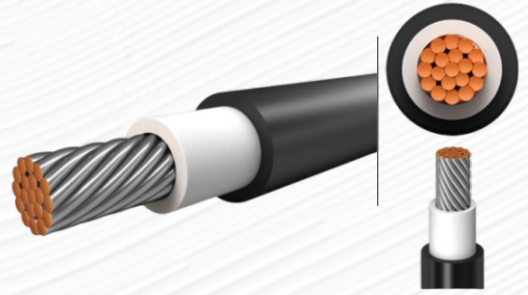
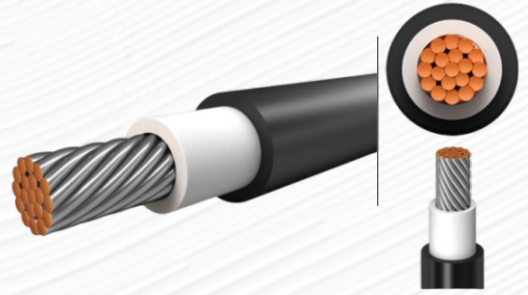


Table 2 — Current carrying capacity of PV cables (as per BSEN 50618)

Nominal cross sectional area mm²	Current carrying capacity according to method of installation		
	Single cable free in air A	Single cable on a surface A	Two loaded cables touching, on a surface 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 deg ° C max. conductor temperature: 120 deg ° C			
NOTE The expected period of use at a max, conductor temperature of 120 deg ° C and at a max. ambient temperature of 90 deg ° C is limited to 20 000 h.			

PHOTOVOLTAIC CABLE (SOLAR)



**Table 3 — Dimensions and Insulation Resistance (for Class 5 Conductors)
as per IS 17293**

SI No.	Nominal Cross-sectional Area of Conductor mm ²	Thickness of Insulation mm	Thickness of Sheath mm	Mean Overall Diameter*	Minimum Insulation Resistance at 20 °C (MΩ·km)	Minimum Insulation Resistance at 90 °C (MΩ·km)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i	1.5	0.7	0.8	5.9	862	0.862
ii	2.5	0.7	0.8	6.9	709	0.709
iii	4	0.7	0.8	7.2	610	0.61
iv	6	0.7	0.8	8.3	489	0.489
v	10	0.7	0.8	9.8	389	0.389
vi	16	0.7	0.9	11.3	393	0.393
vii	25	0.9	1.0	13.8	335	0.335
viii	35	0.9	1.1	15.3	295	0.295
ix	50	1	1.2	18.1	271	0.271
x	70	1.1	1.2	21.1	251	0.251
xi	95	1.1	1.3	23.6	223	0.223
xii	120	1.2	1.3	25.5	207	0.207
xiii	150	1.4	1.4	28.2	204	0.204
xiv	185	1.6	1.6	30.7	203	0.203
xv	240	1.7	1.7	35	237	0.237
xvi	300	1.8	1.8	39.5	237	0.237
xvii	400	2.0	2.0	45	237	0.237

* Indicative value for information only

**Table 4 — Dimensions and Insulation Resistance (for Class 2 Conductors)
as per IS 17293**

SI No.	Nominal Cross-sectional Area of Conductor mm ²	Thickness of Insulation mm	Thickness of Sheath mm	Mean Overall Diameter*	Minimum Insulation Resistance at 20 °C (MΩ·km)	Minimum Insulation Resistance at 90 °C (MΩ·km)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i	16	0.7	0.9	9.5	374	0.374
ii	25	0.9	1	11.8	384	0.384
iii	35	0.9	1.1	13.2	327	0.327
iv	50	1	1.2	15.1	317	0.317
v	70	1.1	1.2	17.3	291	0.291
vi	95	1.1	1.3	19.6	251	0.251
vii	120	1.2	1.3	21.6	244	0.244
viii	150	1.4	1.4	24	254	0.254
ix	185	1.6	1.6	27	261	0.261
x	240	1.7	1.7	30.4	243	0.243
xi	300	1.8	1.8	33.5	231	0.231
xii	400	2	2	37.7	227	0.227
* Indicative value for information only						

Table 5 — Current Carrying Capacity of PV Cables

SI No.	Nominal Cross-sectional Area mm ²	Current Carrying Capacity According to Method of Installation		
		Single cable free in air (A)	Single cable on a surface (A)	Two loaded cables touching, on a surface (A)
(1)	(2)	A (3)	A (5)	A (5)
i	1.5	28	27	22
ii	2.5	38	36	30
iii	4	52	49	41
iv	6	66	63	53
v	10	89	87	73
vi	16	119	118	97

(1)	mm ² (2)	A (3)	A (5)	A (5)
vii	25	167	158	126
viii	35	207	196	156
ix	50	261	248	190
x	70	329	313	245
xi	95	394	374	298
xii	120	462	440	348
xiii	150	537	510	401
xiv	185	611	581	460
xv	240	735	698	545
xvi	300	831	788	631
xvii	400	999	947	751
Ambient temperature: 40°C (see labies for other ambient temperatures) Max conductor temperature: 90 deg * C				

Table 6 — Current Rating Conversion Factors for Different Ambient Temperatures

SI No. (3)	Ambient Temperature (°C) (5)	Conversion Factor (5)
i	0	1.34
ii	10	1.26
iii	20	1.19
iv	30	1.1
v	40	1
vi	50	0.9
vii	60	0.78
viii	70	0.64

Table 7 – Reduction Factors for One Circuit or for a Group of More than One Circuit to be used with Current-Carrying Capacities (Clause A-2)

SI No.	Arrangement (Cable Touching)	Number of Circuits											
		1	2	3	4	5	6	7	8	9	12	16	20
i)	Bunched in air, on a surface, embedded or enclosed	1.00	0.80	0.70	0.65	0.60	0.57	0.54	0.52	0.50	0.45	0.41	0.38
ii)	Single layer on wall, floor or unperforated cable tray systems	1.00	0.85	0.79	0.75	0.73	0.72	0.71	0.71	0.70	No further reduction factor for more than nine circuits or multicore cables		
iii)	Single layer on a perforated horizontal or vertical cable tray systems	1.00	0.88	0.82	0.77	0.75	0.73	0.73	0.72	0.72			
iv)	Single layer on cable ladder systems or cleats etc.	1.00	0.87	0.82	0.80	0.80	0.79	0.79	0.78	0.78			

- These factors are applicable to uniform groups of cables, equally loaded
- Where horizontal clearances between adjacent cables exceeds twice their overall diameter, no reduction factor need to be applied.
- The same factors are applied to:
 - Groups of two or three single core cables.
 - Multicore cables.
- If a group consists of n single core cables, it may either be considered as n/2 circuits of two loaded conductors or n/3 circuits of three loaded conductors
- For some installations and other methods, not provided for in the above table, it may be appropriate to use factors calculated for specific cases

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