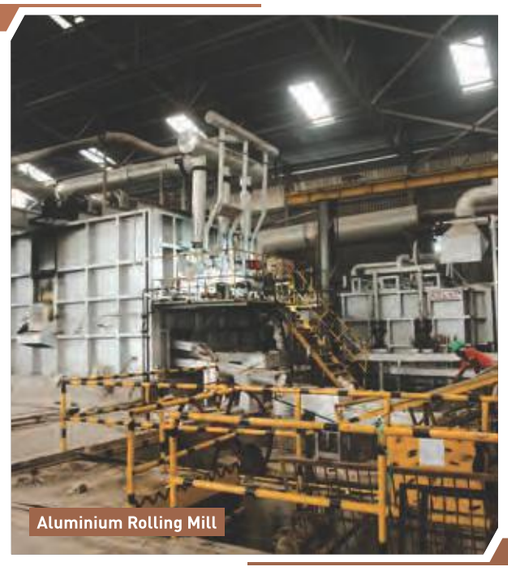
LASER POWER & INFRA

ISO 9001:2015 CERTIFIED COMPANY

COMPANY PROFILE


P.D Lab


Aluminium Rolling Mill

PLC & HMI Controlled

CCV Line


Aluminium Rod

Testing

CONTENTS

ABOUT US

LASER POWER & INFRA PVT LTD. (LPIPL) is the largest Cable and Conductor Manufacturer & Exporter in Eastern India while boasting of a strong foothold in EPC projects pan-India.

A pioneer in world-class Power Transmission & Distribution products for more than 30 years with proven expertise in large-scale Electrification Projects across the country, **LASER POWER & INFRA PVT LTD.** manufactures and markets a wide range of Wires, Cables & Conductors with key products being HT / LT Cables, Aerial Bunched Cables, Power Cables, Control Cables, Instrumental Cables, Solar Cables, Flexible Cables, Flexible / Single / Multi-core Cables, Concentric Cables, Communication Cables and others, including Submersible Flat and Round Cables, Overhead/Covered Conductors, Railway Signaling and Power Cable.

From a one-man show in 1988, **LPIPL** today employs a workforce exceeding 4000, on direct and indirect payrolls. We are not merely a commercial house; rather we are a proud family where every member plays a pivotal role in India's development by providing infrastructural support to industries and generating employment opportunities, which is imperative in the present socio-economic scenario.

With great emphasis on manufacturing excellence, technological advancement and customer satisfaction, our in-house process control and quality assurance experts ensure that every customer receives high quality products. Equipped with state-of-the-art machinery, hardware, software and infrastructure, we are a leading name with a dominant position in the industry. **LPIPL** currently has 3 manufacturing facilities covering almost 700,000 sq.ft. area in the state of West Bengal.

We are committed towards continuous growth of the organization and our country's power infrastructure, empowering a better, more connected future!

LASER POWER stands by every stakeholder with heartfelt gratitude for being part of this success story.

History :

A Legacy That Dreams Power Infrastructure

Our journey had humble beginnings, manufacturing reliable and cost-effective LT Power Cables and Conductors out of a small unit, which, our most respected visionary Chairman and Founder, Mr. P. D. Goel, built from scratch having gauged the need and potential of the power sector in the country in the early 80's.

His Son and present Managing Director, Mr. Deepak Goel with his unparalleled vision and unputdownable zeal, the setup witnessed exponential growth and ultimately LASER CABLES PVT. LTD. came into being in the year 1988.

The first year's turnover was around Rs.10 lacs. Hard work and dedication helped Mr. Goel climb the ladder of success quickly. In the year 2000, he shifted his unit to Jungalpur, covering an area of around 1,00,000 sq.ft.

In the 13th year since inception, annual turnover clocked Rs. 10 Crores. With the rapid demand for economic growth, he multiplied his manufacturing capacity and made a strategic move to

ABOUT US

Poly Park, with an area of almost 2,00,000 sq.ft. in the year 2015.

That year, the company's turnover was around Rs.150 Crores, which was almost 15 times over a period of 15 years!

Today, under his supervision, the company has achieved a turnover of Rs.1500 Crores!

In 2015, his two sons, Mr. Devesh Goel and Mr. Akshat Goel, joined the company and in a short span of time, have become an integral part of our success story. Their new zeal, innovative approach and technology-driven insights prepared us for the challenges of tomorrow.

Under the young and dynamic, next-gen leadership, **LPIPL** diversified its business, foraying into engineering, procurement, and construction or "EPC", which includes design, engineering, supply, erection and commissioning of power distribution and rural electrification projects. **LPIPL** is also engaged in solar projects under turnkey contract basis.

We also added 'Infrastructure' to our portfolio in February 2016 and finally became: **LASER POWER & INFRA PVT LTD.**

Boasting a covered manufacturing area of 4.55 lac sq.ft. and uncovered area of 2 lac sq.ft., the large scale growth is a direct outcome of diversification under the ambit of our dynamic Managing Director, Mr. Deepak Goel, who initiated addition of various cable and conductor verticals and expanded operations in multiple channels, including EPC contracts. Mr. Devesh Goel and Mr. Akshat Goel play vital roles with their expertise in production and marketing.

Since inception, we have played a key role in nation-building, designing, testing and developing products to meet the growing domestic demand of Cables, Conductors and Aerial Bunched Cables and scaling up over the years to cater to market globally.

After setting up the Integrated, State-of-the-Art Manufacturing Plant at Dhulagarh in 2000, we were awarded ISO 9001:2000 Certification in 2003. In 2007, we added high-performance and durable 11 kV XLPE Cable to our product range.

Riding on sound financial capability, dynamism of our Management percolating throughout the organization, planned vision and invaluable support from our customers, **LASER POWER INFRA PVT LTD.** has catapulted itself to a leading position in the industry from scratch within an unbelievable time span.

ABOUT US

Business :

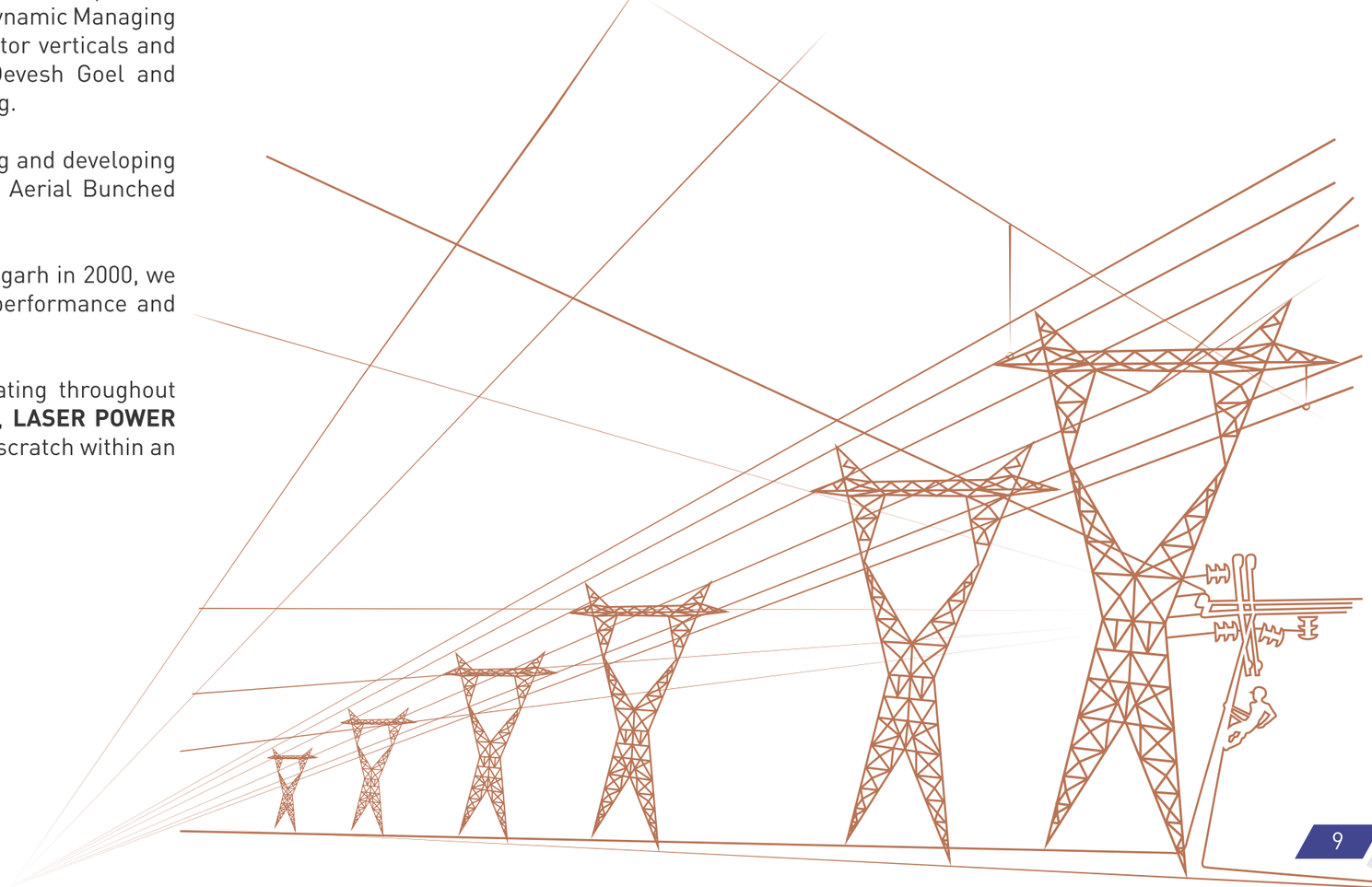
Core Competency to Excel

Excelling is in our DNA. Under a dynamic management with clear vision, we have attained a leadership position by virtue of our cost-effectiveness, reliability and quality.

In addition to manufacturing and marketing LT/Power/Control, Aerial Bunched & HT Cables up to 66 kV, we also specialise in ACSR/AAAC/AAC Conductors featuring higher strength-to-weight ratio and improved corrosion-resistance for all Industry Verticals.

With concentrated investment in R & D and Infrastructure over the years, we ensure Technical superiority and not just compliance while meeting evolved customer requirements and exceeding expectations.

Our own PROPERZI Aluminium Rod Rolling Mill in Dhulagrh facility manufactures Aluminium Rods from Ingots ensuring stringent Quality Control and Cost Competitiveness.
The core team comprising Industry veterans has decades of experience, hailing from domestic and international Cable Companies, EPCs and allied industries.



About Our MANAGING DIRECTOR - FOUNDER

MR. DEEPAK GOEL

Mr. Deepak Goel is a first-generation Entrepreneur, embarking on his empowering journey at the tender age of 18 with a small shop on Ezra Street, Kolkata's famous electrical market. His long-term vision and in-depth knowledge of Electrical Goods inspired him to start large-scale manufacturing of Cables and Conductors.

In 1988, he formed Laser Cable Pvt. Ltd. and commenced operations with a manpower of just 10 in Patipukur area of Dum Dum, Kolkata. His dedication and hard work transformed the promising company into a reputed player in the Cable Industry.

Mr. Goel then shifted his manufacturing unit to Jangalpur Industrial Area, Howrah, in the year 2000, upgrading from a modest 10,000 sq.ft. to an incredible 185,000 sq.ft. After tasting success in his field of expertise involving cables and conductors, Mr. Goel moved ahead and undertook more challenging turnkey projects in Rural Electrification.

He successfully executed projects under Government schemes worth ₹ 2,000 Crores approximately. In the year 2016, it became imperative to shift the manufacturing facility to Dhulagarh, with operations spread across 700,000 sq.ft. It was the same year when Mr. Goel also changed his company's name to what it is now - Laser Power & Infra Pvt Ltd. **(LPIPL)**

Today, **LPIPL** generates a revenue of ₹1500 Crores annually, employing 1800 personnel throughout India. It is a front runner in the manufacture of a wide range of Cables and Conductors in India while exporting to several countries across the globe.

Under the able leadership of Mr. Goel, **LPIPL** has become a name synonymous with turnkey rural electrification projects over the last three decades, with several state DISCOMS in its clientele.

He is not only responsible for **LPIPL**'s success story, establishing it as the market leader, but is also the reason behind the development of the Electrical Cable Industry in Eastern India.

As the guiding light for all of us at **LPIPL**, he continues to be a pillar of strength and inspire us with his indomitable will to succeed, the perseverance to weather all adversities and champion the cause of sustainability enroute to empowering India and striving for energy efficiency in the years to come.

TEAM

Manpower Matters Most

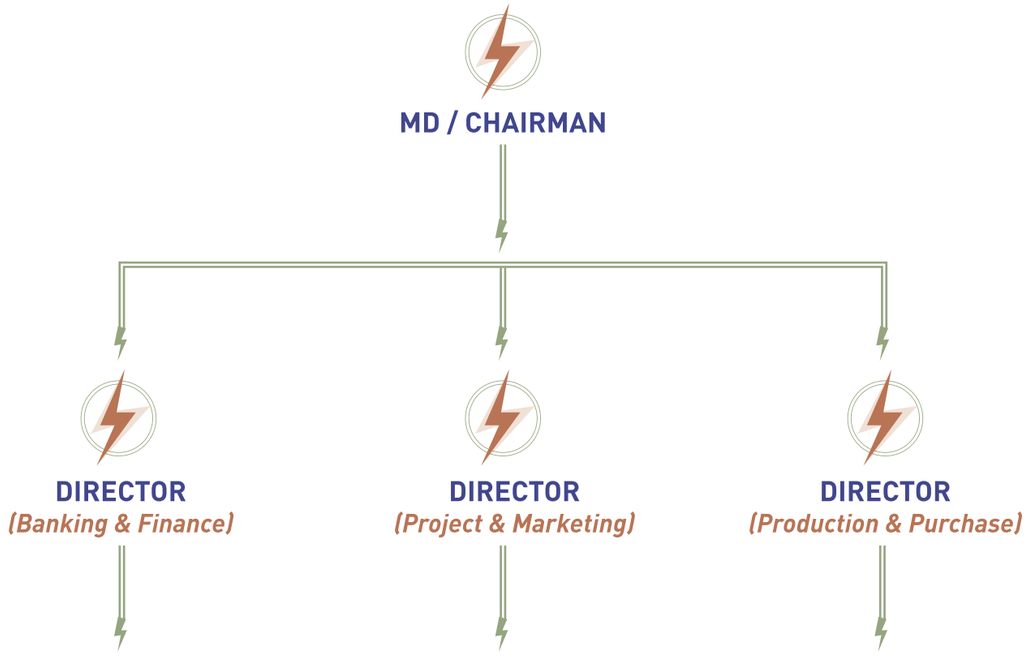
LASER POWER has been built from the ground up by people – they are at the core of everything we do and stand for today – whom we nurture and shape into tomorrow's achievers.

We invest heavily on Manpower recruitment & development, ensuring we equip them with the resources they need to perform optimally. Experienced, skilled and technically competent personnel find themselves deployed at all levels and across departments such as Design, R&D, Projects, Manufacturing, Testing, Quality Control and Marketing.

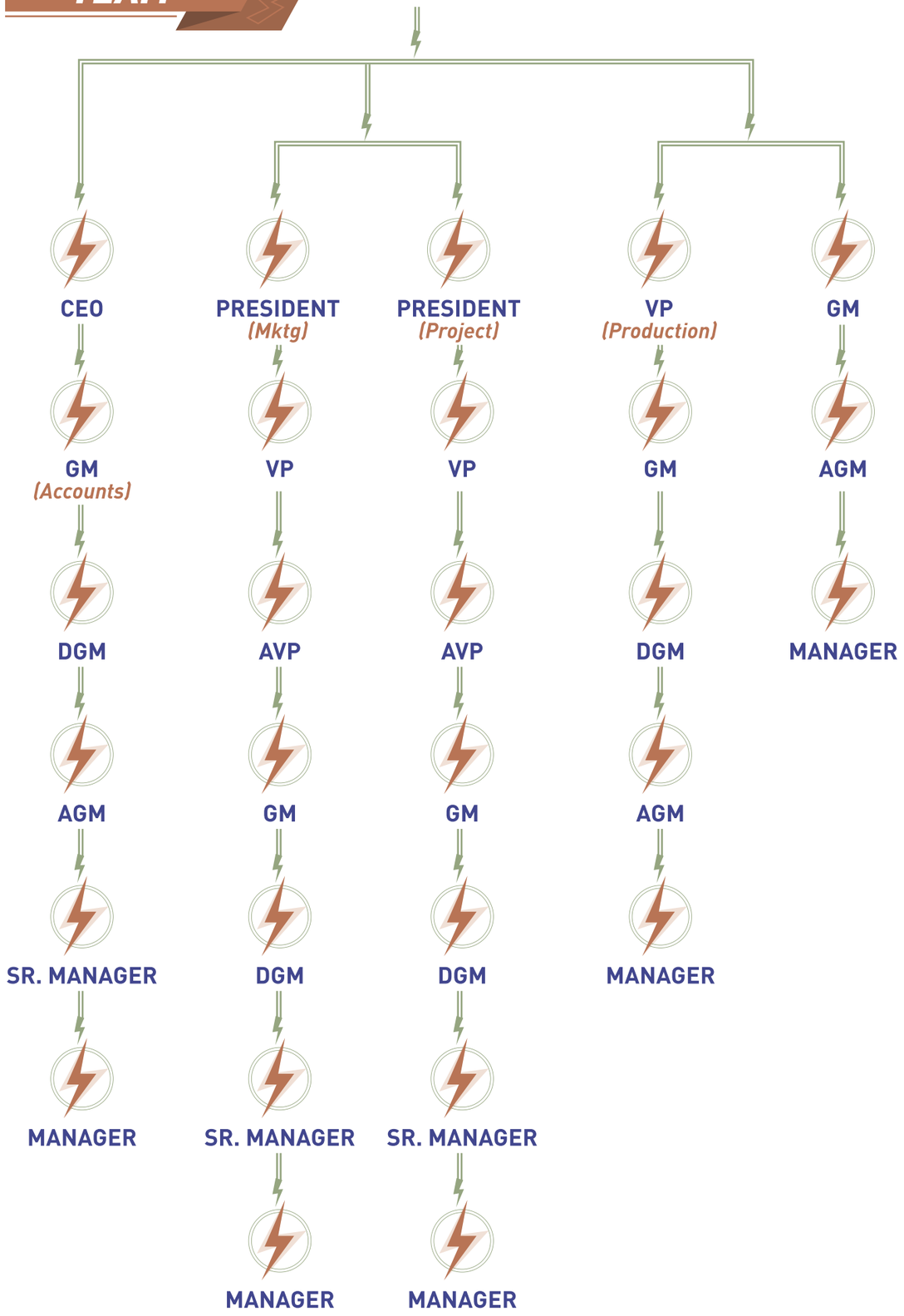
We have adopted an ERP based business model for ease of Control, Monitoring and Maintaining a system throughout all levels and departments within the organization. It acts as a versatile tool, keeping tab of the FG Stock, RM Stock, Production Level and the HR system to name a few. **LPIPL** believes in **SAFETY FIRST SAFETY ALWAYS** and ensures it is adhered to at every stage with frequent training organised across all employee-levels.

An experienced Marketing Team looks after Product Promotion and caters to the requirements of our honourable customers. As a coordinating agency between the customer and production, they work in synergy with the Design team to get the right product delivered. Our marketing network is spread across all the metros and non-metros as well as other major cities with a dedicated Export Team.

The highly experienced and dynamic Engineers of our EPC division are undertaking planning, engineering, drawing & designing, procurement, execution and commissioning of thousands of kilometres of Power Lines.



TEAM



MISSION & VISION

As an agile and growth-centric organisation, **LPIPL** is committed to maintaining an ideal balance between scaling new heights and exploring uncharted avenues with social responsibility and inclusiveness that propel us towards our business objectives while ensuring we continue to care for issues that matter to us, both in the short and long term.

Mission

- To make India power-dependent in the next 5 years

- To lead sustainability and conservation of resources with emphasis on Wind, Solar & Renewable Energy

- To increase investment both in terms of manpower and equipment so as to be ready for the challenges and opportunities of the next decade starting 2021

- To diversify into new verticals and categories to align LPIPL with growth projections

- To consistently allocate financial resources and time towards CSR, making social responsibility more personal and not merely a corporate mandate

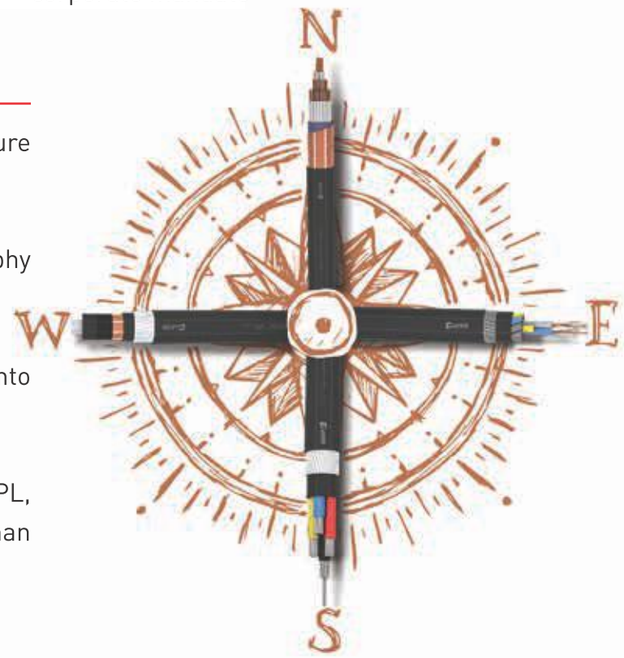
Vision

- To be the leading Power Infrastructure Company in the world

- To champion the Make in India philosophy and cater to global demand

- To expand our Geography and foray into new markets

- To make Technology a way of life at LPIPL, aiming at 100% automation under Human supervision



PRODUCTION FACILITIES

Sl. No.	List of Equipment	No.
01.	ANNEALER	4
02.	ARMOURING	2
03.	BELLING	2
04.	BOILER	2
05.	BUNCHER	5
06.	CCV LINE	1
07.	AUTO COILING	2
08.	DRUM TWISTER	9
09.	DST	4
10.	EXTRUDER	49
11.	FINE WIRE DRAWING	8
12.	GI REWINDING	10
13.	MULTI STRAND	9
14.	PULVERIZER	1
15.	PVC COMPOUNDING	1
16.	QUADDING MACHINE	1

Sl. No.	List of Equipment	No.
17.	REWINDING	18
18.	ALUMINIUM ROLLING MILL	1
19.	SKIP MACHINE	11
20.	TABULAR	2
21.	TAPING MACHINE	8
22.	TESTING LAB	7
23.	WIRE DRAWING	13
24.	AIR COOLED CHILLER	3
25.	COMPRESSOR	16
26.	COOLING TOWER	17
27.	DG SET GENERATOR	10
28.	WATER COOLED CHILLER	2
29.	CRANE	18
30.	FORKLIFT	17
31	HYDRA	2
32.	LIFT	8

Production Capacity

Plant Area

Covered- **4.55 Lac sq.ft.**

Uncovered- **2 Lac sq.ft.**

Annual Production Capacity

LT XLPE Cables: **15,000 Kms.**

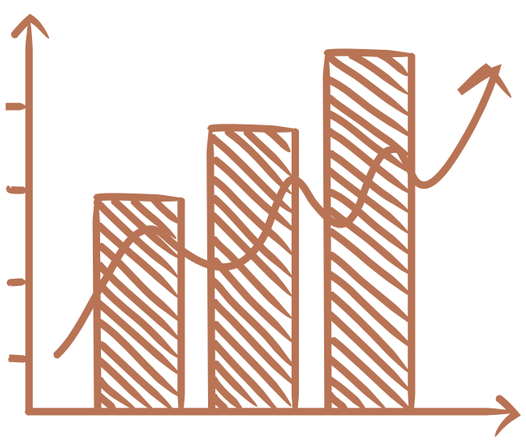
PVC Cables: **60,000 Kms.**

LT Aerial Bunched Cables: **50,000 Kms.**

AAC, AAAC, ACSR Conductors: **1,00,000 Kms.**

HT Power & Aerial Bunched Cables: **2000 Kms.**

Quad Cables: **3000 Kms.**



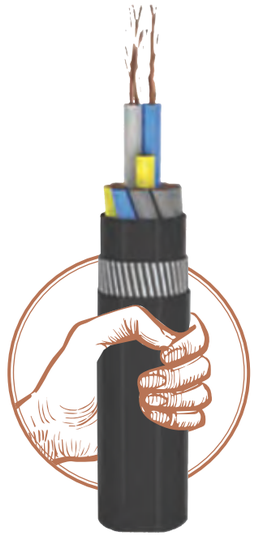
PRODUCT RANGE

LT Power Cables: Standards IS – 7098 (Part-1)

LT Power Cable consists of four major components: conductors, insulation, metal armour and protective jacket. The makeup of individual cables varies depending upon the application.

LASER LT Power Cables with PVC or XLPE insulation voltage conform to various Indian and International Standards. XLPE insulated cables are cross linked, mechanically strong and offer better resistance against stress cracking and ageing caused by hot air.

LASER FR-LSH cables are manufactured using special compounds for sheathing and are resistant to fire.



Control Cables: Standards IS – 1554 (Part-I), IS – 7098 (Part I)

Control Cable is an amalgamation of conductors, insulation, metal armour and protective jacket. LASER Control Cables are multi-conductor cables used in automation and instrumentation. These cables are typically shielded with a foil shield, braid shield or combination of the two. LASER takes complete care of the flexibility of the conductor while manufacturing it.

HT Power Cables: Standards IS – 7098 (Part-II), IEC – 60502, BS – 6622.

XLPE Insulated HT Power Cables up to 66 kV are designed to comply with a standard set of Indian and International specifications. XLPE insulated cross-linked poly-ethylene insulated cables offer extraordinary strength to withstand high voltages and are used as HT (High Tension) Cables for underground voltage transmission systems. Salient features of these cables include better electrical, mechanical and thermal properties along with the merit of being lightweight.

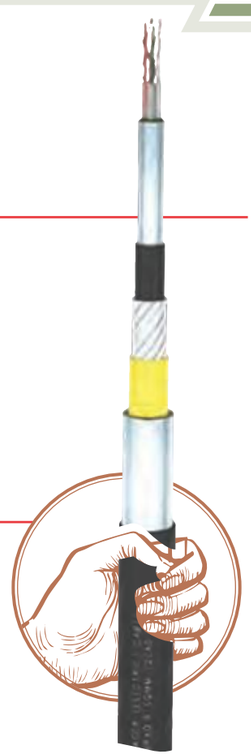
FR-LSH outer sheath is available on request.

PRODUCT RANGE

Railway Signaling Cable: Standard as per RDSO

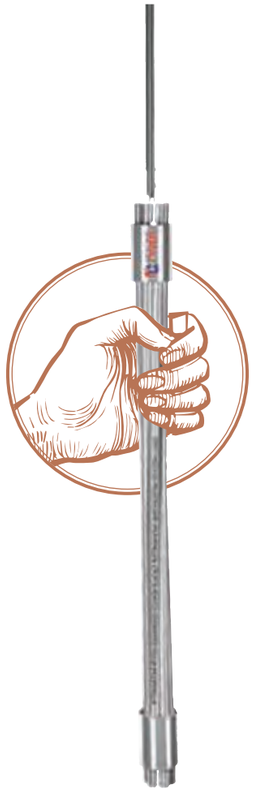
Being one of the largest Signaling Cable suppliers to the Indian Railways, our cables contribute significantly to the safety of passengers and cargo.

LASER Railway Signaling Cables manufactured with stringent RDSO specifications play an essential role in smooth running and connectivity of the railway network, ensuring transmission of signals and continuous power supply to the railway signaling systems.



QUAD Cables: Standard as per RDSO

LASER QUAD Cables are manufactured aligned with RDSO specifications. Polythene Sheathed Jelly-filled Cable with Ploy-Al moisture barrier is used in providing telephone connections. Jelly-filled quad cables are used for special purposes like control circuits, axle counters etc. in RE and Non-RE areas.



Conductor: Standards IS: 398-1, 2, 4 & 5

Being the largest conductor manufacturer in Eastern India, we are a leading name in all types of Aluminium conductors, which include All-Aluminium Conductor, Aluminium Conductor Steel Reinforced and Aluminium Alloy Conductor of National & International Standards, for overhead power transmission lines.

Our conductors are widely known for high tensile strength, corrosion resistance and cost effectiveness. These conductors are manufactured using electrolytically refined aluminium, which has a minimum purity of 99.7% and is used in transmission lines in rural and grid power distribution.

LASER ACSR (Aluminium Conductor Steel Reinforced) is manufactured using high quality steel core wire surrounded by aluminium wire of Indian and international standard. Imparted with properties like durability, high conductivity and low weight, these conductors are widely used in overhead transmission and distribution systems (up to 700 kV Line).

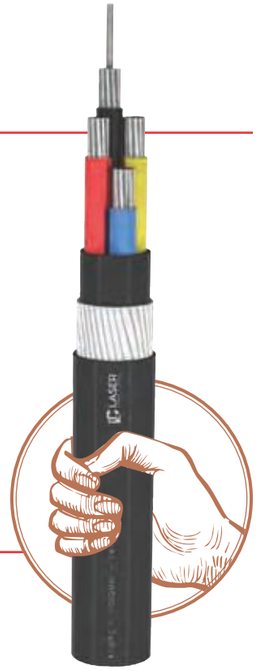
LASER AAC (Aluminium Alloy Conductor) Conductor is designed and developed using aluminium, magnesium and silicon. These Alloys have high electrical conductivity and add to its improved mechanical properties and sag & tension.

PRODUCT RANGE

PVC Insulated Copper Cable: ZHFR, HRFR, FR-LSH: Standard IS 694

LASER PVC-insulated Single and Multi-core Copper Flexible Cables are designed and manufactured for low-voltage applications. This cable finds usage in Panel Control Wiring, Industrial and Commercial Building Wiring, Home Appliance Cords, Battery Cable and 3-Core Flat Cable for submersible pumps.

Mankind and environmental safety being our utmost concern, all flexible cables are heat-resistant, fire-retardant and emit considerable low smoke.



Aluminium Wire Rod and Aluminium-Alloy Wire Rods

LASER Al Rod is manufactured in-house with a production capacity of 100 tons per day. Chemical compositions are checked using a Spectral machine so as to achieve the desired specifications of Al & Alloy Rods.

Aluminium Wire Rods of 9.5 mm in EC and Alloy Grade, Aluminium Alloy Wire Rods (6201 Alloy Rod in T-4 & M temper- online solutionized) and Aluminium Alloy 6061.

LT & HT Aerial Bunched Cable: Standard IS-14255, 7098 - Part II

LASER Aerial Bunched Cable is the safest cable for inhabited areas, minimising the risk of electrical shocks. Salient features include high insulation resistance to earth throughout the year, negligible leakage currents, low losses and anti-theft properties.

It is dubbed as a great product for Overhead Power Distribution, which provides higher safety and reliability in comparison to bare conductor overhead distribution systems.

Covered Conductor: Standard EN 50297- Part I

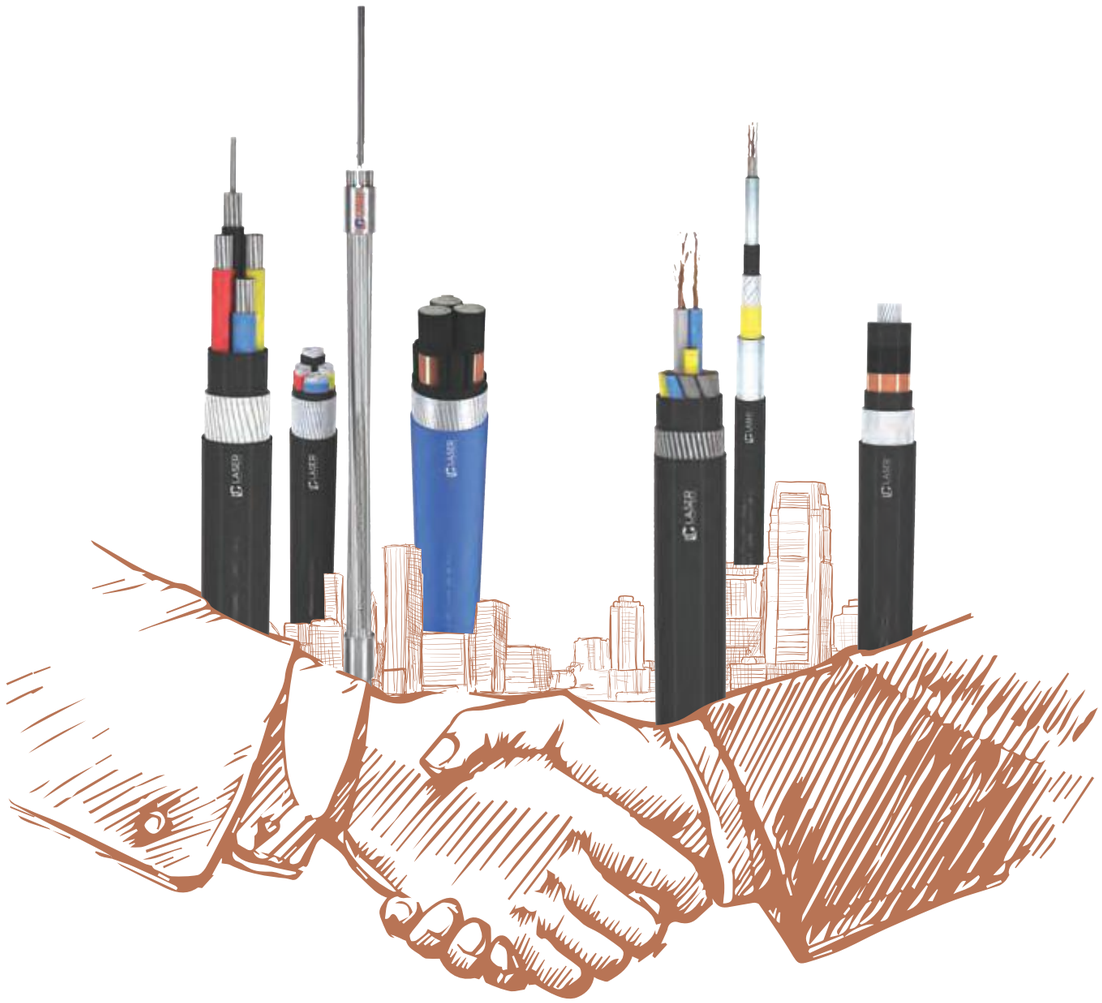
LASER Medium Voltage Covered Conductor is a safe and economical choice for HT overhead conductor. Covered conductor has a casing of insulated material(s) that acts as a protection against other covered conductors it might accidentally come in contact with and grounded parts such as tree branches, etc. In comparison to insulated conductors, this covering is known for its reduced thickness but is sufficient to withstand the phase-to-earth voltage temporarily.

PRODUCT RANGE

Conductor: Longitudinally water-tight stranded All-Aluminium Alloy (AAAC) or Aluminium Conductor Steel Reinforced (ACSR).

Conductor Screen: Water swellable semi-conducting tape (if required) and extruded semi-conducting compound; Inner Insulation: XLPE

Outer insulation: UV protected and anti-tracking black coloured XLPE or HDPE



APPROVALS

ETHIOPIAN ELECTRIC UTILITY

ETHIOPIAN ELECTRIC UTILITY

Inter Office Notification Memo

Issued No.

Page 1 of 1

December 17 /2019

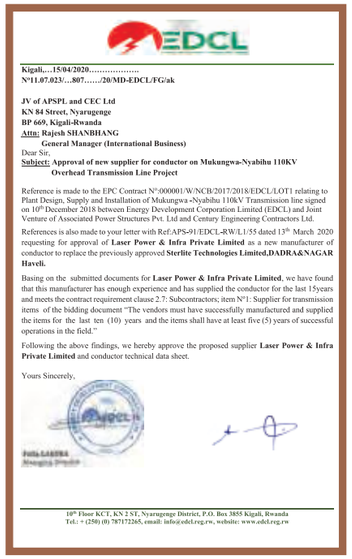
Procurement, logistics, property and Facility

Engineering and Quality Directorate

Subject: Approval of MQP, drawing of drums, various cross sectional areas of LV conductor & ABC cables

- Quality Assurance, Control & PQA
- Metrovil Engineering

ENERGY DEVELOPMENT CORPORATION LTD.



EDCL

Kigali,...15/04/2020.....
N°11.07.023/...807...../20/MD-EDCL/FG/ak

JV of APSPL and CEC Ltd
KN 84 Street, Nyarugenge
BP 669, Kigali-Rwanda
Attn: Rajesh SHANBHANG
General Manager (International Business)

Dear Sir,

Subject: Approval of new supplier for conductor on Mukungwa-Nyabihu 110KV Overhead Transmission Line Project

Reference is made to the EPC Contract N°000001/W/NCB/2017/2018/EDCL/LOT1 relating to Plant Design, Supply and Installation of Mukungwa-Nyabihu 110KV Transmission line signed on 10th December 2018 between Energy Development Corporation Limited (EDCL) and Joint Venture of Associated Power Structures Pvt. Ltd and Century Engineering Contractors Ltd.

References is also made to your letter with Ref:APS-91/EDCL-RW/L1/55 dated 13th March 2020 requesting for approval of **Laser Power & Infra Private Limited** as a new manufacturer of conductor to replace the previously approved **Sterlite Technologies Limited.DADRA&NAGAR Haveli.**

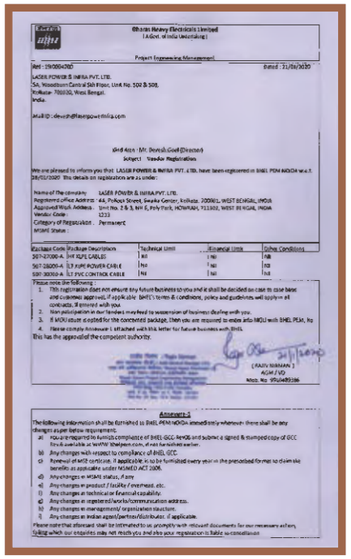
Basing on the submitted documents for **Laser Power & Infra Private Limited**, we have found that this manufacturer has enough experience and has supplied the conductor for the last 15years and meets the contract requirement clause 2.7: Subcontractors; item N°1: Supplier for transmission items of the bidding document "The vendors must have successfully manufactured and supplied the items for the last ten (10) years and the items shall have at least five (5) years of successful operations in the field."

Following the above findings, we hereby approve the proposed supplier **Laser Power & Infra Private Limited** and conductor technical data sheet.

Yours Sincerely,

10th Floor KCT, KN 2 ST, Nyarugenge District, P.O. Box 3855 Kigali, Rwanda
Tel.: + (250) (0) 787172265, email: info@edcl.reg.rw, website: www.edcl.reg.rw

BHARAT HEAVY ELECTRICALS LTD.



Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)

Project Engineering Management

Ref : 19/0804/007 Dated : 31/03/2020

LASER POWER & INFRA PVT. LTD.
5A, Vasudhara Centre at 5th Floor, Unit No. 502 & 503,
Pratikshan 700030, West Bengal,
India.

Email ID : dinesh@laserpowerindia.com

Kind Attn : Mr. Dinesh Goel (Director)
Subject : Vendor Registration

We are pleased to inform you that LASER POWER & INFRA PVT. LTD. have been registered in BHEL PSW MSDH w.e.f. 28/03/2020. The details on registration are as under:

Name of the company : LASER POWER & INFRA PVT. LTD.
Registered Office Address : 4A, Pollock Street, Swaika Center, Kolkata- 700001, WEST BENGAL, INDIA
Approved Work Address : Unit No. 2 & 3, NH 6, Poly Park, HOWRAH, 711302, WEST BENGAL, INDIA
Vendor Code : 1213
Category of Registration : Permanent
MSME Status :

Purchase Code	Package Descriptions	Technical Limit	Financial Limit	Some Conditions
267-27200-A	3.5 KV XLPE CABLES	Nil	Nil	NB
367-28200-A	3.3 KV PVC POWER CABLE	Nil	Nil	NB
597-30050-A	0.1 KV PVC CONTROL CABLE	Nil	Nil	Nil

Please note the following :

1. This registration does not ensure any future business to you and it shall be decided on case to case basis and subsequent approval, if applicable. BHEL's terms & conditions, policy and guidelines will apply in all contracts, if entered with you.
2. Non-participation in our tenders may lead to suspension of business dealing with you.
3. If MOU stands applied for the concerned package, then you are required to enter into MOU with BHEL PSW, by
4. Please comply Annexure-1 attached with this letter for future business with BHEL.

This has the approval of the competent authority.

[RAJIV MANAN]
AGM / PD
Mem. No. 95048206

Annexure-1

The following information shall be furnished to BHEL PSW/MSDH immediately whenever there shall be any changes as per below requirement.

a) You are requested to furnish compliance of BHEL-QCC, ReHQS and submit a signed & stamped copy of QCC Struck available at WWW.bhelpsw.com, if not furnished earlier.
b) Any changes with respect to compliance of BHEL QCC.
c) Renewal of MSE certificate, if applicable (It is to be furnished every year on the prescribed format to claim the benefits as applicable under NSIMED ACT 2006.
d) Any changes in MSME status, if any
e) Any changes in product / facility / overhead, etc.
f) Any changes in technical or financial capability.
g) Any changes in registered/works/communication address.
h) Any changes in management/ organization structure.
i) Any changes in Indian agent/partner/distributor, if applicable.

Please note that aforesaid shall be intimated to us promptly with relevant documents for our necessary action, failing which our enquiries may not match you and also your registration is liable to cancellation.

WATER AND POWER CONSULTANCY SERVICES LTD.

वाप्कोस लिमिटेड
WAPCOS LIMITED
(भारत सरकार का उपक्रम)
जल संसाधन मंत्रालय
(A Government of India Undertaking)
Ministry of Jal Shakti

ISO 9001: 2015

WAPCOS/DRC/KAKROLA/2018/117 Date: 05.03.2020

To,
Fulgence Mutombo-A-Mulonda,
Project Coordinator,
GIZ, MOKWA,
Kinshasa, D.R.Congo.

SUBJECT: Development of Power Distribution Project in Bandundu (Inanga) Province, D.R. Congo – "Submission of Credentials of M/s Laser Power & Infra Private Limited for Supply of Wolf Conductor -Lot 1" – reg.

Ref: Contract Agreement No. 613/WAS-KKR/CONSWP/DCK/AOR/MT/2018 dated 11.02.2018.

Dear Sir,

This is with reference to M/s letter no. APSPL-72/HO/DRC&GIZ-/111 dated 02.03.2020 regarding "Submission of Credentials of M/s Laser Power & Infra Private Limited for Supply of Wolf Conductor -Lot 1".

The same has been reviewed & found generally in order. The credentials of M/s Laser Power & Infra Private Limited for supply of Conductor is hereby concurred for GCK's approval

Sl. No.	Description	M/s AV submitted vide letter no.	Approval Type
1	Submission of Credentials of M/s Laser Power & Infra Private Limited for Supply of Wolf Conductor -Lot 1.	APSPL-72/HO/DRC/LOT-I/111 dtd:02.03.2020	Concurred

This Concurrence, however, does not absolve M/s AV of its contractual obligations and responsibilities.

The stamped copy of the approved MQP & QTP for Conductor is also enclosed hereby.

With regards,

Yours faithfully,

(Dr. Manoj Kumar)
Addl. Chief Engineer (Power)
Email:

2nd Floor, Plot No. 57, SKV House, Sector - 18, Gurugram - 122 015. (Haryana) INDIA
Tel. : +91-124-2347425-2348425 (3 Lines)
E-mail : electrical@wapcos.co.in • website : http://www.wapcos.co.in
CIN : U74899DL1969GOI005070

BHARAT STATE POWER TRANSMISSION COMPANY LTD., PATNA

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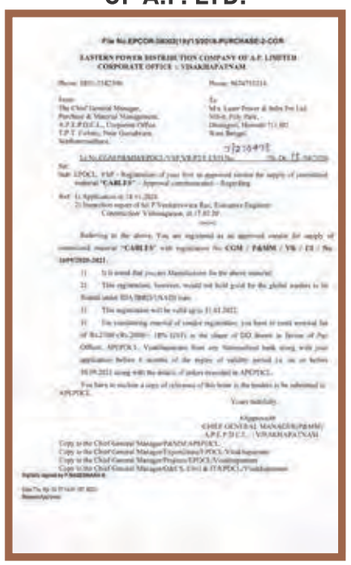
EASTERN POWER DISTRIBUTION COMPANY OF A.P. LTD.



File No.EPCOR/38002/187/2018/PURCHASE-2-COR

EASTERN POWER DISTRIBUTION COMPANY OF A.P. LIMITED
CORPORATE OFFICE : VISAKHAPATNAM

From
The Chief General Manager,
Purchase & Material Management,
E.P.D.C.P.D.C.L., Corporate Office,
P.B.T. Colony, Near Gurudwara,
Vanthavanthidem.

To
M/s Laser Power & Infra Pvt Ltd
502-B, Poly Park,
Dhulagarh, Howrah-711 302
West Bengal

Lr.No.CGM/PM/MM/DGM(C)/SM/WE/F1 dt:29.06.2020

Sub: EPDCL, VSP - Registration of your firm as approved vendor for supply of commissioned material "CABLES" – Approval communicated – Regarding

Ref: 1) Application dt.18.01.2020
2) Inspection report of Sri P.Venkateswara Rao, Executive Engineer/ Construction/ Vizianagaram, dt.17.02.20

Reference to the above, You are registered as an approved vendor for supply of commissioned material "CABLES" with registration No. CGM / P&MM / VS / CI / No. 169/2020-2021.

1) It is noted that you are Manufacturer for the above material.
2) This registration, however, would not hold good for the global tenders to be floated under EOI/IB(E)/15/A25 basis.
3) This registration will be valid up to 31.01.2022.
4) For considering renewal of vendor registration, you have to remit renewal fee of Rs.2,500/-(Rs. 2000/- + 18% GST) in the shape of DD drawn in favour of Pay Officer, APEPDCL, Visakhapatnam from any Nationalised bank along with your application before 4 months of the expiry of validity period i.e. on or before 30.09.2021 along with the details of orders executed in APEPDCL.

You have to enclose a copy of reference of this letter in the tenders to be submitted to APEPDCL.

Yours faithfully,

(Vijaya Kumar)
Chief Engineer (P&S)

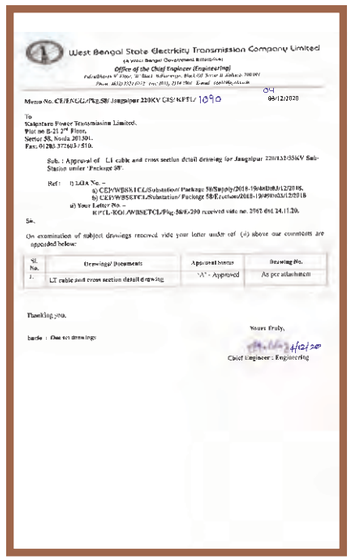
(Vijaya Kumar)
Chief Engineer (P&S)

Approved
CHIEF GENERAL MANAGER/P&MM/
A.P.E.P.D.C.L., VISAKHAPATNAM

Copy to the Chief General Manager/P&MM/APEPDCL.
Copy to the Chief General Manager/Operations/VSP/CL/Vizianagaram
Copy to the Chief General Manager/Projects/EPDCL/Vizianagaram
Copy to the Chief General Manager/O&CS, Civil & IT/APEPDCL/Vizianagaram

APPROVALS

WEST BENGAL STATE ELECTRICITY TRANSMISSION COMPANY LTD.



West Bengal State Electricity Transmission Company Limited

Memo No. CE/BNGG/Proj.SS/ Jangipur 220KV GIS/KFTL/ 1090 06/12/2020

To
Kalpataru Power Transmission Limited.
Plot no B-21 2nd Floor,
Sector 58, Noida 201301.
Fax: 0120-3772631-510.

Sub.: Approval of LI cable and cross section detail drawing for Jangipur 220/132/33kV Sub-Station under 'Package 38'.

Ref.: 1) LOA No. -
a) CEV/WBSETCL/Substation/ Package 58/Sitpur/2018-19/dtd30/12/2018,
b) CEV/WBSETCL/Substation/ Package 58/Cuttack/2018-19/dtd30/12/2018
2) Your Letter No. -
KPTL-BOI/WBSETCL/Pkg-58/K-290 received vide no. 2067 dtd 24.11.20.

Sir,

On examination of subject drawings received vide your letter under ref (2) above our comments are appended below:

Sl. No.	Drawing/ Documents	Approved status	Drawing No.
1.	LI cable and cross section detail drawing	'A' - Approved	As per attachment

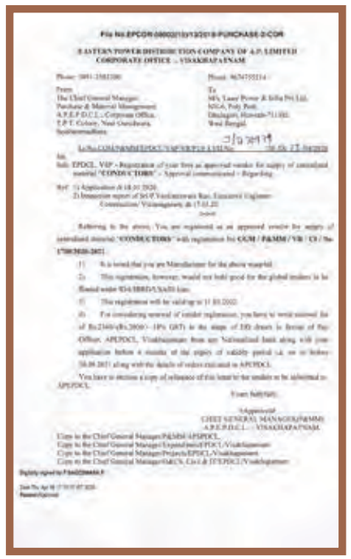
Thanking you,

Yours Truly,

Enclo : One set drawings

Chief Engineer : Engineering

EASTERN POWER DISTRIBUTION COMPANY OF A.P. LTD.



File No.EPDCOR/00000/T/1/12/2019-PURCHASE-2-COR

EASTERN POWER DISTRIBUTION COMPANY OF A.P. LIMITED
CORPORATE OFFICE :: VISAKHAPATNAM

Phone: 0891-2582300 Fax: 0891-2582314

From
The Chief General Manager,
Purchase & Material Management,
A.P.E.P.D.C.L.,Corporate Office,
P.P.T. Colony, Near Gurudwara,
Seethammadhara.

To
M/s. Laser Power & Infra Pvt. Ltd.,
NH-6, Poly park,
Dhalagiri, Howrah-711302,
West Bengal.

Lr.No.CGM(PM)/DGM(PC)/SE(PC)/F.EPDCL/VSP/D.No.1373/19 Dt. 31.12.2019

Sub: EPDCL, VSP - Registration of your firm as approved vendor for supply of centralized material "CONDUCTORS" - Approval communicated - Regarding.

Ref: 1) Application dt.18.01.2020.
2) Inspection report of Sri.P.Venkateswara Rao, Executive Engineer-Commercial, Vijayanagaram, dt.17.01.20

Referring to the above, You are registered as an approved vendor for supply of centralized material "CONDUCTORS" with registration No. CGM / P&MM / VB / C9 / Dt. 17/01/2020-2021.

1) It is noted that you are Manufacturer for the above material.
2) This registration, however, would not hold good for the global tenders to be floated under Rlss/BRED/Tariff-I/etc.
3) This registration will be valid up to 31.03.2022.
4) For considering renewal of vendor registration, you have to remit renewal fee of Rs.2360/-(Rs.2000/- 18% GST) in the shape of DD drawn in favour of the Officer, APEDCL, Visakhapatnam from any Nationalised bank along with your application before 4 months of the expiry of validity period i.e. on or before 30.08.2021 along with the details of orders executed in APEDCL.
You have to enclose a copy of acknowledge of this letter to be submitted to APEDCL.

From Rs80/-

"Approved"
CHIEF GENERAL MANAGER/P&MM
A.P.E.P.D.C.L., VISAKHAPATNAM.

Copy to the Chief General Manager/P&MM/APEDCL.
Copy to the Chief General Manager/Legal/and/PEDCL/Visakhapatnam
Copy to the Chief General Manager/Projects/EPDCL/Visakhapatnam.
Copy to the Chief General Manager/O&CS, Civil & IT/EPDCL/Visakhapatnam.

Deputy signed by Paul Dhanraj.P

Date No. 19/01/07 2020
Password Expired

STEEL AUTHORITY OF INDIA LTD.

स्टील अथॉरिटी ऑफ इंडिया लि
राउरकेला इस्पात संयंत्र
राउरकेला-769011
STEEL AUTHORITY OF INDIA LTD.
ROURKELA STEEL PLANT
ROURKELA-769011

Ref No. DGM (Elect)/SAIL/Vendor Regn./19/ 1613 Date: 10.06.2019

M/s. Laser Cables Private Limited,
Attn: Contact Person,
Laxmi Vihar Building,
Booth No. 1st,
5th Floor,
Kolkata-700 013.

Dear Sir,

Sub: Inclusion in Approved Vendor List for RSP Expansion Projects

We have reference to your letter no.LEC0896/2012-13 dated 18th February'13 for inclusion of your name for supply of LT Cable upto 1.1 KV for both PVC & XLPE of RSP Expansion Projects.

We are pleased to inform you our acceptance of your name for supply of LT cable upto 1.1 KV for both PVC & XLPE of RSP Expansion Projects.

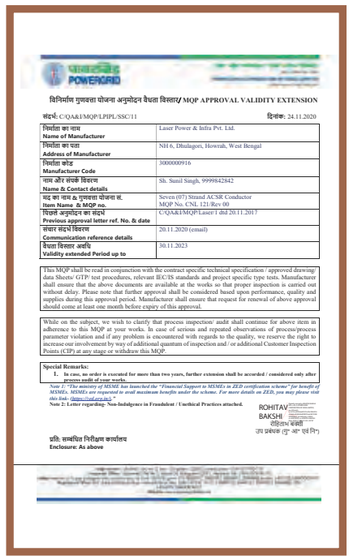
Thanking you,

Yours faithfully,
for SAIL, Rourkela Steel Plant

(D.P. Sardar)
DGM (Elect)

C.C. to: GM (Proj.)/M
GM (Elec.)
AGM(Tech.) to ED(Proj.)

POWER GRID CORPORATION OF INDIA LTD.



पावरग्रिड
POWERGRID

विनिर्माण गुणवत्ता योजना अनुमोदन वैधता विस्तार/ MQP APPROVAL VALIDITY EXTENSION

संदर्भ: CQAR1/MQP/LPIPL/SSC/11 दिनांक: 24.11.2020

निर्माता का नाम Name of Manufacturer	Laser Power & Infra Pvt. Ltd.
निर्माता का पता Address of Manufacturer	NH-6, Dhalagori, Howrah, West Bengal
निर्माता कोड Manufacturer Code	3000000916
नाम और संपर्क विवरण Name & Contact details	Sh. Sunil Singh, 9999842842
मद का नाम & गुणवत्ता योजना सं. Item Name & MQP no.	Seven (07) Strand ACSR Conductor MQP No. CNL 121/Rev 00
पिछले अनुमोदन का संदर्भ Previous approval letter ref. No. & date	CQAR1/MQP/Laser1/ dtd 20.11.2017
संचार संदर्भ विवरण Communication reference details	20.11.2020 (email)
वैधता विस्तार अवधि Validity extended Period up to	30.11.2023

This MQP shall be read in conjunction with the contract specific technical specifications / approved drawing/ data Sheets/ GTP/ test procedures, relevant IEC/IS standards and project specific type tests. Manufacturer shall ensure that the above documents are available at the works so that proper inspection is carried out without delay. Please note that further approval shall be considered based upon performance, quality and supplies during this approval period. Manufacturer shall ensure that request for renewal of above approval should come at least one month before expiry of this approval letter.

While on the subject, we wish to clarify that process inspection/ audit shall continue for above item in adherence to this MQP at your works. In case of serious and repeated observations of process/process parameter violation and if any problem is encountered with regards to the quality, we reserve the right to increase our involvement by way of additional quantum of inspection and / or additional Customer Inspection Points (CIP) at any stage or withdraw this MQP.

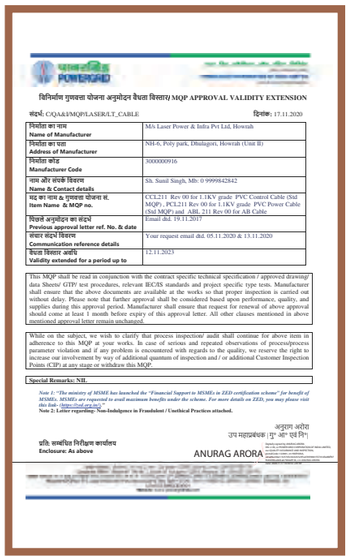
Special Remarks:
1. **In case, no order is executed for more than two years, further extension shall be accorded / considered only after process audit of your works.**

Note 1: "The ministry of MSME has launched the "Financial Support to MSMEs in ZED certification scheme" for benefit of MSMEs. MSMEs are requested to avail maximum benefits under the scheme. For more details on ZED, you may please visit this link- https://zed.org.in/."
Note 2: Letter regarding- Non-Indulgence in Fraudulent / Unethical Practices attached.

ROHITAV BAKSHI
रोहितव बक्षी
उप प्रबंधक (गु. आ एवं नि.)

प्रति, सम्बंधित निरीक्षण कार्यालय
Enclosure: As above

POWER GRID CORPORATION OF INDIA LTD.



पावरग्रिड
POWERGRID

विनिर्माण गुणवत्ता योजना अनुमोदन वैधता विस्तार/ MQP APPROVAL VALIDITY EXTENSION

संदर्भ: CQAA1/MQP/LASER/LT_CABLE दिनांक: 17.11.2020

निर्माता का नाम Name of Manufacturer	M/s Laser Power & Infra Pvt Ltd, Howrah
निर्माता का पता Address of Manufacturer	NH-6, Poly park, Dhalagori, Howrah (Unit II)
निर्माता कोड Manufacturer Code	3000000916
नाम और संपर्क विवरण Name & Contact details	Sh. Sunil Singh, Mb: 0 9999842842
मद का नाम & गुणवत्ता योजना सं. Item Name & MQP no.	CCL211 Rev 00 for 1.1KV grade PVC Control Cable (Std MQP)., PCL211 Rev 00 for 1.1KV grade PVC Power Cables (Std MQP) and ABL 211 Rev 00 for AB Cable
पिछले अनुमोदन का संदर्भ Previous approval letter ref. No. & date	Email dtd. 19.11.2017
संचार संदर्भ विवरण Communication reference details	Your request email dtd. 05.11.2020 & 13.11.2020
वैधता विस्तार अवधि Validity extended for a period up to	12.11.2023

This MQP shall be read in conjunction with the contract specific technical specification / approved drawing/ data Sheets/ GTP/ test procedures, relevant IEC/IS standards and project specific type tests. Manufacturer shall ensure that the above documents are available at the works so that proper inspection is carried out without delay. Please note that further approval shall be considered based upon performance, quality, and supplies during this approval period. Manufacturer shall ensure that request for renewal of above approval should come at least 1 month before expiry of this approval letter. All other clauses mentioned in above mentioned approval letter remain unchanged.

While on the subject, we wish to clarify that process inspectors/ audit shall continue for above item in adherence to this MQP at your works. In case of serious and repeated observations of process/process parameter violation and if any problem is encountered with regards to the quality, we reserve the right to increase our involvement by way of additional quantum of inspection and / or additional Customer Inspection Points (CIP) at any stage or withdraw this MQP.

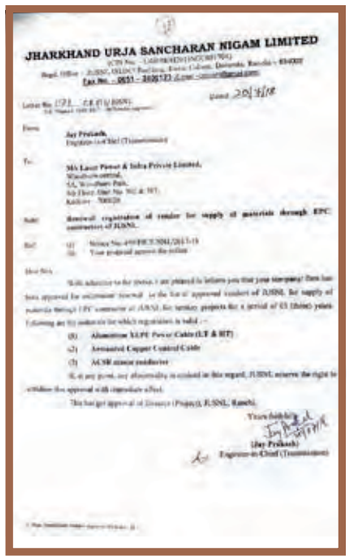
Special Remarks: NIL

Note 1-"The ministry of MSME has launched the "Financial Support to MSMEs in ZED certification scheme" for benefit of MSMEs. MSMEs are requested to avail maximum benefits under the scheme. For more details on ZED, you may please visit this link- https://zed.org.in/."
Note 2: Letter regarding- Non-Indulgence in Fraudulent / Unethical Practices attached.

अनुराग अरोरा
उप महाप्रबंधक (गु. आ एवं नि.)
ANURAG ARORA

प्रति, सम्बंधित निरीक्षण कार्यालय
Enclosure: As above

JHARKHAND URJA SANCHARAN NIGAM LTD.



JHARKHAND URJA SANCHARAN NIGAM LIMITED

Regd. Office : JUSNL, HEC(PS) Dhurwa, Estate Colony, Dhurwa, Ranchi - 834004
Fax No. - 0651 - 2400123 (Com) e-mail:-

Letter No. 1721 Dated 20/4/18

From,
Jay Prakash,
Engineer-in-Chief (Transmission)

To,
M/s Laser Power & Infra Private Limited,
Windsor Corporate,
14, Wood Burn Park,
6th Floor, Unit- No. 602 & 603,
Kolkata - 700020

Sub: Approval/ registration of vendor for supply of materials through EPC contractors of JUSNL.

Ref: (1) Notice No. 449/EE/T-3/JSNL/2017-18
(2) Your proposal against the notice

Dear Sir,

With reference to the subject cited above, this Office/Corporate has floated various tenders to M/s Laser Power Infra Pvt. Ltd. Under PSDF/NMDP schemes. Some tenders are/were floated under the same ibid reference subject for the contractors of Jharkhand Vidyut Sancharan Nigam Limited (JUSNL) for turnkey projects for a period of 03 (three) years. Following are the materials for which registration is held :-

(1) Aluminium XLPE Power Cable (LT & HT)
(2) Armoured Copper Control Cable
(3) ACSR zinnia conductor

If, at any point, any discrepancy is noticed in this regard, JUSNL reserves the right to withdraw the approval with immediate effect.

The last get approval at Director (Projects), JUSNL, Ranchi.

Yours faithfully,
Jay Prakash
Engineer-in-Chief (Transmission)

WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LTD.

WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LIMITED

List of Empanelled manufacturers i.r.o. ACSR Squirrel, Weasel, Rabbit and DOG Conductor.
Ref. NIT No. P 24/2017-18/PC-II/COND opened on 09.11.2017

The following bidders have been empanelled for the ACSR Conductors as mentioned below against the above mentioned NIT w.e.f. 08.03.2018 and the empanelment will remain valid for at least a period of two years with provision for further extension of one year:

Sl. No.	Name of the Vendor	Empanelled as ACSR Conductor	Type Test to be Conducted after successful execution of order for the items/ qty. Empanelled.
1.	M/s. Sreekaleeswara Wires (P) Ltd.	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	The bidder is having Type Test for higher sizes of Conductor but the bidder will have to conduct Type Test for ACSR Squirrel Conductor.
2.	M/s. Gammon Infrastructure Limited	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	------
3.	M/s. Kundu Transformers Ltd.	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	The bidder is having Type Test for higher sizes of Conductor but the bidder will have to conduct Type Test for ACSR Squirrel Conductor.
4.	M/s. Shantidoot Cables and Conductors Pvt. Ltd.	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	------
5.	M/s. Prime Cables Private Limited	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	The bidder is having Type Test for higher sizes of Conductor but the bidder will have to conduct Type Test for ACSR Squirrel Conductor.
6.	M/s. Laser Power and Infra Private Limited	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	------
7.	M/s. Shreshaktee Urjaa Infrastructure Ltd.	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	The bidder is having Type Test for higher sizes of Conductor but the bidder will have to conduct Type Test for ACSR Squirrel Conductor. Not eligible for supply Govt. Deptt. (Jharkhand Unit)
8.	M/s. Gitesh Indo Pvt. Ltd.	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	------
9.	M/s. Laser Power Infrastructure Limited	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	------
10.	M/s. Sumeet Wires Private Ltd.	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	------
11.	M/s. Nicco cables Ltd.	ACSR Weasel, Rabbit and DOG Conductor	------
12.	M/s. Tirupati Transformers Pvt. Ltd.	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	------
13.	M/s. Shri Cables Pvt. Ltd.	ACSR Squirrel, Weasel, Rabbit and DOG Conductor	------

Procurement of the ACSR Conductor will be done as per Policies of WBSEDCL and terms & conditions of NIT as reference above.

(S.K. Sarkar)
Chief Engineer
Procurement & Contracts Department

DAMODAR VALLEY CORPORATION

DAMODAR VALLEY CORPORATION
RURAL ELECTRIFICATION PROJECT, JHARKHAND
SHREE MANSION, AIRPORT ROAD, HINOO, RANCHI-834002
Phone / Fax No. 0651-2252150, e-mail: dvcrep_ranchi@dvcindia.org
No. DVC/REP/Ranchi/SDB/S- 464 Date: June 30, 2015

To
M/s Larsen & Toubro Limited,
11th Floor, Tower-G, Godrej Waterside,
Plot No. 5, DP Block, Sector-V, Salt Lake,
Kolkata-700 091.

>>Kind Attn: Mr. Soumyen Bhattacharya

Sub: Execution of Rural Electrification project in Hazaribagh district of Jharkhand -
Sub-vendor approval for 11 KV XLPE 120 Sq.mm, 3-core armoured Aluminium cable.
Ref: 1. LOA No. EDCON/CE/REP/JH/SDB/S- 2689 & L- 2690 dtd. 10.03.2008.
2. Your letter No. LTCD/EKKO/PTAD/SB/2015-097 dtd. 25.06.2015.

Dear Sir,

This has reference to your letter under reference no. 2, wherein you have requested to accord sub-vendor approval in respect of M/s. Laser Cables Pvt. Ltd., Kolkata for manufacture and supply of 11 KV XLPE 120 Sq.mm, 3-core armoured Aluminium cable conforming to the Technical Specification.

On scrutiny of the credentials, it has been observed that the same vendor is approved by NHPDCL for other RE project under RGGVY. We hereby convey our approval for procurement of the listed item from the said vendor as detailed below;

Sl. No.	Item Details	Sl. No. of LOA	Name of Vendor	Address
1.	11KV XLPE, 120 Sq.mm, 3-core, armoured Aluminium cable as per TS.	42	M/s. Laser Cables Pvt. Ltd., Kolkata	12A, Camac Street, 3rd Floor, Kolkata-700017 Phone no. +91-33-2282-9090 Fax no. +91-33-2282-9206 e-mail: laser@lasercables.com Website: www.Lasercables.com

The approved sub-vendor is to ensure the quality of the product as per relevant standard and if any deficiency is observed at any stage, DVC reserves the right to withdraw this consent.

This approval, however, does not relieve you on your responsibility in supplying materials as per design & specification as well as successful completion of the project in time.

Yours faithfully,

(A.K Kashyap)
Chief Engineer

DAMODAR VALLEY CORPORATION

DAMODAR VALLEY CORPORATION
ELECTRICITY DEPARTMENT
RURAL ELECTRIFICATION PROJECT WING
DVC TOWERS (5TH FLOOR),
VIP ROAD, KOLKATA - 700 054.

Ref No. DDCON/CE/REP/(S)/028/Vol- 36(9) Dated, October 28, 2010.

To
M/s Larsen & Toubro Limited
71, Park Street,
P.O. No. 9015,
Kolkata - 700 016.

-- Kind Attn. Mr. O K Jain, Manager-Electrical, 07650

Sub : Rural Electrification Work in Hazaribag district of Jharkhand under Package : RED – Sub-vendor approval for HT and LT A.B Cables.

Ref : 1. LOA No. EDCON/CE/REP/JH/HZB/S- 2689 dtd. 10.03.08.
2 Your No. LTCD/RWD/EKC/DOS/2008-127 dtd. 02.06.08.
3 Your No. LTCD/RWD/EKC/DOS/2008-135 dtd. 17.06.08.

Dear Sir,

This has reference to your letter under ref. (2) above enclosing credential documents in respect of M/s Laser Cables Pvt. Limited, Kolkata duly proposing for approval as your Sub-vendor for manufacture and supply of 11KV and 1.1KV grade AB cables conforming to the specifications and drawn in the Contract documents for the subject project and subsequent correspondence/ discussions in this regard.

On scrutiny of your proposal, we hereby convey our approval for procurement of the below mentioned items from the said vendor :

Items details	LOA Item No.	Name of Vendor	Address
01. 11KV 3-ph (3x35+1x70) AB cable.	38	M/S LASER CABLES PVT LIMITED	30/1, Sweda Centre, 3rd Floor, 4A, Pollock Street, Kolkata - 700001. Tel.:033-22315391.
02. 11KV 2-ph (2x35+1x70) AB cable.	39		
03. 1.1KV 3-ph (3x16+1x25) AB cable.	40		
04. 1.1KV 3-ph (1x25+1x25) AB cable.	41		

This approval is subject to the condition that you shall arrange our type testing of each rating of AB cables, sample duly drawn from first lot offered for inspection, in NABL accredited laboratory.

The approved sub-vendor is to ensure the quality of the product as per relevant standard and if any deficiency is observed at any stage, DVC reserves the right to withdraw this consent.

This approval, however, does not relieve you on your responsibility in supplying materials as per design & specification as well as satisfactory performance complying with the guarantee clause.

Yours faithfully,

(Subir Ghosh)
Chief Engineer

Cc.: The Chief Engineer, RED, DVC, Ranchi.
Cc.: The Superintending Engineer, RED, DVC, Hazaribag.

ELECTRICIDADE DE MOZAMBIQUE

Electricidade de Moçambique
Mozambique Energy for All Project – PROMOSEIRAS
Supply of cables and Conductors LOT 2

Electricidade de Moçambique, E.P

Mozambique Energy Energy for All Project

(PROENERGIA)

Supply 2,346 Km of ABC Cable and 1,694Km of Conductor (Centre Region)– LOT 2

ims identificator: MZ-EDM-62955-GO-RFB
Loan/Credit Number: IDA D1110 MZ
Contract Number: 162-EDM-11980

Contract Agreement

Between

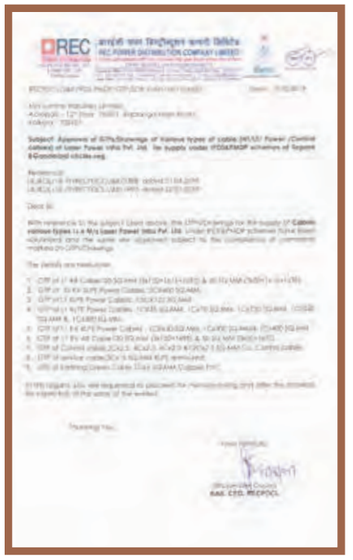
Electricidade de Moçambique, E.P

and

Laser Power & Infra PVT. Ltd (India)

May 2020

REC POWER DISTRIBUTION COMPANY LTD.



REC POWER DISTRIBUTION COMPANY LIMITED

Subject: Approval of ISI'ed drawings of various types of cables (AB/UG Power /Control cables) of Laser Power Infra Pvt. Ltd. for supply under PDSS&RMDP schemes of Nagaland & Arunachal Pradesh regd.

Dear Sir,

With reference to the subject cited above, the CPP/Corporate for the supply of Cables various types is a M/s Laser Power Infra Pvt. Ltd. Under PDSS&RMDP schemes have been approved vide the same vide reference subject to the compliance of comments marked on CPP/Drawings.

The details are mentioned:

1. CPP of (7 Nos Cables) (3x35+1x16+1x25) & (4x16 sq.mm (3x95+1x16+1x25)
2. CPP of 33 KV XLPE Power Cables, (3Cx400 SQ.MM).
3. CPP of (11 KV) XLPE Power Cables, (1Cx630 SQ.MM)
4. CPP of (11 KV) XLPE Power Cables, (1Cx95 SQ.MM), (1Cx150 SQ.MM), (1Cx300 SQ.MM & 1Cx400 SQ.MM).
5. CPP of (11 KV) XLPE Power Cables, (3Cx400 SQ.MM), (1Cx400 SQ.MM)
6. CPP of (11 KV) AB Cable (3x120+1x95) & (3x150+1x95) & (3x300+1x95)
7. CPP of Control cable (2Cx2.5, 4Cx2.5, 7Cx2.5, 10Cx2.5, 14Cx2.5, 19Cx2.5, 24Cx2.5, 30Cx2.5)
8. CPP of service cable (3Cx16 SQ.MM XLPE) armoured
9. CPP of (LT) Power Cable (3Cx4 SQ.MM Copper PVC)

(LT/HT) cables are also required to proceed for manufacturing post after the drawings as approved of the same of the tender.

Thanking You,

Yours faithfully,

(Jay Prakash)
GM, CSD, REPDCL

VERTICALS & CLIENTELE

International Division

LPIPL has a dedicated team of experts and seasoned professionals catering to international clients, complementing their requirements with our know-how and wide portfolio of electrical products. With robust R&D initiatives and more than 15 years of presence in Global markets, **LPIPL** has a steady track record of supplying products that comply with all the major international standards viz.

Successful execution of complex projects across some of the most difficult terrains and climatic conditions through meticulous planning equips us with expertise in commissioning projects ahead of schedule, addressing the key constraints of time and unfavourable ground conditions.

In pursuit of expanding our footprint overseas for EPC contracts in the Power Transmission & Distribution Sector, we have invested our resources into hiring and retaining highly sought-after designers and engineers with vast experience in project execution across international geographies viz. Africa, the Middle East, Asia-Pacific, SAARC and South America.

With a customer-centric approach and integrated capabilities, our International division is equipped to undertake and execute projects in the following sectors:

- **Rural Electrification Projects**
- **Off the Grid and On Grid Solar Power Projects**
- **Transmission Lines**
- **Reconductoring of Transmission Line with New Generation Conductors**
- **Underground Cabling**
- **Conventional Substation**
- **GIS Substations**

New Command Centre

With a zeal to offer more value and world-class experience to every stakeholder, we are all set to upgrade to a 55,000 sq.ft. office area in the business district of Kolkata at Sector-V, Salt Lake with close proximity to the Airport.

This modern infrastructural addition will act as our command centre. It will be our gateway to the rest of the world, reflecting the ethos of our principles and showcase the legacy that has brought us this far. We are excited to expand our wings and soar higher, exploring uncharted territories, realising our full potential and achieving the dreams that fuel our ambitions.

EPC OVERVIEW

LPIPL offers one of the most extensive and innovative line-ups of Energy products in India. Our journey as an EPC contractor for transmission and distribution of power began three decades ago, which is gaining momentum and scaling new heights every day.

The following underpins the growth trajectory of our company:
- Home to a seasoned and dynamic workforce that plays a critical role in Planning, Engineering, Drawing & Designing, Execution, Quality Control (ISO 9001:2015) and Safety Measures (OHSAS 18001:2015)

- Strong tie-ups with our clients (**PGCIL, NTPC, SBPDCL, NBPDCL, WBSEDCL, OPTCL, JBVNL** & **APDCL**) whose continuous support has helped LPIPL cement its position as the Industry leader

- A full-fledged construction division with cutting-edge equipment, tools and testing instruments that ensure high-quality of products

Our plethora of shining awards are testimony to our impact in shaping the Industry with futuristic innovations and serving communities with the most energy-efficient solutions.

PGCIL and **NTPC** - two of the most prestigious government-owned corporations in India's Power segment - have awarded us the most challenging RGGVY project worth ₹603 Cr.

In recognition of our dedication to faster delivery timelines, the **Certificate of Appreciation & Excellence** was conferred upon us by Bihar State Utility during 2017-18.

Innovation is the key to gaining competitive advantage in the Power Transmission & Distribution Sector where **LPIPL** has been a pioneer. We are the proud recipient of consolidated contracts worth approximately ₹3500 Cr. across Eastern & North-Eastern India.

LPIPL is at the forefront of Distribution, installing a number of new 33/11kV Sub-stations and thousands of kilometres of 33kV, 11kV & LT line Distribution Transformers. After successfully making a mark in the Power Industry, we plan to expand our portfolio and take up Transmission, EHV Network, Solar Power and other challenging projects in the future.

PAST & PRESENT PROJECTS

LPIPL has been a front-runner in India's power resurgence. As a pioneer in creating a sustainable future for more than 30 years, we take pride in contributing to India's economic and social development, undertaking turnkey Rural Electrification Projects for various state DISCOMS:

- **Assam Power Distribution Co. Ltd.**
- **Power Grid Corporation of India Ltd.**
- **South Bihar Power Distribution Co. Ltd.**

We take pride in our accomplishments, with an extended scope of work that involves **Survey, Separation & Creation of Agriculture / Non-Agriculture feeders, Engineering, Design, Preparation of All Drawings, Testing of the materials, Supply of materials and Equipment as per technical specifications.**

Projects Undertaken:

- **Rajiv Gandhi Grameen Vidyutikaran Yojna (RGGVY)**
- **Deen Dayal Upadhyay Gram Jyoti Yojna (DDUGJY)**
- **Integrated Power Development Scheme (IPDS)**
- **Mukhyamantri Vidyut Sambandh Nischay Yojana**

Projects under Execution:

We are catering to India's vast and diverse Power needs with a plethora of endeavours in the pipeline, notable among them being works undertaken for:

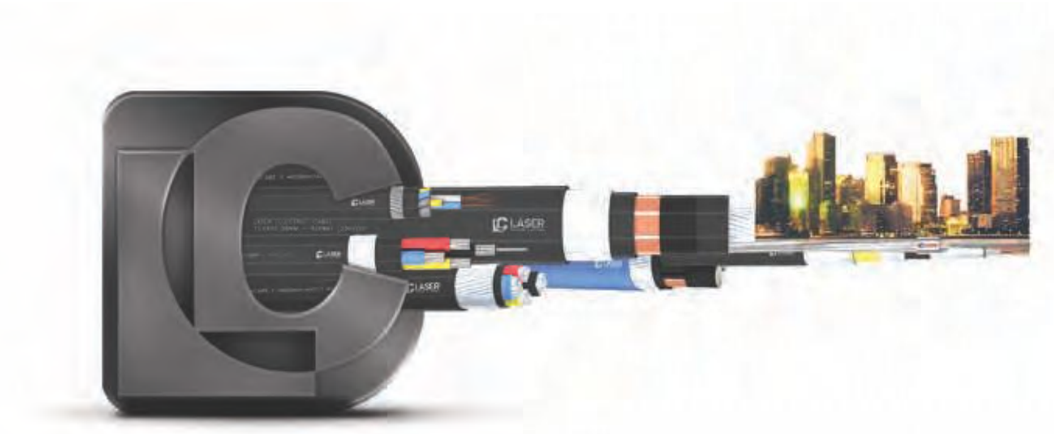
- **Odisha Power Transmission Corporation Ltd.**
- **North Bihar Power Distribution Co. Ltd.**
- **South Bihar Power Distribution Co. Ltd.**
- **Jharkhand Bijli Vitran Nigam Limited**
- **National Thermal Power Corporation Ltd.**
- **West Bengal State Electricity Distribution Co. Ltd.**

Success Stories at **LPIPL** are all about illuminating hopes and dreams, powering progress and strengthening the economy. The road ahead is challenging but our expertise and resilience will outshine every obstacle.

GROUP FINANCIAL PERFORMANCE

Our financial Strength and Stability has been recognized by renowned Credit Rating Agencies. We have been awarded A+ (Long Term) and A1+ (Short Term) rating by Acuite Ratings & Research Ltd.

Particulars	2019-2020 (Rs Lacs)	2018-2019 (Rs Lacs)	2017-2018 (Rs Lacs)	2016-2017 (Rs Lacs)	2015-2016 (Rs Lacs)
Sales & other Income	1,08,845.20	1,21,644.86	65,606.77	39,604.09	27,016.86
PBT	12,413.28	7,325.45	3,533.37	2,041.82	1,159.94
Net Worth	24,891.20	15,449.16	10,746.86	8,430.25	7,181.27
Fixed Assets (Gross)	15,321.22	11,351.95	6,766.19	5,541.46	3,766.04
Fixed Deposit With banks	6,527.09	6,331.60	4,109.69	2,819.22	914.49
Inventories	5,756.16	10,118.75	8,555.44	6,826.12	4,670.56
PAT	9,442.04	4,702.30	2,316.61	1,246.98	776.66



AWARDS & RECOGNITION

At **LPIPL**, we strive to "**achieve new heights**" of success everyday and believe in celebrating our achievements with pride. An array of awards are proof of our dedication, commitment to quality and team work.

Whenever we receive accolades for the quality of products and expertise of service, we remind ourselves of our humble beginnings almost 30 years back and reflect on how far we've come.

But there is a long way to go! We hope the journey ahead will open up new roads of progress and create unique avenues for sustainable growth.

As we celebrate the milestones, we want the nation to celebrate a power-efficient tomorrow with us. These awards are dedicated to India and the people of this beautiful land.

'Great Place to Work' Certificate presented by HRD India for being an effective benchmark for Workplace Culture

बिहार स्टेट पावर (होल्डिंग) कम्पनी लिमिटेड

प्रशस्ति पत्र

मे० लेजर पावर इन्फ्रा लि०, कोलकत्ता को राज्य के अविद्युतीकृत गाँवों के विद्युतीकरण के लक्ष्य की प्राप्ति में उत्कृष्ट योगदान हेतु प्रदत्त।

दिनांक : 27.12.2017

(प्रत्यय अमृत)
अध्यक्ष-सह-प्रबंध निदेशक

For Electrification of all unelectrified villages under RGGVY Scheme at Saran District

बिहार स्टेट पावर (होल्डिंग) कम्पनी लिमिटेड

प्रशस्ति पत्र

बिहार के सभी टोलों तक बिजली पहुँचाने के कार्यक्रम के अन्तर्गत **मेसर्स लेजर पावर एण्ड इन्फ्रा प्रा० लि०** को उत्कृष्ट कार्य करने हेतु प्रदत्त।

दिनांक : 04.05.2018
पटना

(प्रत्यय अमृत)
अध्यक्ष-सह-प्रबंध निदेशक

For Electrification of all unelectrified villages under RGGVY Scheme at Aurangabad District

बिहार स्टेट पावर (होल्डिंग) कम्पनी लिमिटेड

प्रशस्ति पत्र

सौभाग्य योजना (हर घर बिजली) अंतर्गत **गोपालगंज जिला** में विद्युतीकरण के लक्ष्य प्राप्ति के उपलक्ष्य में **मेसर्स लेजर पावर एण्ड इन्फ्रा प्राईवेट लिमिटेड** को प्रदत्त।

दिनांक 10.08.2018
पटना।

(प्रत्यय अमृत)
अध्यक्ष-सह-प्रबंध निदेशक

For outstanding contribution in execution of the "HarGharBijli"/ SAUBHAGYA Scheme at Gopalganj District under Chapra Circle

BIHAR STATE POWER (HOLDING) COMPANY LIMITED

Certificate of Award

BIHAR 100%

This is conferred to

M/s Laser Power & Infra Pvt. Ltd.

for their outstanding contribution
in completion of the
"Har Ghar Bijli"/SAUBHAGYA Scheme
way ahead of its scheduled target.

01.11.2018
(Foundation Day)

Pratyaya Amrit
Chairman-cum-Managing Director

For outstanding contribution in execution of the "HarGharBijli"/ SAUBHAGYA Scheme under Bhagalpur Circle

LASER PVC AND XLPE LT POWER CABLE

Laser Cable produces LT Power Cable with PVC or XLPE Insulation of Voltage grade upto 3.3 Kv conforming to Indian and various International Standards.

Cross Linked Polyethylene (XLPE)

XLPE means crosslinked Polyethylene. The compound is based on a high molecular weight polymer. A high degree of crosslinking is attained in the processed form and thus attains excellent electrical and mechanical properties.

Advantages of XLPE Cables

- Higher current rating allows selecting the lower size of XLPE cable compared to PVC cable
- Higher short circuit rating 250°C compared to 160°C that for PVC cables
- Resistant to heat deformation while PVC is prone to heat deformation
- Respective short circuit/overload condition is reliable
- Lower dielectric loss
- Jointing & Termination is easy
- Lighter in weight considering the lower overall diameter

Comparative properties of PVC and XLPE Insulation

Characteristics	Unit	PVC	XLPE
Permitivity (50 Hz, 20^{0}C)	-	4-6	2.3
Dielectric Loss Factor (50 Hz, 20^{0}C)	-	0.05-0.07	0.0004
Volume Resistivity (27^{0}C)	Ohms cm (min)	10^13	10^14
Max. conductor temperature	Deg. C	70	90
Max. short circuit temperature	Deg. C	12.5	12.5
Tensile Strength	N/mm2 (min)	12.5	12.5
Elongation at break	-	Excellent	Medium
Flexibility at - 10^{0}C	-	Poor	Good
Resistance to abrasion	-	Medium	Good

Applicable Standards

PVC Power & Control Cable : IS 1554/Part 1/1988
XLPE Power & Control Cable : IS 7098/Part 1/1988

CONDUCTOR DATA

Conductor Technical Data for Single Core and Multicore cables conforming to IS-8130/1984 (Stranded - Class 2) Aluminium Conductors and Annealed Copper Conductors, compacted circular / Non-compacted circular

Nominal size conductor	Minimum no. of wires				Max DC resistance at 20^{0}C		AC resistance at 70^{0}C		AC resistance at 90^{0}C	
	Non-compacted		Compacted		Plain Copper	Aluminium	Plain Copper	Aluminium	Plain Copper	Aluminium
Sqmm	Cu	Ai	Cu	Ai	Ohm/Km	Ohm/Km	Ohm/Km	Ohm/Km	Ohm/Km	Ohm/Km
1.5	3	3	-	-	12.10	18.10	14.50	21.72	15.50	23.17
2.5	3	3	-	-	7.14	12.10	8.87	14.52	9.48	15.50
4	7	3	-	-	4.61	7.41	5.52	8.89	5.90	9.48
6	7	3	-	-	3.08	4.61	3.69	5.53	3.94	5.90
10	7	7	6	-	1.83	3.08	2.19	3.70	2.34	3.94
16	7	7	6	6	1.15	1.91	1.38	2.29	1.47	2.44
25	7	7	6	6	0.727	1.20	0.87	1.44	0.93	1.54
35	7	7	6	6	0.524	0.868	0.627	1.04	0.671	1.11
50	19	19	6	6	0.387	0.641	0.463	0.77	0.495	0.82
70	19	19	12	12	0.268	0.443	0.321	0.53	0.343	0.567
95	19	19	15	15	0.193	0.320	0.231	0.38	0.247	0.410
120	37	37	18	15	0.153	0.253	0.184	0.30	0.196	0.324
150	37	37	18	15	0.124	0.206	0.149	0.25	0.159	0.264
185	37	37	30	30	0.0991	0.164	0.120	0.20	0.127	0.210
240	61	37	34	30	0.0754	0.125	0.091	0.15	0.0965	0.160
300	61	61	34	30	0.0601	0.100	0.073	0.12	0.0769	0.128
400	61	61	53	53	0.0470	0.0778	0.059	0.0930	0.0602	0.100
500	61	61	53	53	0.0366	0.0605	0.046	0.0726	0.0468	0.0774
630	91	91	53	53	0.0283	0.0469	0.037	0.0563	0.0362	0.0600
800	91	91	53	53	0.0221	0.0367	0.031	0.0440	0.0283	0.0470
1000	91	91	53	53	0.0176	0.0291	0.027	0.0349	0.0225	0.0372

SHORT CIRCUIT CURRENT RATINGS FOR XLPE/PVC CABLE

Short Circuit Rating for 1 second duration for XLPE & PVC Insulated Cables with Copper and Aluminium Cables (Isc Current in KAmps)

Nominal Size Sq.mm	XLPE Insulated		PVC Insulated	
	Copper	Aluminium	Copper	Aluminium
1.5	0.21	-	0.173	-
2.5	0.36	-	0.283	-
4	0.57	0.38	0.46	0.303
6	0.86	0.57	0.69	0.455
10	1.4	0.94	1.15	0.758
16	2.3	1.5	1.84	1.21
25	3.6	2.4	2.88	1.90
35	5.0	3.3	4.03	2.65
50	7.1	4.7	5.75	3.79
70	10.0	6.6	8.05	5.31
95	13.6	9.0	10.9	7.20
120	17.1	11.3	13.8	9.10
150	21.4	14.2	17.3	11.40
185	26.4	17.5	21.3	14.02
240	34.3	22.6	27.6	18.20
300	42.9	28.3	34.5	22.80
400	57.1	37.7	46.0	30.40
500	71.4	47.2	57.5	38.00
630	90.0	59.4	72.5	47.25
800	114.3	75.5	92.0	60.00
1000	142.9	94.3	115.0	75.00

Rating for any other duration :

1) Max. Initial Conductor Temperature during operation:

XLPE	PVC
90°C	70°C

2) Max. final conductor temperature during short circuit:

XLPE	PVC
250°C	160°C

Formula relating short circuit rating with t second duration $It = \frac{Isc}{\sqrt{t}}$

Where It = Short circuit rating for t second
t = duration in seconds
Isc = Short circuit rating for I second

* PVC Type 'A' Insulation as per IS-5831-1984
** PVC Cables as per IS-1554(P-I) 1988
*** XLPE cables as per IS-7098 (PI) 1988

Comparative current rating of 650/1100 volts multicore heavy duty PVC insulated cables & XLPE Insulated cables. 3,3.5 & 4 core unarmoured / armoured PVC sheathed cables with aluminium conductor

Nominal size of cable	3,3.5 & 4 core PVC Insulated & Sheathed Cables as per IS-1554 (P-1) 1988			3,3.5 & 4 core XLPE Insulated & PVC Sheathed Cables as per IS-1554 (P-1) 1988		
Sq.mm.	In Ground Amp	In Air Amp	Approx. voltage drop Mv/Amp/mtr	In Ground Amp	In Air Amp	Approx. voltage drop Mv/Amp/mtr
16	60	51	4.0	73	70	4.2
25	76	70	2.5	94	96	2.7
35	92	86	1.8	113	117	1.9
50	110	105	1.3	133	142	1.4
70	135	130	0.93	164	179	0.99
95	165	155	0.68	196	221	0.72
120	185	180	0.54	223	257	0.58
150	210	205	0.46	249	292	0.48
185	235	240	0.38	282	337	0.39
240	275	280	0.28	327	399	0.31
300	305	315	0.25	367	455	0.26
400	335	375	0.2	420	530	0.21

CURRENT RATING (PVC)

The current ratings in table 1 & 2 based on the normal conditions of installation as described below :

1. Maximum condr. temperature	70°C	5. Thermal resistivity of soil	150°C cm/watt
2. Ambient air temperature	40°C	6. Thermal resistivity of cable	650°C C cm/watt
3. Ground temperature	30°C	7. Max. short-circuit conductor temperature	160°C
4. Depth of laying (for cable laid directly in ground	75 cm (1.1. KV)	8. Max. Ambient Air Temperature	55°C

Installation method and rating factors are given in tables 1 to 6.

TABLE 1

Rating for variations in ground temperature for cables laid directly in ground and in ducts

Ground temperature °C	15	20	25	30	35	40	45	50	55
Rating factor	1.17	1.12	1.06	1.0	0.94	0.87	0.79	0.70	0.60

TABLE 2

Rating factors for variation in ambient air temperature

Air temperature °C	25	30	35	40	45	50	55
Rating factor	1.25	1.16	1.09	1.00	0.90	0.80	0.69

TABLE 3

Rating facors of group of twin and multicore cables laid directly in ground in horizontal formation

No. of Cables	Rating factor for axial spacing				
	Touching	15 cm	30 cm	45 cm	60 cm
2 cables	0.78	0.81	0.85	0.88	0.90
3 cables	0.68	0.71	0.77	0.81	0.83
4 cables	0.61	0.65	0.72	0.76	0.79
6 cables	0.53	0.58	0.66	0.71	0.76
8 cables	0.48	0.54	0.62	0.67	0.72

TABLE 4

Rating factors of groups of twin and multicore cables laid directly in ground in tier formation

No. of Cables	Rating factor for axial spacing				
	Touching	15 cm	30 cm	45 cm	60 cm
4 cables	0.60	0.67	0.73	0.76	0.78
6 cables	0.51	0,57	0.63	0.67	0.69
8 cables	0.45	0.51	0.57	0.59	0.61

TABLE 5

Rating factors for variation in depth of laying in ground

Depth of laying (cms)	75	90	105	120	150	150 & above
Rating factor upto 25 sq. mm.	1.00	0.99	0.98	0.97	0.96	0.95

TABLE 6

Group-rating factors for cables installed in ground, separated by more than 7 cms.

No. of cables	1	2	3	4	5	6
Single core D.C. cables & multicore power cables	1.00	0.90	0.80	0.75	0 70	0 65
Single core A.C. cables	1.0	0,80	0,75	0.70	0.65	0.60

No. of cores & cross sectional area	Min No. of Wires	Aluminium Strip / Aluminium Round Wire Armoured									UNARMOURED				Max. D.C. Resistance at 20°C	Max.A.C. Resistance at 70°C	CURRENT RATINGS			
		Thickness of PVC insulation (Nom.)	Nominal Dimensions ot Aluminium Flat Strip	Nom. Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Approx. Net Wt. of Cable	Nominal Dimensions of Armour wire	Min Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Approx. Net Wt. of Cable	Thickness of PVC insulation (Norn.)	Nom. Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Approx. Net Wt. of Cable			Direct in Ground		In Air	
																	2 Cables	3 Cables	2 Cables	3 Cables
		(mm)	(mm)	(mm)	(mm)	(Kg/Km)	(mm)	(mm)	(mm)	(Kg/Km)	(mm)	(mm)	(mm)	(Kg/Km)	Ohms/Km	Ohms/Km	Amp	Amp	Amp	Amp
1CX4	1	1.3					1.4	1.24	10.9	148	1.0	1.8	8.6	89	7.4100	8.8900	36	31	32	27
1CX6	1	1.3					1.4	1.24	11.4	165	1.0	1.8	9.1	103	4.6100	5.5300	44	39	41	35
1CX10	1	1.3					1.4	1.24	12.3	196	1.0	1.8	10.1	127	3.0800	3.7000	59	51	56	47
1CX16	6	1.3					1.4	1.24	13.1	225	1.0	1.8	10.8	152	1.9100	2.2900	75	66	72	64
1CX25	6	1.5					1.4	1.24	14.7	287	1.2	1.8	12.4	204	1.2000	1.4400	97	86	99	84
1CX35	6	1.5					1.4	1.24	15.7	334	1.2	1.8	13.4	244	0.8680	1.0400	120	100	120	105
1CX50	6	1.7					1.4	1.24	17.2	411	1.4	1.8	14.9	310	0.6410	0.7700	145	120	150	130
1CX70	12	1.7					1.4	1.40	19.1	513	1.4	1.8	16.5	388	0.4430	0.5300	175	140	185	155
1CX95	15	1.9	4x0.8	1.40	21.0	610	1.6	1.40	21.6	662	1.6	1.8	18.6	501	0.3200	0.3800	210	175	215	190
1CX120	15	1.9	4x0.8	1.40	22.0	710	1.6	1.40	23.7	784	1.6	2.0	21.1	621	0.2530	0.3000	240	195	240	220
1CX150	15	2.1	4x0.8	1.40	24.0	840	1.6	1.40	24.8	898	1.8	2.0	22.2	726	0.2060	0.2500	270	220	270	250
1CX185	30	2.3	4x0.8	1.40	26.0	1020	1.6	1.40	27.1	1069	2.0	2.0	24.5	884	0.1640	0.2000	305	240	305	290
1CX240	30	2.5	4x0.8	1.40	29.0	1250	1.6	1.56	30.2	1337	2.2	2.0	27.3	1106	0.1250	0.1500	335	270	250	335
1CX300	30	2.8	4x0.8	1.56	32.0	1500	2.0	1.56	33.7	1676	2.4	2.0	29.8	1336	0.1000	0.1200	370	295	395	380
1CX400	53	3.0	4x0.8	1.56	36.0	1910	2.0	1.56	37.1	2032	2.6	2.2	33.6	1690	0.0778	0.0934	410	325	455	435
1CX500	53	3.4	4x0.8	1.56	40.0	2350	2.0	1.72	41.2	2531	3.0	2.2	37.4	2120	0.0605	0.0726	435	345	490	480
1CX630	53	3.9	4x0.8	1.72	44.0	2920	2.0	1.88	46.2	3183	3.4	2.4	42.2	2709	0.0469	0.0563	485	390	560	550
1CX800	53	3.9	4x0.8	1.88	48.0	3510	2.0	1.88	52.0	4120	3.4	2.4	48.0	3430	0.0367	0.0440	525	442	640	600
1CX1000	53	4.0	4x0.8	2.04	53.0	4300	2.5	2.04	57.3	4812	3.4	2.6	52.2	4064	0.0291	0.0349	570	485	740	720

1C/PVC/AR/UNAR
LT POWER CABLE

No. of cores & cross sectional area	Min No. of Wires	Aluminium Strip / Aluminium Round Wire Armoured									UNARMOURED				Max. D.C. Resistance at 20°C	Max.A.C. Resistance at 70°C	CURRENT RATINGS			
		Thickness of PVC insulation (Nom.)	Nominal Dimensions ot Aluminium Flat Strip	Nom. Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Approx. Net Wt. of Cable	Nominal Dimensions of Armour wire	Min Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Approx. Net Wt. of Cable	Thickness of PVC insulation (Nom.)	Nom. Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Approx. Net Wt. of Cable			Direct in Ground		In Air	
																	2 Cables	3 Cables	2 Cables	3 Cables
		(mm)	(mm)	(mm)	(mm)	(Kg/Km)	(mm)	(mm)	(mm)	(Kg/Km)	(mm)	(mm)	(mm)	(Kg/Km)	Ohms/Km	Ohms/Km	Amp	Amp	Amp	Amp
1CX4	1	1.3					1.4	1.24	10.9	173	1.00	1.80	8.60	114	4.61	5.52	46	39	43	35
1CX6	1	1.3					1.4	1.24	11.4	204	1.00	1.80	9.10	142	3.08	3.69	57	49	54	44
1CX10	6	1.3					1.4	1.24	12.3	259	1.00	1.80	10.1	190	1.83	2.19	75	65	72	60
1CX16	6	1.3					1.4	1.24	13.1	320	1.00	1.80	10.8	248	1.15	1.38	94	85	92	82
1CX25	6	1.5					1.4	1.24	14.7	440	1.20	1.80	12.4	357	0.727	0.870	125	110	125	110
1CX35	6	1.5					1.4	1.24	15.7	548	1.20	1.80	13.4	458	0.524	0.627	150	135	155	130
1CX50	6	1.7					1.4	1.24	17.2	696	1.40	1.80	14.9	595	0.387	0.463	180	155	190	165
1CX70	12	1.7					1.4	1.40	19.1	930	1.40	1.80	16.5	805	0.268	0.321	220	190	235	205
1CX95	15	1.9	4x0.8	1.40	21	1200	1.6	1.40	21.6	1243	1.60	1.80	18.6	1081	0.193	0.231	265	220	275	245
1CX120	18	1.9	4x0.8	1.40	22	1460	1.6	1.40	23.7	1515	1.60	2.00	21.1	1332	0.153	0.184	300	250	310	280
1CX150	18	2.1	4x0.8	1.40	24	1770	1.6	1.40	24.8	1802	1.80	2.00	22.2	1630	0.124	0.149	340	280	345	320
1CX185	30	2.3	4x0.8	1.40	26	2170	1.6	1.40	27.1	2198	2.00	2.00	24.5	2013	0.0991	0.12	380	305	390	370
1CX240	34	2.5	4x0.8	1.40	29	2740	1.6	1.56	30.2	2822	2.20	2.00	27.3	2592	0.0754	0.091	420	345	445	425
1CX300	34	2.8	4x0.8	1.56	32	3360	2.0	1.56	33.7	3542	2.40	2.00	29.8	3202	0.0601	0.074	465	375	500	475
1CX400	53	3.0	4x0.8	1.56	36	4400	2.0	1.56	37.1	4412	2.60	2.20	33.6	4070	0.0470	0.059	500	400	570	550
1CX500	53	3.4	4x0.8	1.56	40	5450	2.0	1.72	41.2	5585	3.00	2.20	37.4	5175	0.0366	0.046	540	425	610	590
1CX630	53	3.9	4x0.8	1.72	44	6820	2.0	1.88	46.2	7138	3.40	2.40	42.2	6664	0.0283	0.037	590	470	680	660
1CX800	53	3.9	4x0.8	1.88	48	8595	2.0	1.88	52.0	9000	3.40	2.40	48.0	8248	0.0221	0.031	664	530	766	743
1CX1000	53	4.0	4x0.8	2.04	53	10663	2.5	2.04	57.3	11167	3.40	2.60	52.2	10419	0.0176	0.027	733	585	856	830

No. of cores & cross sectional Area	Min No. of Wires	Thickness of PVC insulation (Nom.)	Min. Thickness of PVC Inner Sheath	ARMOURED								UNARMOURED			Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS		
				Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)					Direct in Ground	In Duct	In Air
		(mm)	(mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (kg/km)	Wire (kg/km)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps	Amps
2Cx1.5	1	0.80	0.30	-	1.40	-	1.24	-	13.5	-	390	1.8	10.40	170	18.10	21.72	0.126	0.140	18	16	16
2Cx2.5	1	0.90	0.30	-	1.40	-	1.24	-	15.0	-	450	1.80	11.90	210	12.10	14.52	0.119	0.150	25	21	21
2Cx4	1	1.00	0.30	-	1.40	-	1.24	-	16.5	-	550	1.80	13.40	265	7.41	8.89	0.116	0.160	32	27	27
2Cx6	1	1.00	0.30	-	1.40	-	1.24	-	17.5	-	640	1.80	14.40	320	4.61	5.53	0.110	0.190	40	34	35
2Cx10	1	1.00	0.30	-	1.40	-	1.24	-	19.0	-	703	1.80	16.50	338	3.08	3.70	0.100	0.220	55	45	47
2Cx16	6	1.00	0.30	4x0.8	1.60	1.40	1.40	18.8	20.4	528	795	1.80	18.60	317	1.91	2.29	0.097	0.290	70	58	59
2Cx25	6	1.20	0.30	4x0.8	1.60	1.40	1.40	20.8	22.4	658	887	2.00	20.40	461.0	1.20	1.44	0.097	0.320	90	76	78
2Cx35	6	1.20	0.30	4x0.8	1.60	1.40	1.40	21.8	23.4	747	976	2.00	21.40	537.0	0.868	1.04	0.097	0.370	110	92	99
2Cx50	6	1.40	0.30	4x0.8	1.60	1.40	1.56	24.3	26.2	923	1198	2.00	23.90	683.0	0.641	0.77	0.094	0.370	135	115	125
2Cx70	12	1.40	0.30	4x0.8	1.60	1.56	1.56	26.7	28.3	1124	1411	2.00	26.00	838.0	0.443	0.53	0.090	0.440	160	140	150
2Cx95	15	1.60	0.40	4x0.8	2.00	1.56	1.56	30.2	32.6	1411	1915	2.20	29.90	1107.0	0.320	0.38	0.090	0.440	190	170	185
2Cx120	15	1.60	0.40	4x0.8	2.00	1.56	1.72	31.7	34.4	1613	2170	2.20	31.40	1291.0	0.253	0.30	0.087	0.490	210	190	210
2Cx150	15	1.80	0.40	4x0.8	2.00	1.72	1.72	35.4	37.8	1948	2553	2.40	35.20	1592.0	0.206	0.25	0.087	0.490	240	210	240
2Cx185	30	2.00	0.50	4x0.8	2.00	1.88	1.88	39.1	41.5	2357	3013	2.40	38.50	1933.0	0.164	0.20	0.087	0.490	275	240	275
2Cx240	30	2.20	0.50	4x0.8	2.50	2.04	2.04	42.5	45.9	2880	3908	2.60	42.00	2424.0	0.125	0.15	0.087	0.500	320	275	325
2Cx300	30	2.40	0.60	4x.08	2.50	2.20	2.20	48.5	51.9	3500	4675	2.80	48.10	2981.0	0.100	0.12	0.086	0.520	355	305	365
2Cx400	53	2.60	0.70	4x0.8	3.15	2.36	2.52	55.5	60.5	4560	6560	3.20	52.50	3755.0	0.0778	0.09	0.086	0.530	385	345	420

LT/2CORE/AR/UNAR

No. of cores & cross sectional Area	Min No. of Wires	Thickness of PVC insulation (Nom.)	Min. Thickness of PVC Inner Sheath	ARMOURED								UNARMOURED			Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS		
				Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)					Direct in Ground	In Duct	In Air
		(mm)	(mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (kg/km)	Wire (kg/km)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps	Amps
2Cx1.5	1	0.80	0.30	-	1.40	-	1.24	-	13.5	-	407	1.80	10.4	194	12.1	14.5	0.126	0.14	23	20	20
2Cx2.5	1	0.90	0.30	-	1.40	-	1.24	-	15.0	-	482	1.80	11.9	248	7.4	8.87	0.119	0.15	32	27	27
2Cx4	1	1.00	0.30	-	1.40	-	1.24	-	16.5	-	596	1.80	13.4	316	4.6	5.52	0.116	0.16	41	35	35
2Cx6	1	1.00	0.30	-	1.40	-	1.24	-	17.5	-	711	1.80	14.4	397	3.08	3.69	0.110	0.19	50	44	45
2Cx10	6	1.00	0.30	-	1.40	-	1.24	-	19.0	-	863	1.80	15.9	515	1.83	2.19	0.100	0.22	70	58	60
2Cx16	6	1.00	0.30	4x0.8	1.60	1.40	1.40	18.8	20.4	721	917	1.80	18.0	531	1.115	1.38	0.097	0.29	90	75	78
2Cx25	6	1.20	0.30	4x0.8	1.60	1.40	1.40	20.8	22.4	965	1193	2.00	20.4	767	0.722	0.87	0.097	0.32	115	97	105
2Cx35	6	1.20	0.30	4x0.8	1.60	1.40	1.40	21.8	23.4	1176	1405	2.00	21.4	966	0.524	0.627	0.097	0.37	140	120	125
2Cx50	6	1.40	0.30	4x0.8	1.60	1.40	1.56	24.3	26.2	1494	1768	2.00	23.9	1254	0.387	0.463	0.094	0.37	165	145	155
2Cx70	12	1.40	0.30	4x0.8	1.60	1.56	1.56	26.7	28.3	1963	2250	2.00	26.0	1677	0.268	0.321	0.090	0.44	205	180	195
2Cx95	15	1.60	0.40	4x0.8	2.00	1.56	1.56	30.2	32.6	2577	3081	2.20	29.9	2274	0.193	0.231	0.090	0.44	240	215	230
2Cx120	18	1.60	0.40	4x0.8	2.00	1.56	1.72	31.7	34.4	3082	3639	2.20	31.4	2760	0.153	0.184	0.087	0.49	275	235	265
2Cx150	18	1.80	0.40	4x0.8	2.00	1.72	1.72	35.4	37.8	3765	4369	2.40	35.2	3409	0.124	0.149	0.087	0.49	310	270	305
2Cx185	30	2.00	0.50	4x0.8	2.00	1.88	1.88	39.5	41.5	4626	5281	2.40	38.5	4101	0.0991	0.120	0.087	0.49	350	300	350
2Cx240	34	2.20	0.50	4x0.8	2.50	2.04	2.04	42.5	45.9	5865	6893	2.60	42.0	5409	0.0754	0.091	0.087	0.50	405	345	410
2Cx300	34	2.40	0.60	4x.08	2.50	2.20	2.20	48.5	51.9	7250	8424	2.80	48.1	6732	0.0601	0.073	0.086	0.52	450	385	465
2Cx400	53	2.60	0.70	4x0.8	3.15	2.36	2.52	55.5	60.5	9188	11171	3.20	52.5	8466	0.0470	0.059	0.086	0.53	490	425	530

2CORE PVC ARMOURED/UNARMOURED

No. of cores & cross sectional Area	Min No. of Wires	Thickness of PVC insulation (Nom.)	Min. Thickness of PVC Inner Sheath	ARMOURED								UNARMOURED			Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS		
				Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)					Direct in Ground	In Duct	In Air
		(mm)	(mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (kg/km)	Wire (kg/km)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps	Amps
3Cx1.5	1	0.8	0.3	-	1.40	-	1.24	-	14.0	-	420	1.80	11.0	190	18.10	21.72	0.126	0.140	16	14	13
3Cx2.5	1	0.9	0.3	-	1.40	-	1.24	-	15.0	-	500	1.80	12.0	230	12.10	14.52	0.119	0.150	21	18	18
3Cx4	1	1.0	0.3	-	1.40	-	1.24	-	16.5	-	595	1.80	13.4	300	7.41	8.89	0.116	0.410	28	23	23
3Cx6	1	1.0	0.3	-	1.40	-	1.24	-	17.5	-	685	1.80	14.4	350	4.61	5.53	0.110	0.470	35	30	30
3Cx10	1	1.0	0.3	-	1.40	-	1.40	-	19.5	-	830	1.80	15.6	435	3.08	3.70	0.100	0.560	46	39	40
3Cx16	6	1.0	0.3	4x0.8	1.60	1.40	1.40	18.6	20.2	569	767	1.80	18.4	415	1.91	2.29	0.097	0.760	60	50	51
3Cx25	6	1.2	0.3	4x0.8	1.60	1.40	1.40	21.3	22.9	750	971	2.00	21.5	586	1.20	1.44	0.097	0.860	76	63	70
3Cx35	6	1.2	0.3	4x0.8	1.60	1.40	1.40	23.1	24.7	888	1129	2.00	23.3	705	0.868	1.04	0.097	0.980	92	77	86
3Cx50	6	1.4	0.3	4x0.8	1.60	1.56	1.56	26.6	28.2	1147	1436	2.00	26.5	913	0.641	0.77	0.094	1.020	110	95	105
3Cx70	12	1.4	0.4	4x0.8	2.00	1.56	1.56	29.6	32.0	1426	1914	2.20	29.9	1187	0.443	0.53	0.090	1.180	135	115	130
3Cx95	15	1.6	0.4	4x0.8	2.00	1.56	1.72	33.5	36.2	1815	2420	2.20	33.8	1538	0.320	0.38	0.090	1.200	165	140	155
3Cx120	15	1.6	0.4	4x0.8	2.00	1.72	1.72	37.0	39.4	2166	2796	2.20	37.0	1829	0.253	0.30	0.087	1.310	185	155	180
3Cx150	15	1.8	0.5	4x0.8	2.00	1.88	1.88	40.1	42.4	2584	3249	2.40	40.1	2228	0.206	0.25	0.087	1.310	210	175	205
3Cx185	30	2.0	0.5	4x0.8	2.50	1.88	2.04	44.2	47.9	3099	4246	2.60	44.6	2743	0.164	0.20	0.087	1.310	235	200	240
3Cx240	30	2.2	0.6	4x0.8	2.50	2.20	2.20	50.3	53.7	3945	5171	2.80	50.7	3541	0.125	0.15	0.087	1.340	275	235	280
3Cx300	30	2.4	0.6	4x0.8	2.50	2.36	2.36	55.0	58.4	4731	6085	3.00	55.5	4296	0.100	0.12	0.086	1.410	305	260	315
3Cx400	53	2.6	0.7	4x0.8	3.15	2.52	2.68	62.6	67.6	5927	8135	3.40	63.8	5537	0.0778	0.09	0.086	1.450	335	290	375

3CORE AL ARMOURED/UNARMOURED

No. of cores & cross sectional Area	Min No. of Wires	Thickness of PVC insulation (Nom.)	Min. Thickness of PVC Inner Sheath	ARMOURED								UNARMOURED			Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS		
				Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)					Direct in Ground	In Duct	In Air
		(mm)	(mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (kg/km)	Wire (kg/km)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps	Amps
3Cx1.5	1	0.8	0.3		1.40	-	1.24	-	14.0	-	442	1.80	11.00	218	12.1	14.5	0.126	0.14	21	17	17
3Cx2.5	1	0.9	0.3	-	1.40	-	1.24	-	15.0	-	542	1.80	12.00	284	7.41	8.87	0.119	0.15	27	24	24
3Cx4	1	1.0	0.3	-	1.40	-	1.24	-	16.5	-	663	1.80	13.50	372	4.61	5.52	0.116	0.41	36	30	30
3Cx6	1	1.0	0.3		1.40	-	1.24	-	17.5	-	789	1.80	14.40	470	3.08	3.69	0.110	0.47	45	38	39
3Cx10	1	1.0	0.3	_	1.40	-	1.40	-	19.5	-	1017	1.80	15.60	629	1.83	2.19	0.100	0.56	60	50	57
3Cx16	6	1.0	0.3	4x0.8	1.60	1.40	1.40	18.6	20.2	859	1057	1.80	18.40	705	1.15	1.38	0.097	0.76	77	64	66
3Cx25	6	1.2	0.3	4x0.8	1.60	1.40	1.40	21.3	22.9	1210	1431	2.00	21.50	1046	0.727	0.87	0.097	0.86	99	81	90
3Cx35	6	1.2	0.3	4x0.8	1.60	1.40	1.40	23.1	24.7	1532	1773	2.00	23.30	1350	0.524	0.627	0.097	0.98	120	99	110
3Cx50	6	1.4	0.3	4x0.8	1.60	1.56	1.56	26.6	28.2	2016	2305	2.00	26.50	1783	0.387	0.463	0.094	1.02	145	125	135
3Cx70	12	1.4	0.4	4x0.8	2.00	1.56	1.56	29.6	32.0	2684	3173	2.20	29.90	2446	0.268	0.321	0.090	1.18	175	150	165
3Cx95	15	1.6	0.4	4x0.8	2.00	1.56	1.72	33.5	36.2	3564	4169	2.20	33.80	3286	0.193	0.231	0.090	1.20	210	175	200
3Cx120	18	1.6	0.4	4x0.8	2.00	1.72	1.72	37.0	39.4	4371	5001	2.20	37.00	4034	0.153	0.184	0.087	1.31	240	195	230
3Cx150	18	1.8	0.5	4x0.8	2.00	1.88	1.88	40.1	42.4	5309	5974	2.40	40.10	4954	0.124	0.149	0.087	1.31	270	225	265
3Cx185	30	2.0	0.5	4x0.8	2.50	1.88	2.04	44.2	47.9	6502	7648	2.60	44.60	6145	0.0991	0.12	0.087	1.31	300	255	305
3Cx240	34	2.2	0.6	4x0.8	2.50	2.20	2.20	51.3	53.7	8422	9648	2.80	50.70	8018	0.0754	0.0912	0.087	1.34	345	295	355
3Cx300	34	2.4	0.6	4x0.8	2.50	2.36	2.36	55.0	58.4	10356	11710	3.00	55.50	9920	0.0601	0.0739	0.086	1.41	385	335	400
3Cx400	53	2.6	0.7	4x0.8	3.15	2.52	2.68	62.6	67.6	13107	15315	3.40	63.80	12717	0.047	0.0592	0.086	1.45	425	360	455

3CORE X PVC X AR/UNAR

3.5 CORE ALUMINIUM PVC ARMOURED POWER CABLES

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of PVC insulation (Nom.)	Min. Thickness of PVC Inner Sheath	Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS		
																	Direct in Ground	In Duct	In Air
			(mm)	(mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (kg/km)	Wire (kg/km)	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps	Amps
AYWY/AYFY	3.5CX25/16	6/6	1.2/1.0	0.3	4x0.8	1.60	1.40	1.40	23.8	25.4	882	1128	1.2000	1.44	0.097	0.86	76	63	70
AYWY/AYFY	3.5CX35/16	6/6	1.2/1.0	0.3	4x0.8	1.60	1.40	1.40	24.8	26.4	1000	1263	0.8680	1.04	0.097	0.98	92	77	86
AYWY/AYFY	3.5CX50/25	6/6	1.4/1.2	0.3	4x0.8	1.60	1.56	1.56	28.4	30.0	1289	1583	0.6410	0.77	0.094	1.02	100	95	105
AYWY/AYFY	3.5CX70/35	12/6	1.4/1.2	0.4	4x0.8	2.00	1.56	1.56	32.5	34.9	1640	2184	0.4430	0.53	0.090	1.18	135	115	130
AYWY/AYFY	3.5CX95/50	15/6	1.6/1.4	0.4	4X0.8	2.00	1.56	1.72	36.2	38.9	2075	2716	0.3200	0.38	0.090	1.20	165	140	155
AYWY/AYFY	3.5Cx120/70	15/12	1.6/1.4	0.5	4x0.8	2.00	1.72	1.88	39.3	42.1	2502	3203	0.2530	0.30	0.087	1.31	185	155	180
AYWY/AYFY	3.5Cx150/70	15/12	1.8/1.4	0.5	4x0.8	2.00	1.88	1.88	44.00	46.4	2950	3680	0.2060	0.25	0.087	1.31	210	175	205
AYWY/AYFY	3.5Cx185/95	30/15	2.0/1.6	0.5	4x0.8	2.50	2.04	2.04	48.8	52.2	3610	4813	0.1640	0.20	0.087	1.31	235	200	240
AYWY/AYFY	3.5Cx240/120	30/15	2.2/1.6	0.6	4x0.8	2.50	2.20	2.36	55.2	58.9	4526	5715	0.1250	0.15	0.087	1.34	275	235	280
AYWY/AYFY	3.5C300/150	30/15	2.4/1.8	0.6	4x0.8	3.15	2.36	2.52	59.7	64.7	5400	7531	0.1000	0.12	0.086	1.41	305	260	315
AYWY/AYFY	3.50x400/185	53/30	2.6/2.0	0.7	4x0.8	3.15	2.68	2.68	68.6	73.3	6827	9211	0.0778	0.09	0.086	1.45	335	290	375

3.5 CORE ALUMINIUM PVC UNARMOURED POWER CABLES

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of PVC insulation (Nom.)	Min. Thickness of PVC Inner Sheath	Nominal Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)	Max.D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	Approx. Reactance at 50 Hz	Approx. Capacitance	CURRENT RATINGS		
												Direct in Ground	In Duct	In Air
			(mm)	(mm)	(mm)	(mm)	kg/km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps	Amps
AYY	3.5Cx25/16	6/6	1.2/1.0	0.30	2.00	24.00	692	1.20	1.44	0.097	0.86	76	63	70
AYY	3.5Cx35/16	6/6	1.2/1.0	0.30	2.00	25.00	799	0.868	1.04	0.097	0.98	92	77	86
AYY	3.5Cx50/25	6/6	1.4/12	0.30	2.00	28.30	1034	0.641	0.77	0.094	1.02	110	95	105
AYY	3.5Cx70/35	12/6	1.4/12	0.40	2.20	32.80	1373	0.443	0.53	0.090	1.18	135	115	130
AYY	3.5Cx95/50	15/6	1.6/1.4	0.40	2.20	36.50	1771	0.320	0.38	0.090	1.20	165	140	155
AYY	3.5Cx120/70	18/12	1.6/1.4	0.50	2.40	39.70	2180	0.253	0.30	0.087	1.31	185	155	180
AYY	3.5Cx150/70	18/12	1.8/1.4	0.50	2.40	44.00	2554	0.206	0.25	0.087	1.31	210	175	205
AYY	3.5Cx185/95	30/15	2.0/1.6	0.50	2.60	48.90	3176	0.164	0.20	0.087	1.31	235	200	240
AYY	3.5Cx240/120	34/18	2.2/1.6	0.60	3.00	56.00	4128	0.125	0.15	0.087	1.34	275	235	280
AYY	3.5Cx300/150	34/18	2.4/1.8	0.60	3.20	60.60	4989	0.100	0.12	0.086	1.41	305	260	315
AYY	3.5Cx400/185	53/30	2.6/2.0	0.70	3.40	69.40	6344	0.0778	0.09	0.086	1.45	335	290	375

3.5 CORE COPPER PVC ARMOURED POWER CABLES

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of PVC insulation (Nom.)	Min. Thickness of PVC Inner Sheath	Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS		
																	Direct in Ground	In Duct	In Air
			(mm)	(mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (kg/km)	Wire (kg/km)	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps	Amps
YWY/YFY	3.5CX25/16	6/6	1.2/1.0	0.3	4x0.8	1.60	1.40	1.40	23.8	25.4	1438	1685	0.727	0.87	0.097	0.86	99	81	90
YWY/YFY	3.5CX35/16	6/6	1.2/1.0	0.3	4x0.8	1.60	1.40	1.40	24.8	26.4	1741	2004	0.524	0.627	0.097	0.98	120	99	110
YWY/YFY	3.5CX50/25	6/6	1.4/1.2	0.3	4x0.8	1.60	1.56	1.56	28.4	30.0	2313	2606	0.387	0.463	0.094	1.02	145	125	135
YWY/YFY	3.5CX70/35	12/6	1.4/1.2	0.4	4x0.8	2.00	1.56	1.56	32.5	34.9	3113	3657	0.268	0.321	0.090	1.18	175	150	165
YWY/YFY	3.5CX95/50	15/6	1.6/1.4	0.4	4X0.8	2.00	1.56	1.72	36.2	38.9	4115	4756	0.193	0.231	0.090	1.20	210	175	200
YWY/YFY	3.5Cx120/70	18/12	1.6/1.4	0.5	4x0.8	2.00	1.72	1.88	39.3	42.1	5125	5827	0.153	0.184	0.087	1.31	240	195	230
YWY/YFY	3.5Cx150/70	18/12	1.8/1.4	0.5	4x0.8	2.00	1.88	1.88	44.00	46.4	6095	6825	0.124	0.149	0.087	1.31	270	225	265
YWY/YFY	3.5Cx185/95	30/15	2.0/1.6	0.5	4x0.8	2.50	2.04	2.04	48.8	52.2	7595	8799	0.0991	0.120	0.087	1.31	300	255	305
YWY/YFY	3.5Cx240/120	34/18	2.2/1.6	0.6	4x0.8	2.50	2.20	2.36	55.2	58.9	9738	11128	0.0754	0.0912	0.087	1.34	345	295	355
YWY/YFY	3.5C300/150	34/18	2.4/1.8	0.6	4x0.8	3.15	2.36	2.52	59.7	64.7	11945	14064	0.0601	0.0739	0.086	1.41	385	335	400
YWY/YFY	3.5Cx400/185	53/30	2.6/2.0	0.7	4x0.8	3.15	2.68	2.68	68.6	73.3	15139	17523	0.0470	0.0592	0.086	1.45	425	360	455

3.5 CORE COPPER PVC UNARMOURED POWER CABLES

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of PVC insulation (Nom.)	Min. Thickness of PVC Inner Sheath	Nominal Thickness of PVC Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)	Max.D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	Approx. Reactance at 50 Hz	Approx. Capacitance	CURRENT RATINGS		
												Direct in Ground	In Duct	In Air
			(mm)	(mm)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps	Amps
YY	3.5Cx25/16	6/6	1.2/1.0	0.30	2.00	24.00	1248	0.73	0.87	0.097	0.86	99	81	90
YY	3.5Cx35/16	6/6	1.2/1.0	0.30	2.00	25.00	1541	0.524	0.627	0.097	0.98	120	99	110
YY	3.5Cx50/25	6/6	1.4/1.2	0.30	2.00	28.30	2058	0.387	0.463	0.094	1.02	145	125	135
YY	3.5Cx70/35	12/6	1.4/1.2	0.40	2.20	32.80	2845	0.268	0.321	0.090	1.18	175	150	165
YY	3.5CX95/50	15/6	1.6/1.4	0.40	2.20	31.50	3810	0.193	0.231	0.090	1.20	210	175	200
YY	3.5CX120/70	18/12	1.6/1.4	0.50	2.40	39.70	4804	0.153	0.184	0.087	1.31	240	195	230
YY	3.5Cx150/70	18/12	1.8/1.4	0.50	2.40	44.00	5699	0.124	0.149	0.087	1.31	270	225	265
YY	3.5Cx185/95	30/15	2.0/1.6	0.50	2.60	48.90	7161	0.099	0.1200	0.087	1.31	300	255	305
YY	3.5Cx240/120	34/18	2.2/1.6	0.60	3.00	56.00	9340	0.075	0.0912	0.087	1.34	345	295	355
YY	3.5Cx300/150	34/18	2.4/1.8	0.60	3.20	60.60	11521	0.060	0.0739	0.086	1.41	385	335	400
YY	3.5Cx400/185	53/30	2.6/2.0	0.70	3.40	69.40	14651	0.0470	0.0592	0.086	1.45	425	360	455

No. of cores & cross sectional area	Min No. of Wires	Thickness of PVC insulation (Nom.)	Min. Thickness of PVC Inner Sheath	ARMOURED								UNARMOURED			Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS		
				Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)					Direct in Ground	In Duct	In Air
		(mm)	(mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (kg/km)	Wire (kg/km)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps	Amps
4CX1.5	1	0.8	0.3	-	1.40	-	1.24	-	14.5	-	470	1.80	11.70	210	18.10	21.72	0.126	0.140	16	14	13
4CX2.5	1	0.9	0.3	-	1.40	-	1.24	-	16.0	-	560	1.80	13.20	270	12.10	14.52	0.119	0.150	21	18	18
4CX4	1	1.0	0.3	-	1.40	-	1.24	-	17.5	-	675	1.80	15.00	340	7.41	8.89	0.116	0.410	28	23	23
4CX6	1	1.0	0.3	-	1.40	-	1.24	-	19.0	-	800	1.80	16.00	420	4.61	5.53	0.110	0.470	35	30	30
4CX10	1	1.0	0.3	4X0.8	1.60	1.40	1.40	21.5	23.0	800	1030	1.80	19.00	510	3.08	3.70	0.100	0.560	46	39	40
4CX16	6	1.0	0.3	4X0.8	1.60	1.40	1.40	22.2	23.8	727	966	2.00	22.40	553	1.91	2.29	0.097	0.760	60	50	51
4CX25	6	1.2	0.3	4X0.8	1.60	1.40	1.40	23.6	25.2	915	1165	2.00	23.80	728	1.20	1.44	0.097	0.860	76	63	70
4CX35	6	1.2	0.3	4X0.8	1.60	1.40	1.56	25.9	27.8	1097	1396	2.00	26.10	886	0.868	1.04	0.097	0.980	92	77	86
4CX50	6	1.4	0.4	4X0.8	2.00	1.56	1.56	30.3	32.7	1432	1935	2.20	30.60	1187	0.641	0.77	0.094	1.020	110	95	105
4CX70	12	1.4	0.4	4X0.8	2.00	1.56	1.56	33.4	35.8	1781	2326	2.20	33.70	1505	0.443	0.53	0.090	1.180	135	115	130
4CX95	15	1.6	0.4	4X0.8	2.00	1.72	1.72	38.2	40.6	2311	2948	2.40	38.60	1997	0.320	0.38	0.090	1.200	165	140	155
4CX120	15	1.6	0.5	4X0.8	2.00	1.88	1.88	41.7	44.1	2762	3453	2.40	41.70	2390	0.253	0.30	0.087	1.310	185	155	180
4CX150	15	1.8	0.5	4X0.8	2.50	1.88	2.04	44.7	48.4	3246	4387	2.60	45.10	2885	0.206	0.25	0.087	1.310	210	175	205
4CX185	30	2.0	0.6	4X0.8	2.50	2.04	2.20	50.1	53.8	3982	5245	2.80	50.80	3615	0.164	0.20	0.087	1.310	235	200	240
4CX240	30	2.2	0.6	4X0.8	2.50	2.36	2.36	56.7	60.1	5038	6445	3.00	57.20	4587	0.125	0.15	0.087	1.340	275	235	280
4CX300	30	2.4	0.7	4X0.8	3.15	2.52	2.68	62.9	68.0	6109	8376	3.40	64.10	5716	0.100	0.12	0.086	1.410	305	260	315
4CX400	53	2.6	0.7	4X0.8	3.15	2.84	2.84	70.6	75.3	7640	10124	3.60	71.50	7157	0.0778	0.09	0.086	1.450	335	290	375

No. of cores & cross sectional area	Min No. of Wires	Thickness of PVC insulation (Nom.)	Min. Thickness of PVC Inner Sheath	ARMOURED								UNARMOURED			Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 70°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS		
				Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)					Direct in Ground	In Air	In Duct
		(mm)	(mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (kg/km)	Wire (kg/km)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps	Amps
4CX1.5	1	0.8	0.3	-	1.40	-	1.24	-	14.5	-	503	1.80	11.70	256	12.1	14.5	0.126	0.14	21	17	17
4CX2.5	1	0.9	0.3	-	1.40	-	1.24	-	16.0	-	616	1.80	13.20	335	7.4	8.87	0.119	0.15	27	24	24
4CX4	1	1.0	0.3	-	1.40	-	1.24	-	17.5	-	771	1.80	15.00	446	4.6	5.52	0.116	0.41	36	30	30
4CX6	1	1.0	0.3	-	1.40	-	1.24	-	19.0	-	947	1.80	16.00	576	3.1	3.69	0.110	0.47	45	39	38
4CX10	6	1.0	0.3	4X0.8	1.60	1.40	1.40	21.5	23.0	1045	1273	1.80	19.00	773	1.8	2.19	0.100	0.56	60	57	50
4CX16	6	1.0	0.3	4X0.8	1.60	1.40	1.40	22.2	23.8	1113	1352	2.00	22.40	940	1.2	1.38	0.097	0.76	77	66	64
4CX25	6	1.2	0.3	4X0.8	1.60	1.40	1.40	23.6	25.2	1529	1779	2.00	23.80	1342	0.727	0.87	0.097	0.86	99	90	81
4CX35	6	1.2	0.3	4X0.8	1.60	1.40	1.56	25.9	27.8	1955	2254	2.00	26.10	1744	0.524	0.62	0.097	0.98	120	110	99
4CX50	6	1.4	0.4	4X0.8	2.00	1.56	1.56	30.3	32.7	2593	3096	2.20	30.60	2347	0.387	0.46	0.094	1.02	145	135	125
4CX70	12	1.4	0.4	4X0.8	2.00	1.56	1.56	33.4	35.8	3459	4015	2.20	33.70	3183	0.268	0.32	0.090	1.18	175	165	150
4CX95	15	1.6	0.4	4X0.8	2.00	1.72	1.72	38.2	40.6	4643	5280	2.40	38.60	4330	0.193	0.23	0.090	1.20	210	200	175
4CX120	18	1.6	0.5	4X0.8	2.00	1.88	1.88	41.7	44.1	5702	6393	2.40	41.70	5330	0.153	0.18	0.087	1.31	240	230	195
4CX150	18	1.8	0.5	4X0.8	2.50	1.88	2.04	44.7	48.4	6872	8012	2.60	45.10	6511	0.124	0.14	0.087	1.31	270	265	225
4CX185	30	2.0	0.6	4X0.8	2.50	2.04	2.20	50.1	53.8	8519	9782	2.80	50.80	8152	0.0991	0.12	0.087	1.31	300	305	255
4CX240	34	2.2	0.6	4X0.8	2.50	2.36	2.36	56.7	60.1	11008	12415	3.00	57.20	10557	0.0754	0.091	0.087	1.34	345	355	295
4CX300	34	2.4	0.7	4X0.8	3.15	2.52	2.68	62.9	68.0	13610	15877	3.40	64.10	13218	0.0601	0.073	0.086	1.41	385	400	335
4CX400	53	2.6	0.7	4X0.8	3.15	2.84	2.84	70.6	75.3	17213	19697	3.60	71.50	16729	0.0470	0.059	0.086	1.45	425	455	360

PT. TIF

CURRENT RATINGS (XLPE)

Basic assumption and conditions of installation :

Max. Conductor Temperature at Continuous Operation..................................90°C
Ambient Air Temperature...40°C
Ground Temperature..30°C
Thermal resistivity of Soil..150°C Cm/Watt
Depth of Laying...750mm
Max. Conductor Temperature for Short Circuit...250°C

Rating factors for variation in Ground Temperature :

Ground temperature °C	15	20	25	30	35	40
Rating factor	1.12	1.08	1.03	1.0	0.96	0.91

Rating factors for variation in Ambient Air Temperature

Ground temperature °C	25	30	35	40	45	50
Rating factor	1.14	1.10	1.04	1.00	0.95	0.90

Rating factors for cables laid directly in ground in Horizontal Formation

No. of cables	Distance of cables			
	Touching	15 cm	30 cm	45 cm
2 cables	0.79	0.82	0.87	0.90
3 cables	0.69	0.75	0.79	0.83
4 cables	0.62	0.69	0.74	0.79
5 cables	0.58	0.65	0.72	0.76
6 cables	0.54	0.61	0.69	0.75

Rating factors for variation in Depth of Laying in Ground

Depth of laying	Size		
	Upto 25 mm2	25 to 300 mm²	Above 300 mm²
75cm	1.00	1.00	1.00
90cm	0.99	0.98	0.97
105cm	0.98	0.97	0.96
120cm	0.97	0.96	0.95
150cm	0.96	0.94	0.92
180cm	0.95	0.93	0.91

1 CORE ALUMINIUM XLPE ARMOURED & UNARMOURED POWER CABLES

No. of cores & cross sectional area (No. x Sqmm)	Min. No. of wires	Aluminium Strip/Aluminium Round Wire Armoured									UNARMOURED						Current Ratings	
		Thickness of XLPE insulation (Nom.) (mm)	Nominal Dimensions of Aluminium Flat Strip. (mm)	Minimum Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx) (mm)	Approx. Net Wt. of Cable (Kg/ Km)	Nominal Dimensions of Armour Wire (mm)	Min Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx) (mm)	Approx. Net Wt. of Cable (Kg/ Km)	Thickness of XLPE insulation (Nom.) (mm)	Nom. Thickness of Outer Sheath (mm)	Overall Diameter (Approx) (mm)	Approx. Net Wt. of Cable (Kg/ Km)	Max. D.C. Resistance at 20°c Ohms/ Km	Max. A.C. Resistance at 90°c Ohms/ Km	Direct in Ground Amps	In Air Amps
1C X 4	1	-					-	-	-	-	0.7	1.8	7.5	60	7.41	9.48	36	31
1C X 4	6	-					-	-	-	-	0.7	1.8	8.0	65	7.41	9.48	36	31
1C X 6	1	-					-	-	-	-	0.7	1.8	8.0	70	4.61	5.9	44	39
1C X 6	6	-					-	-	-	-	0.7	1.8	8.5	75	4.61	5.9	44	39
1C X 10	1	1.0					-	-	-	-	0.7	1.8	9	80	3.08	3.94	59	53
1C X 10	6	1.0					-	-	-	-	0.7	1.8	9.5	90	3.08	3.94	59	53
1C X 16	6	1.0					1.4	1.24	13.0	220	0.7	1.8	10.0	115	1.91	2.44	76	73
1C X 25	6	1.20					1.40	1.24	14.1	253	0.90	1.80	11.8	177	1.200	1.5400	97	99
1C X 35	6	1.20					1.40	1.24	15.1	297	0.90	1.80	12.8	215	0.868	1.1100	116	112
1C X 50	6	1.30					1.40	1.24	16.4	358	1.00	1.80	14.1	270	0.641	0.8200	139	149
1C X 70	12	1.40					1.40	1.24	18.2	448	1.10	1.80	15.9	347	0.443	0.567	171	190
1C X 95	15	1.40	4x0.8	1.40	21.0	560	1.60	1.40	20.6	588	1.10	1.80	17.6	438	0.320	0.4100	204	235
1C X 120	15	1.50	4x0.8	1.40	22.0	660	1.60	1.40	22.9	701	1.20	1.80	20.3	556	0.253	0.3250	231	276
1C X 150	15	1.70	4x0.8	1.40	23.0	750	1.60	1.40	24.0	806	1.40	2.00	21.4	652	0.206	0.2650	259	321
1C X 185	30	1.90	4x0.8	1.40	25.0	900	1.60	1.40	26.3	966	1.60	2.00	23.7	795	0.164	0.2110	292	371
1C X 240	30	2.00	4x0.8	1.40	27.5	1100	1.60	1.40	28.9	1179	1.70	2.00	26.3	991	0.125	0.1620	342	447
1C X 300	30	2.10	4x0.8	1.56	30.0	1350	1.60	1.56	31.5	1421	1.80	2.00	28.6	1193	0.100	0.1300	384	515
1C X 400	53	2.40	4x0.8	1.56	34.0	1725	2.00	1.56	35.9	1836	2.00	2.20	32.4	1519	0.0778	0.1023	440	606
1C X 500	53	2.60	4x0.8	1.56	37.5	2090	2.00	1.56	39.3	2232	2.20	2.20	35.8	1887	0.0605	0.0808	500	705
1C X 630	53	2.80	4x0.8	1.72	40.5	2525	2.00	1.72	43.6	2773	2.40	2.20	39.8	2360	0.0469	0.0648	565	823
1C X 800	53	3.10	4x0.8	1.72	46.5	3150	2.00	1.88	50.0	3730	2.60	2.40	46.0	3100	0.0362	0.0530	629	949
1C X 1000	53	3.30	4x0.8	1.88	54.0	3963	2.5	2.04	55.9	4411	2.80	2.60	51.0	3735	0.0291	0.0444	704	1076

LT SINGLE CORE/AR/UNAR

No. of cores & cross sectional area (No. x Sqmm)	Min. No. of wires	Aluminium Strip/Aluminium Round Wire Armoured									UNARMOURED				Max. D.C. Resistance at 20°c Ohms/ Km	Max. A.C. Resistance at 90°c Ohms/ Km	Current Ratings	
		Thickness of XLPE insulation (Nom.) (mm)	Nominal Dimensions of Aluminium Flat Strip. (mm)	Minimum Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx) (mm)	Approx. Net Wt. of Cable (Kg/ Km)	Nominal Dimensions of Armour Wire (mm)	Min Thickness of PVC Outer Sheath (mm)	Overall Diameter (Approx) (mm)	Approx. Net Wt. of Cable (Kg/ Km)	Thickness of XLPE insulation (Nom.) (mm)	Nom. Thickness of Outer Sheath (mm)	Overall Diameter (Approx) (mm)	Approx. Net Wt. of Cable (Kg/ Km)			Direct in Ground Amps	In Air Amps
1C x 4	1	-						-	-	-	0.7	1.8	7.5	91	4.61	5.90	46	40
1C x 4	6	-						-	-	-	0.7	1.8	8.0	95	4.61	5.90	46	40
1C x 6	1	-						-	-	-	0.7	1.8	8.0	115	3.08	3.94	57	51
1C x 6	6	-						-	-	-	0.7	1.8	8.5	125	3.08	3.94	57	51
1C x 10	6	1.0					1.40	1.24	12.0	245	0.7	1.8	9.5	170	1.83	2.34	76	71
1C x 16	6	1.0					1.40	1.24	13.0	315	0.7	1.8	10.0	220	1.15	1.47	97	95
1C x 25	6	1.20					1.60	1.24	14.1	407	0.90	1.8	11.8	330	0.727	0.930	125	126
1C x 35	6	1.20					1.60	1.24	15.1	511	0.90	1.8	12.8	428	0.524	0.671	153	158
1C x 50	6	1.30					1.60	1.24	16.4	643	1.00	1.8	14.1	554	0.387	0.495	181	194
1C x 70	12	1.40					1.60	1.24	18.2	866	1.10	1.8	15.9	764	0.268	0.343	217	249
1C x 95	15	1.40	4x0.8	1.40	21.0	1150	1.60	1.40	20.6	1168	1.10	1.8	17.6	1018	0.193	0.247	264	307
1C x 120	18	1.50	4x0.8	1.40	22.0	1400	1.60	1.40	22.9	1432	1.20	1.8	20.3	1287	0.153	0.196	296	357
1C x 150	18	1.70	4x0.8	1.40	23.0	1680	2.00	1.40	24.0	1710	1.40	2.0	21.4	1556	0.124	0.159	333	411
1C x 185	30	1.90	4x0.8	1.40	25.0	2040	2.00	1.40	26.3	2095	1.60	2.0	23.7	1924	0.0991	0.127	375	479
1C x 240	34	2.00	4x0.8	1.40	27.5	2580	2.00	1.40	28.9	2664	1.70	2.0	26.3	2476	0.0754	0.0965	434	569
1C x 300	34	2.10	4x0.8	1.56	30.0	3200	2.00	1.56	31.5	3287	1.80	2.0	28.6	3058	0.0601	0.0769	490	659
1C x 400	53	2.40	4x0.8	1.56	34.0	4200	2.5	1.56	35.9	4217	2.00	2.2	32.4	3899	0.0470	0.0608	556	769
1C x 500	53	2.60	4x0.8	1.56	37.5	5180	2.00	1.56	39.3	5286	2.20	2.2	35.8	4941	0.0366	0.0468	620	877
1C x 630	53	2.80	4x0.8	1.72	40.5	6425	2.00	1.72	43.6	6728	2.40	2.2	39.8	6315	0.0283	0.0362	695	1013
1C x 800	53	3.10	4x0.8	1.72	46.5	8100	2.00	1.88	50.0	8250	2.60	2.4	46.0	7676	0.0221	0.0283	758	1148
1C x 1000	53	3.30	4x0.8	1.88	54.0	10150	2.5	2.04	55.9	10766	2.80	2.6	51.0	10090	0.0176	0.0225	834	1275

LT SINGLE CORE/AR/UNAR

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of PVC Inner Sheath (mm)	Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Dia.meter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capacitance	CURRENT RATINGS	
					Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (mm)	Wire (mm)	Strip (Kg/Km)	Wire (Kg/Km)					Direct in Ground	In Air
			(mm)	(mm)									Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
A2XWY	2CX4	1	0.7	0.3	-	1.40	-	1.24	-	14.9	*	482	7.4100	9.4800	0.0927	0.22	43	39
A2XWY	2CX4	6	0.7	0.3	-	1.40	-	1.24	-	15.5	-	506	7.4100	9.4800	0.0927	0.22	43	39
A2XWY	2CX6	1	0.7	0.3	-	1.40	-	1.24	-	16.0	-	540	4.6100	5.9000	0.0884	0.25	55	50
A2XWY	2CX6	6	0.7	0.3	-	1.40	-	1.24	-	16.6	-	561	4.6100	5.9000	0.0884	0.25	55	50
A2XWY	2CX10	1	0.7	0.3	-	1.40	-	1.24	-	17.7	-	650	3.0800	3.9400	0.0837	0.31	71	67
A2XWY	2CX10	6	0.7	0.3	-	1.40	-	1.24	-	18.5	-	695	3.0800	3.9400	0.0837	0.31	71	67
A2XWY	2CX16	6	0.7	0.3	-	1.40	-	1.4	-	18.8	-	673	1.9100	2.4400	0.0808	0.36	91	88
A2XWY/A2XFY	2CX25	6	0.90	0.3	4X0.8	1.60	1.40	1.40	19.6	21.2	582	797	1.2000	1.5400	0.080	0.20	120	117
A2XWY/A2XFY	2CX35	6	0.90	0.3	4X0.8	1.60	1.40	1.40	20.6	22.2	664	880	0.8680	1.1100	0.080	0.23	143	145
A2XWY/A2XFY	2CX50	6	1.00	0.3	4X0.8	1.60	1.40	1.40	22.7	24.3	808	1056	0.6410	0.8200	0.078	0.24	167	176
A2XWY/A2XFY	2CX70	12	1.10	0.3	4X0.8	1.60	1.56	1.56	25.5	27.1	1013	1287	0.4430	0.5670	0.077	0.26	204	221
A2XWY/A2XFY	2CX95	15	1.10	0.4	4X0.8	2.00	1.56	1.56	28.4	30.8	1255	1738	0.3200	0.4100	0.074	0.29	245	271
A2XWY/A2XFY	2CX120	15	1.20	0.4	4X0.8	2.00	1.56	1.56	30.3	32.7	1464	1967	0.2530	0.3250	0.072	0.29	278	316
A2XWY/A2XFY	2CX150	15	1.40	0.4	4X0.8	2.00	1.72	1.72	33.8	36.2	1754	2334	0.2060	0.2650	0.072	0.29	315	362
A2XWY/A2XFY	2CX185	30	1.60	0.5	4X0.8	2.00	1.72	1.88	37.1	39.9	2105	2763	0.1640	0.2110	0.072	0.29	356	420
A2XWY/A2XFY	2CX240	30	1.70	0.5	4X0.8	2.50	1.88	2.04	40.2	43.9	2556	3568	0.1250	0.1620	0.072	0.31	407	497
A2XWY/A2XFY	2CX300	30	1.80	0.6	4X0.8	2.50	2.04	2.20	45.8	49.5	3102	4273	0.1000	0.1300	0.071	0.33	463	578
A2XWY/A2XFY	2CX400	53	2.00	0.6	4X0.8	2.50	2.36	2.36	50.0	54.0	4230	5600	0.0778	0.1023	0.070	0.33	528	678

LT 2C/AR

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of Inner Sheath	Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)	Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
												Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
A2XY	2Cx4	1	0.7	0.3	1.8	13.2	204	7.4100	9.48	0.0927	0.22	43	39
A2XY	2Cx4	6	0.7	0.3	1.8	13.8	219	7.4100	9.4800	0.0927	0.22	43	39
A2XY	2Cx6	1	0.7	0.3	1.8	14.2	239	4.6100	5.9000	0.0884	0.25	55	50
A2XY	2Cx6	6	0.7	0.3	1.8	14.8	255	4.6100	5.9000	0.0884	0.25	55	50
A2XY	2Cx10	1	0.7	0.3	1.8	15.8	303	3.0800	3.9400	0.0837	0.31	71	67
A2XY	2Cx10	6	0.7	0.3	1.8	16.8	331	3.0800	3.9400	0.0837	0.31	71	67
A2XY	2Cx16	6	0.7	0.3	1.8	14.0	225	1.9100	2.4400	0.0808	0.36	91	88
A2XY	2Cx25	6	0.90	0.3	2.00	19.2	400	1.2000	1.5400	0.080	0.20	120	117
A2XY	2Cx35	6	0.90	0.3	2.00	20.2	469	0.8680	1.1100	0.080	0.23	143	145
A2XY	2Cx50	6	1.00	0.3	2.00	22.3	588	0.6410	0.8200	0.078	0.24	167	176
A2XY	2Cx70	12	1.10	0.3	2.00	24.8	743	0.4430	0.5670	0.077	0.26	204	221
A2XY	2Cx95	15	1.10	0.4	2.20	28.1	974	0.3200	0.4100	0.074	0.29	245	271
A2XY	2Cx120	15	1.20	0.4	2.20	30.0	1159	0.2530	0.3250	0.072	0.29	278	316
A2XY	2Cx150	15	1.40	0.4	2.20	33.2	1386	0.2060	0.2650	0.072	0.29	315	362
A2XY	2Cx185	30	1.60	0.5	2.40	36.9	1728	0.1640	0.2110	0.072	0.29	356	420
A2XY	2Cx240	30	1.70	0.5	2.60	40.0	2155	0.1250	0.1620	0.072	0.31	407	497
A2XY	2Cx300	30	1.80	0.6	2.80	45.7	2649	0.1000	0.1300	0.071	0.33	463	578
A2XY	2Cx400	53	2.00	0.6	3.00	49.0	3530	0.0778	0.1023	0.070	0.33	528	678

LT 2C/UNAR

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of PVC Inner Sheath	Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
					Strip	Wire	Strip	Wire	Strip	Wire	Strip	Wire					Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/Km)	(Kg/Km)	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
2XWY	2CX4	1	0.7	0.3	-	1.4	-	1.24	-	14.9	-	531	4.6100	5.9000	0.0927	0.22	56	51
2XWY	2CX4	6	0.7	0.3	-	1.4	-	1.24	-	15.5	-	555	4.6100	5.9000	0.0927	0.22	56	51
2XWY	2CX6	1	0.7	0.3	-	1.4	-	1.24	-	16.0	-	614	3.0800	3.9400	0.0884	0.25	71	64
2XWY	2CX6	6	0.7	0.3	-	1.4	-	1.24	-	16.6	-	639	3.0800	3.9400	0.0884	0.25	71	64
2XWY	2CX10	6	0.7	0.3	-	1.4	-	1.24	-	18.5	-	817	1.8300	2.3400	0.0837	0.31	92	88
2XWY	2CX16	6	0.7	0.3	-	1.4	-	1.40	-	18.8	-	866	1.1500	1.4700	0.0808	0.36	116	113
2XWY/2XFY	2CX25	6	0.90	0.3	4X0.8	1.60	1.40	1.40	19.6	21.2	889	1103	0.7270	0.9300	0.0800	0.20	157	153
2XWY/2XFY	2CX35	6	0.90	0.3	4X0.8	1.60	1.40	1.40	20.6	22.2	1093	1309	0.5240	0.6710	0.0800	0.23	180	186
2XWY/2XFY	2CX50	6	1.00	0.3	4X0.8	1.60	1.40	1.40	22.7	24.3	1379	1626	0.3870	0.4950	0.0780	0.24	218	226
2XWY/2XFY	2CX70	12	1.10	0.3	4X0.8	1.60	1.56	1.56	25.5	27.1	1852	2126	0.2680	0.3430	0.0770	0.26	264	284
2XWY/2XFY	2CX95	15	1.10	0.4	4X0.8	2.00	1.56	1.56	28.4	30.8	2422	2904	0.1930	0.2470	0.0740	0.29	314	348
2XWY/2XFY	2CX120	18	1.20	0.4	4X0.8	2.00	1.56	1.56	30.3	32.7	2933	3436	0.1530	0.1960	0.0720	0.29	357	402
2XWY/2XFY	2CX150	18	1.40	0.4	4X0.8	2.00	1.72	1.72	33.8	36.2	3571	4150	0.1240	0.1590	0.0720	0.29	403	461
2XWY/2XFY	2CX185	30	1.60	0.5	4X0.8	2.00	1.72	1.88	37.1	39.9	4373	5032	0.0991	0.1270	0.0720	0.29	453	533
2XWY/2XFY	2CX240	34	1.70	0.5	4X0.8	2.50	1.88	2.04	40.2	43.9	5541	6553	0.0754	0.0965	0.0720	0.31	518	633
2XWY/2XFY	2CX300	34	1.80	0.6	4X0.8	2.50	2.04	2.20	45.8	49.5	6854	8024	0.0601	0.0769	0.0710	0.33	583	732
2XWY/2XFY	2CX400	53	2.00	0.6	4X0.8	2.50	2.36	2.36	50.0	54.0	8437	9688	0.0470	0.0602	0.0700	0.33	658	841

2C/AR

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of Inner Sheath	Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)	Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
												Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
2XY	2Cx4	1	0.7	0.3	1.8	13.2	254	4.6100	5.9000	0.0927	0.22	56	51
2XY	2Cx4	6	0.7	0.3	1.8	13.8	268	4.6100	5.9000	0.0927	0.22	56	51
2XY	2Cx6	1	0.7	0.3	1.8	14.2	314	3.0800	3.9400	0.0884	0.25	71	64
2XY	2Cx6	6	0.7	0.3	1.8	14.8	328	3.0800	3.9400	0.0884	0.25	71	64
2XY	2Cx10	6	0.7	0.3	1.8	16.8	455	1.8300	2.3400	0.0837	0.31	92	88
2XY	2Cx16	6	0.7	0.3	2.00	14.0	425	1.1500	1.4700	0.0808	0.36	116	113
2XY	2Cx25	6	0.90	0.3	2.00	19.2	706	0.727	0.930	0.080	0.20	152	153
2XY	2Cx35	6	0.90	0.3	2.00	20.2	898	0.524	0.671	0.080	0.23	180	186
2XY	2Cx50	6	1.00	0.3	2.00	22.3	1158	0.387	0.495	0.078	0.24	218	226
2XY	2Cx70	12	1.10	0.3	2.00	24.8	1582	0.268	0.343	0.077	0.26	264	284
2XY	2Cx95	15	1.10	0.4	2.20	28.1	2140	0.193	0.247	0.074	0.29	314	348
2XY	2Cx120	18	1.20	0.4	2.20	30.0	2628	0.153	0.196	0.072	0.29	357	402
2XY	2Cx150	18	1.40	0.4	2.20	33.2	3202	0.124	0.159	0.072	0.29	403	461
2XY	2Cx185	30	1.60	0.5	2.40	36.9	3997	0.0991	0.127	0.072	0.29	453	533
2XY	2Cx240	34	1.70	0.5	2.60	40.0	5140	0.0754	0.0965	0.072	0.31	518	633
2XY	2Cx300	34	1.80	0.6	2.80	45.7	6400	0.0601	0.0769	0.071	0.33	583	732
2XY	2Cx400	53	2.00	0.6	3.00	49.0	7732	0.0470	0.0602	0.070	0.33	658	841

2C/UNAR

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of PVC Inner Sheath	Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
					Strip	Wire	Strip	Wire	Strip	Wire	Strip	Wire					Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/Km)	(Kg/Km)	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
A2XWY	3Cx4	1	0.7	0.3	-	1.40	-	1.24	-	15.5	-	487	7.4100	9.4800	0.0927	0.22	34	31
A2XWY	3Cx4	6	0.7	0.3	-	1.40	-	1.24	-	16.1	-	524	7.4100	9.4800	0.0927	0.22	34	31
A2XWY	3Cx6	1	0.7	0.3	-	1.40	-	1.24	-	16.6	-	561	4.6100	5.9000	0.0884	0.25	43	40
A2XWY	3Cx6	6	0.7	0.3	-	1.40	-	1.24	-	17.4	-	587	4.6100	5.9000	0.0884	0.25	43	40
A2XWY	3Cx10	1	0.7	0.3	-	1.40	-	1.24	-	18.5	-	686	3.0800	3.9400	0.0837	0.31	57	53
A2XWY	3Cx10	6	0.7	0.3	-	1.40	-	1.24	-	19.4	-	736	3.0800	3.9400	0.0837	0.31	57	53
A2XWY/A2XFY	3Cx16	6	0.7	0.3	4x0.8	1.60	1.24	1.40	17.8	19.7	530	822	1.9100	2.4400	0.0808	0.36	73	70
A2XWY/A2XFY	3Cx25	6	0.9	0.3	4x0.8	1.60	1.4	1.40	20.1	21.7	769	861	1.2000	1.5400	0.08	0.2	97	95
A2XWY/A2XFY	3Cx35	6	0.9	0.3	4x0.8	1.60	1.4	1.40	22.2	23.8	918	1028	0.8680	1.1100	0.08	0.23	116	117
A2XWY/A2XFY	3Cx50	6	1	0.3	4x0.8	1.60	1.4	1.56	24.6	26.5	1111	1252	0.6410	0.8200	0.078	0.24	134	140
A2XWY/A2XFY	3Cx70	12	1.1	0.4	4x0.8	2.00	1.56	1.56	28.9	31.3	1472	1790	0.4430	0.5670	0.077	0.26	167	176
A2XWY/A2XFY	3Cx95	15	1.1	0.4	4x0.8	2.00	1.56	1.56	31.1	33.5	1575	2091	0.3200	0.4100	0.074	0.29	199	221
A2XWY/A2XFY	3Cx120	15	1.2	0.4	4x0.8	2.00	1.56	1.72	35.7	38.4	2153	2549	0.2530	0.3250	0.072	0.29	227	258
A2XWY/A2XFY	3Cx150	15	1.4	0.5	4x0.8	2.00	1.72	1.88	39.2	42.0	2317	3020	0.2060	0.2650	0.072	0.29	255	294
A2XWY/A2XFY	3Cx185	30	1.6	0.5	4x0.8	2.50	1.88	2.04	43.3	47.0	2808	3940	0.1640	0.2110	0.072	0.29	287	339
A2XWY/A2XFY	3Cx240	30	1.7	0.6	4x0.8	2.50	2.04	2.20	46.3	50.0	3453	4616	0.1250	0.1620	0.072	0.31	333	402
A2XWY/A2XFY	3Cx300	30	1.8	0.6	4x0.8	2.50	2.2	2.36	51.6	55.3	4169	5495	0.1000	0.1300	0.071	0.33	375	461
A2XWY/A2XFY	3Cx400	53	2.0	0.7	4x0.8	3.15	2.52	2.68	58.4	63.5	5267	8041	0.0778	0.1023	0.07	0.33	426	542

LT 3C/AR

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of Inner Sheath	Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)	Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
												Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
A2XY	3Cx4	1	0.7	0.3	1.8	13.8	224	7.4100	9.4800	0.0927	0.22	34	31
A2XY	3Cx4	6	0.7	0.3	1.8	14.5	238	7.4100	9.4800	0.0927	0.22	34	31
A2XY	3Cx6	1	0.7	0.3	1.8	14.9	265	4.6100	5.9000	0.0884	0.25	43	40
A2XY	3Cx6	6	0.7	0.3	1.8	15.5	265	4.6100	5.9000	0.0884	0.25	43	40
A2XY	3Cx10	1	0.7	0.3	1.8	16.6	340	3.0800	3.9400	0.0837	0.31	57	53
A2XY	3Cx10	6	0.7	0.3	1.8	17.7	368	3.0800	3.9400	0.0837	0.31	57	53
A2XY	3Cx16	6	0.7	0.3	1.8	17.9	361	1.9100	2.4400	0.0808	0.36	73	70
A2XY	3Cx25	6	0.90	0.30	2	20.3	502	1.2000	1.5400	0.080	0.20	97	95
A2XY	3Cx35	6	0.90	0.30	2	22.4	616	0.8680	1.1100	0.080	0.23	116	117
A2XY	3Cx50	6	1.00	0.30	2	25.0	782	0.6410	0.8200	0.078	0.24	134	140
A2XY	3Cx70	12	1.10	0.40	2.2	29.2	1059	0.4430	0.5670	0.077	0.26	167	176
A2XY	3Cx95	15	1.10	0.40	2.2	31.4	1322	0.3200	0.4100	0.074	0.29	199	221
A2XY	3Cx120	15	1.20	0.40	2.2	36.0	1626	0.2530	0.3250	0.072	0.29	227	258
A2XY	3Cx150	15	1.40	0.50	2.4	39.6	1997	0.2060	0.2650	0.072	0.29	255	294
A2XY	3Cx185	30	1.60	0.50	2.6	43.7	2461	0.1640	0.2110	0.072	0.29	287	339
A2XY	3Cx240	30	1.70	0.60	2.8	47.0	3118	0.1250	0.1620	0.072	0.31	333	402
A2XY	3Cx300	30	1.80	0.60	3	52.4	3801	0.1000	0.1300	0.071	0.33	375	461
A2XY	3Cx400	53	2.00	0.70	3.2	59.2	4853	0.0778	0.1023	0.070	0.33	426	542

LT 3C/UNAR

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of PVC Inner Sheath	Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
					Strip	Wire	Strip	Wire	Strip	Wire	Strip	Wire					Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/Km)	(Kg/Km)	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
2XWY	3CX4	1	0.7	0.3	-	1.4	-	1.24	-	15.5	-	561	4.6100	5.9000	0.0927	0.22	44	40
2XWY	3CX4	6	0.7	0.3	-	1.4	-	1.24	-	16.1	-	598	4.6100	5.9000	0.0.927	0.22	44	40
2XWY	3CX6	1	0.7	0.3	-	1.4	-	1.24	-	16.6	-	673	3.0800	3.9400	0.0884	0.25	55	51
2XWY	3CX6	6	0.7	0.3	-	1.4	-	1.24	-	17.4	-	697	3.0800	3.9400	0.0884	0.25	55	51
2XWY	3CX10	6	0.7	0.3	-	1.4	-	1.24	-	19.9	-	922	1.8300	2.3400	0.0837	0.31	73	70
2XWY/2XFY	3CX16	6	0.7	0.3	4X0.8	1.60	1.24	1.40	17.8	19.7	885	1112	1.1500	1.4700	0.0808	0.36	97	90
2XWY/2XFY	3CX25	6	0.90	0.3	4X0.8	1.60	1.40	1.40	20.1	21.7	1230	1450	0.7270	0.9300	0.0800	0.20	125	122
2XWY/2XFY	3CX35	6	0.90	0.3	4X0.8	1.60	1.40	1.40	22.2	23.8	1563	1803	0.5240	0.6710	0.0800	0.23	148	148
2XWY/2XFY	3CX50	6	1.00	0.3	4X0.8	1.60	1.40	1.56	24.6	26.5	1980	2272	0.3870	0.4950	0.0780	0.24	175	181
2XWY/2XFY	3CX70	12	1.10	0.4	4X0.8	2.00	1.56	1.56	28.9	31.3	2730	3266	0.2680	0.3430	0.0770	0.26	213	230
2XWY/2XFY	3CX95	15	1.10	0.4	4X0.8	2.00	1.56	1.56	31.1	33.5	3521	4092	0.1930	0.2470	0.0740	0.29	254	284
2XWY/2XFY	3CX120	18	1.20	0.4	4X0.8	2.00	1.56	1.72	35.7	38.4	4358	5033	0.1530	0.1960	0.0720	0.29	292	330
2XWY/2XFY	3CX150	18	1.40	0.5	4X0.8	2.00	1.72	1.88	39.2	42.0	5263	6049	0.1240	0.1590	0.0720	0.29	325	375
2XWY/2XFY	3CX185	30	1.60	0.5	4X0.8	2.50	1.88	2.04	43.3	47.0	6503	7713	0.0991	0.1270	0.0720	0.29	366	434
2XWY/2XFY	3CX240	34	1.70	0.6	4X0.8	2.50	2.04	2.20	46.3	50.0	8278	9600	0.0754	0.0965	0.0720	0.31	421	515
2XWY/2XFY	3CX300	34	1.80	0.6	4X0.8	2.50	2.20	2.36	51.6	55.3	10191	11628	0.0601	0.0769	0.0710	0.33	472	588
2XWY/2XFY	3CX400	53	2.00	0.7	4X0.8	3.15	2.52	2.68	58.4	63.5	12950	15220	0.0470	0.0602	0.0700	0.33	528	677

LT/3C/AR

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of Inner Sheath	Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)	Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
												Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
2XY	3CX4	1	0.7	0.3	1.8	13.8	298	4.6100	5.9000	0.0927	0.22	44	40
2XY	3CX4	6	0.7	0.3	1.8	14.5	313	4.6100	5.9000	0.0927	0.22	44	40
2XY	3CX6	1	0.7	0.3	1.8	14.9	376	3.0800	3.9400	0.0884	0.25	55	51
2XY	3CX6	6	0.7	0.3	1.8	15.5	390	3.0800	3.9400	0.0884	0.25	55	51
2XY	3CX10	6	0.7	0.3	1.8	17.7	554	1.8300	2.3400	0.0837	0.31	73	70
2XY	3CX16	6	0.7	0.3	1.8	17.9	639	1.1500	1.4700	0.0808	0.36	97	90
2XY	3CX25	6	0.90	0.3	2.0	20.3	962	0.7270	0.930	0.0800	0.20	125	122
2XY	3CX35	6	0.90	0.3	2.0	22.4	1260	0.5240	0.671	0.0800	0.23	148	148
2XY	3CX50	6	1.00	0.3	2.0	25.0	1651	0.3870	0.495	0.0780	0.24	175	181
2XY	3CX70	12	1.10	0.4	2.2	29.2	2317	0.2680	0.343	0.0770	0.26	213	230
2XY	3CX95	15	1.10	0.4	2.2	31.4	3071	0.1930	0.247	0.0740	0.29	254	284
2XY	3CX120	18	1.20	0.4	2.2	36.0	3831	0.1530	0.196	0.0720	0.29	292	330
2XY	3CX150	18	1.40	0.5	2.4	39.6	4722	0.1240	0.159	0.0720	0.29	325	375
2XY	3CX185	30	1.60	0.5	2.6	43.7	5863	0.0991	0.127	0.0720	0.29	366	434
2XY	3CX240	34	1.70	0.6	2.8	47.0	7595	0.0754	0.0965	0.0720	0.31	421	515
2XY	3CX300	34	1.80	0.6	3.0	52.2	9426	0.0601	0.0769	0.0710	0.33	472	588
2XY	3CX400	53	2.00	0.7	3.2	59.2	12032	0.0470	0.0602	0.0700	0.33	528	677

LT/3C/UNAR

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of PVC Inner Sheath	Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Diameter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
					Strip	Wire	Strip	Wire	Strip	Wire	Strip	Wire					Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/Km)	(Kg/Km)	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
A2XWY/A2XFY	3.5Cx25	6/6	0.9/0.7	0.3	4X0.8	1.60	1.40	1.40	22.2	23.8	760	999	1.2000	1.5400	0.080	0.70	97	95
A2XWY/A2XFY	3.5Cx35	6/6	0.9/0.7	0.3	4X0.8	1.60	1.40	1.40	23.9	25.5	885	1146	0.8680	1.1100	0.080	0.23	116	117
A2XWY/A2XFY	3.5Cx50	6/6	1.0/0.9	0.3	4X0.8	1.60	1.40	1.56	27.1	29.0	1114	1427	0.6410	0.8200	0.078	0.24	134	140
A2XWY/A2XFY	3.5Cx70	12/6	1.1/0.9	0.4	4X0.8	2.00	1.56	1.56	31.6	34.0	1473	2006	0.4430	0.5670	0.077	0.26	167	176
A2XWY/A2XFY	3.5Cx95	15/6	1.1/1.0	0.4	4X0.8	2.00	1.56	1.56	35.2	37.6	1834	2436	0.3200	0.4100	0.074	0.29	199	221
A2XWY/A2XFY	3.5Cx120	15/12	1.2/1.1	0.4	4X0.8	2.00	1.72	1.72	37.8	40.2	2220	2863	0.2530	0.3250	0.072	0.29	227	258
A2XWY/A2XFY	3.5Cx150	15/12	1.4/1.1	0.5	4X0.8	2.00	1.72	1.88	42.4	45.2	2623	3378	0.2060	0.2650	0.072	0.29	255	294
A2XWY/A2XFY	3.5Cx185	30/15	1.6/1.1	0.5	4X0.8	2.50	1.88	2.04	46.0	49.7	3179	4339	0.1640	0.2110	0.072	0.29	287	339
A2XWY/A2XFY	3.5Cx240	30/15	1.7/1.2	0.6	4X0.8	2.50	2.04	2.20	51.7	55.4	3981	5298	0.1250	0.162	0.072	0.31	333	402
A2XWY/A2XFY	3.5Cx300	30/15	1.8/1.4	0.6	4X0.8	2.50	2.20	2.36	55.6	59.3	4750	6172	0.1000	0.1300	0.071	0.33	375	461
A2XWY/A2XFY	3.5Cx400	53/30	2.0/1.6	0.7	4X0.8	3.15	2.52	2.68	64.1	69.2	6030	8341	0.0778	0.1023	0.070	0.33	426	542

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of Inner Sheath	Nom. Thickness of Outer Sheath	Overall Diameter (Approx.)	Net Wt. of Cable (Approx.)	Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
												Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
A2XY	3.50x25	6/6	0.9/0.7	0.3	2.00	22.4	587	1.2000	1.5400	0.080	0.20	97	95
A2XY	3.50x35	6/6	0.9/0.7	0.3	2.00	24.1	694	0.8680	1.1100	0.080	0.23	116	117
A2XY	3.50x50	6/6	1.0/0.9	0.3	2.00	27.3	890	0.6410	0.8200	0.078	0.24	134	140
A2XY	3.50x70	12/6	1.1/0.9	0.4	2.20	31.9	1215	0.4430	0.5670	0.077	0.26	167	176
A2XY	3.50x95	15/6	1.1/1.0	0.4	2.20	35.5	1540	0.3200	0.4100	0.074	0.29	199	221
A2XY	3.50x120	15/12	1.2/1.1	0.4	2.20	37.8	1875	0.2530	0.3250	0.072	0.29	227	258
A2XY	3.50x150	15/12	1.4/1.1	0.5	2.40	42.8	2271	0.2060	0.2650	0.072	0.29	255	294
A2XY	3.50x185	30/15	1.6/1.1	0.5	2.60	46.4	2805	0.1640	0.2110	0.072	0.29	287	339
A2XY	3.50x240	30/15	1.7/1.2	0.6	2.80	52.4	3599	0.1250	0.1620	0.072	0.31	333	402
A2XY	3.50x300	30/15	1.8/1.4	0.6	3.00	56.4	4348	0.1000	0.1300	0.071	0.33	375	461
A2XY	3.50x400	53/30	2.0/1.6	0.7	3.40	65.3	5629	0.0778	0.1023	0.070	0.33	426	542

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of PVC Inner Sheath	Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Dia.meter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
					Strip	Wire	Strip	Wire	Strip	Wire	Strip	Wire					Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/Km)	(Kg/Km)	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
2XWY/2XFY	3.5CX25/16	6/6	0.9/0.7	0.3	4X0.8	1.60	1.40	1.40	22.2	23.8	1316	1556	0.727	0.930	0.080	0.20	125	122
2XWY/2XFY	3.5CX35/16	6/6	0.9/0.7	0.3	4X0.8	1.60	1.40	1.40	23.9	25.5	1626	1887	0.524	0.671	0.080	0.23	148	148
2XWY/2XFY	3.5CX50/25	6/6	1.0/0.9	0.3	4X0.8	1.60	1.40	1.56	27.1	29.0	2137	2627	0.387	0.495	0.078	0.24	175	181
2XWY/2XFY	3.5CX70/35	12/6	1.1/0.9	0.4	4X0.8	2.00	1.56	1.56	31.6	34.0	2946	3479	0.268	0.343	0.077	0.26	213	230
2XWY/2XFY	3.5CX95/50	15/6	1.1/1.0	0.4	4X0.8	2.00	1.56	1.56	35.2	37.6	3874	4476	0.193	0.247	0.074	0.29	254	284
2XWY/2XFY	3.5CX120/70	18/12	1.2/1.1	0.4	4X0.8	2.00	1.72	1.72	37.8	40.2	4844	5487	0.153	0.196	0.072	0.29	292	330
2XWY/2XFY	3.5CX150/70	18/15	1.4/1.1	0.5	4X0.8	2.00	1.72	1.88	42.4	45.2	5768	6523	0.124	0.159	0.072	0.29	325	375
2XWY/2XFY	3.5CX185/95	30/15	1.6/1.1	0.5	4X0.8	2.50	1.88	2.04	46.0	49.7	7164	8325	0.0991	0.127	0.072	0.29	366	434
2XWY/2XFY	3.5CX240/120	34/18	1.7/1.2	0.6	4X0.8	2.50	2.04	2.20	51.7	55.4	9193	10510	0.0754	0.0965	0.072	0.31	421	515
2XWY/2XFY	3.5CX300/150	34/18	1.8/1.4	0.6	4X0.8	2.50	2.20	2.36	55.6	59.3	11282	12705	0.0601	0.0769	0.071	0.33	472	588
2XWY/2XFY	3.5CX400/185	53/30	2.0/1.6	0.7	4X0.8	3.15	2.52	2.68	64.1	69.2	14342	16653	0.0470	0.0602	0.070	0.33	528	677

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of Inner Sheath	Nom. Thickness of Outer Sheath	Overall Dia.meter (Approx.)	Net Wt. of Cable (Approx.)	Max. D.C. Resistance at 20°C	Max. A.C. Resistance at at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
												Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
2XY	3.5CX25/16	6/6	0.9/0.7	0.3	2.00	22.4	1143	0.727	0.930	0.080	0.20	125	122
2XY	3.5CX35/16	6/6	0.9/0.7	0.3	2.00	24.1	1436	0.524	0.671	0.080	0.23	148	148
2XY	3.5CX50/25	6/6	1.0/0.9	0.3	2.00	27.3	1914	0.387	0.495	0.078	0.24	175	181
2XY	3.5CX70/35	12/6	1.1/0.9	0.4	2.20	31.9	2688	0.268	0.343	0.077	0.26	213	230
2XY	3.5CX95/50	15/6	1.1/1.0	0.4	2.20	35.5	3579	0.193	0.247	0.074	0.29	254	284
2XY	3.5CX120/70	18/12	1.2/1.1	0.4	2.20	37.8	4498	0.153	0.196	0.072	0.29	292	330
2XY	3.5CX150/70	18/15	1.4/1.1	0.5	2.40	42.8	5416	0.124	0.159	0.072	0.29	325	375
2XY	3.5CX185/95	30/15	1.6/1.1	0.5	2.60	46.4	6791	0.0991	0.127	0.072	0.29	366	434
2XY	3.5CX240/120	34/18	1.7/1.2	0.6	2.80	52.4	8812	0.0754	0.0965	0.072	0.31	421	515
2XY	3.5CX300/150	34/18	1.8/1.4	0.6	3.00	56.4	10881	0.0601	0.0769	0.071	0.33	472	588
2XY	3.5CX400/185	53/30	2.0/1.6	0.7	3.40	65.3	13914	0.0470	0.0602	0.070	0.33	528	677

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of PVC Inner Sheath	Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Dia.meter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
					Strip	Wire	Strip	Wire	Strip	Wire	Strip	Wire					Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/Km)	(Kg/Km)	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
A2XWY	4Cx4	1	0.7	0.3	-	1.40	-	1.24	-	16.5	-	542	7.410	9.4800	0.0927	0.22	34	31
A2XWY	4Cx4	6	0.7	0.3	-	1.40	-	1.24	-	17.2	-	581	7.410	9.4800	0.0927	0.22	34	31
A2XWY	4Cx6	1	0.7	0.3	-	1.40	-	1.24	-	17.8	-	625	4.610	5.9000	0.0884	0.25	43	40
A2XWY	4Cx6	6	0.7	0.3	-	1.40	-	1.24	-	18.5	-	653	4.610	5.9000	0.0884	0.25	43	40
A2XWY	4Cx10	1	0.7	0.3	-	1.40	-	1.40	-	20.5	-	837	3.080	3.9400	0.0837	0.31	57	53
A2XWY	4Cx10	6	0.7	0.3	-	1.40	-	1.40	-	21.8	-	899	3.080	3.9400	0.0837	0.31	57	53
A2XWY/A2XFY	4Cx16	6	0.7	0.3	4X0.8	1.60	1.40	1.40	21.2	22.8	686	896	1.910	2.4500	0.0808	0.36	73	70
A2XWY/A2XFY	4Cx25	6	0.9	0.3	4X0.8	1.60	1.40	1.40	22.2	23.8	829	1051	1.200	1.5400	0.0800	0.20	97	95
A2XWY/A2XFY	4Cx35	6	0.9	0.3	4X0.8	1.60	1.40	1.40	24.4	26.0	992	1236	0.868	1.1100	0.0800	0.23	116	117
A2XWY/A2XFY	4Cx50	6	1.0	0.3	4X0.8	1.6	1.56	1.56	27.9	29.5	1246	1525	0.641	0.8200	0.0780	0.24	134	140
A2XWY/A2XFY	4Cx70	12	1.1	0.4	4X0.8	2.00	1.56	1.56	31.7	34.1	1606	2132	0.443	0.5670	0.0770	0.26	167	176
A2XWY/A2XFY	4Cx95	15	1.1	0.4	4X0.8	2.00	1.56	1.72	35.2	37.9	1975	2606	0.320	0.4100	0.0740	0.29	199	221
A2XWY/A2XFY	4Cx120	15	1.2	0.5	4X0.8	2.00	1.72	1.88	39.1	41.9	2422	3102	0.253	0.3250	0.0720	0.29	227	258
A2XWY/A2XFY	4Cx150	15	1.4	0.5	4X0.8	2.50	1.88	2.04	42.6	46.3	2892	3985	0.206	0.2650	0.0720	0.29	255	294
A2XWY/A2XFY	4Cx185	30	1.6	0.5	4X0.8	2.50	2.04	2.20	47.8	51.5	3542	4761	0.164	0.2110	0.0720	0.29	287	339
A2XWY/A2XFY	4Cx240	30	1.7	0.6	4X0.8	2.50	2.20	2.36	53.8	57.5	4453	5824	0.125	0.1620	0.0720	0.31	333	402
A2XWY/A2XFY	4Cx300	30	1.8	0.7	4X0.8	3.15	2.36	2.52	59.5	64.5	5394	7518	0.100	0.1300	0.0710	0.33	375	461
A2XWY/A2XFY	4Cx400	53	2.0	0.7	4X0.8	3.15	2.68	2.84	67.1	72.1	6779	9179	0.0778	0.1023	0.0700	0.33	426	542

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of Inner Sheath	Nom. Thickness of Outer Sheath	Overall Dia.meter (Approx.)	Net Wt. of Cable (Approx.)	Max. D.C. Resistance at 20°C	Max. A.C. Resistance at at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
												Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
A2XY	4Cx4	1	0.7	0.3	1.8	14.8	257	7.4100	9.4800	0.0927	0.22	34	31
A2XY	4Cx4	6	0.7	0.3	1.8	15.5	275	7.4100	9.4800	0.0927	0.22	34	31
A2XY	4Cx6	1	0.7	0.3	1.8	16.0	308	4.6100	5.9000	0.0884	0.25	43	40
A2XY	4Cx6	6	0.7	0.3	1.8	16.7	325	4.6100	5.9000	0.0884	0.25	43	40
A2XY	4Cx10	1	0.7	0.3	1.8	17.9	400	3.0800	3.9400	0.0837	0.31	57	53
A2XY	4Cx10	6	0.7	0.3	1.8	19.6	449	3.0800	3.9400	0.0837	0.31	57	53
A2XY	4Cx16	6	0.7	0.3	1.8	21.0	457	1.9100	2.4500	0.0808	0.36	73	70
A2XY	4Cx25	6	0.9	0.3	2.0	22.4	618	1.2000	1.5400	0.0800	0.20	97	95
A2XY	4Cx35	6	0.9	0.3	2.0	24.6	763	0.8680	1.1100	0.0800	0.23	116	117
A2XY	4Cx50	6	1.0	0.3	2.0	27.8	964	0.6410	0.8200	0.0780	0.24	134	140
A2XY	4Cx70	12	1.1	0.4	2.2	32.0	1321	0.4430	0.5670	0.0770	0.26	167	176
A2XY	4Cx95	15	1.1	0.4	2.2	35.5	1681	0.3200	0.4100	0.0740	0.29	199	221
A2XY	4Cx120	15	1.2	0.5	2.4	39.5	2103	0.2530	0.3250	0.0720	0.29	227	258
A2XY	4Cx150	15	1.4	0.5	2.6	43.0	2551	0.2060	0.2650	0.0720	0.29	255	294
A2XY	4Cx185	30	1.6	0.5	2.8	48.3	3164	0.1640	0.2110	0.0720	0.29	287	339
A2XY	4Cx240	30	1.7	0.6	3.0	54.6	4067	0.1250	0.1620	0.0720	0.31	333	402
A2XY	4Cx300	30	1.8	0.7	3.2	60.6	5012	0.1000	0.1300	0.0710	0.33	375	461
A2XY	4Cx400	53	2.0	0.7	3.6	68.3	6373	0.0778	0.1023	0.0700	0.33	426	542

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of PVC Inner Sheath	Nominal Dimensions of Armour		Min. Thickness of PVC Outer Sheath		Overall Dia.meter (Approx.)		Approx. Net Wt. of Cable		Max. D.C. Resistance at 20°C	Max. A.C. Resistance at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
					Strip	Wire	Strip	Wire	Strip	Wire	Strip	Wire					Direct in Ground	In Air
			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/Km)	(Kg/Km)	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
2XWY	4CX4	1	0.7	0.3	-	1.4	-	1.24	-	16.5	-	641	4.6100	5.9000	0.0927	0.22	44	40
2XWY	4CX4	6	0.7	0.3	-	1.4	-	1.24	-	17.2	-	679	4.6100	5.9000	0.0927	0.22	44	40
2XWY	4CX6	1	0.7	0.3	-	1.4	-	1.24	-	17.8	-	773	3.0800	3.9400	0.0884	0.25	55	51
2XWY	4CX6	6	0.7	0.3	-	1.4	-	1.24	-	18.5	-	800	3.0800	3.9400	0.0884	0.25	55	51
2XWY	4CX10	6	0.7	0.3	-	1.4	-	1.40	-	21.8	-	1146	1.8300	2.3400	0.0837	0.31	73	70
2XWY/2XFY	4CX16	6	0.7	0.3	4X0.8	1.6	1.40	1.40	21.2	22.8	1149	1381	1.15	1.47	0.080	0.36	97	90
2XWY/2XFY	4CX25	6	0.9	0.3	4X0.8	1.6	1.40	1.40	22.2	23.8	1536	1782	0.727	0.930	0.080	0.20	125	122
2XWY/2XFY	4CX35	6	0.9	0.3	4X0.8	1.6	1.40	1.40	24.4	26.0	1960	2230	0.524	0.671	0.080	0.23	148	148
2XWY/2XFY	4CX50	6	1.0	0.3	4X0.8	1.6	1.56	1.56	27.9	29.5	2545	2855	0.387	0.495	0.078	0.24	175	181
2XWY/2XFY	4CX70	12	1.1	0.4	4X0.8	2.0	1.56	1.56	31.7	34.1	3462	4048	0.268	0.343	0.077	0.26	213	230
2XWY/2XFY	4CX95	15	1.1	0.4	4X0.8	2.0	1.56	1.72	35.2	37.9	4535	5219	0.193	0.247	0.074	0.29	254	284
2XWY/2XFY	4CX120	18	1.2	0.5	4X0.8	2.0	1.72	1.88	39.1	41.9	5623	6373	0.153	0.196	0.072	0.29	292	330
2XWY/2XFY	4CX150	18	1.4	0.5	4X0.8	2.5	1.88	2.04	42.6	46.3	6809	7991	0.124	0.159	0.072	0.29	325	375
2XWY/2XFY	4CX185	30	1.6	0.5	4X0.8	2.5	2.04	2.20	47.8	51.5	8416	9755	0.0991	0.127	0.072	0.29	366	434
2XWY/2XFY	4CX240	34	1.7	0.6	4X0.8	2.5	2.20	2.36	53.8	57.5	10843	12360	0.0754	0.0965	0.072	0.31	421	515
2XWY/2XFY	4CX300	34	1.8	0.7	4X0.8	3.15	2.36	2.52	59.5	64.5	13402	15802	0.0601	0.0769	0.071	0.33	472	588
2XWY/2XFY	4CX400	53	2.0	0.7	4X0.8	3.15	2.68	2.84	67.1	72.1	16889	19582	0.0470	0.0602	0.070	0.33	528	677

4 CORE COPPER XLPE UNARMOURED POWER CABLES

Type	No. of cores & cross sectional area	Min No. of Wires	Thickness of insulation (Nom)	Min. Thickness of Inner Sheath (mm)	Nom. Thickness of Outer Sheath	Overall Dia.meter (Approx.)	Net Wt. of Cable (Approx.)	Max. D.C. Resistance at 20°C	Max. A.C. Resistance at at 90°C	Approx. Reactance at 50 Hz	Approx. Capaci-tance	CURRENT RATINGS	
												In Air	Direct in Ground
			(mm)	(mm)	(mm)	(mm)	Kg/Km	Ohms/Km	Ohms/Km	Ohms/Km	mFd/Km	Amps	Amps
2XY	4CX4	1	0.7	0.3	1.8	14.8	356	4.6100	5.9000	0.0927	0.22	40	44
2XY	4CX4	6	0.7	0.3	1.8	15.5	372	4.6100	5.9000	0.0927	0.22	40	44
2XY	4CX6	1	0.7	0.3	1.8	16.0	455	3.0800	3.9400	0.0884	0.25	51	55
2XY	4CX6	6	0.7	0.3	1.8	16.7	472	3.0800	3.9400	0.0884	0.25	51	55
2XY	4CX10	6	0.7	0.3	1.8	19.6	697	1.8300	2.3400	0.0837	0.31	70	73
2XY	4CX16	6	0.7	0.3	1.8	21.0	843	1.1500	1.4700	0.0800	0.36	90	97
2XY	4CX25	6	0.9	0.3	2.0	22.4	1232	0.7270	0.9300	0.0800	0.20	122	125
2XY	4CX35	6	0.9	0.3	2.0	24.6	1630	0.5240	0.6710	0.0800	0.23	148	148
2XY	4CX50	6	1.0	0.3	2.0	27.8	2125	0.3870	0.4950	0.0780	0.24	181	175
2XY	4CX70	12	1.1	0.4	2.2	32.0	3000	0.2680	0.3430	0.0770	0.26	230	213
2XY	4CX95	15	1.1	0.4	2.2	35.5	4013	0.1930	0.2470	0.0740	0.29	284	254
2XY	4CX120	18	1.2	0.5	2.4	39.5	5043	0.1530	0.1960	0.0720	0.29	330	292
2XY	4CX150	18	1.4	0.5	2.6	43.0	6176	0.1240	0.1590	0.0720	0.29	375	325
2XY	4CX185	30	1.6	0.5	2.8	48.3	7701	0.0991	0.1270	0.0720	0.29	434	366
2XY	4CX240	34	1.7	0.6	3.0	54.6	10037	0.0754	0.0965	0.0720	0.31	515	421
2XY	4CX300	34	1.8	0.7	3.2	60.6	12513	0.0601	0.0769	0.0710	0.33	588	472
2XY	4CX400	53	2.0	0.7	3.6	68.3	15945	0.0470	0.0602	0.0700	0.33	677	528

ARMOURED PVC CONTROL CABLES- IS : 1554(P-1)-1998

No. of cores & cross sectional area No.	Thickness of PVC Insulation (Nom)	Thickness of Inner Sheath (min.) extruded	Strip Armoured cable				Wire Amourned cable				Standard Delivery Length in	CURRENT RATINGS	
			Strip size	Thickness of PVC Outer Sheath (Min.)	Approx. OD	Approx. Net weight of cable	Round Wire Dia.	Thickness of PVC Outer Sheath (Min.)	Approx. OD	Approx. Net weight of cable		Direct in Ground	In Air/ Duct.
mm2	(mm)	(mm)	(mm)	(mm)	(mm)	Kg/Km	(mm)	(mm)	(mm)	Kg/Km	Mtrs.	Amps	Amps
2x1.5	0.8	0.3	-	-	-	-	1.4	1.24	13.6	415	1000	23	20
3x1.5	0.8	0.3	-	-	-	-	1.4	1.24	14.1	430	1000	21	17
4x1.5	0.8	0.3	-	-	-	-	1.4	1.24	15.0	490	1000	21	17
5x1.5	0.8	0.3	-	-	-	-	1.4	1.24	15.9	545	1000	16	14
6x1.5	0.8	0.3	-	-	-	-	1.4	1.24	16.9	605	1000	15	13
7x1.5	0.8	0.3	-	-	-	-	1.4	1.24	16.9	630	1000	14	13
10x1.5	0.8	0.3	-	-	-	-	1.4	1.40	20.6	835	1000	13	11
12x1.5	0.8	0.3	4x0.8	1.24	19.5	760	1.6	1.40	21.5	950	1000	12	10
14x1.5	0.8	0.3	4x0.8	1.40	20.8	830	1.6	1.40	22.4	1040	1000	11	10
16x1.5	0.8	0.3	4x0.8	1.40	21.7	920	1.6	1.40	23.3	1130	1000	11	9
19x1.5	0.8	0.3	4x0.8	1.40	23.1	1040	1.6	1.40	24.7	1265	1000	10	9
24x1.5	0.8	0.3	4x0.8	1.40	26.4	1250	1.6	1.40	28.0	1510	1000	9	8
27x1.5	0.8	0.3	4x0.8	1.40	26.9	1355	1.6	1.40	28.5	1610	1000	9	8
30x1.5	0.8	0.3	4x0.8	1.40	27.8	1430	1.6	1.40	29.4	1700	1000	9	7
37x1.5	0.8	0.3	4x0.8	1.40	29.7	1670	1.6	1.40	31.3	1960	1000	8	7
2x2.5	0.9	0.3	-	-	-	-	1.4	1.24	14.8	500	1000	32	27
3x2.5	0.9	0.3	-	-	-	-	1.4	1.24	15.4	520	1000	27	24
4x2.5	0.9	0.3	-	-	-	-	1.4	1.24	16.4	590	1000	27	24
5x2.5	0.9	0.3	-	-	-	-	1.4	1.24	17.5	660	1000	23	19
6x2.5	0.9	0.3	-	-	-	-	1.4	1.24	18.7	745	1000	21	18
7x2.5	0.9	0.3	-	-	-	-	1.4	1.24	18.7	780	1000	20	17
10x2.5	0.9	0.3	4x0.8	1.40	21.8	900	1.6	1.40	23.4	1110	1000	18	15
12x2.5	0.9	0.3	4x0.8	1.40	22.8	1020	1.6	1.40	24.4	1240	1000	17	14
14x2.5	0.9	0.3	4x0.8	1.40	23.8	1130	1.6	1.40	25.4	1340	1000	16	13
16x2.5	0.9	0.3	4x0.8	1.40	24.9	1210	1.6	1.40	26.5	1455	1000	15	13
19x2.5	0.9	0.3	4x0.8	1.40	26.1	1355	1.6	1.40	27.7	1605	1000	14	12
24x2.5	0.9	0.3	4x0.8	1.40	30.0	1655	1.6	1.56	32.0	1970	1000	13	11
27x2.5	0.9	0.3	4x0.8	1.40	30.6	1770	1.6	1.56	32.6	2100	1000	12	10
30x2.5	0.9	0.3	4x0.8	1.56	32.0	1940	1.6	1.56	33.6	2250	1000	12	10
37x2.5	0.9	0.4	4x0.8	1.56	34.7	2300	2.0	1.56	37.1	2900	1000	11	9

Construction:

1. Solid /Stranded Annealed Copper Conductor & Tinned /Bare
2. General purpose/ HR PVC insulation
3. Cores laid up (filled if needed)
4. FRLS/General Purpose PVC Inner sheath
5. Armouring round galvanized steel wires/strips
6. FRLS/General purpose PVC outer sheath

Max. Conductor D.C. resistance at 20°C-conductor size:

1.5 sq.mm - 12.1 Ohm/km (Bare), 12.2 Ohm/Km (Tinned)

2.5 sq. mm - 7.41 Ohms/km (Bare), 7.56 Ohm/km(Tinned)

* Dimensions specified are with stranded conductor

UNARMOURED PVC CONTROL CABLES- IS : 1554(P-1)-1988

No. of cores & cross sectional area No.	Thickness of PVC Insulation (Nom)	Thickness of Inner Sheath (min.)	Thickness of PVC Outer Sheath (Min.)	Approx. OD	Approx. Net weight of cable	Standard Delivery Length	CURRENT RATINGS	
							Direct in Ground	In Air/ Duct.
mm2	(mm)	(mm)	(mm)	(mm)	Kg/Km	In Mtrs.	Amps	Amps
2x1.5	0.8	0.3	1.8	11.8	185	1000	23	20
3x1.5	0.8	0.3	1.8	12.3	190	1000	21	17
4x1.5	0.8	0.3	1.8	13.2	225	1000	21	17
5x1.5	0.8	0.3	1.8	14.1	260	1000	16	14
6x1.5	0.8	0.3	1.8	15.1	295	1000	15	13
7x1.5	0.8	0.3	1.8	15.1	315	1000	14	13
10x1.5	0.8	0.3	1.8	18.4	425	1000	13	11
12x1.5	0.8	0.3	1.8	18.9	480	1000	12	10
14x1.5	0.8	0.3	1.8	19.8	535	1000	11	10
16x1.5	0.8	0.3	1.8	20.7	595	1000	11	9
19x1.5	0.8	0.3	2.0	22.5	720	1000	10	9
24x1.5	0.8	0.3	2.0	25.8	880	1000	9	8
27x1.5	0.8	0.3	2.0	26.3	960	1000	9	8
30x1.5	0.8	0.3	2.0	27.2	1040	1000	9	7
37x1.5	0.8	0.3	2.0	29.1	1230	1000	8	7
2x2.5	0.9	0.3	1.8	13.0	230	1000	32	27
3x2.5	0.9	0.3	1.8	13.6	240	1000	27	24
4x2.5	0.9	0.3	1.8	14.6	290	1000	27	24
5x2.5	0.9	0.3	1.8	15.7	335	1000	23	19
6x2.5	0.9	0.3	1.8	16.9	385	1000	21	18
7x2.5	0.9	0.3	1.8	16.9	420	1000	20	17
10x2.5	0.9	0.3	1.8	20.8	570	1000	18	15
12x2.5	0.9	0.3	2.0	22.2	690	1000	17	14
14x2.5	0.9	0.3	2.0	23.2	775	1000	16	13
16x2.5	0.9	0.3	2.0	24.3	860	1000	15	13
19x2.5	0.9	0.3	2.0	25.5	985	1000	14	12
24x2.5	0.9	0.3	2.0	29.4	1215	1000	13	11
27x2.5	0.9	0.3	2.0	30.0	1330	1000	12	10
30x2.5	0.9	0.3	2.0	31.0	1450	1000	12	10
37x2.5	0.9	0.4	2.2	34.1	1790	1000	11	9

Construction:

1. Solid /Stranded Annealed Copper Conductor & Tinned /Bare
2. General purpose / HR PVC insulation
3. Cores laid up (filled if needed)
4. FRLS/General Purpose PVC Inner sheath
5. FRLS/General purpose PVC outer sheath

Max. Conductor D.C. resistance at 20°C-conductor size:

1.5 sq.mm - 12.1 Ohm/km (bare), 12.2 Ohm/Km (Tinned)

2.5 sq. mm - 7.41 Ohm/km (Bare), 7.56 Ohm/km(Tinned)

* Dimensions specified are with stranded conductor

ARMOURED XLPE CONTROL CABLES- IS : 7098(P-1)-1988

No. of cores & cross sectional area No.	Thickness of PVC Insulation (Nom)	Thickness of Inner Sheath (min.) extruded	Strip Armoured cable				Wire Amourned cable				Standard Delivery Length in	CURRENT RATINGS	
			Strip size	Thickness of PVC Outer Sheath (Min.)	Approx. OD	Approx. Net weight of cable	Round Wire Dia.	Thickness of PVC Outer Sheath (Min.)	Approx. OD	Approx. Net weight of cable		Direct in Ground	In Air/ Duct.
mm2	(mm)	(mm)	(mm)	(mm)	(mm)	Kg/Km	(mm)	(mm)	(mm)	Kg/Km	Mtrs.	Amps	Amps
2x1.5	0.7	0.3	-	-	-	-	1.4	1.24	13.2	410	1000	33	29
3x1.5	0.7	0.3	-	-	-	-	1.4	1.24	13.6	453	1000	25	22
4x1.5	0.7	0.3	-	-	-	-	1.4	1.24	14.4	503	1000	25	22 •
5x1.5	0.7	0.3	-	-	-	-	1.4	1.24	15.2	507	1000	24	21
6x1.5	0.7	0.3	-	-	-	-	1.4	1.24	16.0	558	1000	22	19
7x1.5	0.7	0.3	-	-	-	-	1.4	1.24	16.0	576	1000	21	18
10x1.5	0.7	0.3	-	-	-	-	1.4	1.24	18.9	746	1000	18	16
12x1.5	0.7	0.3	-	-	-	-	1.4	1.24	19.4	799	1000	17	15
14x1.5	0.7	0.3	-	-	-	-	1.4	1.40	20.5	874	1000	16	14
16x1.5	0.7	0.3	4x0.8	1.40	20.1	816	1.6	1.40	21.7	1021	1000	16	14
19x1.5	0.7	0.3	4x0.8	1.40	21.0	880	1.6	1.40	22.6	1120	1000	15	13
24x1.5	0.7	0.3	4x0.8	1.40	24.3	1102	1.6	1.40	25.9	1357	1000	13	12
27x1.5	0.7	0.3	4x0.8	1.40	24.7	1162	1.6	1.40	26.3	1433	1000	13	11
30x1.5	0.7	0.3	4x0.8	1.40	25.5	1251	1.6	1.40	27.1	1512	1000	12	11
37x1.5	0.7	0.3	4x0.8	1.40	27.2	1425	1.6	1.40	28.8	1724	1000	11	10
44x1.5	0.7	0.3	4x0.8	1.40	30.0	1639	1.6	1.56	32.0	1996	1000	11	9
52x1.5	0.7	0.3	4x0.8	1.56	31.6	1855	1.6	1.56	33.2	2205	1000	10	9
61x1.5	0.7	0.4	4X0.8	1.56	33.3	2092	2.0	1.56	35.7	2687	1000	9	8
2x2.5	0.7	0.3	-	-	-	-	1.4	1.24	14.0	460	1000	39	32
3x2.5	0.7	0.3	-	-	-	-	1.4	1.24	14.5	526	1000	34	30
4x2.5	0.7	0.3	-	-	-	-	1.4	1.24	15.3	602	1000	34	30
5x2.5	0.7	0.3	-	-	-	-	1.4	1.24	16.3	602	1000	31	28
6x2.5	0.7	0.3	-	-	-	-	1.4	1.24	17.2	664	1000	29	26
7x2.5	0.7	0.3	-	-	-	-	1.4	1.24	17.2	692	1000	27	25
10x2.5	0.7	0.3	4x0.8	1.40	19.7	773	1.6	1.40	21.3	987	1000	24	21
12x2.5	0.7	0.3	4x0.8	1.40	22.2	860	1.6	1.40	21.8	1064	1000	22	20
14x2.5	0.7	0.3	4x0.8	1.40	21.2	925	1.6	1.40	22.7	1160	1000	21	19
16x2.5	0.7	0.3	4x0.8	1.40	22.0	1017	1.6	1.40	23.6	1259	1000	20	18
19x2.5	0.7	0.3	4x0.8	1.40	23.4	1157	1.6	1.40	25.0	1406	1000	19	17
24x2.5	0.7	0.3	4x0.8	1.40	26.7	1413	1.6	1.40	28.3	1696	1000	17	16
27x2.5	0.7	0.3	4x0.8	1.40	27.2	1502	1.6	1.40	28.8	1800	1000	16	16
30x2.5	0.7	0.3	4x0.8	1.40	28.0	1622	1.6	1.40	29.6	1912	1000	16	14
37x2.5	0.7	0.3	4x0.8	1.40	30.0	1866	1.6	1.56	32.0	2223	1000	15	13
44x2.5	0.7	0.4	4x0.8	1.56	33.6	2209	2.0	1.56	36.0	2829	1000	14	12
52x2.5	0.7	0.4	4x0.8	1.56	35.0	2475	2.0	1.56	37.4	3119	1000	13	12
61x2.5	0.7	0.4	4x0.8	1.56	36.9	2777	2.0	1.56	39.3	3470	1000	12	11

Construction:

1. Solid/Stranded Annealed Copper Conductor & Tinned /Bare
2. Cross - Linked Polyethylene (XLPE) insulation
3. Cores laid up (filled if needed)
4. FRLS/General purpose PVC Inner sheath
5. Armouring round Galvanised Steel wires/strips
6. FRLS/General purpose PVC outer sheath

Dimensions specified are with stranded conductor.

UNARMOURED XLPE CONTROL CABLES- IS : 7098(P-1)-1988

No. of cores & cross sectional area No.	Thickness of PVC Insulation (Nom)	Thickness of Inner Sheath (min.)	Thickness of PVC Outer Sheath (Min.)	Approx. OD	Approx. Net weight of cable	Standard Delivery Length	CURRENT RATINGS	
							Direct in Ground	In Air/ Duct.
mm²	(mm)	(mm)	(mm)	(mm)	Kg/Km	In Mtrs.	Amps	Amps
2x1.5	0.7	0.3	1.8	10.0	140	1000	33	29
3x1.5	0.7	0.3	1.8	10.5	160	1000	25	22
4x1.5	0.7	0.3	1.8	11.5	200	1000	25	22
5x1.5	0.7	0.3	1.8	12.5	225	1000	24	21
6x1.5	0.7	0.3	1.8	13.5	250	1000	22	19
7x1.5	0.7	0.3	1.8	13.5	260	1000	21	18
10x1.5	0.7	0.3	1.8	17.0	340	1000	18	16
12x1.5	0.7	0.3	1.8	17.5	390	1000	17	15
14x1.5	0.7	0.3	1.8	18.0	430	1000	16	14
16x1.5	0.7	0.3	1.8	18.5	475	1000	16	14
19x1.5	0.7	0.3	1.8	19.5	540	1000	15	13
24x1.5	0.7	0.3	2.0	22.5	665	1000	13	12
27x1.5	0.7	0.3	2.0	23.0	750	1000	13	11
30x1.5	0.7	0.3	2.0	23.5	820	1000	12	11
37x1.5	0.7	0.3	2.0	25.0	975	1000	11	10
44x1.5	0.7	0.4	2.0	28.0	1150	1000	11	9
52x1.5	0.7	0.3	2.0	29.0	1300	1000	10	9
61x1.5	0.7	0.4	2.2	31.0	1500	1000	9	8
2x2.5	0.7	0.3	1.8	11.5	185	1000	39	32
3x2.5	0.7	0.3	1.8	12.0	220	1000	34	30
4x2.5	0.7	0.3	1.8	13.0	260	1000	34	30
5x2.5	0.7	0.3	1.8	14.0	300	1000	31	28
6x2.5	0.7	0.3	1.8	15.0	340	1000	29	26
7x2.5	0.7	0.3	1.8	15.0	360	1000	27	25
10x2.5	0.7	0.3	1.8	17.5	475	1000	24	21
12x2.5	0.7	0.3	1.8	18.0	550	1000	22	20
14x2.5	0.7	0.3	1.8	19.0	625	1000	21	19
16x2.5	0.7	0.3	2.0	20.5	680	1000	20	18
19x2.5	0.7	0.3	2.0	21.5	770	1000	19	17
24x2.5	0.7	0.3	2.0	24.5	950	1000	17	16
27x2.5	0.7	0.3	2.0	25.5	1050	1000	16	16
30x2.5	0.7	0.3	2.0	26.0	1150	1000	16	14
37x2.5	0.7	0.3	2.0	28.0	1350	1000	15	13
44x2.5	0.7	0.4	2.2	32.0	1650	1000	14	12
52x2.5	0.7	0.4	2.2	33.5	1950	1000	13	12
61x2.5	0.7	0.4	2.2	35.0	2150	1000	12	11

Construction:

1. Solid/Stranded Annealed Copper Conductor & Tinned /Bare
2. Cross - Linked polyethylene (XLPE) insulation
3. Cores laid up (filled if needed)
4. FRLS/General purpose PVC Inner sheath
5. FRIS/General purpose PVC outer sheath

'Dimensions specified are with stranded conductor.

LASER HT XLPE POWER CABLES

Laser Power & Infra produces HT Power Cable with XLPE Insulation of Voltage grade upto 33 kV(UE) conforming to Indian and various International Standards.

HT plant is equipped with heavy-duty machines for wire drawing, conductor manufacturing, laying up, armouring (Strip and Round wire), Sheathing and packaging. The manufacturing process starts with a compact circular conductor being fed to the extruder. The conductor passes through the extruder crosshead, which is covered with a semi conducting layer then the XLPE Insulation followed by a layer of a semi conductor layer as a core screen. The core is cured followed by the lapping of copper tape. A core is tested for partial discharge. The cores are laid up with fillers, provided with an Inner sheath, armoured and finally outer sheathed. The outer sheath can be PVC, FRLS or ZHFR.

Laser manufacturing process ensures quality cables for all Industry Verticals. All the latest techniques and new-generation compounds are used to ensure fast curing, superior electrical & mechanical properties, dimensional controls and higher productivity.

The extrusion process is carried out in a contamination free atmosphere to ensure that the insulation is free from any micro-voids and has negligible moisture content.

The manufacturing process is controlled by sophisticated instruments to ensure top quality.

Cables are produced strictly as per the quality plan and tested in a fully equipped Test lab to ensure the best quality products are produced as per the design and specifications.

Applicable standard:

IS7098/Part 2/1985

CONDUCTOR DATA

Conductor Technical data for single-core and multi-core cables conforming to IS 8130/1984 (Stranded Class -2) Aluminium Conductors and Annealed Copper Conductors, compacted circular or shaped.

Nominal size of Conductor Sq. Mm	Minimum no. of wires		Max. D.C. Resistance at 20°C		A.C. Resistance at 90°C	
	Copper Nos.	Aluminium Nos.	Plain copper Ohms/Km	Aluminium Ohms/Km	Plain copper Ohms/Km	Aluminium Ohms/Km
25	6	6	0.727	1.20	0.930	1.54
35	6	6	0.524	0.868	0.671	1.11
50	6	6	0.387	0.641	0.495	0.82
70	12	12	0.268	0.443	0.343	0.567
95	15	15	0.193	0.320	0.247	0.410
120	18	15	0.153	0.253	0.196	0.324
150	18	15	0.124	0.206	0.159	0.264
185	30	30	0.0991	0.164	0.127	0.210
240	34	30	0.0754	0.125	0.0965	0.160
300	34	30	0.0601	0.100	0.0769	0.130
400	53	53	0.0470	0.0778	0.0602	0.10
500	53	53	0.0366	0.0605	0.0468	0.0774
630	53	53	0.0283	0.0469	0.0362	0.060
800	53	53	0.0221	0.0367	0.0283	0.0470
1000	53	53	0.0176	0.0291	0.0225	0.0372

SHORT CIRCUIT CURRENT RATINGS FOR XLPE CABLES

Short Circuit Rating for 1 second duration for Copper and Aluminium XLPE Cables (Isc Current in KAmps)

Nominal Size Sq.mm	XLPE Insulated	
	Copper	Aluminium
25	3.6	2.4
35	5.0	3.3
50	7.1	4.7
70	10.0	6.6
95	13.6	9.0
120	17.1	11.3
150	21.4	14.2
185	26.4	17.5
240	34.3	22.6
300	42.9	28.3
400	57.1	37.7
500	71.4	47.2
630	90.0	59.4
800	114.3	75.5
1000	142.9	94.3

Rating for any other duration :

1) Max. Intial Conductor Temperature during operation : 90°C

2) Max. Final Conductor Temperature during short circuit: 250°C

Formula relating short Circuit Rating with t second duration

$$It = \frac{Isc}{\sqrt{t}}$$

Where It = Short Circuit Rating for t second
t = duration in seconds
Isc = Short Circuit rating for 1 second

Emergency overload : Cable may operate under overload conditions. Under such condition temperature not to exceed 130°C for maximum 100 hours per year and not more than 500 hours during lifetime of cable. This is approximately 20% higher than specified rating current duration the emergency period.

CAPACITANCE

Approximate Capacitance for Single core & Multi core cable in Microfarad per Km at 50 C/s

SQ MM	1.9/3.3KV(E) or 3.3/3.3KV(UE)		3.8/6.6KV(E)	6.35/11 KV(E) or 6.6/6.6KV(UE)	11/11KV(UE)	12.7/22KV(E)	19/33KKV(E)
	UNARMOURED	ARMOURED					
25	0.230	0.210	0.220	0.180	0.140	-	-
35	0.270	0.240	0.250	0.210	0.150	0.140	-
50	0.300	0.270	0.270	0.220	0.160	0.160	0.120
70	0.340	0.310	0.310	0.250	0.190	0.170	0.140
95	0.390	0.350	0.350	0.290	0.210	0.190	0.150
120	0.430	0.390	0.380	0.310	0.220	0.210	0.160
150	0.490	0.420	0.430	0.340	0.240	0.230	0.180
185	0.520	0.460	0.450	0.360	0.260	0.240	0.180
240	0.590	0.510	0.510	0.410	0.290	0.270	0.200
300	0.670	0.570	0.540	0.460	0.320	0.300	0.230
400	0.760	0.630	0.570	0.520	0.360	0.340	0.250
500	0.770	0.680	0.570	0.560	0.390	0.360	0.270
630	0.810	0.680	0.640	0.630	0.430	0.400	0.290
800	0.860	0.740	0.730	0.710	0.490	0.450	0.330
1000	0.880	0.740	0.800	0.780	0.530	0.490	0.360

REACTANCE

Approximate Reactance for Multi core table in Ohms per Km at 50 C/s

SQ MM	1.9/3.3KV(E)OR 3.3/3.3KV(UE)	3.8/6.6KV(E)	6.35/11KV(E) OR 6.6/6.6KV(UE)	11/11KV(UE)	12.7/22KV(E)	19/33KV(E)
25	0.0981	0.1090	0.1160	0.1300	-	-
35	0.0940	0.1050	0.1110	0.1240	0.1270	-
50	0.0878	0.0989	0.1050	0.1170	0.1200	0.1340
70	0.0842	0.0945	0.1000	0.1110	0.1140	0.1260
95	0.0813	0.0909	0.0959	0.1070	0.1090	0.1210
120	0.0785	0.0878	0.0925	0.1030	0.1050	0.1170
150	0.0769	0.0851	0.0894	0.0987	0.1000	0.1120
185	0.0755	0.0838	0.0879	0.0968	0.0990	0.1100
240	0.0737	0.0812	0.0850	0.0932	0.0952	0.1060
300	0.0725	0.0798	0.0823	0.0897	0.0915	0.1000
400	0.0712	0.0788	0.0799	0.0866	0.0883	0.0971

APPROXIMATE REACTANCE FOR SINGLE CORE CABLE IN OHM PER KM AT 50 C/S, CABLES LAID TREFOIL TOUCHING

Approximate Capacitance for Single core & Multi core cable in Microfarad per Km at 50 C/s

Sq. MM	UNARMOURED						ARMOURED					
	1.9/3.3 KV(E) or 3.3/3.3KV (UE)	3.8/6.6 KV(E)	6.35/11KV(E) or 6.6/6.6KV(UE)	11/11 KV(UE)	12.7/22 KV(E)	19/33 KV(E)	1.9/3.3KV(E) or 3.3/3.3KV(UE)	3.8/6.6 KV(E)	6.35/11KV(E) or 6.6/6.6KV(UE)	11/11 KV(UE)	12.7/22 KV(E)	19/33 KV(E)
25	0.1170	0.1230	0.1280	0.1390	-	-	0.1300	0.1330	0.1370	0.1470	-	-
35	0.1110	0.1170	0.1220	0.1330	0.1350	-	0.1230	0.1270	0.1310	0.1400	0.1420	-
50	0.1040	0.1110	0.1160	0.1260	0.1300	0.1400	0.1170	0.1200	0.1240	0.1340	0.1360	0.1470
70	0.0988	0.1050	0.1100	0.1190	0.1290	0.1330	0.1120	0.1140	0.1180	0.1270	0.1290	0.1400
95	0.0957	0.1010	0.1050	0.1150	0.1170	0.1270	0.1080	0.1120	0.1210	0.1240	0.1400	0.1340
120	0.0920	0.1020	0.1010	0.1100	0.1120	0.1220	0.1040	0.1090	0.1180	0.1190	0.1150	0.1290
150	0.0887	0.0936	0.0973	0.1060	0.1080	0.1170	0.1010	0.1050	0.1130	0.1150	0.1120	0.1240
185	0.0871	0.0919	0.0963	0.1040	0.1060	0.1160	0.0993	0.1040	0.1110	0.1120	0.1080	0.1210
240	0.0840	0.0894	0.0926	0.1000	0.1010	0.1110	0.0969	0.0997	0.1070	0.1080	0.1040	0.1170
300	0.0815	0.0869	0.0896	0.0961	0.0977	0.1060	0.0936	0.0936	0.1020	0.1040	0.0997	0.1130
400	0.0797	0.0850	0.0860	0.0925	0.0939	0.1030	0.0917	0.0926	0.0984	0.0997	0.0989	0.1180
500	0.0788	0.0838	0.0845	0.0905	0.0918	0.0994	0.0900	0.0884	0.0959	0.0989	0.0953	0.1060
630	0.0744	0.0819	0.0826	0.0875	0.0893	0.0960	0.0876	0.0879	0.0941	0.0953	0.0922	0.1020
800	0.0762	0.0778	0.0798	0.0855	0.0866	0.0925	0.0858	0.0844	0.0912	0.0922	0.0904	0.0976
1000	0.0758	0.0769	0.0787	0.0836	0.0851	0.0907	0.0844	0.0846	0.0890	0.0904	0.0904	0.0966

RECOMMENDATIONS FOR CURRENT RATINGS

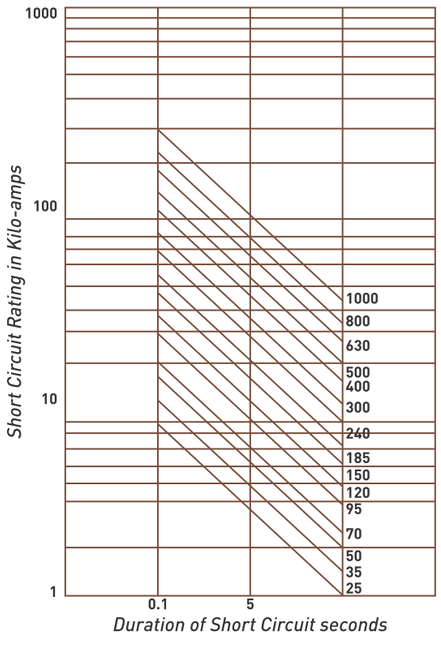
The current rating of the power cable is defined by the maximum intensity of current (amperes) which can flow continuously through the cable under permanent loading conditions. Without any risk of damaging the cable or deterioration of its electrical properties. The value given in the tables are valid for one circuit in a three phase system under the conditions specified. For grouping cables, rating factors must be used.
The current carrying capacities mentioned in LASER technical data are intended as a guide, to assist operating engineers in selecting cables for safety and reliability.
Basic assumptions and conditions of installation :

- Max. conductor temperature : 90°C
- Ambient ground temperature : 30°C
- Ambient Air temperature : 40°C
- Thermal resistively of soil : 150°C Cm/W
- Depth of laying (to the highest point of the cables laid direct in the ground)
  3.3, 6.6 & 11 KV cables : 90 cm
- Max. conductor temperature for short circuit : 250°C

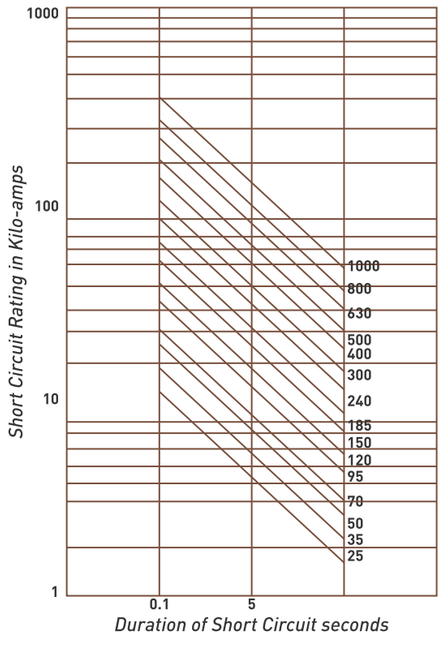
To obtain the maximum current carrying capacity of a cable operating at different conditions from the standard, various rating factors are to be multiplied as follows:
la = K x Is
Where :
la : Current rating at actual operating conditions (amperes)
Is : Current rating at standard operating conditions (amperes)
K : Rating factor as applicable

GRAPHICAL REPRESENTATION OF SHORT CIRCUIT CURRENT RATINGS OF XLPE INSULATED ALUMINIUM & COPPER CONDUCTOR

Aluminium Conductor



Copper Conductor



LASER CABLES PRIVATE LIMITED RATING FACTORS

For Air and Ground Temperature :

a) Rating Factors for variation in Ambient Air Temperature

Air temperature deg. C Rating factor (maximum conductor temperature 90°C)

25	30	35	40	45	50	55	60
1.16	1.11	1.06	1	0.94	0.88	0.81	0.74

b) Rating Factors for variation in ground Temperature for cables laid direct in the Ground

15	20	25	30	35	40	45	50
1.12	1.08	1.04	1	0.96	0.91	0.87	0.82

Ground temperature deg. C Rating factor (maximum conductor temperature 90°C)

2. Rating Factors for variation in ground temperature for cables in ducts.

15	20	25	30	35	40	45	50
1.12	1.08	1.04	1	0.96	0.91	0.87	0.82

Ground temperature deg. C Rating factor (maximum conductor temperature 90°C)

3) Rating Factors for depth of laying for cables laid direct in the Ground

Depth of laying (mm)	3.3, 6.6 & 11KV cables	22& 33Kv Cables
900	1	-
1050	0.99	1
1200	0.97	0.99
1500	0.95	0.97
1800	0.94	0.95
2000	0.93	0.94
2500	0.91	0.92
3000 or more	0.9	0.91

GROUP RATING FACTORS

For Single Core Cables

A) Group rating factors for three core cables. In Horizontal Formation Laid Direct in the ground

Number of cables in group	Spacing between trefoil group centres				
	Touching	200	400	600	800
2	0.79	0.86	0.9	0.92	0.94
3	0.67	0.77	0.82	0.86	0.89
4	0.61	0.72	0.79	0.83	0.87
5	0.56	0.68	0.76	0.81	0.85
6	0.53	0.65	0.74	0.8	0.84
7	0.5	0.63	0.72	0.78	0.83
8	0.48	0.61	0.71	0.78	-
9	0.46	0.6	0.7	0.77	-
10	0.44	0.59	0.69	-	-
11	0.43	0.58	0.69	-	-
12	0.42	0.57	0.68	-	-

B) Cables laid on Racks /Trays in covered trench with removable covers where air circulation is restricted, Trefoils are separated by two cable diameter horizontally and trays are in tiers having 300 mm distance.

No. Racks /Trays in Tiers	No. of Trefoils in Horizontal Formation		
	1	2	3
1	0.95	0.90	0.88
2	0.90	0.85	0.83
3	0.88	0.83	0.81
6	0.86	0.81	0.79

C) As above B, but cables laid in open air:

1	1	0.98	0.96
2	1	0.95	0.93
3	1	0.94	0.92
6	1	0.93	0.90

FOR MULTI CORE CABLES

A) Cables laid inside concrete trench with removable covers, on cable trays where air circulation is restricted. The cables spaced by one cable diameter and trays are in tiers spaced by 300 mm. The clearance between the wall and the cable is 25 mm :

No. of cables trays in tier	Distance between Trefoils				
	1	2	3	6	9
1	0.95	0.90	0.88	0.85	0.84
2	0.90	0.85	0.83	0.81	0.80
3	0.88	0.83	0.81	0.79	0.78
6	0.86	0.81	0.79	0.77	0.76

B) Cables laid on cable trays exposed to air, the cables spaced by one cable diameter and trays are in tiers spaced by 300 mm. The clearance of the cable from the wall is 25 mm.

No. of cables trays in tier	No of cables per tray				
	1	2	3	6	9
1	1	0.98	0.96	0.93	0.92
2	1	0.95	0.93	0.90	0.89
3	1	0.94	0.92	0.89	0.88
6	1	0.93	0.90	0.87	0.86

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

No. of cables trays in tier	No of cables				
	1	2	3	6	9
1	1	0.84	0.80	0.75	0.73
2	1	0.80	0.76	0.71	0.69
3	1	0.78	0.74	0.70	0.68
6	1	0.76	0.72	0.68	0.66

D) Cables laid direct In ground in horizontal formation:

No. of cables trays in tier	Distance of cables			
	Touching	15 cm	30 cm	45 cm
2	0.79	0.82	0.87	0.90
3	0.69	0.75	0.79	0.83
4	0.62	0.69	0.74	0.79
5	0.58	0.65	0.72	0.76
6	0.54	0.61	0.69	0.75

SINGLE CORE COMPACTED ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLE AL & CU/XLPE/AL WIRE/ PVC CONFORMING

Voltage Grade : 1.9/3.3 kV (Unscreened) (E) 3.3 / 3.3 kV (Unscreened) (UE)
TO IS 7098 PART-2/2011 WEIGHT & DIMENSIONS

Nom. stranded class 2 conductor as per IS 8130/ 1984	Unarmoured Cable				Armounred Cable				CURRENT RATINGS															
									Aluminium								Copper							
									Cu. weight of cable	Burned Direct in the round		In Single-way Ducts		In Air		Burned in the Direct 3 round		In Single-way Ducts		In Air			
										Trefoil Touching	Flat Touching	Trefoil Touching Ducts	Rat Touching Ducts	Trefoil Touching	Rat Touching	Trefoil Touching	Rat Touching	Trefoil Touching Ducts	Rat Touching Ducts	Trefoil Touching	Flat Touching
Sq.mm	mm	mm	mm	Kg/Km	mm	mm	mm	Kg/Km	Kg/Km	A	A	A	A	A	A	A	A	A	A	A	A
25	2.2	1.8	15.0	235	1.4	1.24	17.5	340	490	98	100	88	91	110	110	125	130	115	115	140	145
35	2.2	1.8	16.0	275	1.4	1.40	18.5	390	595	115	120	105	110	135	135	150	155	135	140	170	175
50	2.2	1.8	17.0	325	1.6	1.40	20.0	460	740	140	140	120	125	160	165	180	185	155	165	205	215
70	2.2	1.8	18.5	405	1.6	1.40	22.0	575	975	170	175	150	155	200	210	215	225	190	200	260	270
95	2.2	2.0	20.5	515	1.6	1.40	23.5	680	1240	200	205	175	185	250	255	260	265	230	235	320	330
120	2.2	2.0	23.0	615	1.6	1.40	26.0	795	1500	230	235	200	210	285	295	295	300	255	265	370	380
150	2.2	2.0	23.5	695	1.6	1.40	26.5	880	1750	255	260	225	230	325	335	325	335	285	300	420	430
185	2.2	2.0	25.5	825	1.6	1.40	28.5	1025	2115	285	295	250	260	375	390	370	380	325	335	485	495
240	2.2	2.0	28.0	1010	1.6	1.56	31.5	1255	2685	330	340	290	300	445	460	425	435	370	385	570	590
300	2.2	2.0	30.0	1195	2.0	1.56	33.5	1470	3265	375	385	325	335	510	530	475	490	415	430	660	670
400	2.2	2.2	33.5	1495	2.0	1.56	37.5	1845	4140	425	440	370	380	610	620	540	550	465	480	770	780
500	2.4	2.2	37.0	1850	2.0	1.72	40.5	2240	5180	485	495	420	430	710	730	600	610	520	530	880	900
630	2.6	2.2	41.0	2305	2.0	1.72	45.5	2790	6600	540	560	470	485	820	840	670	680	570	590	1010	1020
800	2.8	2.4	48.0	2940	2.0	1.88	50.5	3430	8315	610	620	520	530	950	960	730	740	620	630	1140	1140
1000	3.0	2.6	52.5	3645	2.5	2.04	57.5	4405	10525	660	670	570	570	1070	1070	780	780	660	660	1260	1250

SINGLE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART -2/2011

Voltage Grade : 3.3 /6.6KV (E)

WEIGHT & DIMENSIONS

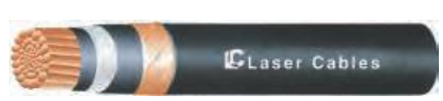
Nom. size of stranded class 2 conductor as per IS 8130/ 1984	Unarmoured Cable					Armounred Cable					CURRENT RATINGS											
											Alluminium						Copper					
											Burned Direct in the round		In Single-way Ducts		In Air		Burned in the Direct 3 round		In Single-way Ducts		In Air	
	Nom. Thickness of XLPE insulation	Nom. Thickness of PVC Outer Sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. Thickness of XLPE insulation	Mn. Thickness ofPVC outer sheath	Approx, overall diameter of cable	Al. Approx weight of cable	Cu. Approx weight of cable	Trefoil Touching	Flat Touching	Trefoil Touching Ducts	Rat Touching Ducts	Trefoil Touching Ducts	Rat Touching	Trefoil Touching	Rat Touching	Trefoil Touching Ducts	Rat Touching Ducts	Trefoil Touching	Flat Touching
Sq.mm	mm	mm	mm	Kg/km	Kg/km	mm	mm	mm	Kg/km	Kg/km	A	A	A	A	A	A	A	A	A	A	A	A
25	2.8	1.8	18.00	340	485	1.6	1.40	22.00	560	705	99	100	87	90	115	120	125	130	110	115	150	155
35	2.8	2.0	20.00	440	645	1.6	1.40	23.50	635	840	115	120	105	105	140	145	150	155	135	140	180	185
50	2.8	2.0	21.00	500	780	1.6	1.40	24.50	705	985	137	139	120	117	174	177	180	185	155	160	215	220
70	2.8	2.0	23.50	615	1020	1.6	1.40	26.00	815	1215	170	175	150	155	210	215	215	225	190	195	270	275
95	2.8	2.0	25.00	725	1285	1.6	1.40	28.00	935	1495	200	205	175	180	255	260	260	265	225	235	330	340
120	2.8	2.0	27.50	870	1575	1.6	1.40	30.00	1070	1775	230	235	200	205	295	305	295	300	255	265	380	390
150	2.8	2.0	28.50	985	1855	1.6	1.56	31.00	1190	2060	255	260	220	230	335	345	325	335	285	295	430	440
185	2.8	2.0	30.50	1135	2220	1.6	1.56	33.00	1355	2445	290	295	250	260	385	395	370	380	320	330	495	510
240	2.8	2.2	33.50	1380	2815	2.0	1.56	36.50	1700	3135	330	340	290	300	455	470	425	435	370	380	580	600
300	3.0	2.2	36.50	1655	3450	2.0	1.56	39.00	1955	3755	375	385	325	335	520	540	475	490	415	425	670	680
400	3.3	2.2	41.00	2080	4375	2.0	1.72	43.00	2370	4665	425	440	370	380	610	630	540	550	465	480	780	790
500	3.5	2.4	44.24	2490	5430	2.0	1.88	47.00	2795	5774	485	495	415	430	720	730	600	610	520	530	900	910
630	3.5	2.4	48.00	2975	6785	2.0	1.88	50.50	3390	7200	495	453	494	367	770	715	670	680	580	580	1020	1030
800	3.5	2.6	53.50	3620	8505	2.5	2.04	56.50	4235	9120	610	620	520	530	950	960	730	740	630	630	1150	1140
1000	3.6	2.6	57.50	4310	10430	2.5	2.04	62.50	5120	11240	670	680	570	580	1070	1070	790	790	670	670	1260	1250

SINGLE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED,UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART -2/2011

Voltage Grade : 6.35/11KV (E), 6.6/6.6KV(UE)

WEIGHT & DIMENSIONS

Nom. size of dass2 as per IS 8130/ 84	Unarmoured Cable					Round Wire Armounred Cable					CURRENT RATINGS											
											Alluminium						Copper					
											Burned Direct in the round		In Single-way Ducts		In Air		Burned in the Direct 3 round		In Single-way Ducts		In Air	
	Nom. Thickness of XLPE insulation	Nom. Thickness of PVC Outer Sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. ofAL Round wire	Mn. Thickness ofPVC outer sheath	Approx, overall diameter of cable	Al. Approx weight of cable	Cu. Approx weight of cable	Trefoil Touching	Flat Touching	Trefoil Touching Ducts	Rat Touching	Trefoil Touching Ducts	Rat Touching	Trefoil Touching	Rat Touching	Trefoil Touching Ducts	Rat Touching	Trefoil Touching Ducts	Rat Touching
Sq.mm	mm	mm	mm	Kg/km	Kg/km	mm	mm	mm	Kg/km	Kg/km	A	A	A	A	A	A	A	A	A	A	A	A
35	3.6	2.0	21.00	455	660	1.6	1.40	25.00	710	915	115	120	105	105	140	145	150	155	135	140	180	185
50	3.6	2.0	22.00	515	790	1.6	1.40	26.00	780	1060	140	140	120	125	170	170	180	185	155	160	215	220
70	3.6	2.0	23.50	605	1010	1.6	1.40	27.50	890	1295	170	175	150	155	210	215	215	225	190	195	270	275
95	3.6	2.0	25.00	715	1275	1.6	1.40	29.50	1020	1580	200	205	175	180	255	260	260	265	225	235	330	340
120	3.6	2.0	27.50	830	1535	1.6	1.56	32.00	1190	1895	230	235	200	205	295	305	295	300	255	265	380	390
150	3.6	2.0	28.00	915	1785	1.6	1.56	32.50	1285	2155	255	260	220	230	335	345	325	335	285	295	430	440
185	3.6	2.2	30.50	1090	2175	2.0	1.56	35.50	1560	2645	290	295	250	260	385	395	370	380	320	330	495	510
240	3.6	2.2	33.00	1300	2730	2.0	1.56	38.00	1805	3240	330	340	290	300	455	470	425	435	370	380	580	600
300	3.6	2.2	35.00	1500	3300	2.0	1.56	40.00	2040	3840	375	385	325	335	520	540	475	490	415	425	670	680
400	3.6	2.2	38.00	1795	4090	2.0	1.72	43.50	2420	4710	425	440	370	380	610	630	540	550	465	480	780	790
500	3.6	2.4	41.50	2195	5135	2.0	1.88	47.00	2870	5810	485	495	415	430	720	730	600	610	520	530	900	910
630	3.6	2.4	45.00	2655	6465	2.0	1.88	51.00	3405	7215	550	560	470	480	830	840	670	680	580	580	1020	1030
800	3.6	2.6	51.00	3315	8195	2.5	2.04	56.50	4250	9135	610	620	520	530	950	960	730	740	630	630	1150	1140
1000	3.6	2.6	55.50	4015	10135	2.5	2.04	62.50	5120	11240	670	680	570	580	1070	1070	790	790	670	670	1260	1250



SINGLE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART -2/2011

Voltage Grade : 11/11KV (UE)

WEIGHT & DIMENSIONS

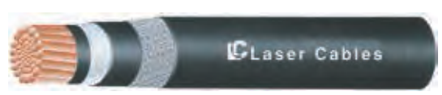
Nom. size of	Unarmoured Cable					Round Wire Armounred Cable					CURRENT RATINGS											
											Alluminium						Copper					
											Burned Direct in the round		In Single-way Ducts		In Air		Burned in the Direct 3 round		In Single-way Ducts		In Air	
	Nom. Thickness of XLPE insulation	Nom. Thickness of PVC Outer Sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. ofAL Round wire	Mn. Thickness ofPVC outer sheath	Approx, overall diameter of cable	Al. Approx weight of cable	Cu. Approx weight of cable	Trefoil Touching	Flat Touching	Trefoil Touching Ducts	Rat Touching Ducts	Trefoil Touching Ducts	Rat Touching	Trefoil Touching	Rat Touching	Trefoil Touching Ducts	Rat Touching Ducts	Trefoil Touching	Flat Touching
Sq.mm	mm	mm	mm	Kg/km	Kg/km	mm	mm	mm	Kg/km	Kg/km	A	A	A	A	A	A	A	A	A	A	A	A
35	5.5	2.0	24.50	605	810	1.6	1.40	29.00	900	1105	115	120	105	105	140	145	150	155	135	140	180	185
50	5.5	2.0	25.50	665	945	1.6	1.56	30.50	1005	1285	140	140	120	125	170	170	180	185	155	160	215	220
70	5.5	2.0	27.50	770	1170	1.6	1.56	32.00	1130	1530	170	175	150	155	210	215	215	225	190	195	270	275
95	5.5	2.2	29.00	890	1445	2.0	1.56	33.50	1270	1825	200	205	175	180	255	260	260	265	225	235	330	340
120	5.5	2.2	31.50	1045	1750	2.0	1.56	37.00	1535	2240	230	235	200	205	295	305	295	300	255	265	380	390
150	5.5	2.2	32.50	1135	2010	2.0	1.56	37.50	1640	2510	255	260	220	230	335	345	325	335	285	295	430	440
185	5.5	2.2	34.00	1290	2380	2.0	1.56	39.50	1820	2910	290	295	250	260	385	395	370	380	320	330	495	510
240	5.5	2.2	36.50	1515	2945	2.0	1.72	42.50	2115	3545	330	340	290	300	455	470	425	435	370	380	580	600
300	5.5	2.2	38.50	1730	3525	2.0	1.72	44.50	2360	4160	375	385	325	335	520	540	475	490	415	425	670	680
400	5.5	2.4	42.00	2080	4375	2.0	1.88	48.00	2785	5080	425	440	370	380	610	630	540	550	465	480	780	790
500	5.5	2.6	45.00	2460	5400	2.5	2.04	51.00	3210	6150	485	495	415	430	720	730	600	610	520	530	900	910
630	5.5	2.6	49.00	2990	6800	2.5	2.04	56.00	3955	7760	550	560	470	480	830	840	670	680	580	580	1020	1030
800	5.5	2.8	55.50	3690	8570	2.5	2.20	61.00	4725	9610	610	620	520	530	950	960	730	740	630	630	1150	1140
1000	5.5	2.8	59.00	43.60	10480	2.5	2.20	66.00	5535	11655	670	680	570	580	1070	1070	790	790	670	670	1260	1250

SINGLE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART -2/2011

Voltage Grade : 12.7/22KV (E)

WEIGHT & DIMENSIONS

Nom. size of conductor	Unarmoured Cable					Round Wire Armounred Cable					CURRENT RATINGS											
											Alluminium						Copper					
											Burned Direct in the round		In Single-way Ducts		In Air		Burned in the Direct 3 round		In Single-way Ducts		In Air	
	Nom. Thickness of XLPE insulation	Nom. Thickness of PVC Outer Sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. ofAL Round wire	Mn. Thickness ofPVC outer sheath	Approx, overall diameter of cable	Al. Approx weight of cable	Cu. Approx weight of cable	Trefoil Touching	Flat Touching	Trefoil Touching Ducts	Rat Touching	Trefoil Touching Ducts	Rat Touching	Trefoil Touching	Rat Touching	Trefoil Touching Ducts	Rat Touching	Trefoil Touching Ducts	Rat Touching
Sq.mm	mm	mm	mm	Kg/km	Kg/km	mm	mm	mm	Kg/km	Kg/km	A	A	A	A	A	A	A	A	A	A	A	A
35	6	2.0	26.00	660	870	1.60	1.56	30.00	980	1185	115	120	100	105	145	145	150	155	130	135	185	190
50	6	2.0	27.00	730	1010	1.60	1.56	31.50	1085	1360	135	140	120	125	175	175	175	180	155	160	225	230
70	6	2.0	28.50	835	1235	1.60	1.56	33.50	1210	1610	165	170	145	150	215	220	215	220	185	195	275	285
95	6	2.2	31.00	985	1545	2.00	1.56	36.00	1465	2025	200	205	170	180	260	270	255	265	220	230	340	345
120	6	2.2	33.00	1120	1825	2.00	1.56	38.50	1630	2335	225	230	195	200	300	310	290	300	250	260	390	400
150	6	2.2	33.50	1215	2085	2.00	1.56	39.00	1735	2605	250	260	220	225	340	350	325	330	280	290	440	450
185	6	2.2	35.50	1370	2460	2.00	1.72	41.00	1920	3010	285	290	245	255	390	400	365	375	315	325	500	510
240	6	2.2	38.00	1600	3030	2.00	1.72	44.00	2220	3650	330	335	285	290	460	470	420	430	360	370	590	600
300	6	2.4	40.00	1815	3615	2.00	1.72	46.00	2520	4315	370	380	320	325	530	540	470	480	405	415	680	690
400	6	2.4	43.50	2180	4475	2.00	1.88	49.50	2910	5200	420	430	360	370	620	630	530	540	455	465	780	790
500	6	2.6	47.00	2610	5555	2.50	2.04	54.00	3540	6480	475	485	410	420	720	730	590	600	510	520	900	910
630	6	2.6	50.50	3105	6915	2.50	2.04	57.50	4100	7905	540	550	460	470	830	840	660	660	560	570	1020	1020
800	6	2.6	57.00	3815	8700	2.50	2.20	62.50	4870	9750	600	610	510	520	950	950	730	720	620	620	1150	1140
1000	6	2.8	61.00	4555	10675	2.50	2.20	68.00	5765	11885	660	660	560	560	1070	1060	780	760	660	660	1270	1240



SINGLE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, UNARMOURED & ARMOURED CABLE CONFORMING TO IS 7098 PART -2/2011

Voltage Grade : 19/33KV (E)

WEIGHT & DIMENSIONS

Nom. size of	Unarmoured Cable					Round Wire Armounred Cable					CURRENT RATINGS											
											Alluminium						Copper					
											Burned Direct in the round		In Single-way Ducts		In Air		Burned in the Direct 3 round		In Single-way Ducts		In Air	
	Nom. Thickness of XLPE insulation	Nom. Thickness of PVC Outer Sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. ofAL Round wire	Mn. Thickness ofPVC outer sheath	Approx, overall diameter of cable	Al. Approx weight of cable	Cu. Approx weight of cable	Trefoil Touching	Flat Touching	Trefoil Touching Ducts	Rat Touching Ducts	Trefoil Touching Ducts	Rat Touching	Trefoil Touching	Rat Touching	Trefoil Touching Ducts	Rat Touching Ducts	Trefoil Touching	Flat Touching
Sq.mm	mm	mm	mm	Kg/km	Kg/km	mm	mm	mm	Kg/km	Kg/km	A	A	A	A	A	A	A	A	A	A	A	A
50	8.8	2.2	34.00	1065	1345	2.00	1.56	39.00	1590	1865	135	140	120	125	175	175	175	180	155	160	225	230
70	8.8	2.2	35.50	1185	1590	2.00	1.56	40.50	1730	2130	165	170	145	150	215	220	215	220	185	195	275	285
95	8.8	2.2	37.00	1325	1885	2.00	1.72	43.00	1935	2495	200	205	170	180	260	270	255	265	220	230	340	345
120	8.8	2.2	39.00	1480	2185	2.00	1.72	45.00	2125	2830	225	230	195	200	300	310	290	300	250	260	390	400
150	8.8	2.4	40.00	1580	2450	2.00	1.72	45.50	2235	3105	250	260	220	225	340	350	325	330	280	290	440	450
185	8.8	2.4	42.00	1800	2885	2.00	1.88	48.00	2480	3570	285	290	245	255	390	400	365	375	315	325	500	510
240	8.8	2.4	44.50	2050	3485	2.00	1.88	50.50	2800	4230	330	335	285	290	460	470	420	430	360	370	590	600
300	8.8	2.6	47.00	2340	4135	2.50	2.04	54.00	3270	5065	370	380	320	325	530	540	470	480	405	415	680	690
400	8.8	2.6	50.00	2690	4985	2.50	2.04	57.00	3670	5965	420	430	360	370	620	630	530	540	455	465	780	790
500	8.8	2.8	53.50	3155	6100	2.50	2.20	60.50	4230	7170	475	485	410	420	720	730	590	600	510	520	900	910
630	8.8	3.0	57.00	3690	7495	2.50	2.36	64.00	4825	8635	540	550	460	470	830	840	660	660	560	570	1020	1020
800	8.8	3.0	63.50	4465	9350	2.50	2.36	69.00	5625	10505	600	610	510	520	950	950	730	720	620	620	1150	1140
1000	8.8	3.2	67.50	5255	11375	3.15	2.52	76.00	6850	12970	660	660	560	560	1070	1060	780	760	660	660	1270	1240

THREE CORE COMPACTED ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, ARMOURED CABLE CONFORMING TO IS 7098 PART -2/2011

Voltage Grade : 1.9/3.3KV (UNSCREENED)(E) 3.3 & 3.3 KV (UNSCREENED) (UE)

WEIGHT & DIMENSIONS

Nom. Size of conductor as per IS 8130/84 (class 2)	From of conductor stranded	Nom. Thick-ness of XLPE insulation mm	Min. Thickness of PVC Inner Sheath	Strip Armoured Cable					Round Wire Armoured Cable					CURRENT RATINGS					
														Aluminium			Copper		
				Nom. Dimension of GI flat strip	Min. Thickness of PVC outer sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. Dimension of GI. round wire	Min. Thickness of PVC outer sheath	Approx Overall diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Burned Direct in Ground	Buried in Duct	In Air	Burned Direct in Ground	Buried in Duct	In Air
Sq.mm	-		mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km	A	A	A	A	A	A
25	Shaped	2.2	0.3	4X08	1.4	28.00	1010	1455	1.60	1.56	30.00	1330	1775	94	80	99	120	100	125
35	Shaped	2.2	0.3	4X08	1.56	30.00	1155	1775	1.60	1.56	31.50	1460	2080	115	94	120	145	120	155
50	Shaped	2.2	0.4	4X08	1.56	33.00	1360	2200	2.00	1.56	35.50	1960	2795	135	110	145	170	145	190
70	Shaped	2.2	0.4	4X08	1.56	35.00	1625	2835	2.00	1.56	37.50	2245	3455	165	140	185	210	175	235
95	Shaped	2.2	0.4	4X08	1.72	38.50	1965	3645	2.00	1.72	40.50	2660	4340	195	165	225	250	210	290
120	Shaped	2.2	0.5	4X08	1.72	50.00	2295	4415	2.00	1.88	43.50	3040	5165	220	185	255	285	240	330
150	Shaped	2.2	0.5	4X08	1.88	43.50	2670	5295	2.50	2.04	47.50	3885	6510	245	210	295	315	270	375
185	Shaped	2.2	0.5	4X08	2.04	47.00	3170	6450	2.50	2.04	50.50	4435	7710	280	235	340	355	300	435
240	Shaped	2.2	0.6	4X08	2.20	50.00	3790	8105	2.50	2.20	53.50	5160	9470	320	270	400	410	350	510
300	Shaped	2.2	0.6	4X08	2.20	56.00	4540	9955	2.50	2.36	59.50	6115	11530	360	305	460	460	390	590
400	Shaped	2.2	0.7	4X08	2.52	60.50	5530	12445	3.15	2.68	65.00	7900	14810	410	350	535	520	440	670

THREE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, ARMOURED CABLE CONFORMING TO IS 7098 PART-2/2011

Voltage Grade : 1.9/ 3.3 kV (Screened) (E) 3.3 & 3.3 kV (Screened) (UE)

WEIGHT & DIMENSIONS

Nom. size of conductor as per IS 8130/84 class 2	From of conductor stranded	Nom. Thick-ness of XLPE insulation mm	Min. Thickness of PVC Outer Sheath	Strip Armoured Cable					Round Wire Armoured Cable					CURRENT RATINGS					
														Aluminium			Copper		
				Nom. Dimension of GI flat strip	Min. Thickness of PVC outer sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. Dimension of GI. round wire	Min. Thickness of PVC outer sheath	Approx Overall diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Burned Direct in Ground	Buried in Duct	In Air	Burned Direct in Ground	Buried in Duct	In Air
Sq.mm	0		mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km	A	A	A	A	A	A
25	Circular	2.2	0.4	4x0.8	1.56	34.5	1570	2020	2.0	1.56	37.0	2100	2545	94	80	99	120	100	125
35	Circular	2.2	0.4	4x0.8	1.56	36.5	1730	2350	2.0	1.72	39.0	2330	2955	115	94	120	145	120	155
50	Circular	2..2	0.4	4x0.8	1.72	39.5	2040	2880	2.0	1.72	42.0	2665	3500	135	110	145	170	145	190
70	Circular	2.2	0.5	4x0.8	1.72	43.0	2440	3650	2.0	1.88	45.5	3140	4355	165	140	185	210	175	235
95	Circular	2.2	0.5	4x0.8	1.88	47.0	2905	4590	2.5	2.04	50.5	4080	5760	195	165	225	250	210	290
120	Circular	2.2	0.5	4x0.8	2.04	52.0	3475	5595	2.5	2.04	55.5	4700	6820	220	185	255	285	240	330
150	Circular	2.2	0.6	4x0.8	2.04	53.5	3750	6375	2.5	2.20	57.0	5070	7690	245	210	295	315	270	375
185	Circular	2.2	0.6	4x0.8	2.20	58.0	4370	7645	2.5	2.36	61.5	5810	9085	280	235	340	355	300	435
240	Circular	2.2	0.6	4x0.8	2.36	63.5	5195	9510	2.5	2.36	67.0	6745	11055	320	270	400	410	350	510
300	Circular	2.2	0.7	4x0.8	2.52	68.5	6085	11500	3.15	2.68	73.5	8525	13940	360	305	460	460	390	590
400	Circular	2.2	0.7	4x0.8	2.68	75.0	7225	14105	3.15	2.84	80.0	9870	16750	410	350	535	520	440	670

THREE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, ARMOURED CABLE CONFORMING TO IS 7098 PART-2/2011

Voltage Grade : 3.8 / 6.6 kV (E)

WEIGHT & DIMENSIONS

Nom. size of conductor as per IS 8130/84 ciass2	From of conductor stranded	Nom. Thick-ness of XLPE insulation mm	Min. Thickness of PVC Outer Sheath	Strip Armoured Cable					Round Wire Armoured Cable					CURRENT RATINGS					
														Aluminium			Copper		
				Nom. Dimension of GI flat strip	Min. Thickness of PVC outer sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. Dimension of GI. round wire	Min. Thickness of PVC outer sheath	Approx Overall diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Burned Direct in Ground	Buried in Duct	In Air	Burned Direct in Ground	Buried in Duct	In Air
Sq.mm	-		mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km	A	A	A	A	A	A
25	Circular	2.8	0.4	4x0.8	1.56	37.00	1785	2230	2.00	1.72	39.50	2390	2835	95	82	105	120	105	135
35	Circular	2.8	0.4	4x0.8	1.72	39.50	1975	2595	2.00	1.72	42.00	2600	3220	115	97	125	145	125	165
50	Circular	2..8	0.5	4x0.8	1.72	42.00	2280	3115	2.00	1.88	44.50	2980	3815	130	115	150	170	150	195
70	Circular	2.8	0.5	4x0.8	1.88	46.00	2650	3865	2.00	1.88	48.00	3365	4580	160	140	190	210	180	240
95	Circular	2.8	0.5	4x0.8	1.88	49.50	3095	4780	2.50	2.04	53.00	4330	6015	190	165	230	250	215	295
120	Circular	2.8	0.6	4x0.8	2.04	54.50	3655	5775	2.50	2.20	58.00	5005	7130	220	190	260	280	240	335
150	Circular	2.8	0.6	4x0.8	2.20	56.50	3995	6620	2.50	2.20	59.50	5340	7965	245	210	295	310	270	380
185	Circular	2.8	0.6	4x0.8	2.20	60.50	4565	7840	2.50	2.36	64.00	6050	9330	275	240	335	350	305	430
240	Circular	2.8	0.7	4x0.8	2.36	66.50	5570	9885	3.15	2.52	71.50	7935	12250	315	275	395	400	350	500
300	Circular	3.0	0.7	4x0.8	2.52	72.00	6520	11935	3.15	2.68	77.00	9090	14505	355	310	450	445	390	570
400	Circular	3.3	0.7	4x0.8	2.84	80.00	7910	14790	4.00	3.00	87.00	11890	18770	400	350	520	500	440	650

THREE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, ARMOURED CABLE CONFORMING TO IS 7098 PART-2/2011

Voltage Grade : 6.35 / 11 kV (E)

WEIGHT & DIMENSIONS

Nom.size of conductor as per IS 8130/84 Class 2	From of conductor stranded	Nom. Thick-ness of XLPE insulation	Min. Thickness of PVC Outer Sheath	Strip Armoured Cable					Round Wire Armoured Cable					CURRENT RATINGS					
														Aluminium			Copper		
				Nom. Dimension of GI flat strip	Min. Thickness of PVC outer sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. Dimension of GI. round wire	Min. Thickness of PVC outer sheath	Approx Overall diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Burned Direct in Ground	Buried in Duct	In Air	Burned Direct in Ground	Buried in Duct	In Air
Sq.mm	-	mm	mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km	A	A	A	A	A	A
35	Circular	3.6	0.5	4x0.8	1.72	43.00	2300	2920	2.00	1.88	46.00	3000	3620	115	97	125	145	125	165
50	Circular	3.6	0.5	4x0.8	1.88	46.00	2555	3395	2.50	2.04	49.50	3690	4530	130	115	150	170	150	195
70	Circular	3.6	0.5	4x0.8	1.88	49.00	2950	4175	2.50	2.04	53.00	4160	5375	160	140	190	210	180	240
95	Circular	3.6	0.6	4x0.8	2.04	53.50	3510	5195	2.50	2.20	57.00	4830	6515	190	165	230	250	215	295
120	Circular	3.6	0.6	4x0.8	2.20	58.00	4080	6200	2.50	2.20	61.50	5470	7590	220	190	260	280	240	335
150	Circular	3.6	0.6	4x0.8	2.20	59.50	4365	6990	2.50	2.36	63.50	5850	8475	245	210	295	310	270	380
185	Circular	3.6	0.7	4x0.8	2.36	64.50	5050	8330	3.15	2.52	69.50	7320	10600	275	240	335	350	305	430
240	Circular	3.6	0.7	4x0.8	2.52	70.00	5955	10270	3.15	2.68	75.00	8425	12740	315	275	395	400	350	500
300	Circular	3.6	0.7	4x0.8	2.68	75.00	6835	12250	3.15	2.84	80.00	9470	14890	355	310	450	445	390	570
400	Circular	3.6	0.7	4x0.8	2.84	81.50	8195	15075	4.00	3.00	88.00	12240	19120	400	350	520	500	440	650

THREE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, ARMOURED CABLE CONFORMING TO IS 7098 PART-2/2011

Voltage Grade : 11 /11 KV (UE)

WEIGHT & DIMENSIONS

Nom.size of conductor as per IS 8130/S4	From of conductor stranded	Nom. Thick-ness of XLPE insulation	Min. Thickness of PVC Outer Sheath	Strip Armoured Cable					Round Wire Armoured Cable					CURRENT RATINGS					
														Aluminium			Copper		
				Nom. Dimension of GI flat strip	Min. Thickness of PVC outer sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. Dimension of GI. round wire	Min. Thickness of PVC outer sheath	Approx Overall diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Burned Direct in Ground	Buried in Duct	In Air	Burned Direct in Ground	Buried in Duct	In Air
Sq.mm	-	mm	mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km	A	A	A	A	A	A
35	Circular	5.5	0.5	4x0.8	2.04	52.00	3115	3735	2.50	2.20	55.50	4385	5005	115	97	125	145	125	165
50	Circular	5.5	0.6	4x0.8	2.20	55.00	3400	4240	2.50	2.20	58.00	4720	5555	130	115	150	170	150	195
70	Circular	5.5	0.6	4x0.8	2.20	58.00	3885	5095	3.15	2.36	63.50	5950	7160	160	140	190	210	180	240
95	Circular	5.5	0.6	4x0.8	2.36	62.50	4475	6155	3.15	2.52	67.50	6645	8330	190	165	230	250	215	295
120	Circular	5.5	0.7	4x0.8	2.36	67.00	5085	7205	3.15	2.52	72.00	7480	9605	220	190	260	280	240	335
150	Circular	5.5	0.7	4x0.8	2.52	69.00	5435	8060	3.15	2.68	74.00	7870	10495	245	210	295	310	270	380
185	Circular	5.5	0.7	4x0.8	2.68	73.00	6160	9435	3.15	2.84	78.00	8760	12040	275	240	335	350	305	430
240	Circular	5.5	0.7	4x0.8	2.84	79.00	7135	11450	3.15	3.00	84.00	9940	14255	315	275	395	400	350	500
300	Circular	5.5	0.7	4x0.8	3.00	83.50	8080	13495	4.00	3.00	90.00	12135	17550	355	310	450	445	390	570
400	Circular	5.5	0.7	4x0.8	3.00	90.00	9455	16335	4.00	3.00	96.50	13885	20765	400	350	520	500	440	650

THREE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, ARMOURED CABLE CONFORMING TO IS 7098 PART-2/2011

Voltage Grade : 12.7 / 22 KV (E)

WEIGHT & DIMENSIONS

Nom. size of conductor as per IS 8130/84	From of conductor stranded	Nom. Thick-ness of XLPE insulation	Min. Thickness of PVC Outer Sheath	Strip Armoured Cable					Round Wire Armoured Cable					CURRENT RATINGS					
														Aluminium			Copper		
				Nom. Dimension of GI flat strip	Min. Thickness of PVC outer sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. Dimension of GI. round wire	Min. Thickness of PVC outer sheath	Approx Overall diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Burned Direct in Ground	Buried in Duct	In Air	Burned Direct in Ground	Buried in Duct	In Air
Sq.mm	-	mm	mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km	A	A	A	A	A	A
35	Circular	6	0.6	4x0.8	2.04	55.00	3345	3965	2.50	2.20	59.00	4710	5335	110	98	130	145	125	165
50	Circular	6	0.6	4x0.8	2.20	58.00	3730	4570	2.50	2.36	61.50	5165	6005	130	115	155	170	150	200
70	Circular	6	0.6	4x0.8	2.36	61.50	4245	5460	2.50	2.36	65.00	5700	6910	160	140	190	205	180	245
95	Circular	6	0.7	4x0.8	2.36	65.50	4730	6410	3.15	2.52	70.50	7030	8715	190	170	230	245	215	300
120	Circular	6	0.7	4x0.8	2.52	70.50	5370	7490	3.15	2.68	75.50	7840	9960	215	190	265	275	245	340
150	Circular	6	0.7	4x0.8	2.68	72.00	5845	8470	3.15	2.68	77.00	8355	10980	240	215	300	305	275	385
185	Circular	6	0.7	4x0.8	2.68	76.50	6535	9810	3.15	2.84	81.50	9205	12485	270	240	340	345	305	435
240	Circular	6	0.7	4x0.8	2.84	82.00	7530	11840	4.00	3.00	88.50	11575	15885	310	275	400	395	350	510
300	Circular	6	0.7	4x0.8	3.00	86.50	8485	13900	4.00	3.00	93.00	12680	18095	350	310	455	440	390	580
400	Circular	6	0.7	4x0.8	3.00	93.00	9745	16625	4.00	3.00	99.50	14290	21170	395	355	530	495	440	660

THREE CORE ALUMINIUM & COPPER CONDUCTOR, XLPE INSULATED, ARMOURED CABLE CONFORMING TO IS 7098 PART-2/2011

Voltage Grade : 19 / 33 KV (E)

WEIGHT & DIMENSIONS

Nom.size of conductor as per IS 8130/84	From of conductor stranded	Nom. Thick-ness of XLPE insulation	Min. Thickness of PVC Outer Sheath	Strip Armoured Cable					Round Wire Armoured Cable					CURRENT RATINGS					
														Aluminium			Copper		
				Nom. Dimension of GI flat strip	Min. Thickness of PVC outer sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. Dimension of GI. round wire	Min. Thickness of PVC outer sheath	Approx Overall diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Burned Direct in Ground	Buried in Duct	In Air	Burned Direct in Ground	Buried in Duct	In Air
Sq.mm	-	mm	mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km	A	A	A	A	A	A
50	Circular	8.8	0.7	4x0.8	2.52	72.00	5355	6195	3.15	2.68	77.00	7920	8760	130	115	155	170	150	200
70	Circular	8.8	0.7	4x0.8	2.68	76.00	5980	7195	3.15	2.84	81.00	8655	9865	160	140	190	205	180	245
95	Circular	8.8	0.7	4x0.8	2.84	80.00	6520	8205	3.15	3.00	85.00	9325	11010	190	170	230	245	215	300
120	Circular	8.8	0.7	4x0.8	2.84	84.50	7230	9355	4.00	3.00	91.00	11415	13540	215	190	265	275	245	340
150	Circular	8.8	0.7	4x0.8	3.00	86.00	7760	10385	4.00	3.00	92.50	11960	14585	240	215	300	305	275	385
185	Circular	8.8	0.7	4x0.8	3.00	90.50	8540	11815	4.00	3.00	96.50	12945	16220	270	240	340	345	305	435
240	Circular	8.8	0.7	4x0.8	3.00	95.50	9555	13865	4.00	3.00	102.00	14260	18575	310	275	400	395	350	510
300	Circular	8.8	0.7	4x0.8	3.00	100.00	10555	15975	4.00	3.00	106.50	15450	20865	350	310	455	440	390	580
400	Circular	8.8	0.7	4x0.8	3.00	106.50	11905	18785	4.00	3.00	113.00	17075	23955	395	355	530	495	440	660

PROPERTIES OF FIRE PERFORMANCE IN CABLES

Properties Covered		Types							
		FR Flame Retardant		FRLS Flame Retardant Low Smoke		ZHLS Zero Halogen Low Smoke		Flame Spread Resistant	
Properties	Ref. Standard	Applicable	Limit	Applicable	Limit	Applicable	Limit	Applicable	Limit
Oxygen Index	ASTMD-2863	✓	29% (Min.)	✓	29% (Min.)	✓	30% (Min.)	✓	30% (Min.)
Temperature Index	ASTMD-2863	✓	250°C (Min.)	✓	250°C (Min.)	✓	250°C (Min.)	✓	250°C (Min.)
Smoke Density Rating	ASTMD-2843 IEC:61034			✓	40% (Max.)	✓	20% (Max.)		
Halogen Acid Gas Generation	IEC:60754-1 EN-50267-2-1			✓	20% (Max.)	✓	0.5% (Max.)		
Toxicity Index	IEC-60754-2 EN-50267-2-2					✓	0.5% (Max.)		
Corrosive Gases	IEC:60754-2 EN-50267-2-2					✓	PH>4.3 Conductivity ≤100µs/cm		
Flame Test on Single Cable	IEC:60332-1 EN-50265	✓	As Per Specification	✓	As Per Specification	✓	As Per Specification	✓	As Per Specification
Fire Test on Bunched Cable	IEC:60332-3 EN-50266-2					✓	As Per Specification	✓	As Per Specification
Applicable Symbols									

Flame Retardant - IEC 60332-1

Flame Retardant - IEC 60332-3

Low Emission of Dark Fumes - ASTM D 2843

Halogen Free - IEC 60754-1

Low-toxicity and Corrosivity of Emitted Gases-IEC 60754-2

DETAIILS OF FIRE TEST

Performance of cables in the event of fire

In order to determine the behavior of cables in case of fire, a group of standards has been developed to establish conditions of fire and to measure the behavior of the cable in such a situation, but it should be taken into account that those tests are used to assess the behavior of the cables under established, reproducible conditions and that they are not necessarily those of the actual installation. The current IEC regulation considers the following cases :

Flame retardant (Standard IEC 60332-1)

A flame in contact with the sheath of the cable for an established period of time should not lead to propagation. This prevents the cable from being the origin of a fire caused by a minor incident or an external source of heat coming in contact with the cable.

Flame spread (Standard IEC 60332-3-22)

A fire unrelated to the cable can affect a cable tray (worst case if it is in a vertical position allowing air circulation and creating the so-called chimney effect). If the decomposition temperature of the organic materials is reached, exothermic combustion (with the contribution of energy) of the cables takes place with the consequent propagation of the fire. The insulation and sheath compounds can be formulated to make this exothermic reaction limited (by the addition of inhibitors). To simulate this situation, the test consists of the application of a high-energy gas burner to a bunch of cables arranged to reproduce a vertical cable tray with forced air. Under those conditions, the fire provoked in the cables should extinguish within the time established in the standard. Based on the amount of combustible material per meter for a bunch exposed to the fire action, the IEC standard defines different categories.

Zero halogen and low smoke cable

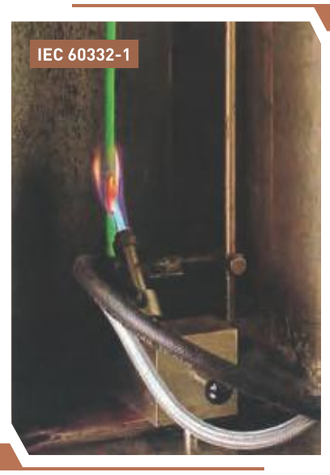
If the cables are immersed in a situation of fire and depending on the constituent materials, they can release gases which are toxic for the health of people or corrosive affecting the correct operation and preservation of the electronic and computer components in the vicinity. They can also release smoke, which due to their opacity, makes it difficult to see the escape routes from the spaces affected.

To minimize those effects, Laser Cable has developed the low smoke zero halogen series which minimizes harmful halogenated emissions (IEC 60754-1 and 60754-2) and reduces substantially the opaque smoke emissions in accordance with IEC 61034-1&2.

Fire-resistant (Standard IEC 60331)

For circuit integrity and all those systems which need to maintain service under fire conditions, there is the IEC 60331 standard where the fire conditions to which the cables are tested & defined, and which have to continue in service even if the fire has destroyed the organic parts of same.

In the standard, the cable is exposed to a ribbon gas burner for a maximum time of 180 minutes or higher as specified in the standard and at a minimum temperature of 750°C or higher as specified in the standard, while being subjected every 5 minutes to shocks simulating debris fallout. We produce better fire-resistant cables to withstand higher temperatures than standard, giving an extra margin of safety in this field. During the test and at the end of it the cable has to maintain circuit integrity although all of its organic parts have disappeared.



LASER LT AERIAL BUNCHED CABLE

Aerial Bunched Cable (ABC) is a very novel concept for overhead Power distribution. ABC provides higher safety and reliability compared to bare conductor overhead distribution systems. The other advantages are lower power losses and system economy by reducing installation, maintenance and operation costs. This system is ideal for rural distribution and especially suitable in difficult terrains like hills, forests and coastal areas etc.

ABC is also considered a better choice for power distribution in densely populated areas where the laying of underground cables is either difficult or extremely expensive. This is attributed to narrow lanes and bylanes of congested urban areas. Needless to mention that ABC is a better choice due to the flexibility of re-routing demand, should there be any changes in an urban development plan.

Bare Overhead Transmission lines are more prone to system failures causing immense loss and inconvenience to the consumers.

Aerial Bunched Cables systems for both HT & LT have been introduced across the globe to arrest such problems. It is basically a compromise between an Insulated Power Cable system and Bare Overhead Conductor.

There are 3 or 4 Power carrying conductors suitably insulated and laid around a bare or insulated Neutral/Earth conductor. This earth/neutral conductor carries the entire weight of the cable when hunged on Transmission poles/towers suitably.

The chances of faults are reduced to a great extent because the conductors are insulated. However, it lacks the Safety and Mechanical Strength of Underground Cables. The fact that ABC runs overhead and hence it is never subjected to the mechanical abuses that an underground cable undergoes.

ABC ensures good protection against ground and line faults ensuring system reliability and increased system efficiency compared to bare overhead lines. The problem of free clearance is also minimized. ABC system hinders tampering with power-line like hooking resulting in efficient Power utilization.

Advantages :

- Easier Installation particularly in Congested, Forests or Hilly areas. Saving in cost of Poles, Insulators, Cross-arms etc.
- Human Safety in case of accidental contact.
- A water proof system, no corrosion.
- System reliability hence customer satisfaction.
- Reduced clearance.

Insulated Neutral :

In low voltage networks, in case of unbalanced load on the 3 phases, a current can flow in the neutral. This flow of current causes a voltage to be present in the neutral. This voltage can reach dangerous levels even in 'Earthed' conditions. It is observed that the permissible voltage shift between neutral and earth can go up 100 volts! This surely establishes the need for an insulated neutral. Moreover, parallels can be drawn with the underground cables. Single insulation damage on the conductor will not necessarily trip the system unless an adjacent conductor also suffers insulation damage at the same point. Unlike in underground cables system, there are a lot of relative movements between the conductors leading to abrasion which more likely to damage the adjoining insulation if the neutral is not insulated.

LT Aerial Bunched Cables as per IS:14255-1995 Size and requirement of phase, street lighting and messenger conductor

Phase Conductor (Aluminium)			Street Lighting Conductor (Aluminium)			Messenger Conductor (Aluminium Alloy)		
Nominal Area	Maximum Conductor D.C. Resistance at 20°C	Nominal Thickness of Insulation XLPE/PE	Nominal Area	Maximum Conductor D.C. Resistance at 20°C	Nominal Thickness of Insulation XLPE/PE	Nominal Area	Maximum D.C. Resistance at 20°C	Minimum Breaking Load
sqmm	ohm/km	mm	sqmm	ohm/km	mm	sqmm	ohm/km	KN
16	1.91	1.2	16	1.91	1.2	25	1.38	7
25	1.20	1.2	16	1.91	1.2	25	1.38	7
35	0.868	1.2	16	1.91	1.2	25	1.38	7
50	0.641	1.5	16	1.91	1.2	35	0.986	9.8
70	0.443	1.5	16	1.91	1.2	50	0.689	14
95	0.320	1.5	16	1.91	1.2	70	0.492	19.7

Composition and Designation of LT Aerial Bunched Cables

Designation	Complete Bunched Cables	
	Approx. Overall Dia mm	Approx. Total Mass Kg/Km
3x16 + 25	19	250
3x16 + 16 + 25	19	310
3x25 + 25	22	330
3x25 + 16 + 25	22	390
3x35 + 25	24	430
3x35+16 + 25	24	490
3x50 + 35	32	580
3x50 + 16 + 35	32	640

The first part for phase conductor, middle for street lighting conductor and last for bare messenger conductor.

TECHNICAL PARTICULARS

LT Aerial Bunched Cable 1100 Volts (3.5 Core). Reference Standard : IS : 14255/95

Sl. No.	Description		3 x 25 + 1 x 16 + 1 x 35	3 x 25 + 1 x 16 + 1 x 35	3 x 50 + 1 x 25 + 1 x 35	3 x 70 + 1 x 35 + 1 x 55	3 x 95 + 1 x 50 + 1 x 55
1.	Power/Neutral core:						
1.1	**Conductors:**						
	a) Nom. Cross Sectional Area						
	i) Power cores	(Sq. mm)	25	35	50	70	95
	ii) Neutral core	(Sq. mm)	16	16	25	35	50
	b) Max. D.C. resistance of conductor						
	i) Power cores	(Ohm/Km)	1.200	0.868	0.641	0.443	0.320
	ii) Neutral core	(Ohm/Km)	1.910	1.910	1.200	0.868	0.641
	c) Approx. diameter of conductor						
	i) Power cores	(mm)	6.200	7.300	8.350	10.100	12.000
	ii) Neutral core	(mm)	5.100	5.100	6.200	7.300	8.350
1.2	**Insulation:**						
	Minimum thickness:						
	i) Power cores	(mm)	0.980	0.980	1.25	1.25	1.25
	ii) Neutral core	(mm)	0.980	0.980	0.980	1.25	1.25
2.	**Messenger Wire (Bare):**						
	i) Nom. Cross sectional area	(Sq. mm)	35	35	35	55	55
	ii) Approx. breaking load	(KN)	9.80	9.80	9.80	16.03	16.03
3.	Current ratings. Continuous current carrying capacity of cable in Air at Ambient temp 40°C	(Amps)	99	122	149	190	235
4.	Approx. weight	(Kg/Km)	580	665	810	1165	1430
5.	Number of cores :						
	i) Power cores	(No.) : 3					
	ii) Neutral core	(No.) : 1					
	iii) Bare messenger	(No.) : 1					
6.	Derating factor : Derating factors for variation in air temp.						
	Air Temp.	(°C) 30	35	40	45	50	55
	Rating factor	1.12	1.06	1.00	0.94	0.88	0.83
7.1	Identification of Power cores :		By Providing ridges on the insulation.				
7.2	Laying :		Three power cores and one neutral core shall be suitably twisted around Aluminium Alloy messenger.				
8.	Details of the Power/Neutral core :						
8.1	Conductor :						
	a) Material		Aluminium to IS : 8130/84				
	b) Flexibility class as per IS:8130/84		Class-2				
	c) Form of conductor		Compacted circular.				
8.2	Insulation :						
	a) Material		Cross linked Polyethylene to IS:7098(I)/88				
	b) Colour of insulation		Black				
9.	Details of the Messenger wire (Bare)						
	a) Material		Aluminium Alloy Wire to IS : 398(IV)				
	b) Form of conductor		Stranded Circular / Compacted Circular.				

TECHNICAL PARTICULARS

LT Aerial Bunched Cable 1100 Volts (4 Core). Reference Standard : IS : 14255/95

Sl. No.	Description		3 x 25 + 1 x 25 + 1 x 35	3 x 25 + 1 x 35 + 1 x 35	3 x 50 + 1 x 50 + 1 x 35	3 x 70 + 1 x 70 + 1 x 55	3 x 95 + 1 x 95 + 1 x 55
1.	Power/Neutral core:						
1.1	**Conductors:**						
	a) Nom. Cross Sectional Area						
	i) Power cores	(Sq. mm)	25	35	50	70	95
	ii) Neutral core	(Sq. mm)	25	35	50	70	95
	b) Max. D.C. resistance of conductor						
	i) Power cores	(Ohm/Km)	1.200	0.868	0.641	0.443	0.320
	ii) Neutral core	(Ohm/Km)	1.200	0.868	0.641	0.443	0.320
	c) Approx. diameter of conductor						
	i) Power cores	(mm)	6.200	7.300	8.350	10.100	12.000
	ii) Neutral core	(mm)	6.200	7.300	8.350	10.100	12.000
1.2	**Insulation:**						
	Minimum thickness:						
	i) Power cores	(mm)	0.980	0.980	1.25	1.25	1.25
	ii) Neutral core	(mm)	0.980	0.980	0.980	1.25	1.25
2.	**Messenger Wire (Bare):**						
	i) Nom. Cross sectional area	(Sq. mm)	35	35	35	55	55
	ii) Approx. breaking load	(KN)	9.8	9.8	9.8	16.03	16.03
3.	Current ratings. Continuous current carrying capacity of cable in Air at Ambient temp 40°C	(Amps)	99	122	149	190	235
4.	Approx. weight	(Kg/Km)	610	725	880	1270	1570
5.	Number of cores :						
	i) Power cores	(No.) : 3					
	ii) Neutral core	(No.) : 1					
	iii) Bare messenger	(No.) : 1					
6.	Derating factor : Derating factors for variation in air temp.						
	Air Temp.	(°C) 30	35	40	45	50	55
	Rating factor	1.12	1.06	1.00	0.94	0.88	0.83
7.1	Identification of Power cores :		By Providing ridges on the insulation.				
7.2	Laying :		Three power cores and one neutral core shall be suitably twisted around Aluminium Alloy messenger.				
8.	Details of the Power/Neutral core :						
8.1	Conductor :						
	a) Material		Aluminium to IS : 8130/84				
	b) Flexibility class as per IS:8130/84		Class-2				
	c) Form of conductor		Compacted circular.				
8.2	Insulation :						
	a) Material		Cross linked Polyethylene to IS:7098(I)/88				
	b) Colour of insulation		Black				
9.	Details of the Messenger Wire (Bare)						
	a) Material		Aluminium Alloy Wire to IS : 398(IV)				
	b) Form of conductor		Stranded Circular / Compacted Circular.				

LASER HT AERIAL BUNCHED CABLES

In HT Aerial Bunched Cables the phase conductor consists of a stranded circular compacted Aluminium conductor, conductor screened with extruded semi-cone compound, Insulated with cross-linked polyethylene (XLPE), Insulation screened with extruded Semicon Compound followed by copper tape or plastic coated Aluminium tape, outer sheathed with PVC or black weather-resistant polyethylene and three such phase conductor are twisted around bare stranded circular compacted Aluminium Alloy Messenger conductor which takes all the mechanical stress and also serves as the earth cum neutral conductor.

Application Standard

1. IS : 10810-1984 : Methods of Test for Cables
2. IS : 8130-1984 : Conductors for Insulated Cables
3. IS : 6474-1984 : Polyethylene Insulation of Cables
4. IS : 398 (Part-IV)-1979 : Aluminium Alloy Conductors
5. IS : 14255-1995
6. IS : 7098-Part 1 & 2

11 KV(E) AERIAL BUNCHED CABLES GENERALLY TO IS : 7098/PART-2

(Three phase conductors around bare steel messenger)

	Phase Conductor		3x25	3x35	3x50	3x70	3x95	3x120	3x150
	Messenger Conductor		1x35	1x35	1x35	1x55	1x55	1x55	1x55
1.	Power/Neutral core:								
1.1	Conductors :								
1.	Trade Name		LASER						
2.	Rated Voltage	Kv	6.35x11						
3.	Reference Standard		Generally to IS 7098 (Part-2)/85						
4.	**PHASE CONDUCTOR**								
4.1	**Conductor**								
i)	Material		Aluminium to IS 8130/84, H4 Grade						
ii)	Nominal cross-sectional area	Sqmm	25	35	50	70	95	120	150
iii)	Flexibility class as per IS 8130		Class 2	Class 2	Class 2	Class 2	Class 2	Class 2	Class 2
iv)	Form of Conductor		Stranded Compacted Circular						
v)	Max. DC resistance at 20^{0}C	ohm/km	1.2	0.868	0.641	0.443	0.32	0.253	0.206
vi)	Approx conductor diameter	mm	6.2	7.3	8.4	10.1	12.0	13.2	14.6
4.2	**Conductor Screen**								
i)	Material & Type		Extruded semi-conducting layer						
ii)	Min. thickness	mm	0.3	0.3	0.3	0.3	0.3	0.3	0.3
4.3	**Insulation**								
i)	Material		Cross-linked Polyethylene to IS 7098 (Part-2)/85						
ii)	Nominal thickness	mm	3.6	3.6	3.6	3.6	3.6	3.6	3.6
4.4	**Insulation screen** (Non-Metallic)								
i)	Material & Type		Extruded semi-conductor layer						
ii)	Min. Thickness of extruded layer	mm	0.3	0.3	0.3	0.3	0.3	0.3	0.3
4.5	**Insulation screen** (Metallic)								
i)	Material & Type		Copper Tape applied helically with overlap						
ii)	Approx. thickness of copper tape	mm	0.045	0.045	0.045	0.045	0.045	0.045	0.045
4.6	Sheath								
i)	Material & Tape		PVC Type ST2 to IS 5831/84, Black Colour						
ii)	Nom. thickness	mm	2.0	2.0	2.0	2.0	2.0	2.0	2.0
4.7	Approx. diameter of Power core	mm	20.4	21.5	22.6	24.3	26.2	27.4	28.8
5.	**Bare Messenger**								
i)	Material		High Tensile galvanized steel strand to IS 398 (Part 2)/96						
ii)	Nom. Cross Sectional Area	Sqmm	35	35	35	55	55	55	55
iii)	Form of conductor		Stranded Circular						
iv)	Approx. breaking load	kN	41	41	41	62	62	62	62
v)	Approx. messenger diameter	mm	7.8	7.8	7.8	9.5	9.5	9.5	9.5
6.	**Number of Cores**								
i)	Phase Conductor		3	3	3	3	3	3	3
ii)	Bare Messenger		1	1	1	1	1	1	1
7.	Identification of Phase conductor		By one, two & three ridges on outer sheath						
8.	Cable assembly		Phase conductor laid up around the bare messenger						
9.	Approx. weight of cable	kg/km	1590	1760	1940	2385	2490	3040	3370
10	Continuous current carrying capacity of cable when laid freely in air at 50°C ambient Air temp.	Amps	95	115	140	175	215	250	280
11	Short circuit rating for one second duration								
i)	Phase conductor	KA	2.4	3.3	4.7	6.6	9.0	11.3	14.2
ii)	Copper Screen	Amp	200	200	200	200	200	200	200

Note: Copper tape screen has been designed for earth fault current of 200 Amp. for 1 second duration. However if required it can be suitably redesigned to meet specific requirement if any.

11 KV(E) AERIAL BUNCHED CABLES GENERALLY TO IS : 7098/PART-2

(Three phase conductors around bare steel messenger)

	Phase Conductor		3x185	3x240	3x300
	Messenger Conductor		1x90	1x90	1x90
1.	Trade Name		LASER		
2.	Rated Voltage	Kv	6.35x11		
3.	Reference Standard		Generally to IS 7098 (Part-2)/85		
4.	**PHASE CONDUCTOR**				
4.1	**Conductor**				
i)	Material		Aluminium to IS 8130/84, H4 Grade		
ii)	Nominal cross-sestional area	Sqmm	185	240	300
iii)	Flexibility class as per IS 8130		Class 2	Class 2	Class 2
iv)	Form of Conductor		Stranded Compacted Circular		
v)	Max. DC resistance at 20^{0}C	ohm/km	0.164	0.125	0.1
vi)	Approx conductor diameter	mm	16.2	18.6	20.6
4.2	**Conductor Screen**				
i)	Material & Type		Extruded semi-conducting layer		
ii)	Min. thickness	mm	0.3	0.3	0.3
4.3	**Insulation**				
i)	Material		Cross-linked Polyethylene to IS 7098 (Part-2)/85		
ii)	Nominal thickness	mm	3.6	3.6	3.6
4.4	**Insulation screen** (Non-Metallic)				
i)	Material & Type		Extruded semi-conductor layer		
ii)	Min. Thickness of extruded layer	mm	0.3	0.3	0.3
4.5	**Insulation screen** (Metallic)				
i)	Material & Type		Copper Tape applied helically with overlap		
ii)	Approx. thickness of copper tape	mm	0.045	0.045	0.045
4.6	**Sheath**				
i)	Material & Tape		PVC Type ST2 to IS 5831/84, Black Colour		
ii)	Nom. thickness	mm	2.2	2.2	2.2
4.7	Approx. diameter of Power core	mm	30.8	33.2	35.2
5.	**Bare Messenger**				
i)	Material		High Tensile galvanized steel strand to IS 398 (Part 2)/96		
ii)	Nom. Cross Sectional Area	Sqmm	90	90	90
iii)	Form of conductor		Stranded Circular		
iv)	Approx. breaking load	kN	103	103	103
v)	Approx. messenger diameter	mm	12.3	12.3	12.3
6.	**Number of Cores**				
i)	Phase Conductor		3	3	3
ii)	Bare Messenger		1	1	1
7.	Identification of Phase conductor		By one, two & three ridges on outer sheath		
8.	Cable assembly		Phase conductor laid up around the bare messenger		
9.	Approx. weight of cable	kg/km	4160	4820	5515
10	Continuous current carrying capacity of cable when laid freely in air at 50°C ambient Air temp.	Amps	325	400	445
11	Short circuit rating for one second duration				
i)	Phase conductor	KA	17.5	22.6	28.3
i)	Copper Screen	Amp	200	200	200

Note: Copper tape screen has been designed for earth fault current of 200 Amp. for 1 second duration. However if required it can be suitably redesigned to meet specific requirement if any.

LASER PVC FLEXIBLE CABLES

Laser flexible cables are available in single core and multi-core varieties. These flexible cables are made from E.C. grade copper having high purity (99.97%), fine wires are drawn and bunched together to make flexible conductor, PVC (Type-A) insulated, multi-core cables are sheathed with PVC (Type-ST1). These cables find their application in industrial wiring, wiring of panels & other electrical equipment. These cables are designed to withstand 3 kV for 5 minutes or Spark Voltage test as per IS. Governing specification IS 694-1990. Packing – 100 mtr / 200 mtr / 500 mtr or as per customers requirement.

SINGLE CORE FLEXIBLE COPPER CONDUCTOR PVC INSULATED UNSHEATHED INDUSTRIAL WIRING CABLES

Nominal Area of Conductor	Number/ Nominal Dia of Wire	Thickness of Insulation (Nom.)	Approx. Overall Diameter	Current carrying capacity for 2 Cables Single Phase AC or DC or 3-Phase AC (unenclosed)	Resistance max. per km. at 20°C	Reference Conductor Class of IS: 8130-1984
(sq.mm)	(No./mm)	(mm)	(mm)	(Amps)	(Ohms)	
0.5	16/0.2	0.6	2.2	4	39	Class 5
0.75	24/0.2	0.6	2.4	7	26	Class 5
1.0	32/0.2	0.6	2.6	12	19.5	Class 5
1.5	48/0.2	0.6	2.9	16	13.5	Class 5
2.5	80/0.2	0.7	3.5	22	7.98	Class 5
4.0	56/0.3	0.8	4.3	29	4.95	Class 5
6.0	84/0.3	0.8	5.0	37	3.300	Class 5
10.0	140/0.3	1.0	6.3	51	1.910	Class 5
16	126/0.4	1.0	7.3	68	1.210	Class 5
25	196/0.4	1.2	8.9	85	0.780	Class 5
35	276/0.4	1.2	10.1	112	0.554	Class 5
50	396/0.4	1.4	11.9	143	0.386	Class 5
70	360/0.5	1.4	13.6	214	0.272	Class 5
95	475/0.5	1.6	15.8	260	0.206	Class 5
120	608/0.5	1.6	17.5	305	0.161	Class 5
150	750/0.5	1.8	19.5	355	0.129	Class 5
185	925/0.5	2.0	21.5	415	0.1060	Class 5
240	1221/0.5	2.2	25.0	500	0.0801	Class 5
300	1527/0.5	2.4	27.0	580	0.0641	Class 5
400	2036/0.5	2.6	31.0	690	0.0486	Class 5
500	1710/0.6	2.8	34.5	780	0.0384	Class 5

TWO, THREE & FOUR CORE FLEXIBLE COPPER CONDUCTOR PVC SHEATHED CABLES

Nominal Area of Conductor	Number/ Nominal Dia of Wire	Thickness of Insulation (Nom.)	Thickness of Sheath (Nom.) (2 core)	Thickness of Sheath (Nom.) (3 core)	Thickness of Sheath (Nom.) (4 core)	Approx. Overall Diameter (2 core)	Approx. Overall Diameter (3 core)	Approx. Overall Diameter (4 core)	Current Carrying capacity for Single cable for Single ph AC or DC (unenclosed)	Current Carrying capacity for Single cable for Three ph AC (unenclosed)	Resistance Max. per km. at 20°C	Reference conductor class of IS:8130
(sq.mm)	(No./mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(Amps)	(Amps)	(Ohms)	
0.5	16/0.2	0.6	0.9	0.9	0.9	6.50	7.0	7.5	4	4	39	Class 5
0.75	24/0.2	0.6	0.9	0.9	0.9	7.00	7.5	8.0	7	6	26	Class 5
1.0	32/0.2	0.6	0.9	0.9	0.9	7.25	8.0	8.5	12.5	11	19.5	Class 5
1.5	48/0.2	0.6	0.9	0.9	1.0	7.75	8.5	9.5	15	14	13.5	Class 5
2.5	80/0.2	0.7	1.0	1.0	1.0	9.25	10.25	11.0	20	19	7.98	Class 5
4.0	56/0.3	0.8	1.0	1.0	1.0	10.75	11.75	12.75	27	26	4.95	Class 5
6.0	84/0.3	0.8	1.1	1.3	1.4	12.00	15.0	14.50	35	31	3.300	Class 5
10.0	140/0.3	1.0	1.1	1.4	1.4	14.75	17.5	19.0	46	42	1.910	Class 5
16	126/0.4	1.0	1.2	1.4	1.4	17.00	19.5	21.5	65	57	1.210	Class 5
25	196/0.4	1.2	1.3	1.5	1.6	20.5	23.5	25.5	75	72	0.780	Class 5
35	276/0.4	1.2	1.4	1.6	1.7	23.0	26.5	29.5	100	91	0.554	Class 5
50	396/0.4	1.4	1.6	2.0	2.0	28.0	32.5	35.0	130	120	0.386	Class 5
70	360/0.5	1.4	1.8	2.2	2.2	32.5	38.5	40.0	180	165	0.272	Class 5
95	475/0.5	1.6	1.9	2.4	2.4	38.5	45.0	46.5	220	200	0.206	Class 5
120	608/0.5	1.6	2.0	2.5	2.5	42.5	52.0	52.0	250	225	0.161	Class 5
150	750/0.5	1.8	2.2	2.6	2.6	45.0	52.0	54.0	275	250	0.129	Class 5

FIVE CORE FLEXIBLE COPPER CONDUCTOR PVC SHEATHED CABLES

Nominal area of conductor	Number/Nominal Dia of Wire	Thickness of Insulation (Nom.)	Thickness of Sheath (Nom.)	Approx. overall Diameter	Current carrying capacity for single cable for control circuits (unenclosed)	Resistance Max. per km. at 20°C	Reference conductor class of IS:8130
(Sq.mm)	(No/mm)	(mm)	(mm)	(mm)	(Amps)	(Ohms)	
0.5	16/0.2	0.6	0.9	8.50	4	39	Class 5
0.75	24/0.2	0.6	0.9	9.00	6	26	Class 5
1.0	32/0.2	0.6	1.0	9.75	11	19.5	Class 5
1.5	48/0.2	0.6	1.0	10.50	14	13.3	Class 5
2.5	80/0.2	0.7	1.0	12.00	19	7.98	Class 5
4.0	56/0.3	0.8	1.1	14.25	26	4.95	Class 5
6.0	84/0.3	0.8	1.2	16.00	31	3.300	Class 5
10.0	140/0.3	1.0	1.3	19.75	40	1.910	Class 5

LASER INSTRUMENTATION CABLE

Design Basics

Instrumentation cables are designed for the Transmission of Analog & Digital signals in instruments and Control Systems. Laser makes instrumentation cables are designed to maintain a high level of accuracy and sensitivity of the system without a drop in signal. It is designed to obtain Maximum rejection of Electromagnetic noise, minimal cross-talk and minimal electromagnetically induced noise & common mode interference. Individual pairs or Triads are Colour coded for simplified identification and hook-up. Rugged armoured versions are recommended for use in Intrinsically Safe Systems. The Aluminium Myler Tape screening ensures exact data and pulse transmission, protecting the cable against electromagnetic disturbances and interferences. Fire performance options are designed to resist and withstand extreme fire conditions, with minimal emission of toxic gases. The lead sheath provides excellent resistance to chemical, oil, gas & radial water blocking.

Characteristics

- Signal protection between pairs.
- Good electromagnetic protection from external influences.
- Excellent Electrical, Thermal & Physical properties.
- Flame Retardant, Fire Retardant & Fire resistant – Highly recommended in areas with High Explosion & Fire risks.
- Lead sheath provides radial water tightness and resistance to chemicals & hydrocarbons.
- Excellent mechanical protection during laying, installation & service.
- Extra pulling force.
- Option class-5 conductor provides extra flexibility.

Application

- Generally used for transmission of signals in control systems
- Typical applications include audio, intercom, control, energy measurements, alarm circuits.
- Suitable for use in wet and dry locations.
- Armoured cables are recommended for Outdoor & Direct Burial.
- Unarmoured cables are recommended for indoor use.

Category of Cables

Other than Conductor & Insulation variances Instrumentation cables are categorized broadly by the following :

Type-1 Unarmoured	Collectively Screened Individually & Collectively Screened	Collective Screen / Sheath Individual Screen / Collective Screen / Sheath
Type-2-Armoured	Collectively Screened Individually & Collectively Screened	Collective Screen / Sheath or Bedding / Armoured / Overall Sheath Individual Screen / Collective Screen / Sheath or Bedding / Armoured / Overall Sheath
Type-3-Lead Sheathed & Armoured	Collectively Screened Individually & Collectively Screened	Collective Screen / Sheath or Bedding / lead Sheath / Beeding / Armour & Armoured / Overall Sheath Individual Screen / Collective Screen / Sheath or Bedding / Lead Sheath/ Beeding / Amour / Overall Sheath

CLASS OF CONDUCTOR

Cond. Size in Sq. mm.	No./Dia (mm) of wires		
	Solid (Class 1)	Stranded (Class2)	Flexible (Class 5)
0.5	1 / 0.8	7/0.3	16/0.2
0.75	1 / 0.98	7/ 0.37	24 / 0.2
1.0	1 / 1.13	7 / 0.43	32 / 0.2
1.5	1 / 1.38	7 / 0.53	30 / 0.25
2.5	1 / 1.78	7 /0.67	50 / 0.25

Electrical & Transmission Characteristics

Electrical & Transmission Characteristics	Refer Specification
• Conductor resistance	IS : 1554 Part-l / BS : 5308 Part-1&2
• Dielectric constant	IS : 5608 Part-l / BS : 5308 Part-1&2
• Volume resistivity at 27°C	BS : 5608 Part-ll / BS : 5308 Part-1&2
• Mutual capacitance	BS : 5608 Part-lll / BS : 5308 Part-1&2
• Co-axial capacitance	BS : 5308 Part-1&2
• Characteristic impedence	IEC : 189 / BS : 5308 Part-1&2
• Cross talk / attenuation	VDE 0815
• Inductance	VDE 0816 / BS : 5308 Part-1&2

Constructional Features

Process	Features with Materials
Conductor	Electrolytic grade Annealed high cinductivity plain or tinned, solid or stranded or flexible copper wires.
Insulation	PVC / HRPVC / POLYETHYLENE (PE) / XLPE
Core & Pair Indentification	Colouring of Insulation, number printing, Ring marking or combination of above schemes.
Pairing	Two cores twisted to form apair with staggered lay lengths for minimizing cross talk.
Individual pair screening	Pairs screened with Aluminium Mylar Tape (100% coverage) having Tinned Copper drain wire under the screen longitudinally along the length, in contact with the Aluminium face.
Pair laying-up	Pair laid up in suitable condition
Binder tape (optional)	Mylar Tape
Collective screening	With Aluminium Mylar Tape (100% coverage) having Tinned Copper drain wire under the screen longitudinally along the length, in contact with the Aluminium face.
Sheath or Bedding	PVC/HR PVC/PE/FRLS/ZHLS
Lead Seath	Lead Alloy 'E' sheath
Bedding	PVC/HR PVC/FRLS/ZHLS
Armour	Single layer of round glavanized steel wires or flat galvanized steel strips.
Overall Sheath	PVC/HR PVC/FRLS/ZHLS

BASIC DATA FOR ALL ALUMINIUM CONDUCTORS (AAC) AS PER

IS 398 (PART - I) : 1996

Code Word	Aluminium Area (Sq Mm)		Stranding & Wire Diameter		"Overall Dia (Mm) (Approx)"	"Mass (Approx) (Kg /Km)"	"Resistance AT 20 Deg C (Ohms/Km) (Max)"	"Ultimate Breaking Load (Kn)"	Current Carrying Capacity		
	Nominal	Sectional	Conductor						"65 Deg. C Amps"	"75 Deg. C Amps"	"90 Deg. C Amps"
			No.	DIA (Mm)							
Gnat	25	26.85	7	2.21	6.63	74	1.096	4.52	107	152	NA
Ant	50	52.83	7	3.10	9.3	145	0.5525	8.25	180	225	NA
Wasp	100	106	7	4.39	13.17	290	0.2752	15.96	292	365	NA
19/3.18 Mm	150	150.9	19	3.18	15.9	415	0.1942	23.28	363	460	NA
Spider	240	237.6	19	3.99	19.95	654	0.1235	35.74	495	510	NA
Butterfly	300	322.7	19	4.65	23.25	888	0.09107	48.74	600	760	NA

BASIC DATA FOR ALL ALUMINIUM CONDUCTORS (AAC) AS PER

IS 398 (PART - I) : 1996

Code Word	Aluminium Area (Sq Mm)		Stranding & Wire Diameter		"Overall Dia (Mm) (Approx)"	"Mass (Approx) (Kg /Km)"	"Resistance AT 20 Deg C (Ohms/Km) (Max)"	"Ultimate Breaking Load (Kn)"	Current Carrying Capacity		
	Nominal	Sectional	Conductor						"65 Deg. C Amps"	"75 Deg. C Amps"	"90 Deg. C Amps"
			No.	DIA (Mm)							
Rose	20.89	21.12	7	1.96	5.88	58	1.362	385	100	124	Na
Lady Bird	42.33	42.8	7	2.79	8.37	117	0.6721	737	159	198	Na
Fly	62.86	63.55	7	3.40	10.2	174	0.4526	1051	207	260	Na
Blue Bottle	72.84	73.65	7	3.66	10.95	201	0.3936	1203	225	284	Na
Earwig	77.7	78.55	7	3.78	11.34	215	0.3662	1272	238	300	Na
Grass Hopper	83.13	84.05	7	3.91	11.73	230	0.3422	1356	250	312	Na
Clegg	94.56	95.6	7	4.17	12.51	261	0.3009	1523	270	335	Na
Caterpiller	183	186	19	3.53	17.65	511	0.1555	2985	420	530	Na
Chaffer	209.9	213.2	19	3.78	18.9	586	0.1356	3381	460	580	Na
Cockroach	261.5	265.8	19	4.22	21.1	730	0.1088	4144	530	670	Na
Moth	367.2	373.1	19	5.00	25	1025	0.0774	5695	654	828	Na
Locust	421.9	428.7	19	5.36	26.8	1176	0.0674	6516	711	904	Na
May Bug	473.6	486.1	37	4.09	28.63	1343	0.0598	7289	764	970	Na
Scorpion	518.4	529.8	37	4.27	29.89	1464	0.0548	7878	805	1030	Na
Iris	33.45	33.81	7	2.48	7.44	92	0.8506	582	121	162	NA
Pansy	42.02	42.49	7	2.78	8.34	116	0.677	730	159	198	Na

QUAD Jelly Filled Armoured Underground Screened Cable

S/L	Size	Conductor	Insulation			Laidup of QUAD with Jelly		Poly-Al & Inner Sheath			
		"Conductor Size (in mm)"	Insulation Material	"Nominal Insulation Thickness (in mm)"	"Insulation Core Dia. (mm)"	"Laidup of QUAD with Jelly "	"Dia Over Tape Over Laidup Approx (in mm)"	"Poly-Al Tape Thickness (mm)"	Inner Sheath Material	"Inner Sheath Thickness Nom. (in mm)"	"Dia Over Inner Sheath ± 1.0 (in mm)"
1	4QUAD X 0.90MM	0.90	HDPE	0.325	1.55	4 Quad Unit	7.70	0.300	LDPE	2.00	12.9
2	6QUAD X 0.90MM	0.90	HDPE	0.325	1.55	6 Quad Unit	10.70	0.300	LDPE	2.00	16.9
3	4QUAD X 1.40MM	1.40	HDPE	0.60	2.60	4 Quad Unit	12.80	0.300	LDPE	2.00	17.8
4	6QUAD X 1.40MM	1.40	HDPE	0.60	2.60	6 Quad Unit	17.20	0.300	LDPE	2.00	22.2

Electrical Paremeters

Spark Test During Insulation Extrusion :- 3 KV AC (RMS) or 4.5 KV DC	Spark Test During Inner Extrusion:- 11 KV AC (RMS) or 17 KV DC
Spark Test During Intermediata Extrusion:- 6 KV AC (RMS) or 9 KV DC	Spark Test During Outer Extrusion:- 15 KV AC (RMS) or 23 KV DC
HV Test - 2KV for 10 Second Each Core & Core to Screen with Armour & DST	Insulation Resistance 5000 mega Ωs / Km (min.)
Reduction Factor (Field intensity of 50v to 450v) : 0.10 (Max)	

Insulation Colour:- White, Red, Grey, Orange, Blue, Brown, Green, Yellow & Black

Color Coding for Quad :

Quad No 1 - White, Orange, Red , Green	Quad No 4 - White, Green, Red , Green
Quad No 2 - White, Blue, Red , Green	Quad No 5 - White, Yellow, Red , Green
Quad No 3 - White, Brown, Red , Green	Quad No 6 - White, Black, Red , Green

QUAD Jelly Filled Armoured Underground Screened Cable

Size	Conductor Resistance at 20°C	Attenuation at 20°C	Characteristic Impedance (Ω)	"Crosstalk ELFEXT :"	"Crosstalk NEXT :"
0.90 mm	28 (Each Core) Ω/Km (Max)	4.40 dB/Km (Max. Avg.) at 150KHz	470 +/- 15% Ω at 0.8KHz	150 KHz 55 dB/Km Ind. (Min.)	55 dB (min.) at 150 KHz
	56 (loop) Ω/Km (Max)	2 dB/Km (Max. Avg.)at 300-3400 Hz	195 +/- 15% Ω at 5.0 KHz	67.8 dB/Km (RMS) (Min.)	
1.40 mm	11.6 (Each Core) Ω/Km (Max)	0.3 dB/Km (Max. Avg.) at 0.8KHz	310 +/- 15% Ω at 0.8KHz		
	23.2 (loop) Ω/Km (Max)	0.8 dB/Km (Max. Avg.) at 5KHz	150 +/- 15% Ω at 5.0 KHz	at 0.8KHz, 5KHz 21 KHz & 150 KHz Ind. (Min.)	55 dB (min.) at 0.8 KHz, 5 KHz, 21 KHz & 150 KHz
		1.3 dB/Km (Max. Avg.) at 21KHz	110 +/- 15% Ω at 21.0 KHz	60.0 dB/Km	
		2.5 dB/Km (Max. Avg.) at 150KHz	100 +/- 15% Ω at 150.0 KHz	70.8 dB/Km (RMS) (Min.)	

Electrical Paremeters	
During Insulation Extrusion :- 3 KV AC [RMS] or 4.5 KV DC	Spark Test During Inner Extrusion:- 11 KV AC (RMS) or 17 KV DC
During Intermediata Extrusion:- 6 KV AC [RMS] or 9 KV DC	Spark Test During Outer Extrusion:- 15 KV AC (RMS) or 23 KV DC
for 10 Second Each Core & Core to een with Armour & DST	Insulation Resistance 5000 mega Ωs / Km (min.)
tor (Field intensity of 50v to 450v) : 0.10 (Max)	

Insulation Colour:- White, Red, Grey, Orange, Blue, Brown, Green, Yellow & Black	
Color Coding for Quad :	Spark Test During In AC [RMS
Quad No 1 - White, Orange, Red , Green	Quad No 4 - White, Green, Red , Green
Quad No 2 - White, Blue, Red , Green	Quad No 5 - White, Yellow, Red , Green
Quad No 3 - White, Brown, Red , Green	Quad No 6 - White, Black, Red , Green

RECOMMENDATIONS FOR CURRENT RATINGS

Wire Strands
Stay Wire

Stay Wires are galvanized steel wire strands that are used for sustaining mechanical load. Generally, they are made up of 6 wires stranded around 1 wire, twisting 7 wires together. A common use for stay wires are in the electricity industry, using the wire to stay power poles and tower structures.

Material:
The wire is cold drawn from steel and coated with zinc, the finished strand and the individual wires having uniform quality and the properties and product characteristics as specified in technical specification.

Construction: 7 Strand (6+1)
Specification: BS:183 or other customer specified specifications
Size: 7/1.60 to 7/4.0mm
(amperes)
K: Rating factor as applicable

Grade	Tensile Grade	Min. Tensile Strength (N/mm2)
1	1770	1770
2	1570	1570
3	1100	1100
4	700	700
5	450	450

RECOMMENDATIONS FOR CURRENT RATINGS

Construction Number of wires/wire diameter	Approximate strand diameter	Minimum breaking load of strand							Approx. mass
		Grade 350	Grade 480	Grade 700	Grade 850	Grade 1000	Grade 1150	Grade 1300	
	mm	KN	KN	KN	KN	KN	KN	KN	Kg/1000m
3/1.80	3.9	2.65	3.66	-	-	-	-	-	3.9
3/2.65	5.7	5.80	7.95	-	-	-	-	-	5.7
3/3.25	7.0	8.70	11.95	-	-	-	-	-	7.0
3/4.00	8.6	13.20	18.10	-	-	-	-	-	8.6
4/1.80	4.4	3.55	4.90	-	-	-	-	-	4.4
4/2.65	6.4	7.70	10.60	-	-	-	-	-	6.4
4/3.25	7.9	11.60	15.90	-	-	-	-	-	7.9
4/4.00	9.7	17.60	24.10	35.20	-	-	-	-	9.7
5/1.50	4.1	3.10	4.24	6.18	-	-	-	-	4.1
5/1.80	4.9	4.45	6.10	8.90	-	-	-	-	4.9
5/2.65	7.2	9.65	13.25	19.30	-	-	-	-	7.2
5/3.25	8.8	14.50	19.90	29.00	-	-	-	-	8.8
5/4.00	10.8	22.00	30.15	43.95	-	1.70	-	2.24	10.8
7/0.56	1.7	0.6	0.83	1.20	-	2.75	1.98	3.60	1.7
7/0.71	2.1	0.97	1.33	1.94	-	3.95	3.19	5.15	2.1
7/0.85	2.6	1.39	1.90	2.80	-	4.45	4.57	5.80	2.6
7/0.90	2.7	1.55	2.14	3.10	-	5.50	5.12	7.15	2.7
7/1.00	3.0	1.92	2.64	3.85	-	8.55	6.32	11.15	3.0
7/1.25	3.8	3.01	4.10	6.00	-	10.75	9.88	14.00	3.8
7/1.40	4.2	3.75	5.17	7.54	9.16	11.00	12.35	14.30	4.2
7/RS+	4.3	3.85	5.28	7.70	9.35	14.10	12.65	18.30	4.3
7/1.6	4.8	4.90	6.75	9.85	11.95	17.80	16.20	23.20	4.8
7/1.8	5.4	6.23	8.55	12.45	-	22.00	20.50	38.60	5.4
7/2.00	6.0	7.70	10.55	15.40	-	30.60	25.30	39.80	6.0
7/2.36	7.1	10.70	14.70	21.40	-	38.60	35.20	50.20	7.1
7/2.65	8.0	13.50	18.50	27.00	-	49.50	44.40	64.30	8.0
7/3.00	9.0	17.30	23.75	34.65	-	54.55	56.90	70.90	9.0
7/3.15	9.5	19.10	26.20	38.20	-	58.05	62.75	75.50	9.5
7/3.25	9.8	20.30	27.85	40.65	-	73.25	66.80	95.20	9.8
7/3.65	11.0	25.60	35.15	51.25	-	88.00	84.20	114.0	11.0
7/4.00	12.0	30.90	42.20	61.60	-	99.30	101.0	129.0	12.0
7/4.25	12.8	34.75	47.65	69.50	-	124.0	114.0	161.3	12.8
7/4.75	14.0	43.40	59.45	86.80	-	14.92	142.7	19.40	14.0
19/1.00	5.0	5.22	7.16	10.45	-	23.32	17.16	30.31	5.0
19/1.25	6.3	8.16	11.19	16.32	-	29.25	26.81	38.02	6.3
19/1.40	7.0	10.24	14.04	20.47	-	38.20	33.64	49.66	7.0
19/1.60	8.0	13.37	18.34	26.75	-	59.69	43.93	77.60	8.0
19/2.00	10.0	20.90	28.65	41.78	50.74	93.27	68.64	121.3	10.0
19/2.50	12.5	32.65	44.80	65.29	79.28	134.3	107.3	174.6	12.5
19/3.00	15.0	47.00	64.50	94.00	114.1	188.0	154.5	244.5	15.0
19/3.55	17.8	65.80	90.27	131.6	159.9	283.7	216.3	310.4	17.8
19/4.00	20.0	83.55	114.6	167.1	203.0	336.7	274.6	437.7	20.0
19/4.75	23.8	117.85	161.6	235.7	286.0		387.2		23.8

+: The construction of this strand consists of six wires of 1.40 mm diameter on a centre wire of 1.50 mm diameter. The diameter of the centre wire shall not be less than 0.08 mm or more than 0.12 mm greater than the diameter of the outer wire.

PACKING:

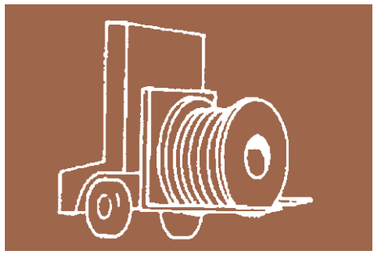
The galvanized steel stay strand is protected with paper/polythene/HDPE and outside wooden lagging on drum/reel.

ROLLING MILL

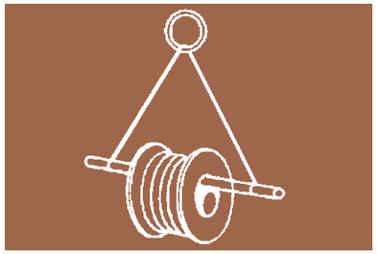
Nom.size of conductor as per IS 8130/84	From of conductor stranded	Nom. Thick-ness of XLPE insulation	Min. Thickness of PVC Outer Sheath	Strip Armoured Cable								Round Wire Armoured Cable								CURRENT RATINGS							
				Nom. Dimension of GL flat strip	Min. Thickness of PVC outer sheath	Approx Overall Diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Nom. Dimension of Al. round wire	Min. Thickness of PVC outer sheath	Approx Overall diameter of cable	Al. Approx Weight of cable	Cu. Approx Weight of cable	Aluminium				Copper			
														Burned Direct in Ground	Buried in Duct	In Air		Burned Direct in Ground	Buried in Duct	In Air	
Sq.mm	-	mm	mm	mm	mm	mm	kg/km	kg/km	mm	mm	mm	kg/km	kg/km	A	A	A		A	A	A	
50	Circular	8.8	0.7	4x0.8	2.52	72.00	5355	6195	3.15	2.68	77.00	7920	8760	130	115	155		170	150	200	
70	Circular	8.8	0.7	4x0.8	2.68	76.00	5980	7195	3.15	2.84	81.00	8655	9865	160	140	190		205	180	245	
95	Circular	8.8	0.7	4x0.8	2.84	80.00	6520	8205	3.15	3.00	85.00	9325	11010	190	170	230		245	215	300	
120	Circular	8.8	0.7	4x0.8	2.84	84.50	7230	9355	4.00	3.00	91.00	11415	13540	215	190	265		275	245	340	
150	Circular	8.8	0.7	4x0.8	3.00	86.00	7760	10385	4.00	3.00	92.50	11960	14585	240	215	300		305	275	385	
185	Circular	8.8	0.7	4x0.8	3.00	90.50	8540	11815	4.00	3.00	96.50	12945	16220	270	240	340		345	305	435	
240	Circular	8.8	0.7	4x0.8	3.00	95.50	9555	13865	4.00	3.00	102.00	14260	18575	310	275	400		395	350	510	
300	Circular	8.8	0.7	4x0.8	3.00	100.00	10555	15975	4.00	3.00	106.50	15450	20865	350	310	455		440	390	580	
400	Circular	8.8	0.7	4x0.8	3.00	106.50	11905	18785	4.00	3.00	113.00	17075	23955	395	355	530		495	440	660	

HOW TO HANDLE CABLE DRUMS

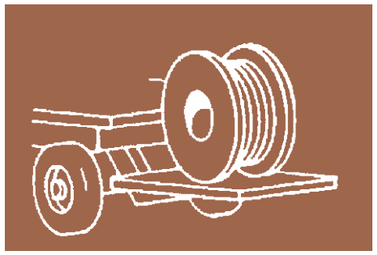
Do's



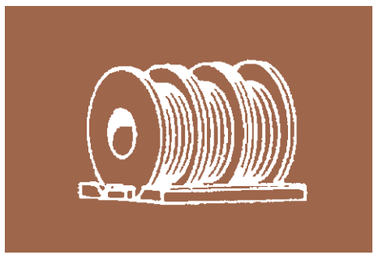
Cradle both drum flanges between forks



Drums can be hoisted with a shaft extending through both flanges



Lower drums from truck using hydraulic gate, hoist or fork lift. LOWER CAREFULLY



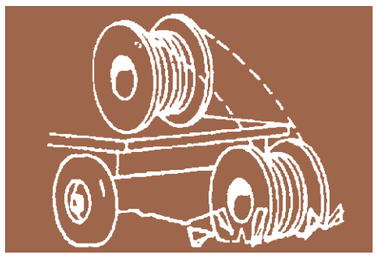
Always load with flanges on edge

Dont's

Upended heavy drums will often arrive damaged. Refuse or receive subject to inspection forbidden damages

Do not lift by top flange. Cable or drum will be damaged

Never allow forks to touch cable surface or drum wrap



Never drop drums

RECOMMENDED CABLE HANDLING PRACTICES

Unloading and Moving of Drums

Cable Drum should never be shipped flat side down. Cable Drums that arrive in this manner should either be rejected or may be accepted after a thorough inspection.

Evidence of damage during shipment may be ascertained by inspecting the Cable's protective covering, if the damage is found, the same should be immediately reported to the Transporter. Cable Drums should never be dropped from the delivering vehicle to the ground. It should be ensured that the unloading equipment does not come in contact with the Cable surface or the protective wrap, if provided with a protective wrap. If the unloading of the Drum is accomplished by Crane, then it should be ensured that either a cradle supporting the Drum flanges or a shaft through the borehole is used. If Fork-lift is used it should be ensured that forks must lift the Drum at 90° to the flanges and the forks must be long enough to make complete lifting contact with both flanges. It must be ensured that under no circumstances should the forks come in contact with the cable surface or the protective wraps.

In the event of an inclined ramp is used for unloading, it should be ensured that the ramp is wide enough to accommodate both flanges completely. The stopping of the drum at the bottom shall be done by using the drum flanges and not the surface of the cable.

RECOMMENDED CABLE STORAGE PRACTICES

Storage & Storage Maintenance

Finished cables have no established shelf-life. Oxidation and discoloring can be caused to the conductor if exposed to moisture and atmospheric conditions. Uncovered/Unsheltered cable will degrade due to exposure to direct sunlight and/or the elements. This can be avoided by protecting the cables ensuring no degradation of insulation.

In general, cables meant for indoor application should be stored indoors. However, cable suitable for outdoor application may be stored outside but proper care should be taken that the cables are provided with end seals to prevent ingress of moisture/water into the cable.

The cable should be stored in a sheltered area and should be covered with Masonite or Dark film wrap to block sun rays.

Cables with sub-zero temperature marks may be stored in low ambient temperature areas. However, Cables without sub-zero marking should never be stored in low temperature areas.

Cable drums should never be stacked or stored on their sides and must remain in the upright position. Cable drums should be stored with a protective covering or lagging in place. If the length of the cable is cut from the drum, the cable end should be immediately sealed to prevent the ingress of moisture. If a part length is returned to storage, the drum's protective covering should be restored.

Drums should be stored on a flat, hard surface so that flanges do not sink into the earth. The weight of the reel and cable must be carried by the flanges at all times. Wooden drums should be stored off the ground to prevent rotating. Cable reels and lagging must not be stored for an extended period in direct contact with water or dampness. Timbers or metal supports must be placed under the drum flanges to provide elevated storage of the drums away from direct contact with water or damp soil.

Drums should be stored away from the construction equipment where falling or flying objects may cause damage to the cable.

The cable should be stored in areas where chemicals or petroleum will not be spilled or sprayed on the cable.

Cable should be stored in an area away from open fires in high-heat zone.

In the event drums are relocated, they should be handled as suggested in the "Recommended Drum handling practices" section and an inspection made on each drum during relocation.

If the cables are stored in a secure area and are not subjected to the adverse effects of weather, an annual inspection would be sufficient. Where the drums are exposed to weather, a bimonthly inspection should be carried out to observe any sign of deterioration.

If the drums are exposed in a non-secure area inspection at frequent intervals may be required depending upon the circumstances.

Records of a delivery date, manufacturer, installation date and any extenuating circumstances, along with all test reports should be kept on file.

Recommended Minimum Permissible Bending Radius

While installing the cables, the following minimum bending radius should be observed so that the Cable, particularly insulation is not damaged. Wherever possible larger bending radius should be maintained.

Rated Voltage (KV)	PVC & XLPE Cables	
	Single Core	Multicore
Upto 1.1 Kv	15 D	12 D
Above 1.1 to 11 Kv	15 D	15 D
22 Kv & 33 Kv	20 D	20 D
Where D is the Outer Diameter of cable		

PRE-INSTALLATION INSTRUCTIONS

Overview

To ensure reliability and safety during cable installation the following points may be checked prior to installation:

- The selected cable is appropriate for the desired application.
- No damage has occurred on the cable in transit or storage.
- Review all applicable codes and practices to verify that the selected cable is suitable for the application.
- Any existing cable damage is promptly identified precaution may be taken to ensure that no further damage occurs. This can be ensured by proper cable inspection, handling and storage.

Cable Inspection

Inspect every cable reel for damage before accepting the shipment. Extra caution may be taken if, A Drum is lying flat on its side.
Several drums are stacked together.
Other freight items are stacked on the Drum.
Nails have been driven into the drum flanges to secure shipping blocks.
The drum flange is damaged.
The cable covering is removed stained or damaged a drum has been dropped (likely a chance of hidden damage).

Cable Handling

All nails and staples should be removed from the drum flanges before moving a drum. Avoid all objects that could crush, gouge or impact the cable while moving. Cable should never be used as a means to move a drum.
Recommended bending radii should be observed while unreeling, use swivels to prevent twisting and overruns.

INSTALLATION

Overview

Generally, cables are subjected to more mechanical stress during installation than they ever experience in actual operation. Handling and pulling the cable as per manufacturers' recommendations is of prime importance.

The following are the 5 prime considerations in a cable installation:

- Ambient Temperature
- Equipment
- Conduit fill
- Mechanical fit in raceway
- Physical limitations

Installation Temperature

Low temperatures are causes for concern while installing cable in low ambient temperature areas. Cable installation should be avoided when the ambient temperature is less than the cold bend temperature rating of the cable plus 15° centigrade. Minimum installation temperature may not be marked for cables meant for normal temperature regions.

Prior to performing a low temperature (less than 10°F) cable installation, the cable should be stored for a minimum of 24 hours at a Temperature of 55°F or higher. The cable should be pulled more slowly and trained in place the same day it is removed from storage. Avoid impact, drop, kink, or bending cable sharply in low temperatures. It should also be ensured that the ambient temperature should be less than the maximum temperature limit of the cable.

Equipment

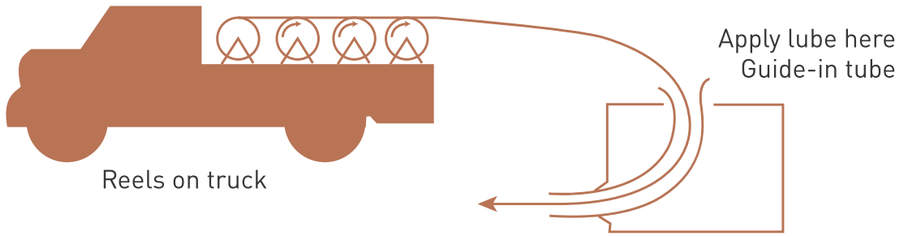
Proper usage of appropriate equipment is crucial for a successful cable installation. The details of the equipment needed for most installations are as below :

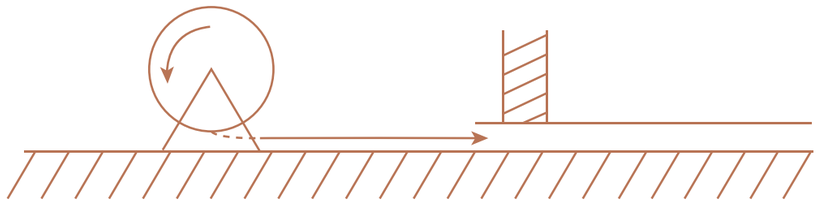
0-1/5/10 kip Dynamometer • Basket grip pullers • Cable cutter • Cable pulling lubricant Cable tray bend sheaves

• Cable tray rollers • Capstan type puller • Diameter tape • Drum arbor • Drum brakes • Drum jacks • Duct cleaning mandrels • Duct testing mandrels • Electric safety blankets and clamps • Extension cords and GFCI protection • Fishtape or string blower / vacuum flood lamp • Gang rollers, with a minimum 4 ft effective radius • Gloves • Guidein flexible tubing (elephant trunks) • Hand winches (come-a-long) • Hipot tester • Lint-free rags • Make-up air blowers and hose • Manhole cover hooks • Manhole edge sheaves • Measuring tapes • Personal Safety clothings • Plywood sheets • Portable Electric Generator • Pre-lubing devices • Pulling ropes • Pump, diaphragm • Radios or Telephones • Several wire rope slings of various lengths • Shackles / Clevis • Short ropes for temperature tie offs • Silicone caulking (to seal cable ends) • Swivels • Warning flags, signs

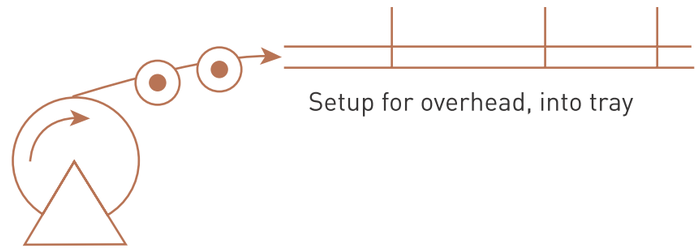
CABLE INSTALLATION FEED-IN SETUPS

The following diagrams illustrate various cable feed-in setups





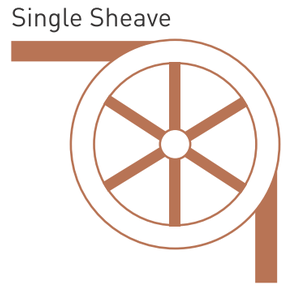
Setup for duct close to floor

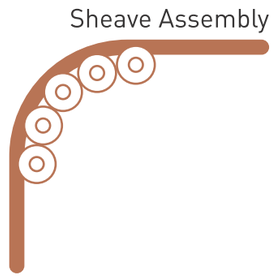


Setup for overhead, into tray

CABLE INSTALLATION FEED-IN SETUPS (CONTD.)

Single Sheave may be used only for GUIDING cables. Arrange multiple blocks to hold bending radii whenever a cable is deflected





For pulling around bends, use conveyor sheave assemblies of the appropriate radius series

The pulleys must be positioned to ensure that the effective curvature is smooth and deflected evenly at each pulley. Never allow a polygon curvature to occur (Figure 3).

The fit of a pulley around the cable is also important when pulling heavy weights (i.e. pulleys at the top of a vertical drop).

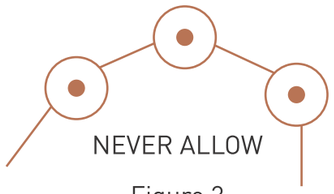
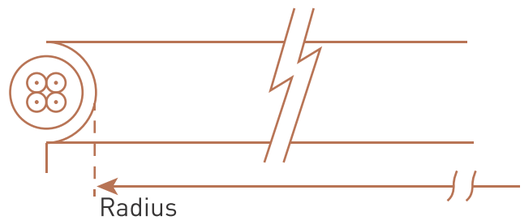


Figure 3



Remember to use the radius of the surface over which the cable is bent, not the outside flange diameter of the pulley. A '10 inch' cable sheave typically has an inside (bending) radius of 3 inches.

DC HIGH-POTENTIAL (HI-POT) TEST OF CABLE (APPLICABLE FOR 3.3 KV AND ABOVE)

Overview

This procedure is intended to provide general guidelines for high-potential DC testing of power cables. All tests made after cable installation and during the guarantee period shall be made in accordance with applicable specifications. All safety precautions must be observed during testing at high voltage.

Read and follow the operator's manual for the particular test set being used.

Test Equipment– DC test equipment is available in a wide range of voltage grades. Accessories like barriers, rubber gloves and non-conducting rubber hats must be used from a safety point of view. An appropriate safety officer may be consulted.

Test Procedure– As guided in IS 1255. The details are as below:

The following must be ensured before performing any DC high-potential test:

All equipment must be disconnected from the cable system i.e. Transformers, Circuit Breakers, motors etc. This will cause damage to such equipment and will prevent test interruptions due to flashovers and/or trip-outs resulting from excessive leakage current.

Maintain adequate clearance (approx. 75 cm) between the circuit test ends and any grounded objects and to the other equipment not under test. All circuit conductors not under test should be grounded with cable shields, including nearby equipment. Termination kit manufacturers should be consulted for maximum test voltage recommendations with time limits.

Follow IS:1255 guidelines.

The DC test voltage may be applied either continuously or in predetermined steps to the maximum value as per applicable specifications.

Continuous method– Test voltage is to be applied at an approx. increment rate of 1 Kv per sec or 75% of the rated current output of the equipment, whichever is less. Some equipment may take longer time to reach the maximum test voltage because of the amount of charging current.

Step Method– Test voltage is to be applied slowly in 5 to 7 increments of equal value to the maximum specified limit. A sufficient time-gap is to be maintained at each step to allow the leakage current to stabilize.

Hi-pot testing procedure– Unless circuits of high capacitance are involved, this requires only a few seconds. Record leakage current at each step.

Test voltage at the prescribed value and stipulated time as per specification need to be applied. The following times are normally considered sufficient. At the end of the test period, set the voltage control to zero, allow the residual voltage on the circuit to decay and then ground the conductor just tested.

Caution– It should be appreciated that DC charges on cables can build up to potentially dangerous levels if grounds are removed too quickly. Maintain solid grounds after the test on the cable for at least 4 times the duration of the test. On longer cable lengths it may be necessary to increase the grounding time.

Acceptance testing– After installation and before the cable is placed in regular service, the specified test voltage shall be applied for 5 minutes.

Proof testing– At any time during the guarantee, the cable circuit may be removed from service and tested at a reduced voltage (1.5 times the rated voltage) for 5 minutes.

Record the leakage current at one-minute intervals for the duration of the test time involved

Testing problems

Extra leakage current:

Failure to guard against corona

Failure to clean the insulation surface

Failure to keep cable ends dry

Failure to provide adequate clearance to ground

Improper shield termination

Erratic readings:

Fluctuating voltage to test set

Improper test leads

Environmental influences:

High relative humidity

Dampness, dew, fog

Wind, snow

Results vs. cable life

To date, there is no established evidence for correlating DC test results and cable life expectancy.

Note:

Frequent high-voltage tests on cable installation should be avoided. This test is to be done only when absolutely necessary.

Acceptance Test:

This test is performed to detect any defects in cable insulation and termination arising out of poor workmanship or mechanical damage. DC testing is not expected to reveal deterioration due to ageing in service. This proof test confirms the integrity of the insulation and accessories before the cable is put into service. Testing recommendations during installation at the DC test voltage specified in the table below, applied for 5 minutes before commissioning.

Maintenance test after installation:

After the cable is completely installed and placed in service, a DC proof test may be done any time within the first five years at a voltage 1.5 times the rated voltage applied for 5 minutes. After this period DC testing is not recommended. Test voltage here should be determined depending upon the condition of cable joints, terminations

etc. or if repaired in some place, test voltage will not be less than the rated voltage.

Rated Voltage (Uo / U) KV	Test Voltage KV
1.9 / 3.3	5
3.3 / 3.3	9
3.8 / 6.6	10.5
6.6 / 6.6	18
6.35 / 11	18
11 / 11	30
12.7/22	37.5
19/33	60

Note :

DC test voltage is applied to find out gross problems such as improperly installed accessories or mechanical damage. This is not expected to reveal any deterioration due to ageing in service. There are some evidence that DC testing of aged cross-linked polyethylene cable can lead to early cable failures.

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