torrent
ELECTRICALS

HIGH VOLTAGE CABLES

www.torrentelectricals.com

torrent GROUP

torrent ELECTRICALS

Torrent Electricals Limited, embodies the Group's spirit of innovation. With over 3 decades of experience, we are a leading manufacturer of power cables, catering to a diverse clientele across the private and public sectors. We offer a comprehensive range of cables, from low-tension (LT) to high voltage (HV), constantly expanding our portfolio to include cutting-edge solutions like E-beam and specialty cables. Our 82 acres manufacturing facility is strategically located at Nadiad NH-8 Gujarat and is equipped with latest technology.

torrent PHARMA

Torrent Pharma, the flagship company of Torrent Group is a leader in niche therapeutic segments including cardiovascular, central nervous system and women's healthcare. With a presence in over 50 countries, Torrent Pharma holds the largest market share among Indian companies in Brazil and Germany.

torrent POWER

Torrent Power, a leading brand in the Indian power sector, excels in power generation, transmission and distribution. With a generation capacity of about 5000 MW, including thermal and renewable energy and extensive transmission and distribution networks, Torrent Power operates efficiently across multiple regions. The Company distributes power to over 4.13 million customers in its distribution areas spreading across Gujarat, Maharashtra and Uttar Pradesh.

torrent GAS

Torrent Group is dedicated to transforming lives by addressing essential needs of community, through its City Gas Distribution business. With operations in 17 geographical areas across 34 districts, Torrent Gas is committed to driving socio-economic development by ensuring widespread availability of natural gas, reducing pollution and providing significant cost savings.

INDEX

TORRENT GROUP

The Torrent Group, founded by late Shri U. N. Mehta in 1959 and currently led by Mr. Samir Mehta, is a driving force dedicated to transforming life.

It was six decades ago that Shri U.N. Mehta embarked on a journey called Torrent for a simple cause and a unique sense of purpose - 'Happiness for All'. A medical representative with an exemplary vision, he ventured out on his own by making niche marketing as his core competency. And the rest, as they say, is history.

The Torrent Group today is not just spreading care, hope and happiness, it is also empowering the people and lighting up their lives.

TORRENT ELECTRICALS LIMITED

The company has been a leading manufacturer of power cables for over 30 years, serving both private and public sectors. Established in 1989 the company has a reputation for delivering a wide range of high- performance cables that cater to the most discerning clients, elevating their expectations and redefining the standards of quality.

Our manufacturing capabilities are reinforced by Torrent Power's distinguished expertise in transmission and distribution. This distinctive combination ensures uniform and exceptional experiences for our customers, setting us apart in the industry.

At Torrent Electricals, we share the core values of the Torrent Group - a commitment to excellence, a passion for innovation and a dedication to transforming lives.

Torrent Electricals Limited is the first Cable Manufacturing company in India to acquire ISO 9001:2000 certification, demonstrating a commitment to excellence. This milestone has helped the company adapt to market changes and establish itself as a trusted brand. This assurance of excellence has earned the organization a reputation for delivering high-quality products and services that consistently meet customer expectations.

Torrent Electricals specializes in the manufacturing of High Voltage (HV), High Tension (HT) XLPE, Low Tension (LT) XLPE/PVC Power Cables and Control Cables. The company conducts a precise regime of Routine, Type, Acceptance and Special Tests to ensure the reliability and safety of its products.

Torrent Electricals has achieved a significant milestone by producing cables that cover an aggregate length of approximately 1.5 times the Earth's circumference. Notably, the cables manufactured by our company have exhibited an exceptionally low defect rate due to their construction and have demonstrated seamless functionality across diverse geographical regions.

Torrent Electricals is committed to delivering the best consumer experience. The company places a high priority on understanding and meeting customer needs, ensuring that every interaction is positive. We aspire to become a player for all electrical needs. Ensuring its legacy of trust and reliability continues well into the future, the company is charting new pathways to expand its horizons beyond the power cable industry. The strategic foray into the Business-to-Consumer (B2C) segment reflects TEL's customer-centric approach and dedication to delivering reliable, safe and convenient products across diverse domains.

MANUFACTURING
UNIT SPREAD OVER 82 ACRES

APPROVALS AND CERTIFICATIONS

TÜVNORD

Certificate

Management system as per

ISO 9001:2015

The Certification Body TÜV NORD CERT GmbH, hereby confirms as a result of the audit, assessment and certification decision according to ISO/IEC 17021-1:2015, that the organization

TORRENT ELECTRICALS PRIVATE LIMITED
Yoginagar, Mission Road,
Nadiad – 387 002,
Gujarat,
India

operates a management system in accordance with the requirements of ISO 9001 : 2015 and will be assessed for conformity within the 3 year term of validity of the certificate.

Scope

Design, Development, Manufacture and Supply of Cross Linked Polyethylene Insulated PVC / Thermoplastic Sheathed Cables for Working Voltages up to and Including 132 KV, PVC Insulated Cables for Working Voltages up to and Including 11 KV and Manufacture of PVC Compounds.

Certificate Registration No. **44 100 114097** Valid from **12.06.2024**
Audit Report No. **2.5-5019/2011** Valid until **11.06.2027**
Initial certification **11.01.1997**

Mumbai, **27.05.2024**

Certification Body at TÜV NORD CERT GmbH

Visit our database to verify the validity of this certificate.

TÜV NORD CERT GmbH
Am TÜV 1, 45307,
Essen

www.tuev-nord-cert.com

TÜV NORD CERT GmbH

TUV INDIA PVT. LTD.
801, Raheja Plaza 1, L.B.S Marg,
Ghatkopar (W) Mumbai – 400 086,
India

www.tuv-nord.com/in

TÜV NORD GROUP

TÜVNORD

Certificate

Management system as per

ISO 14001:2015

The Certification Body TÜV NORD CERT GmbH, hereby confirms as a result of the audit, assessment and certification decision according to ISO/IEC 17021-1:2015, that the organization

TORRENT ELECTRICALS PRIVATE LIMITED
Yoginagar, Mission Road,
Nadiad – 387 002,
Gujarat,
India

operates a management system in accordance with the requirements of ISO 14001 : 2015 and will be assessed for conformity within the 3 year term of validity of the certificate.

Scope

Design, Development and Manufacture of Cross Linked Polyethylene Insulated PVC / Thermoplastic Sheathed Cables for Working Voltages up to and Including 132 KV, PVC Insulated Cables for Working Voltages up to and Including 11 KV and Manufacture of PVC Compounds.

Certificate Registration No. **44 104 153906653** Valid from **12.06.2024**
Audit Report No. **2.5-5019/2011** Valid until **11.06.2027**
Initial certification **06.07.2015**

Mumbai, **27.05.2024**

Certification Body at TÜV NORD CERT GmbH

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Ghatkopar (W) Mumbai – 400 086,
India

www.tuv-nord.com/in

TÜV NORD GROUP

TÜVNORD

Certificate

Management system as per

ISO 45001:2018

The Certification Body TÜV NORD CERT GmbH, hereby confirms as a result of the audit, assessment and certification decision according to ISO/IEC 17021-1:2015, that the organization

TORRENT ELECTRICALS PRIVATE LIMITED
Yoginagar, Mission Road,
Nadiad – 387 002,
Gujarat,
India

operates a management system in accordance with the requirements of ISO 45001 : 2018 and will be assessed for conformity within the 3 year term of validity of the certificate.

Scope

Design, Development and Manufacture of Cross Linked Polyethylene Insulated PVC / Thermoplastic Sheathed Cables for Working Voltages up to and Including 132 KV, PVC Insulated Cables for Working Voltages up to and Including 11 KV and Manufacture of PVC Compounds.

Certificate Registration No. **44 126 153906653** Valid from **12.06.2024**
Audit Report No. **2.5-5019/2011** Valid until **11.06.2027**
Initial certification **06.07.2015 (BS OHSAS 18001)**

Mumbai, **27.05.2024**

Certification Body at TÜV NORD CERT GmbH

Visit our database to verify the validity of this certificate.

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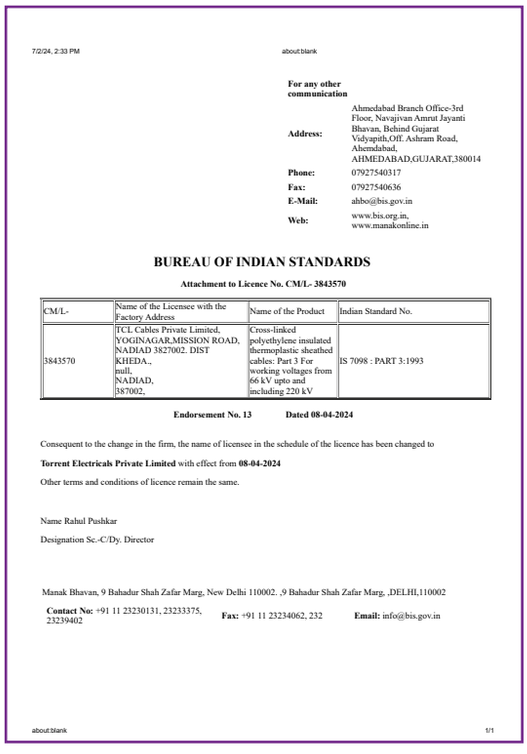
TÜV NORD GROUP



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For any other communication

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Web:	www.bis.org.in, www.manakonline.in

BUREAU OF INDIAN STANDARDS

Attachment to Licence No. CM/L- 3843570

CM/L-	Name of the Licensee with the Factory Address	Name of the Product	Indian Standard No.
3843570	TCL Cables Private Limited, YOGINAGAR,MISSION ROAD, NADIAD 3827002. DIST KHEDA., null, NADIAD, 387002,	Cross-linked polyethylene insulated thermoplastic sheathed cables: Part 3 For working voltages from 66 kV upto and including 220 kV	IS 7098 : PART 3:1993

Endorsement No. 13 **Dated 08-04-2024**

Consequent to the change in the firm, the name of licensee in the schedule of the licence has been changed to

Torrent Electricals Private Limited with effect from **08-04-2024**

Other terms and conditions of licence remain the same.

Name Rahul Pushkar

Designation Sc.-C/Dy. Director

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002. ,9 Bahadur Shah Zafar Marg, ,DELHI,110002

Contact No: +91 11 23230131, 23233375, 23239402 **Fax:** +91 11 23234062, 232 **Email:** info@bis.gov.in

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HV CABLES

1C Medium Voltage
Aluminium Power Cables

1C Medium Voltage
Aluminium Power Cables

1C Medium Voltage
Copper Power Cables

3C Medium Voltage
Copper Power Cables

3C Medium Voltage
Aluminium Power Cables

3C Medium Voltage Power
Cables With Wire Armoured

OTHER PRODUCT RANGE
EHV CABLES, LV POWER CABLES, CONTROL CABLES, INDUSTRIAL FLEXIBLE AND INSTRUMENTATION CABLES


Copper Power Cables


Aluminium Power Cables


Copper Control Cable


Aluminium Power Cables For Solar


Low Voltage Aluminium Power Cables


1C EHV Aluminium Power Cables With Al-Corrugation


1C EHV Copper Power Cables With Al-Corrugation


1C EHV Aluminium Power Cables With Wire Armour


1C EHV Copper Power Cables With Wire Armour

INTRODUCTION OF
HV CABLES

TEL manufactures high quality HV cable as per customer requirements with the standard of IS7098-II/IEC 60502-2. Most of the modern High voltage power cables are made with cross-linked polyethylene (XLPE) technology with the Cores

a) Single core unscreened, unarmoured
b) Single core screened, unarmoured
c) Single core armoured with aluminium wires screened or unscreened
d) Three core armoured, screened or unscreened

Cables suitable for voltage grades are as follows

i) For earthed system - 1.9/3.3 kV, 3.8/6.6 kV, 6.35/11 kV, 12.7/22 kV & 19/33 kV
ii) For unearthed system - 3.3/3.3 kV, 6.6/6.6 kV & 11/11 kV.

APPLICATION OF HV CABLES

High Voltage XLPE insulated power cables are suitable for use where combination of ambient temperature and temperature rise due to load results in conductor temperature not exceeding 90°C under normal operation and 250°C under short circuit condition.

- Power transmission and distribution
- Industrial power supply
- Renewal energy
- Railway electrification
- Smart grids

HV cables are used in various industries due to their,

1. High Power transmission capacity
2. Higher Short Circuit Rating Durability
3. Less energy losses
4. Longer Service Life

TECHNICAL SPECIFICATIONS
HV CABLES

CONSTRUCTION

CONDUCTOR

The conductors are made of Aluminium or Copper wires and are constructed from 25 mm² to 1000 mm² in case of Aluminium and 25 mm² to 630 mm² in case of copper confirming to IS:8130-2013 or IEC 60228. The shape of conductor Is compacted circular for HV cable and is constructed from drawn wires in a defined configuration to form a circular stranded compacted geometry. The surface of the conductor should be very smooth, dust free and polished.

TEL Provides water- tight conductor construction for Excellent Water proofing properties on special demand.

CONDUCTOR SCREENING

HV Power cables rated above 3.3/3.3 kV are provided with conductor screening. Semiconducting tapes or extruded polymeric semiconducting compound is applied over conductor to provide a smooth finish. The material is compatible with XLPE insulation. Conductor screen will act as an electrical shield which together with the elimination of the so called “strand effect” prevents to a great extent air ionization on the surface of the conductor.

INSULATION

Extruded polymeric (XLPE) insulation is applied over conductor screen by “Tripple Extrusion”. The thickness of insulation varies with voltage grade and increases as voltage grade increase. The nominal insulation thickness varies from 2.2 mm to 9.0 mm as voltage increases from 3.3 kV to 33 kV. XLPE Insulation shall be extruded through CCV/CDCC Tripple extrusion line. XLPE insulation should be manufactured with Dry/Gas Curing process for better dielectric strength.

INSULATION SCREENING

Insulation screens consist of two parts, namely metallic & non-metallic.

Non-metallic part of Insulation screen shall be applied directly over the insulation of each core and shall consist of either extruded semi conducting compound or a combination of semi conducting tape & extruded semiconducting

compound. It’s provided uniform distribution of the electric field over the insulation & the partial discharge level at the surface of the insulation is brought to a minimum.

Metallic part shall consist of either tape, or braid or concentric serving of wires or a combination of wires and tapes or a sheath shall be non-magnetic and shall applied over the non-metallic part. For single core armoured cables, the armouring may constitute the metallic part of screening. Metallic screen will carry the suitable screen earth fault current.

IDENTIFICATION OF CORES

The cores of chemically cross-linked polyethylene (XLPE) insulation are of natural colour with black colour of semiconducting compound. For the identification of the Multicores in three phase cables, polyester strips/tapes of red, yellow and blue are applied longitudinally over the non-metallic screen extruded semiconducting compound.

LAYING UP OF CORES (FOR MULTI CORES)

Cores laid ups together at interstices with Suitable Non- Hygroscopic PVC/PP fillers shall be filled & suitable binder tape for binding all cores tightly.

INNER SHEATH

For Inner sheathing, heat resistant ST-2 PVC compound or thermoplastic compound or high density polyethene are used. Inner sheathing is done after laying up of cores. Inner sheath provides Thermal protection, mechanical protection, chemical resistance and moisture barrier. Inner sheath will not be applicable to where armour will act as metallic part of screening.

ARMOUR

Armouring is done on inner sheathed cables by applying galvanized steel wires/strip for multicore cables & single core cables are armoured with Aluminium or Aluminium alloy wire/ strips, thus avoiding magnetic hysteresis losses on A.C. System., laying helically in succession; to cover the periphery of the inner sheathed cables. Armour provides mechanical strength to the cables. Armour construction is similar in both single core and multicore variety. Round steel wires are used where the diameter over the inner sheath does not exceed 13 mm, above 13 mm flat steel strip armour is used. Round wire of different sizes can also be provided against specific request.

For mining application, we provide Double layer armouring to fulfil its requirements as per IS-7098-2 to meet conductivity of armour more than 75% of main conductor of cable on special request.

OUTER SHEATH

Outer sheathing is done over armour for multicore & single core armoured cables & over metallic screen for single core unarmoured cables. Outer sheathing is done using heat resistant Extruded PVC ST-2 or MDPE or HDPE compound. The nominal thickness of Unarmoured cables and minimum thickness of armoured cables of will be as per IS:7098 (2) 2011. TEL Provides Flame Retardant (FR)/Flame Retardant Low Smoke (FRLS) compound of Outer sheath which provide better fire Protection.

FRLS Properties:

Minimum oxygen Index	%	29 minimum as per ASTM-D 2863
Minimum Temperature Index	°C	250 °C at oxygen index value 21 as per ASTM-D 2863
Maximum smoke density rating	%	60% max. As per ASTM-D 2843
Light transmission	%	(100-smoke density) = 40% as per ASTM-D-2843
Maximum Acid Gas emissions	%	20% max. As per IEC 60754 (1)
Flammability Test		As per IEC 60332 Part I& III, IEEE 383

PACKAGING

HT cables will be provided in High quality Non-returnable Wooden drums or Returnable/Non-returnable steel drums as per withstand capacity of cables & special customer requirements. Each drum will be provided with End sealing caps to protect against water ingress at both ends. Each drum will be provided with PP sheet over outer most layer as environment point of view for better protection against external damage.

Product Code as per IS 7098 (Part II), the codes are:

ALUMINIUM	A
COPPER	-
XLPE	2X
PVC	Y
POLYETHYLENE	2Y
SINGLE LAYER GALVANISED STEEL ROUND WIRE	W
DOUBLE LAYER GALVANISED STEEL ROUND WIRE	WW
SINGLE LAYER GALVANISED STEEL FLAT STRIP (FORMED WIRE)	F
DOUBLE LAYER GALVANISED STEEL FLAT STRIP (FORMED WIRE)	FF
ALUMINIUM WIRE ARMOURING	Wa
ALUMINIUM STRIP ARMOURING	Fa

HIGH-VOLTAGE TEST

The following test voltages are applied between conductors and screen/armour for period of 5 minutes.

Voltage grade	**Test Voltage in kV (rms) Between Conductor & screen/armour (Routine test)**
1.9/3.3 kV	10
3.8/6.6 kV	13
6.35/11 kV	21
11/11 kV	35
12.7/22 kV	42
19/33 kV	63
33/33 kV	84

CABLE CONSTRUCTION

HV Cable - Aluminium Medium

1. Aluminum Conductor
2. XLPE insulation
3. Semi conductive conductor screen
4. Insulation screen
5. Copper tape
6. PVC/HDPE inner sheath
7. Aluminum/GI round wire
8. Outer sheath PVC (ST-2, FR, FRLS)/HDPE

HV Cable - Copper Medium

1. Aluminium conductor
2. Conductor Screen
3. XLPE Insulation
4. Insulation Screen (Triple Extrusion)
5. Wrapped Copper tape (Metallic screen)
6. PVC Fillers
7. Extruded PVC/HDPE Inner sheath
8. Galvanized Steel Flat Strip
9. Outer sheath PVC (ST-2, FR, FRLS)/HDPE

1-CORE - HT XLPE AS PER IS: 7098

1C Aluminium Medium Voltage Power Cable

Particular	Details
Conductor	Aluminium/Copper Stranded Compacted circular conductor (Class-2)
Separator tape (optional)	Semiconducting tape
Conductor screen	Extruded semiconducting compound
Insulation	Extruded XLPE Insulation
Insulation screen (Non-metallic)	Extruded semiconducting compound
Metallic screen part	Copper wire screen with Helically copper tape/ Wrapped copper tape
Fillers (For 3 cores only)	PVC fillers/PP fillers
Inner sheath	Extruded High Density Polyethylene/Extruded PVC
Armour (For armoured cables)	Aluminium (Non-magnetic) round wire/Flat strip for Single core & Galvanised steel flat/Round wire for multicore cables
Outer sheath	Extruded High Density Polyethylene/Extruded PVC (FR, FRLS)
Core Size Range (sq.mm)	1 Core=35 to 1000 sq.mm. Aluminium conductor (up to 11 kV UE) & 50 to 1000 sq.mm. Aluminium conductor (Above 11 kV UE)
	1 Core = 35 to 630 sq.mm. Copper conductor (up to 11 kV UE) & 50 to 630 sq.mm. Copper conductor (Above 11 kV UE)
Type of Cable	Single core {PVC= A2XFaY/2XFaY, A2XWaY/2XWaY
	HDPE = A2XFa2Y/A2XFa2Y, A2XWa2Y/2XWa2Y}
Rated Voltage Range	3.3 kV (E), 3.3 kV (UE), 6.6 kV (E), 6.6 kV (UE), 11 kV (E), 11 kV (UE), 22 kV (E), 33 kV (E), 33 kV (UE)
Specification (IS Details which we comply)	IS: 7098 (PT-2) 2011
Application	For External & burial application for High Voltage Power distribution & Transmission Network system.

DATA SHEET

SINGLE CORE - HT XLPE 3.3 kV (E) or 3.3/3.3 kV AS PER IS:7098 (PT-2) 2011

Techanical Parameters										Current rating in (a.c.) in Trefoil		
Nominal Area	Nominal Thickness of Insulation	Minimum Thickness of Inner Sheath	Nominal Diameter of Round AL. Wire	Minimum Thickness of Outer Sheath	Approx Overall Diameter	Approx weight of Cable	Standard Drum length	Approx Capaci-tance	Approx React-ance	Current rating in Ground at 30 dec C	Current rating in Duct at 30 dec C	Current rating in Air at 40 dec C
Sq mm	mm	mm	mm	mm	mm	kgs/km	Mtrs	mF/km	Ohm/km	Amp	Amp	Amp
50	2.50	0.30	1.60	1.40	22.5	625	500	0.29	0.120	138	123	166
70	2.50	0.30	1.60	1.40	24.0	720	500	0.33	0.113	168	149	208
95	2.50	0.30	1.60	1.40	25.8	850	500	0.37	0.108	200	177	252
120	2.50	0.30	1.60	1.40	27.5	960	500	0.42	0.104	227	201	292
150	2.50	0.30	1.60	1.56	29.3	1100	500	0.45	0.102	252	223	329
185	2.50	0.30	1.60	1.56	30.4	1210	500	0.48	0.099	285	251	380
240	2.50	0.40	2.00	1.56	32.3	1520	500	0.54	0.098	326	286	448
300	2.50	0.40	2.00	1.56	35.7	1740	500	0.59	0.095	365	319	511
400	2.60	0.40	2.00	1.72	39.3	2110	500	0.65	0.092	412	359	593
500	2.80	0.40	2.00	1.72	43.8	2590	500	0.70	0.089	461	401	680
630	3.00	0.50	2.00	1.88	48.0	3180	500	0.70	0.089	514	445	777
800	3.30	0.50	2.50	2.04	55.1	4140	500	0.72	0.088	552	476	863
1000	3.50	0.60	2.50	2.20	59.5	4950	500	0.77	0.087	595	509	954

SINGLE CORE - HT XLPE 6.6 kV (E) or 3.8/6.6 kV AS PER IS:7098 (PT-2) 2011

Techanical Parameters										Current rating in (a.c.) in Trefoil		
Nominal Area	Nominal Thickness of Insulation	Minimum Thickness of Inner Sheath	Nominal Diameter of Round AL. Wire	Minimum Thickness of Outer Sheath	Approx Overall Diameter	Approx weight of Cable	Standard Drum length	Approx Capaci-tance	Approx React-ance	Current rating in Ground at 30 dec C	Current rating in Duct at 30 dec C	Current rating in Air at 40 dec C
Sq mm	mm	mm	mm	mm	mm	kgs/km	Mtrs	mF/km	Ohm/km	Amp	Amp	Amp
50	2.80	0.30	1.60	1.40	23.0	650	500	0.26	0.121	138	123	166
70	2.80	0.30	1.60	1.40	24.6	750	500	0.30	0.115	168	149	208
95	2.80	0.30	1.60	1.40	26.4	875	500	0.34	0.109	200	177	252
120	2.80	0.30	1.60	1.40	28.0	985	500	0.38	0.105	227	201	292
150	2.80	0.30	1.60	1.56	29.9	1130	500	0.41	0.103	252	223	329
185	2.80	0.30	1.60	1.56	31.3	1270	500	0.44	0.101	285	251	380
240	2.80	0.40	2.00	1.56	34.4	1560	500	0.49	0.099	326	286	448
300	3.00	0.40	2.00	1.56	36.7	1800	500	0.51	0.097	365	319	511
400	3.30	0.40	2.00	1.72	40.7	2210	500	0.53	0.095	412	359	593
500	3.50	0.50	2.00	1.72	45.8	2780	500	0.57	0.092	461	401	680
630	3.50	0.50	2.00	1.88	48.8	3250	500	0.63	0.090	514	445	777
800	3.50	0.50	2.50	2.04	55.1	4140	500	0.72	0.088	552	476	863
1000	3.60	0.60	2.50	2.20	59.5	4950	500	0.77	0.087	595	509	954

SINGLE CORE - HT XLPE 6.6 kV (UE) or 6.35/11 kV AS PER IS:7098 (PT-2) 2011

Techanical Parameters										Current rating in (a.c.) in Trefoil		
Nominal Area	Nominal Thickness of Insulation	Minimum Thickness of Inner Sheath	Nominal Diameter of Round AL. Wire	Minimum Thickness of Outer Sheath	Approx Overall Diameter	Approx weight of Cable	Standard Drum length	Approx Capaci-tance	Approx React-ance	Current rating in Ground at 30 dec C	Current rating in Duct at 30 dec C	Current rating in Air at 40 dec C
Sq mm	mm	mm	mm	mm	mm	kgs/km	Mtrs	mF/km	Ohm/km	Amp	Amp	Amp
50	3.60	0.30	1.60	1.40	24.7	720	500	0.22	0.125	138	122	167
70	3.60	0.30	1.60	1.40	26.2	820	500	0.25	0.119	168	149	209
95	3.60	0.30	1.60	1.40	28.0	950	500	0.28	0.113	200	177	254
120	3.60	0.30	1.60	1.56	30.0	1100	500	0.31	0.110	227	200	294
150	3.60	0.30	1.60	1.56	31.5	1210	500	0.33	0.106	252	223	331
185	3.60	0.40	2.00	1.56	33.7	1430	500	0.36	0.106	284	250	383
240	3.60	0.40	2.00	1.56	36.0	1660	500	0.40	0.102	326	286	450
300	3.60	0.40	2.00	1.56	37.9	1870	500	0.43	0.099	365	319	512
400	3.60	0.40	2.00	1.72	41.3	2250	500	0.49	0.095	412	359	594
500	3.60	0.50	2.00	1.88	46.0	2800	500	0.56	0.093	461	401	680
630	3.60	0.50	2.00	1.88	49.0	3270	500	0.61	0.090	514	445	778
800	3.60	0.50	2.50	2.04	55.3	4160	500	0.70	0.088	553	476	863
1000	3.60	0.60	2.50	2.20	59.5	4950	500	0.77	0.087	595	509	954

SINGLE CORE - HT XLPE 11 kV (UE) or 11/11 kV AS PER IS:7098 (PT-2) 2011

Techanical Parameters										Current rating in (a.c.) in Trefoil		
Nominal Area	Nominal Thickness of Insulation	Minimum Thickness of Inner Sheath	Nominal Diameter of Round AL. Wire	Minimum Thickness of Outer Sheath	Approx Overall Diameter	Approx weight of Cable	Standard Drum length	Approx Capaci-tance	Approx React-ance	Current rating in Ground at 30 dec C	Current rating in Duct at 30 dec C	Current rating in Air at 40 dec C
Sq mm	mm	mm	mm	mm	mm	kgs/km	Mtrs	mF/km	Ohm/km	Amp	Amp	Amp
50	5.50	0.30	1.60	1.56	28.8	930	500	0.16	0.135	138	122	167
70	5.50	0.30	1.60	1.56	30.4	1030	500	0.18	0.128	168	149	209
95	5.50	0.30	2.00	1.56	33.0	1250	500	0.20	0.123	200	177	254
120	5.50	0.40	2.00	1.56	34.8	1400	500	0.22	0.119	227	200	294
150	5.50	0.40	2.00	1.56	36.3	1535	500	0.24	0.115	252	223	331
185	5.50	0.40	2.00	1.56	37.5	1665	500	0.25	0.112	284	250	383
240	5.50	0.40	2.00	1.72	40.1	1940	500	0.28	0.108	326	286	450
300	5.50	0.40	2.00	1.72	42.0	2165	500	0.30	0.105	365	319	512
400	5.50	0.50	2.00	1.88	45.8	2610	500	0.34	0.102	412	359	594
500	5.50	0.50	2.50	2.04	51.2	3280	500	0.39	0.099	461	401	680
630	5.50	0.50	2.50	2.04	54.2	3780	500	0.42	0.096	514	445	778
800	5.50	0.60	2.50	2.20	59.6	4600	500	0.48	0.093	553	476	863
1000	5.50	0.60	2.50	2.36	63.7	5390	500	0.52	0.091	595	509	954

SINGLE CORE - HT XLPE 12.7/22 kV (E) or 22 kV (E) AS PER IS:7098 (PT-2) 2011

Techanical Parameters										Current rating in (a.c.) in Trefoil		
Nominal Area	Nominal Thickness of Insulation	Minimum Thickness of Inner Sheath	Nominal Diameter of Round AL. Wire	Minimum Thickness of Outer Sheath	Approx Overall Diameter	Approx weight of Cable	Standard Drum length	Approx Capaci-tance	Approx React-ance	Current rating in Ground at 30 dec C	Current rating in Duct at 30 dec C	Current rating in Air at 40 dec C
Sq mm	mm	mm	mm	mm	mm	kgs/km	Mtrs	mF/km	Ohm/km	Amp	Amp	Amp
50	6.00	0.30	1.60	1.56	29.8	980	500	0.15	0.137	137	120	174
70	6.00	0.30	1.60	1.56	31.4	1090	500	0.17	0.130	167	146	217
95	6.00	0.40	2.00	1.56	34.2	1330	500	0.19	0.126	198	172	262
120	6.00	0.40	2.00	1.56	35.8	1465	500	0.21	0.121	224	195	302
150	6.00	0.40	2.00	1.56	37.3	1600	500	0.22	0.117	249	217	339
185	6.00	0.40	2.00	1.72	38.8	1760	500	0.24	0.115	280	243	389
240	6.00	0.40	2.00	1.72	41.1	2010	500	0.26	0.110	321	278	455
300	6.00	0.40	2.00	1.72	43.0	2235	500	0.28	0.107	355	307	515
400	6.00	0.50	2.00	1.88	46.8	2685	500	0.32	0.103	400	345	594
500	6.00	0.50	2.50	2.04	52.2	3365	500	0.36	0.101	447	384	678
630	6.00	0.50	2.50	2.04	55.2	3870	500	0.39	0.098	496	424	770
800	6.00	0.60	2.50	2.20	60.6	4695	500	0.45	0.094	543	475	866
1000	6.00	0.60	2.50	2.36	64.7	5490	500	0.49	0.092	572	498	944

SINGLE CORE - HT XLPE 19/33 kV (E) or 33 kV (E) AS PER IS:7098 (PT-2) 2011

Techanical Parameters										Current rating in (a.c.) in Trefoil		
Nominal Area	Nominal Thickness of Insulation	Minimum Thickness of Inner Sheath	Nominal Diameter of Round AL. Wire	Minimum Thickness of Outer Sheath	Approx Overall Diameter	Approx weight of Cable	Standard Drum length	Approx Capaci-tance	Approx React-ance	Current rating in Ground at 30 dec C	Current rating in Duct at 30 dec C	Current rating in Air at 40 dec C
Sq mm	mm	mm	mm	mm	mm	kgs/km	Mtrs	mF/km	Ohm/km	Amp	Amp	Amp
50	8.80	0.40	2.00	1.56	36.4	1400	500	0.12	0.150	137	120	174
70	8.80	0.40	2.00	1.56	38.0	1530	500	0.13	0.142	167	146	217
95	8.80	0.40	2.00	1.72	40.2	1725	500	0.15	0.136	198	172	262
120	8.80	0.40	2.00	1.72	41.8	1870	500	0.16	0.130	224	195	302
150	8.80	0.40	2.00	1.72	43.3	2020	500	0.17	0.126	249	217	339
185	8.80	0.50	2.00	1.88	45.1	2235	500	0.18	0.124	280	243	389
240	8.80	0.50	2.00	1.88	47.4	2500	500	0.20	0.119	321	278	455
300	8.80	0.50	2.50	2.04	50.7	2940	500	0.21	0.117	355	307	515
400	8.80	0.50	2.50	2.04	53.8	3340	500	0.23	0.112	400	345	594
500	8.80	0.60	2.50	2.20	58.3	3960	500	0.26	0.108	447	384	678
630	8.80	0.60	2.50	2.36	61.6	4540	500	0.29	0.105	496	424	770
800	8.80	0.60	2.50	2.36	66.5	5335	500	0.32	0.100	543	475	866
1000	8.80	0.70	3.15	2.52	72.6	6580	500	0.35	0.099	572	498	944

3 CORE - HT XLPE AS PER IS: 7098

3C Copper Medium Voltage Power Cable

Particular	Details
Conductor	Aluminium/Copper Stranded Compacted circular conductor (Class-2)
Separator tape (optional)	Semiconducting tape
Conductor screen	Extruded semiconducting compound
Insulation	Extruded XLPE Insulation
Insulation screen (Non-metallic)	Extruded semiconducting compound
Metallic screen part	Copper wire screen with Helically copper tape/ Wrapped copper tape
Fillers (For 3 cores only)	PVC fillers/PP fillers
Inner sheath	Extruded High Density Polyethylene / Extruded PVC
Armour (For armoured cables)	Aluminium (Non-magnetic) round wire/Flat strip for Single core & Galvanised steel flat/Round wire for multicore cables
Outer sheath	Extruded High Density Polyethylene/Extruded PVC (FR, FRLS)
Core Size Range (sq.mm)	3 Core = 35 to 630 sq.mm. Aluminium conductor (up to 11 kV UE) & 50 to 630 sq.mm. Aluminium conductor (Above 11kV UE)
	3 Core = 35 to 400 sq.mm. Copper conductor (up to 11 kV UE) & 50 to 400 sq.mm. Copper conductor (Above11 kV UE)
Type of Cable	PVC = A2XFY/2XFY, A2XWY/2XWY HDPE = A2XF2Y/A2XF2Y, A2XW2Y/2XW2Y
Rated Voltage Range	3.3 kV (E), 3.3 kV (UE), 6.6 kV (E), 6.6 kV (UE), 11 kV (E), 11 kV (UE), 22 kV (E), 33 kV (E), 33 kV (UE)
Specification (IS Details which we comply)	IS: 7098 (PT-2) 2011
Application	For External & burial application for High Voltage Power distribution & Transmission Network system.

DATA SHEET

3 CORE - HT XLPE 3.3 kV/3.3 kV (UE) AS PER IS:7098 (PT-2)

Nominal Area	Sq mm	50	70	95	120	150	185	240	300	400
Nominal Thickness of Insulation	mm	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Minim Thickness of Inner Sheath	mm	0.40	0.50	0.50	0.50	0.60	0.60	0.60	0.70	0.70
FLAT GALVANISED STEEL STRIP ARMOURED										
Nominal Thickness of Armour G.S Flat Strip	mm	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Minim Thickness of Outer Sheath	mm	1.72	1.72	1.88	2.04	2.04	2.20	2.36	2.52	2.68
Approx Overall Diameter	mm	37.60	41.30	45.50	49.30	52.70	55.60	61.00	65.50	72.40
Approx weight of Cable kgs/km	kgs/km	1910	2290	2790	3240	3690	4190	5030	5860	7110
Standard Drum length	Mtrs	500	500	500	500	500	500	500	500	500
Drum Size		1809G	1809G	1809G	2009G	2009G	2212G	2412G	2412G	2412G
ROUND GALVANISED WIRE ARMOURED										
Nominal Diameter of Round Armour wire	mm	2.00	2.00	2.50	2.50	2.50	2.50	2.50	3.15	3.15
Minim Thickness of Outer Sheath	mm	1.72	1.88	2.04	2.04	2.20	2.36	2.36	2.68	2.84
Approx Overall Diameter	mm	39.60	43.70	48.90	52.30	56.00	59.00	63.90	70.70	77.00
Approx weight of Cable kgs/km	kgs/km	2420	2920	3810	4280	4880	5420	6330	8040	9560
Standard Drum length	Mtrs	500	500	500	500	500	500	500	500	250
Drum Size		1809G	1809G	1809G	2009G	2009G	2212G	2412(12)G	2413(14)G	2413(14)G
REACTIVE COMPONENT										
Approx Capaci-tance mF/km	mF/km	0.32	0.37	0.42	0.47	0.51	0.55	0.62	0.67	0.76
Approx React- ance Ω/KM	Ω/KM	0.092	0.088	0.085	0.082	0.080	0.079	0.077	0.076	0.074
CONTINUOUS CURRENT RATING FOR THREE CORE CABLES										
Current rating in Ground at 30 dec C	Amp	131	160	191	216	241	273	315	354	403
Current rating in Duct at 30 dec C	Amp	113	138	165	187	208	236	277	312	355
Current rating in Air at 40 dec C	Amp	146	182	221	254	286	330	385	440	512

3 CORE - HT XLPE 3.8/6.6 kV (E) AS PER IS:7098 (PT-2)

Nominal Area	Sq mm	50	70	95	120	150	185	240	300	400
Nominal Thickness of Insulation	mm	2.80	2.80	2.80	2.80	2.80	2.80	2.80	3.00	3.30
Minim Thickness of Inner Sheath	mm	0.50	0.50	0.50	0.60	0.60	0.60	0.70	0.70	0.70
FLAT GALVANISED STEEL STRIP ARMOURED										
Nominal Thickness of Armour G.S Flat Strip	mm	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Minim Thickness of Outer Sheath	mm	1.72	1.88	1.88	2.04	2.20	2.20	2.36	2.52	2.84
Approx Overall Diameter	mm	40.50	44.20	48.10	52.00	55.60	58.20	63.50	68.80	77.40
Approx weight of Cable kgs/km	kgs/km	2120	2550	2990	3510	3990	4440	5340	6240	7780
Standard Drum length	Mtrs	500	500	500	500	500	500	500	500	500
Drum Size		1809G	1809G	1809G	2009G	2009G	2212G	2412G	2412G	2613(14)G
ROUND GALVANISED WIRE ARMOURED										
Nominal Diameter of Round Armour wire	mm	2.00	2.00	2.50	2.50	2.50	2.50	3.15	3.15	4.00
Minim Thickness of Outer Sheath	mm	1.88	1.88	2.04	2.20	2.20	2.36	2.52	2.68	3.00
Approx Overall Diameter	mm	42.90	46.30	51.50	55.40	58.60	61.50	68.20	73.50	83.80
Approx weight of Cable kgs/km	kgs/km	2740	3160	4070	4660	5170	5760	7485	8570	10480
Standard Drum length	Mtrs	500	500	500	500	500	500	500	250	250
Drum Size		1809G	1809G	2009G	2009G	2009G	2212G	2412(12)G	2413(14)G	2413(14)G
REACTIVE COMPONENT										
Approx Capaci-tance mF/km	mF/km	0.27	0.30	0.35	0.38	0.42	0.45	0.50	0.51	0.53
Approx React- ance Ω/KM	Ω/KM	0.097	0.093	0.089	0.086	0.084	0.083	0.080	0.080	0.079
CONTINUOUS CURRENT RATING FOR THREE CORE CABLES										
Current rating in Ground at 30 dec C	Amp	131	160	191	216	241	273	315	354	403
Current rating in Duct at 30 dec C	Amp	113	138	165	187	208	236	277	312	355
Current rating in Air at 40 dec C	Amp	146	182	221	254	286	330	385	440	512

3 CORE - HT XLPE 6.35/11 kV AS PER IS:7098 (PT-2)

Nominal Area	Sq mm	50	70	95	120	150	185	240	300	400
Nominal Thickness of Insulation	mm	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
Minim Thickness of Inner Sheath	mm	0.50	0.50	0.60	0.60	0.60	0.70	0.70	0.70	0.70
FLAT GALVANISED STEEL STRIP ARMOURED										
Nominal Thickness of Armour G. S. Flat Strip	mm	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Minim Thickness of Outer Sheath	mm	1.88	1.88	2.04	2.20	2.20	2.36	2.52	2.68	2.84
Approx Overall Diameter	mm	44.20	47.70	52.00	55.80	59.00	62.00	67.30	71.70	78.70
Approx weight of Cable kgs/km	kgs/km	2450	2840	3390	3880	4340	4890	5790	6640	7960
Standard Drum length	Mtrs	500	500	500	500	500	500	500	500	500
Drum Size		1809G	1809G	2010G	2010G	2212G	2412G	2412G	2412G	2413(14)G
ROUND GALVANISED WIRE ARMOURED										
Nominal Diameter of Round Armour wire	mm	2.50	2.50	2.50	2.50	2.50	3.15	3.15	3.15	4.00
Minim Thickness of Outer Sheath	mm	2.04	2.04	2.20	2.20	2.36	2.52	2.68	2.84	3.00
Approx Overall Diameter	mm	47.70	51.00	55.40	58.80	62.40	66.70	72.00	76.40	85.70
Approx weight of Cable kgs/km	kgs/km	3420	3910	4550	5060	5670	7000	8070	9035	11830
Standard Drum length	Mtrs	500	500	500	500	500	500	250	250	250
Drum Size		1809G	2010G	2010G	2212G	2412G	2412G	2412G	2214(13)G	2214(13)G
REACTIVE COMPONENT										
Approx Capaci-tance mF/km	mF/km	0.22	0.25	0.28	0.31	0.34	0.36	0.40	0.44	0.50
Approx React-ance Ω/KM	Ω/KM	0.103	0.098	0.094	0.091	0.089	0.087	0.084	0.082	0.080
CONTINUOUS CURRENT RATING FOR THREE CORE CABLES										
Current rating in Ground at 30 dec C	Amp	Drum Size	161	190	216	242	273	315	354	404
Current rating in Duct at 30 dec C	Amp	114	139	165	188	209	240	278	312	356
Current rating in Air at 40 dec C	Amp	148	184	222	256	288	330	387	441	512

3 CORE - HT XLPE 11/11 kV; 11 kV(UE) AS PER IS:7098 (PT-2)

Nominal Area	Sq mm	50	70	95	120	150	185	240	300	400
Nominal Thickness of Insulation	mm	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
Minim Thickness of Inner Sheath	mm	0.60	0.60	0.60	0.70	0.70	0.70	0.70	0.70	0.70
FLAT GALVANISED STEEL STRIP ARMOURED										
Nominal Thickness of Armour G. S. Flat Strip	mm	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Minim Thickness of Outer Sheath	mm	2.20	2.20	2.36	2.36	2.52	2.68	2.84	3.00	3.00
Approx Overall Diameter	mm	53.20	56.70	60.90	64.40	68.00	70.90	76.10	80.50	87.20
Approx weight of Cable kgs/km	kgs/km	3280	3720	4310	4820	5370	5930	6900	7830	9170
Standard Drum length	Mtrs	500	500	500	500	500	500	500	500	250
Drum Size		2009G	2009G	2212G	2412G	2412G	2412G	2413(14)G	2413(14)G	241(14)G
ROUND GALVANISED WIRE ARMOURED										
Nominal Diameter of Round Armour wire	mm	2.50	2.50	3.15	3.15	3.15	3.15	3.15	4.00	4.00
Minim Thickness of Outer Sheath	mm	2.20	2.36	2.52	2.52	2.68	2.84	3.00	3.00	3.00
Approx Overall Diameter	mm	56.40	60.00	65.50	69.10	72.60	75.50	80.80	87.20	93.80
Approx weight of Cable kgs/km	kgs/km	4430	4980	6390	7030	7665	8320	9460	11510	13270
Standard Drum length	Mtrs	500	500	500	500	500	250	250	250	250
Drum Size		2009G	2212G	2412G	2412G	2614(13)G	2414(14)G	2414(14)G	2616(14)G	2616(14)G
REACTIVE COMPONENT										
Approx Capaci-tance mF/km	mF/km	0.16	0.18	0.21	0.23	0.24	0.26	0.29	0.31	0.35
Approx React-ance Ω/KM	Ω/KM	0.116	0.110	0.105	0.101	0.098	0.096	0.093	0.090	0.087
CONTINUOUS CURRENT RATING FOR THREE CORE CABLES										
Current rating in Ground at 30 dec C	Amp	131	161	190	216	242	273	315	354	404
Current rating in Duct at 30 dec C	Amp	114	139	165	188	209	240	278	312	356
Current rating in Air at 40 dec C	Amp	148	184	222	256	288	330	387	441	512

3 CORE - HT XLPE 12.7/22 kV (E) AS PER IS:7098 (PT-2)

Nominal Area	Sq mm	50	70	95	120	150	185	240	300	400
Nominal Thickness of Insulation	mm	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Minim Thickness of Inner Sheath	mm	0.60	0.60	0.70	0.70	0.70	0.70	0.70	0.70	0.70
FLAT GALVANISED STEEL STRIP ARMOURED										
Nominal Thickness of Armour G. S. Flat Strip	mm	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Minim Thickness of Outer Sheath	mm	2.20	2.36	2.36	2.52	2.68	2.68	2.84	3.00	3.00
Approx Overall Diameter	mm	55.40	59.10	63.10	66.90	70.40	73.00	78.30	82.70	89.30
Approx weight of Cable kgs/km	kgs/km	3510	4000	4560	5140	5700	6240	7220	8120	9510
Standard Drum length	Mtrs	500	500	500	500	500	500	500	250	250
Drum Size		2009G	2212G	2412G	2412G	2412G	2412G	2613(14)G	2414(14)G	2614(14)G
ROUND GALVANISED WIRE ARMOURED										
Nominal Diameter of Round Armour wire	mm	2.50	2.50	3.15	3.15	3.15	3.15	4.00	4.00	4.00
Minim Thickness of Outer Sheath	mm	2.36	2.36	2.52	2.68	2.68	2.84	3.00	3.00	3.00
Approx Overall Diameter	mm	58.80	62.20	67.80	71.60	74.80	77.70	85.20	89.30	95.90
Approx weight of Cable kgs/km	kgs/km	4740	5250	6735	7430	8010	8680	10900	11975	13625
Standard Drum length	Mtrs	500	500	500	500	400	400	300	300	250
Drum Size		2212G	2412G	2412G	2412G	2412G	2413(14)G	2414(14)G	2616(14)G	2616(14)G
REACTIVE COMPONENT										
Approx Capaci-tance mF/km	mF/km	0.15	0.17	0.19	0.21	0.23	0.24	0.27	0.29	0.32
Approx React-ance Ω/KM	Ω/KM	0.119	0.113	0.108	0.104	0.100	0.098	0.095	0.092	0.089
CONTINUOUS CURRENT RATING FOR THREE CORE CABLES										
Current rating in Ground at 30 dec C	Amp	130	159	189	215	239	270	312	351	400
Current rating in Duct at 30 dec C	Amp	116	142	169	192	214	245	282	317	361
Current rating in Air at 40 dec C	Amp	152	189	227	262	294	336	393	448	519

3 CORE - HT XLPE 19/33 kV; 33 kV (E) AS PER IS:7098 (PT-2)

Nominal Area	Sq mm	50	70	95	120	150	185	240	300	400
Nominal Thickness of Insulation	mm	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80
Minim Thickness of Inner Sheath	mm	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
FLAT GALVANISED STEEL STRIP ARMOURED										
Nominal Thickness of Armour G. S. Flat Strip	mm	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Minim Thickness of Outer Sheath	mm	2.52	2.68	2.84	2.84	3.00	3.00	3.00	3.00	3.00
Approx Overall Diameter	mm	68.20	71.90	76.10	79.60	83.10	85.70	90.60	94.60	101.30
Approx weight of Cable kgs/km	kgs/km	4950	5530	6200	6790	7430	7980	9020	9920	11420
Standard Drum length	Mtrs	500	500	500	500	500	500	250	250	250
Drum Size		0	0	0	0	0	0	0	0	0
ROUND GALVANISED WIRE ARMOURED										
Nominal Diameter of Round Armour wire	mm	3.15	3.15	3.15	4.00	4.00	4.00	4.00	4.00	4.00
Minim Thickness of Outer Sheath	mm	2.68	2.84	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Approx Overall Diameter	mm	72.90	76.60	80.80	86.50	89.70	92.30	97.20	101.30	107.90
Approx weight of Cable kgs/km	kgs/km	7380	8040	8860	10740	11470	12200	13450	14510	16400
Standard Drum length	Mtrs	500	400	400	300	300	250	250	250	200
Drum Size		0	0	0	0	0	0	0	0	0
REACTIVE COMPONENT										
Approx Capaci-tance mF/km	mF/km	0.12	0.13	0.15	0.16	0.17	0.18	0.20	0.22	0.24
Approx React-ance Ώ/KM	Ώ/KM	0.134	0.127	0.120	0.116	0.112	0.109	0.105	0.102	0.098
CONTINUOUS CURRENT RATING FOR THREE CORE CABLES										
Current rating in Ground at 30 dec C	Amp	130	159	189	215	239	270	312	351	400
Current rating in Duct at 30 dec C	Amp	116	142	169	192	214	245	282	317	361
Current rating in Air at 40 dec C	Amp	152	189	227	262	294	336	393	448	519

COMMON DESIGN DETAILS

CONDUCTOR RESISTANCE AND SHORT CIRCUIT CURRENT CARRYING CAPACITY

Nominal Cross Sectional Area	Maximum DC Resistance at 20°C	Approx. AC Resistance at 90°C	Maximum DC Resistance at 20°C	Approx. AC Resistance at 90°C	Short Circuit Conductor	Current for -
	Aluminium Conductor		Copper Conductor		Aluminium	Copper
sq.mm.	ohms/km	ohms/km	ohms/km	ohms/km	ka/sec	ka/sec
35	0.8680	1.137	0.5240	0.6864	3.29	5 01
50	0.6410	0.840	0.3870	0.5070	4.70	7.15
70	0.4430	0.580	0.2680	0.3511	6.58	10.01
95	0.3200	0.419	0.1930	0.2528	8.93	13.58
120	0.2530	0.331	0.1530	0.2004	11.28	17.16
150	0.2060	0.270	0.1240	0.1624	14.10	21.45
185	0.1640	0.215	0.0991	0.1298	17.39	26.46
240	0.1250	0.164	0.0754	0.0988	22.56	34.32
300	0.1000	0.131	0.0601	0.0787	28.20	42.90
400	0.0778	0.102	0.0470	0.0616	37.60	57.20
500	0.0605	0.079	0.0366	0.0479	47.00	71.50
630	0.0469	0.061	0.0283	0.0371	59.22	90.09
800	0.0367	0.048	0.0221	0.0280	75.20	114.40
1000	0.0291	0.038	0.0176	0.0231	94.00	143.00

GROUP RATING FACTOR FOR SINGLE CORE / MULTI CORE CABLES

Number of cables in Group	Spacing between Cables in mm				
	Touching	200	400	600	800
2	0.78 0.80	0.85 0.86	0.89 0.90	0.91 0.92	0.93 0.94
3	0.66 0.69	0.75 0.77	0.81 0.82	0.85 0.86	0.88 0.89
4	0.59 0.62	0.70 0.72	0.77 0.79	0.82 0.83	0.86 0.87
5	0.55 0.57	0.66 0.68	0.74 0.76	0.80 0.81	0.84 0.85
6	0.51 0.54	0.64 0.65	0.72 0.74	0.78 0.80	0.83 0.84
7	0.48 0.51	0.61 0.63	0.71 0.72	0.77 0.78	0.82 0.83
8	0.46 0.49	0.60 0.61	0.70 0.71	0.76 0.78	- -
9	0.44 0.47	0.58 0.60	0.69 0.70	0.76 0.77	- -
10	0.43 0.46	0.57 0.59	0.68 0.69	- -	- -
11	0.42 0.45	0.56 0.57	0.67 0.69	- -	- -
12	0.40 0.43	0.55 0.56	0.67 0.68	- -	- -

SINGLE CORE: A. Group Rating factors for Circuil of three Single core cables in Trefoils lard direct in Ground in Horizontal formation

MULTI CORE: B. Group Rating factors For cables laid in Horizontal formation

GROUP RATING FACTORS FOR SINGLE MULTICORE CABLES

"No. at racks/trays in tiers	No. of trefoils in horizontal formation									
	1		2		3		6		9	
	Single	Multi	Single	Multi	Single	Multi	Single	Multi	Single	Multi
1	0.95	0.95	0.90	0.90	0.88	0.88		0.85		0.84
	1.00	1.00	0.98	0.98	0.96	0.96		0.93		0.92
	0.86	1.00	0.81	0.84	0.79	0.80		0.75		0.73
2	0.90	0.90	0.85	0.85	0.83	0.83		0.81		0.80
	1.00	1.00	0.95	0.95	0.93	0.93		0.90		0.89
	0.73	1.00	0.78	0.80	0.76	0.76		0.71		0.69
3	0.88	0.88	0.83	0.83	0.81	0.81		0.79		0.78
	1.00	1.00	0.94	0.94	0.92	0.92		0.89		0.88
	0.79	1.00	0.75	0.78	0.73	0.74		0.70		0.68
6	0.86	0.89	0.81	0.81	0.79	0.79		0.77		0.76
	1.00	1.00	0.93	0.93	0.90	0.90		0.87		0.86
	0.77	1.00	0.73	0.76	0.71	0.72		0.68		0.66

Ground | Air | RCC.

SINGLE CORE:

A. Ground

Cables laid on racks/trays in covered trench with removable covers where air circulation is restricted, trefoils are separated by 2 cable diameter honzontally and the trays are in tier with 30 rnm gap between them.

B. Air

Cables laid as in "A' but in Air

C. RCC

Single Core Cables laid in trefoil formation on racks/trays in Sand Filled RCC cable trenches when trefoils are separated by 2 cable dia. horizontally.

MULTI CORE:

A. Ground

Cables laid inside trench with removable covers, on trays where Air circulation is restricted. The cable spaced by one cable - diameter and trays in tiers by 300 mm. The clearance of the Cable tram the wee is 25 mm.

B. Air

Cables laid on cable trays exposed to air, the cables spaced by one cable diameter and trays in tiers by 300 mm. The clearance between watt and the cable is 25 mm.

C. RCC

Cables laid on cable trays exposed to air, the cables touching and trays in tiers by 300 mm. The clearance between the wall and cable is 25 mm.

GENERAL PROPERTIES OF XLPE INSULATED CABLES

Specific Gravity	0.93
Dielectric loss factor (tan §) at 20°C	0
Volume resistivity at 20°C ohm-cm	10^17
Max. permissible operating conductor Temp °C	90
Max. permissible short circuit Temp °C	250
Short time overload Temp °C	130
Dielectric constant at 20°C	2.35
Power factor at max cond. temp.	0.008
Impulse level volts/Mil	2000
Thermal resistivity °/C cm/watt	350
Partial discharge pC	5

RATING FACTORS FOR AMBIENT AIR/GROUND TEMPERATURE VARIATION

Ambient Air/Ground temp. °/C	15	20	25	30	35	40	45	50	55	60
Rating Factor (Air)	-	-	1.14	1.10	1.05	1.00	0.95	0.89	0.84	0.77
Rating Factor (Ground)	1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82	-	-
Rating Factor (Duct)	1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82	-	-

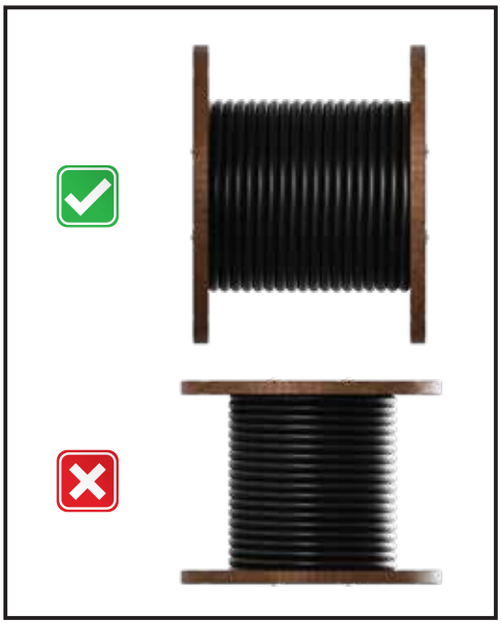
RATING FACTORS FOR DEPTH OF LAYING FOR DIRECT BURIED CABLES

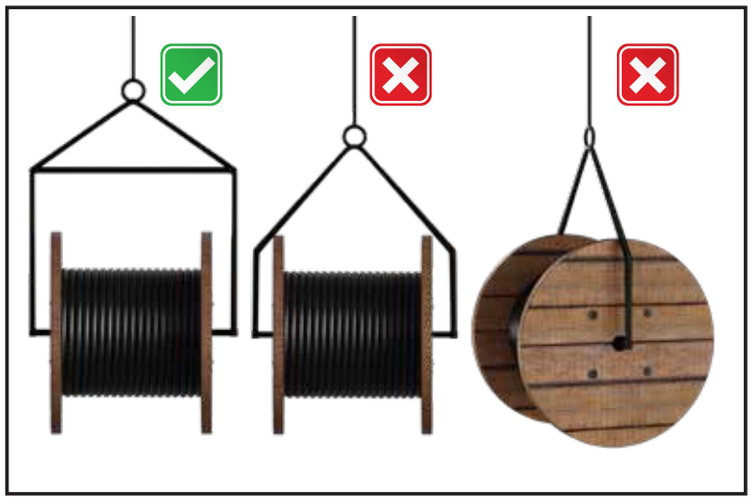
Sl No.	Depth of laying mm	3.3 kV, 6.6 kV and 11 kV Cables			22 kV and 33 kV Cables		
		Single-Core Nominal Conductor Size, mm^2		Three Core	Single-Core Nominal Conductor Size, mm^2		Three Core
		< 185	> 185		< 185	> 185	
(1)	(2)	(4)	(5)	(6)	(7)	(8)	(8)
i)	900	1.00	1.00	1.00	-	-	-
ii)	1050	0.99	0.98	0.98	1.00	1.00	1.00
iii)	1200	0.97	0.96	0.97	0.99	0.98	0.99
iv)	1500	0.95	0.94	0.95	0.97	0.96	0.97
v)	1800	0.93	0.92	0.94	0.95	0.94	0.95
vi)	2000	0.92	0.91	0.93	0.94	0.93	0.94
vii)	2500	0.91	0.89	0.91	0.92	0.91	0.92
viii)	3000	0.89	0.87	0.90	0.90	0.89	0.91

RATING FACTORS FOR DEPTH OF LAYING FOR DIRECT BURIED CABLES

Sl No.	Depth of laying mm	3.3 kV, 6.6 kV and 11 kV Cables			22 kV and 33 kV Cables		
		Single-Core Nominal Conductor Size, mm^2		Three Core	Single-Core Nominal Conductor Size, mm^2		Three Core
		≤ 185	> 185		≤ 185	> 185	
(1)	(2)	(4)	(5)	(6)	(7)	(8)	(8)
i)	900	1.00	1.00	1.00	-	-	-
ii)	1050	0.98	0.98	0.99	1.00	1.00	1.00
iii)	1200	0.97	0.97	0.98	0.99	0.98	0.99
iv)	1500	0.95	0.94	0.96	0.96	0.96	0.97
v)	1800	0.93	0.92	0.95	0.95	0.94	0.96
vi)	2000	0.92	0.91	0.94	0.94	0.93	0.95
vii)	2500	0.90	0.89	0.93	0.92	0.90	0.94
viii)	3000	0.89	0.88	0.91	0.91	0.89	0.92

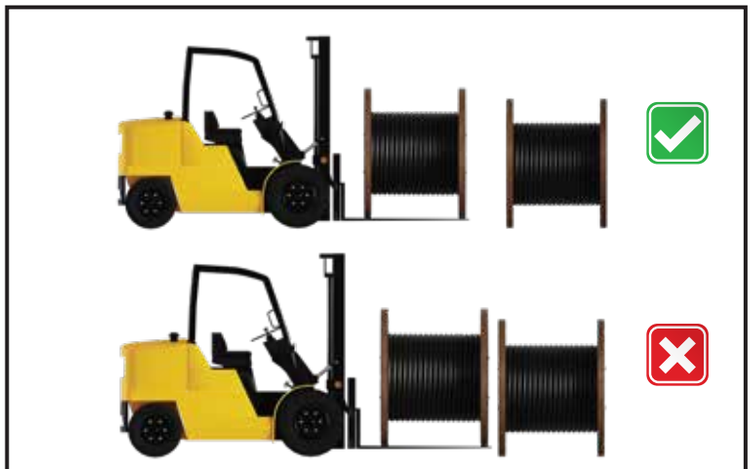
DRUM HANDLING





Cable must to pulled from top
with help of screw jack

This is incorrect way of pulling the cable
& will cause kinks & twist in cable.
Should be avoided.



Do not use the forklift tynes to push cable drums sideways on a truck, tray, or direct on the ground as damage to the flanges can result in the drum being unacceptable to customers.

When storing cable drums for long periods, please take the following guidelines into consideration:

- ✓ The drums must always be stored with their flanges vertical.
- ✓ Leave enough space between stored drums for air circulation.
- ✓ The bolts should be tightened at regular intervals.

PREVENTING ENVIORNMENTAL HAZARDS

Disposal/Salvage Method for Cables and Cable Pieces.

After the installation of cables, any leftover cable or cable pieces must be disposed of in an environmentally proper manner to prevent harm to the environment, human health, and safety. To ensure the proper disposal and salvage of cables and cable pieces, the following procedures may be followed.

METALS (ALUMINIUM, COPPER, STEEL):

1. Segregation: The metal components of the cable or cable piece, such as aluminum, copper, and steel, must be separated from other materials for proper recycling.
2. Categorization: The separated metals should be sorted based on their type to ensure that they can be recycled in the right manner.
3. Using the material for recycling: The separated metals should be handed over to an approved agency involved in the recycling process.

XLPE / PVC MATERIAL:

1. Separation of residual waste is required to avoid environment contamination.
2. Necessary arrangements are required to deliver this material to the appropriate recycling agencies.
3. All regulatory guidelines are to be followed to avoid pollution.

BEST PRACTICES:

1. Periodic inspection of cables is required to identify signs of damage/ deterioration.
2. Define SOP to handle damaged/waste cable.

INDUSTRIES & CUSTOMERS WE CATER TO

GOVERNMENT AND SEMI-GOVERNMENT COMPANIES

PRIVATE SECTOR

BRANCH OFFICES

MUMBAI

TORRENT ELECTRICALS LIMITED
The Ruby , 22nd Floor, Kasarwadi,29,
Senapati Bapad Marg, Dadar (West), Mumbai - 400093.

KOLKATA

TORRENT ELECTRICALS LIMITED
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Kolkata - 700020.

BANGALORE

TORRENT ELECTRICALS LIMITED
No.15 & 16, 5th Floor, Vayudhdoot Chambers,
M. G. Road, Bangalore - 560001.

NEW DELHI

TORRENT ELECTRICALS LIMITED
115/116, World Trade Centre, Babar Road,
Connaught Place, New Delhi - 110001.

CHENNAI

TORRENT ELECTRICALS LIMITED
5E, Century Plaza, 56/562, Anna Salai, Teynampet,
Chennai - 600018.

HYDERABAD

TORRENT ELECTRICALS LIMITED
Unit No.5A, & 5B, 5th Floor, Space & More Business Park,
Plot No. 98 & 99, Lumbini Layout, Sangareddy,
Hyderabad - 500032.

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