



C A B L E S



PVC Insulated Power & Control Cables

(600 / 1000V)

Foreword

This catalogue contains the dimensions, electrical properties and installation data on PVC insulated power cables according to British Standards, 63-46 and IET wiring regulation Seventeenth Edition: 2008+A1:2010.

ACL Cables PLC is proud to establish a relationship with you and we are offering you a reliability of over five decades of cable manufacturing since 1962, coupled with the developing technological efficiency of electric cables. We have ventured as far Europe, Africa, Asia to New Zealand and Australia since 1989 with PVC and our journey of Innovation will continue.

We would also express our sincere thanks to our customers and well wishes who had already established a mutually beneficial relationship. We hope this catalogue to be of good aid and use.

ACL CABLES PLC

2016 June
(Fifth Edition)



Certificates of Excellence



ISO 9001 : 2008



ISO 14001 : 2004

Awards of Excellence



Taiki Akimoto
5s Merit
Award
2007



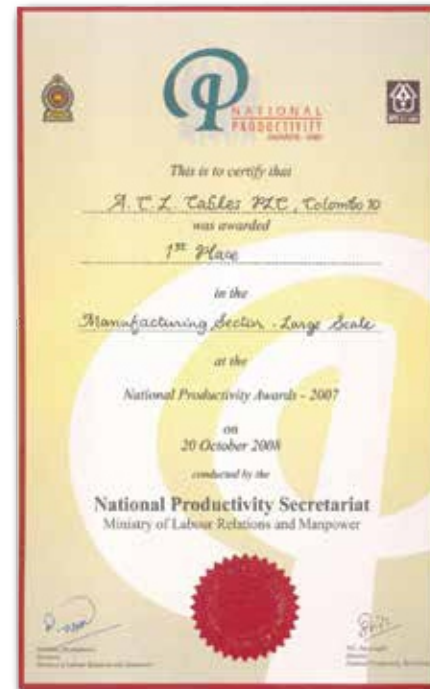
Industrial
Excellence Award
In Extra Large
Manufacturing
Category
2007



Highest Sri Lanka Award for Quality



National Quality Award
Large Manufacturing
Category
2007



Highest Sri Lanka Award for Productivity

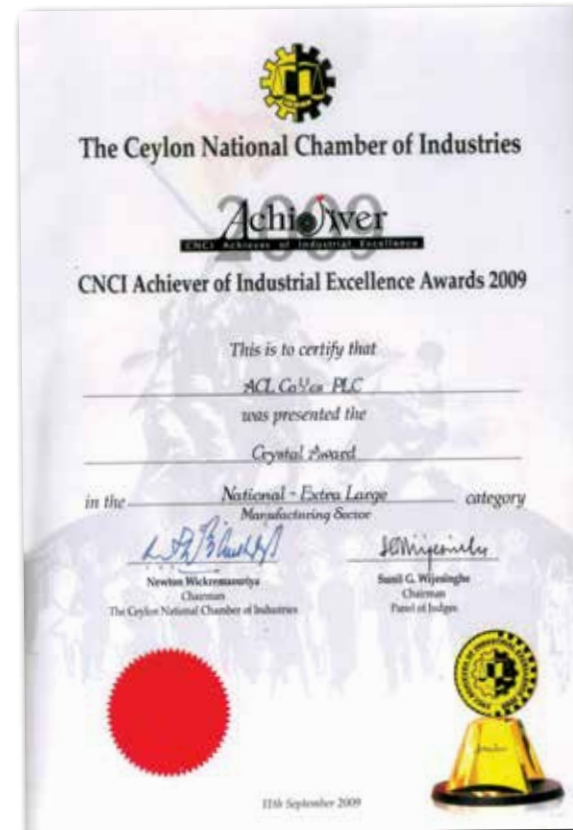
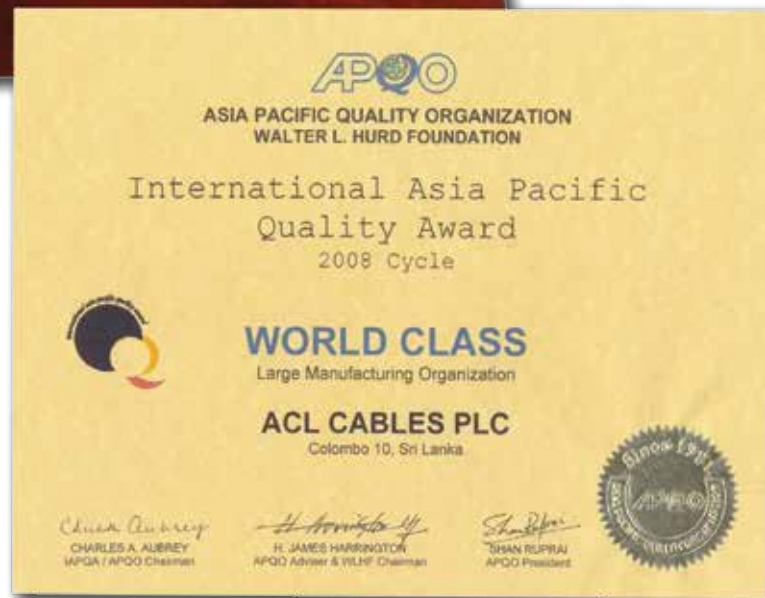


National Productivity Award
Large Manufacturing Sector
2007



Winner of World Class Award or the Highest Award of International Asia Pacific Quality Organization in 2008

Beating National Quality Award Winners of 46 Countries in the Asia Pacific Region which included countries such as Japan, Australia, Mexico, Singapore, India, Korea Taiwan etc.



Industrial Excellence Crystal Award
Extra Large Manufacturing Category
-2009



Award for Excellence Performance in Material Efficiency
Manufacturing Large Category
2013



National Cleaner Production Award
Large Category
2013



B2B Brand of the year at SLIM Brand Excellence
2015



Global Commerce Excellence Export Award 2014
Awarded by Shippers Academy in Association with
Central Bank of Sri Lanka

In recognition of export and technological leadership created by
ACL Cables PLC, which has significantly contributed to the growth
of National Economy.

ACL Since 1962

ACL is the largest manufacturer of cables in Sri Lanka having pioneered the industry in 1962. ACL holds 45% share of the local market and produce the widest range of cables in Sri Lanka. Today, ACL has grown to be a Group of companies holding 70% share of the cable market in Sri Lanka.

ACL is the most sought after brand of cables in Sri Lanka, having supplied 80% of the requirements of Duty Free projects owned by overseas investors and approved by the Board of Investment, beating foreign supplies of cables. All leading factories, hotels, commercial buildings and warehouses have used ACL Cables.

ACL continues to innovate and lead the field in the introduction of new products modern technology and machinery. In the five decades of its existence, the Company has evolved as a specialized manufacturer and supplier of the widest range of quality cables and conductors in the country, while possessing the **most advanced technology in the Asian region** for the manufacture of low voltage Cross Linked Polyethylene cables (XLPE).

Concept at ACL

Modern industries and technologies have opened forth a wide range of endeavors and ventures in the Island of Sri Lanka. ACL ushered a new era in power sector and dedicated itself to the cause of transmission, distribution and utilization of electrical energy for all cross sections of the country. With a rich heritage of over five decades, ACL offers its products, which not only meet the stipulated requirements of the governing National and International specifications, but far exceeding them.

Excellence through Total Quality Management is the catchword at ACL. Since its inception ACL has striven not only to upgrade the product quality but to bring into practice superior management of men to make its place in the international market. Professionalism, advanced know how and technology, customer services have been the hallmark of ACL. Its concept is translated into every length of product through co-ordinated efforts of professionals on job.

ACL Technology

From the inception ACL has been acquiring foreign technology for the development of existing and new products. In the year 1962, ACL commenced business with technical assistance arranged through the Colombo based liaison office of Mitsui. The Japanese Technology, Machinery, & Engineers helped ACL to establish a Foundation of Quality products. Thereafter, ACL joined hands with two cable companies in India to establish the manufacture of Aluminum Conductors and Armored Cables.

One of the companys most notable technology transfer agreements in recent times have been with NOKIA Cables of Finland for the manufacture of XLPE insulated Cables, Aerial Bundled Cables and Aluminum Alloy Conductors.

Having obtained technology from NOKIA on two occasions in the year 1989 and 1993, ACL upgraded its technology on XLPE insulated Aerial Bundled Cables to surpass National French Standard NFC 33 209 in the year 1998 through its own Research and Development. This feat not matched in the region by any other manufacturer at that time. The technology so achieved is employed in the manufacture of XLPE insulated Armoured and Unarmoured power cables. These developments offer many benefits to valued customers and in order to highlight those benefits it was decided to name all our XPLE insulated cables under the brand name **Power X**.

Having obtained ISO 9002 certification in the year 1998, ACL was awarded the prestigious ISO 9001 2000 certificate in the Year 2002. In the same year ACL was awarded ISO 14001 : 1997 Environmental Management Systems Certification.

ACL - TECHNOLOGICAL DEVELOPMENT

- 1962 - Establishment of ACL with technical assistance from Mitsui of Japan.
- 1978 - Introduction of Wire Drawing facility.
- 1981 - Acquisition of Technology from Alind of India for drawing and processing of Aluminium Conductors to jointly manufacture and supply 1400 MT of AAC-Fly Conductor to Ceylon Electricity Board.
- 1985 - Manufacture of Armoured Power and Control Cables for the first time in Sri Lanka with Indian Technical assistance.
- 1989 - Acquisition of Technology from NOKIA of Finland to jointly manufacture XLPE insulated Aerial Bundled Cables to execute an order for 800 km of that product on an ADB funded tender floated by Lanka Electricity Company.
- 1993 - Acquisition of Technology from NOKIA of Finland to draw and age Aluminium Alloy and establishment of aging furnace.
- 1993 - Establishment of ACL Plastics Limited for the manufacture of our own PVC Compound.
- 1994 - Pilot Project for 11kV partially insulated conductors working with Ceylon Electricity Board.
- 1998 - Successfully upgraded XLPE Extrusion Technology to National French Standard NFC 33-209 and won 500 km order for Aerial Bundled Cables from Ceylon Electricity Board.

- 2005 - Introduction of Flame Retardant (FR), Flame Retardant Low Smoke (FRLS) and Low Smoke Halogen Free (LSHF) cables with technical assistance from a British Company.
- 2007 - Setting up of Aluminium Rod Plant with a total capacity of 24000 Metric Tons per annum.
- 2010 - Re - launch of 11 kV & 33 kV ACL SAX as per new specifications of CEB with the second pilot project.
- 2013 - Manufacture of Fire Survival cables to maintain circuit integrity under fire conditions in accordance with BS 6387:1994, for the first time in Sri Lanka.

ACL - CORPORATE HIGHLIGHTS

- 1962 - Commencement as a member of Associated Motorways Group (AMW) of Companies under the name Associated Cables Ltd.
- 1976 - Converted to a Public Limited Liability Company.
- 1978 - Moved out of AMW Group.
- 1982 - Establishment of own island wide distribution network.
- 1990 - Change of Company name in to ACL Cables Limited
- 1991 - Establishment of ACL Plastics Limited
- 1995 - Acquisition of Ceylon Bulbs and Electricals Limited.
- 1999 - Purchase of 75% of shares of the second largest cable manufacturer in the Island.
- 2002 - Setting up of state of the art Magnet Wire project.
- 2007 - Establishment of ACL Metals & Alloys (PVT)Ltd.
- 2011 - Setting up of Copper Plant
- 2011 - Shifting of ACL Head Office to newly constructed four storied own building at Colombo 08.
- 2013 - Establishment of ACL Electric PVT (Ltd) for manufacture of switches

OTHER ACHIEVEMENTS OF ACL

- 1995 - **Commencement of Export of Cables**
In August 1995 US\$ 269,650/- worth of Alloy Conductors were exported to Rural Electrification Board, Bangladesh. In November 1995 US\$ 117,609/- worth of Armoured Cables were exported to Maldives Electricity Board, Maldives.
- 1998 - **Achievement of ISO 9002:1994 Quality Management System Certificate**
Achieved prestigious ISO 9002:1994 Quality Management System Certificate.
- 2002 - **Achievement of ISO 9001: 2000 Quality Management System Certificat**
Achieved prestigious ISO 901:2000 Quality Management System certificate.
- 2002 - **Introduction of ACL FLEXI cables to the Sri Lanka market.**
Introduced a series of domestic wires with super flexibility in the range of 1.0mm² - 6mm².
- 2002 - **Achievement of ISO 14001:1997 Environmental Managment System Certificate**
Achieved prestigious ISO 14001:1997 Environmental Management System Certificate.
- 2004 - Large scale export of Aerial Bundled Cables to India.
- 2004 - Achievement of IS 694 Product Certificate from Bureau of Indian Standards.
- 2007 - Taiki Akimoto 5 S Merit Award.
- 2007/2008 - Industrial Excellence Gold Award in Extra Large Manufacturing category.
- 2007 - National Quality Award - Large Scale Manufacturing category (highest award for Quality in Sri Lanka).
- 2007 - National Productivity Award - Large Scale Manufacturing category (highest award for Productivity in Sri Lanka).
- 2008 - Highest Award of Asia Pacific Quality Organization called the World Class Award (A record to date among all Sri Lankan manufactures).
- 2008 - Commencement of Export of cable to Australia.
- 2009 - Industrial Excellence Crystal Award in Extra Large Manufacturing category.
- 2011 - Commencement of Export of cable to New Zealand.
- 2013 - National Cleaner Production Award in recognition of Excellence in Resource Efficient & Production Practices in Manufacturing Large Category.
- 2013 - Special Award for Excellence Performance in Material Efficiency in Manufacturing Large Category.
- 2015 - B2B Brand of the Year - Gold. At Slim Brand Excellence 2015.

“ACL” - PRODUCTS

BARE CONDUCTORS



All Aluminium Conductors (AAC)

All Aluminium Alloy Conductors (AAAC)

Aluminium Conductors Steel Reinforced (ACSR/GZ ,ACSR/AC) to BS, ASTM, CSA and DIN, Standards. Sizes up to 750mm²

For low, medium and high voltage electricity, transmission and distribution.

* BS 215 Part 1, BS 215 Part 2, BSEN 50183, SLS 750 Part 1, SLS 750 Part 2, IS 398 Part 1, IS 398 Part 4

“ACL SAX “ COVERED CONDUCTORS (CC)



This is an area where ACL lead the Asian region and remain second to none in the World. Partially Insulated Conductors or Covered Conductors are used for medium voltage distribution of electricity by Power Distribution companies to improve Reliability and Safety.

Traditional Bare Conductors are prone to failure due to vegetation. A superior alternative to Bare Conductors are Fully Insulated Cables (Underground or aerial) but those are prohibitively expensive for country wide usage. Therefore, ACL has developed a range of Partially Insulated Conductors (Covered Conductors) branded as ACLSAX V which is relatively in-expensive. The extensive Research & Development done by ACL, has made ACLSAX-V, not only to meet BSEN 50397-1:2006, but to surpasses it. In addition, ACL joins hands with ENSTO of Finland to supply their Fittings along with ACLSAX-V Conductors since it is absolutely essential to use (a) Correct Conductors, (b) Correct Fittings and (c) Correct installation Techniques as specified by the 3 separate British standards covering Partially Insulated Conductors. Without such rigorous adherence to Standards, Partially Insulated Conductors may fail to deliver optimum results as we have seen in some parts of the world. Therefore, ACL promotes ACLSAX-V as a Complete System.

The three BS standards are

* BSEN 50397-1:2006, BSEN 50397-2 :2009 & BSEN 50397-3:2010

HOUSE/BUILDING WIRES



Cu/PVC and Cu/PVC/PVC cables to BS, SLS, IS & IEC Standards in 300/500V, 450/750V, 1100V and 600/1000V sizes 1mm² to 1000mm²

Single core upto 1000mm²

2 Core up to 70mm²

3 or 3 1/2 core upto 400mm²

4 core up to 400mm²

Cu/PVC Green Earth Wire

For wiring of houses/commercial buildings and distribution of electricity within factories.

BS 6004, BS 6346, SLS 733, SLS 987, IS 694, IS 1554, IEC 60502

These total range is now available in fire retardant, low smoke, halogen free properties.

ARMoured & UNARMoured POWER CABLES



To BS, IEC, SLS Standards 600/1000V & IS 1100V -Cu or Al, PVC insulated and Cu or Al, XLPE insulated

Power cables single core up to 1000mm²

2 Core up to 400 mm² 3 or 3 1/2 Core upto 400mm²

4 Core up to 400 mm² 5 Core up to 50mm²

For distribution of electricity within cities, factories and buildings.

* BS 6346, BS 5467, SLS 1186, IS 1554, IEC 60502

CONTROL CABLES



Cu/PVC Control Cables sizes 1.5mm², 2.5mm², and 4mm². Number of cores range from 5 to 48 cores and conform to BS 6346, 600/1000 V and IS 1554 1100V. Can be armoured or unarmoured and either screened or unscreened.

* BS 6346, IS 1554

XLPE INSULATED AERIAL BUNDLED CABLES (ABC)



To NFC 33-209, 600/1000V and IS 14255, 1100V Size 16mm², 25mm², 35mm², 50mm², 70mm², 95mm², 120mm², (2 core, 4 core, 5 core and 6 core) for rural and semi-urban low voltage distribution of electricity.

* NFC 33-209, IS 14255

INSTRUMENTATION CABLES



Multicore, screened instrument cables, conductor of annealed solid/stranded/flexible copper/tinned copper, insulated with PVC/PE, twisted pair/triode/quad, screened with mylar aluminium and provided with copper drainwire, laid up circular, overall screened and finally sheathed with PVC/PE for data and signal transmission without external interference.

ACL Fire Retardant Cables FR, FRLS & LSHF



ACL FIRE RETARDANT Cables are to be used in any building in lieu of traditional PVC insulated Cables which spread a fire easily. The main function of Fire Retardant Cables is to prevent spread of fire originated probably due to an electrical short circuit.

ACL has 3 different grades of Fire Retardant Cables. 1. ACL FIREGUARD (FR), 2. Fire Retardant Low Smoke (FRLS) both made of modified PVC. Third variety is ACL FIREZERO (LSHF) which unlike the other two, is completely free of PVC and is the highest grade of Fire Retardant Cable manufactured and recommended by ACL. Since All FIREZERO is free of PVC, it emits negligible amounts of Acidic gasses and Smoke even if it is caught in a fire. These Cables conform to following standards -

* ASTM D2863 :2013 ,IEC 60332-1:2004 ,IEC 60754-1:2011, IEC 61034-2 :2005 &IEC 60754-2:1997

ACL Fire Resistant Cables ACL FIRESURVIVOR



These cables are needed to supply electricity to circuits which become critically important in the midst of a Fire. In a building caught on fire, Electrical circuits providing electricity to Fire Alarms, Escape Lights, Exhaust Fans, Sprinklers, Lifts etc. become critically important not only to extinguish the fire but also to help in evacuation of people.

Cables for those equipment should be wired with ACL FIRESURVIVOR Cables which can provide uninterrupted electricity (circuit integrity) in the midst of a fire having a temperature of 950 deg centigrade for 3 hours. These Cables conform to the following standards -

* BS 6387:2013 & IEC 60331-21 :1999-04

* CWZ - PLWRI

COPPER BUS BARS AND BUS BAR DUCT SYSTEMS



Bus bar systems refers to conductors that take the form of a bar or bars of copper conductor. The bars may be exposed or enclosed. Bus bars are used within electrical installations for distributing power from a supply point to a number of output circuits. They may be used in a variety of configurations ranging from vertical risers, carrying current to each floor of a multi-storey building, to bars used entirely within a distribution panel or within an industrial process related switchboard, distribution board , substation panels and ,battery banks, ect .

These bus bars or bus bar duct systems may have one or more joints to assure proper length and configuration and one or more take-off points connected to end-use equipment.

it is necessary to use more expensive grade of high conductivity copper which is specially produced for this purpose. This type of copper, known as oxygen-free high conductivity copper, is normally produced by melting and casting under a protective atmosphere. The result is a high purity copper containing 99.95% copper. In additionally, these products are fully type tested to the standard of. IEC 60439-2 & 3

ACL Facilities

State of the art manufacturing facilities and testing equipment from leaders of Europe, ensure highest standards of products.



12 channel copper upward casting induction furnace for the manufacture of 8mm diameter oxygen free copper rods .

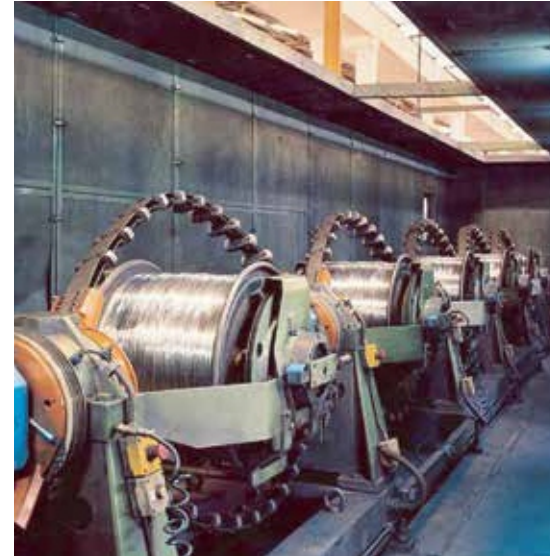


Aluminium melting furnace and rod mill for the manufacturing of 9.5mm diameter Aluminum and Aluminum Alloy Rods.





Annealed Copper without dust being drawn at 30m/sec on 15 draft angular shaft. Separate motor driven Sictra rod break down machine



Seven Strand Aluminium conductor is being stranded on 1400 rpm 630 DIN bobbin Skip Strander at 150m/min



Batch loading of Copper wires in 630 DIN Spools on 61 strand high speed Tandem Strander.



Extrusion of outer sheath of 4x400mm² at the rate of 800kg of PVC per hour on an 120mm Extruder.



Assembly of an Aerial Bundled Cable on a Bow strander machine at 180m/min



Drum Twister Machine for the assembly and armouring of Power Cables



Heavy duty, high boddin weight, Planetary Strander line for assemblies of LA / MV Aerial Bundled Cables



Centralized warehouse for live inventory management

QUALITY ASSURANCE DEPARTMENT

Testing facilities



Electronic Tensile Tester - To Obtain tensile strength & elongation values of Power - X Cables up to $4 \times 400 \text{ mm}^2$.



High precision automatic Resisrana Bridge used for the measurement of electrical resistance of Power - X Cables up to 1000 mm^2



Oxygen index and temperature index tester for the testing of fire retardant properties of low smoke halogen free power cables.



Testing of vertical flame spread of vertically mounted bunched wires or cables .



Testing of vertical flame spread of low smoke halogen free power cables.



Measuring of the vertical flame propagation of low smoke halogen free power cables.



Profile Projector & Digimatic mini Processor -

To obtain accurate measurement of thickness of insulated cores of Power - X Cables.

1 Core Armoured Cables - Cu / PVC / AWA / PVC

600 / 1000 V
BS 6346 : 1997

ITEM CODE		UNIT	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8	C-9	C-10	C-11	C-12	C-13
Nominal Area of Conductor		sq.mm	50	70	95	120	150	185	240	300	400	500	630	800	1000
Nominal Thickness of insulation		mm	1.4	1.4	1.6	1.6	1.8	2.0	2.2	2.4	2.6	2.8	2.8	2.8	3.0
Thickness of Extruded bedding		mm	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.4	1.4
Aluminium Armour wire diameter		mm	1.25	1.25	1.25	1.6	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.5	2.5
Thickness of oversheath		mm	1.5	1.6	1.6	1.7	1.7	1.8	1.9	1.9	2.1	2.1	2.2	2.4	2.5
Maximum armour resistance at 20°C		ohm/km	0.82	0.73	0.64	0.45	0.40	0.37	0.33	0.30	0.21	0.19	0.18	0.13	0.12
Gross armour wire area		sq.mm	39	44	50	72	80	88	98	108	153	169	185	260	289
Maximum resistance of conductor	D.C. at 20° C	ohm/km	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
	A.C. at 70° C	ohm/km	0.464	0.321	0.232	0.184	0.150	0.121	0.093	0.075	0.060	0.049	0.041	0.034	0.030
Inductance		mH/km	0.344	0.327	0.315	0.312	0.307	0.300	0.292	0.285	0.286	0.279	0.272	0.270	0.265
Reactance at 50Hz		ohm/km	0.108	0.103	0.099	0.098	0.096	0.094	0.092	0.090	0.090	0.088	0.086	0.085	0.083
Impedance at 70°C		ohm/km	0.476	0.337	0.252	0.208	0.178	0.153	0.130	0.117	0.108	0.101	0.095	0.091	0.088
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	12.2	17.1	23.2	29.3	36.6	45.3	58.6	73.2	85.7	107.2	135.0	171.5	214.3
	for 1.0 Sec	kA	5.5	7.6	10.4	13.1	16.4	20.2	26.2	32.7	38.3	47.9	60.4	76.7	95.8
	for 3.0 Sec	kA	3.2	4.4	6.0	7.6	9.5	11.7	15.1	18.9	22.1	27.7	34.9	44.3	55.3
Maximum earth - fault short - circuit current ratings	for 0.2 Sec	kA	4.9	5.5	6.4	9.3	10.0	11.0	12.3	13.5	19.2	21.2	23.5	33.1	36.1
	for 1.0 Sec	kA	2.2	3.6	4.2	6.0	6.5	7.1	8.0	8.8	12.4	13.7	15.2	21.4	23.4
	for 3.0 Sec	kA	1.3	1.4	1.7	2.4	2.6	2.9	3.2	3.5	5.0	5.5	6.1	8.5	9.3
Approximate overall diameter		mm	18.8	20.8	23.1	26	28	30.4	33.7	36.5	41.5	45	49.2	55.3	60.4
Approximate Cable weight		kg/km	784.4	1035	1354.2	1712.2	2036.1	2483.8	3145.6	3832.1	4929.8	6035.3	7625.5	9579.4	11807.9
Minimum bending radius		mm	113	125	139	156	168	182	202	219	249	270	295	332	362

4 Core Unarmoured Cables - Cu / PVC / PVC
With Sector Shaped Conductors

600 / 1000 V
BS 6346 : 1989

ITEM CODE		UNIT	C-118	C-119	C-120	C-121	C-122	C-123	C-124	C-125	C-126	C-127	C-128
Nominal Area of Conductor		sq.mm	25	35	50	70	95	120	150	185	240	300	400
Nominal Thickness of insulation		mm	1.2	1.2	1.4	1.4	1.6	1.6	1.8	2	2.2	2.4	2.6
Thickness of oversheath		mm	1.8	1.8	1.9	2.0	2.2	2.3	2.5	2.6	2.8	3.1	3.3
Maximum resistance of conductor	D.C. at 20 ⁰ C	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
	A.C. at 70 ⁰ C	ohm/km	0.87	0.627	0.464	0.321	0.232	0.184	0.15	0.121	0.093	0.075	0.0604
Inductance		mH/km	0.271	0.263	0.262	0.244	0.243	0.239	0.239	0.233	0.235	0.234	0.232
Reactance at 50Hz		ohm/km	0.085	0.083	0.082	0.077	0.076	0.075	0.075	0.073	0.074	0.073	0.073
Impedance at 70 ⁰ C		ohm/km	0.874	0.632	0.471	0.330	0.244	0.199	0.168	0.141	0.119	0.105	0.095
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	6.1	8.5	12.2	17.1	23.2	29.3	36.6	45.2	58.6	73.2	85.7
	for 1.0 Sec	kA	2.7	3.8	5.5	7.6	10.4	13.1	16.4	20.2	26.2	32.7	38.3
	for 3.0 Sec	kA	1.6	2.2	3.2	4.4	6.0	7.6	9.5	11.7	15.1	18.9	22.1
Approximate overall diameter		mm	23.5	25.9	30.1	33.8	38.8	42.2	47.1	51.8	58.3	64.7	73.2
Approximate Cable weight		kg/km	1269.9	1672.2	2254	3126.8	4295.8	5253.3	6472.2	8065.2	10486.5	13085.2	16591.2
Minimum bending radius		mm	188	207	241	270	310	338	377	414	466	518	586

5 Core Unarmoured Cables - Cu / PVC / PVC With Circular Conductors

600 / 1000 V
BS 6346 : 1989

ITEM CODE		UNIT	C-185	C-186	C-187	C-188	C-189	C-190	C-191	C-192	C-193	C-194
Nominal Area of Conductor		sq.mm	1.5	2.5	4	6	10	16	25	35	50	70
Nominal Thickness of insulation		mm	0.6	0.7	0.8	0.8	1	1.0	1.2	1.2	1.4	1.4
Thickness of extruded Bedding		mm	0.8	0.8	0.8	0.8	1	1.0	1.0	1.0	1.2	1.2
Thickness of oversheath		mm	1.4	1.5	1.5	1.6	1.7	1.7	1.9	1.9	2.1	2.2
Maximum resistance of conductor	D.C. at 20 ⁰ C	ohm/km	12.1	7.41	4.61	3.08	1.83	1.15	0.727	0.524	0.387	0.268
	A.C. at 70 ⁰ C	ohm/km	-	-	-	-	-	1.380	0.87	0.627	0.464	0.321
Inductance		mH/km	-	-	-	-	-	0.269	0.266	0.258	0.249	0.241
Reactance at 50Hz		ohm/km	-	-	-	-	-	0.085	0.084	0.081	0.078	0.076
Impedance at 70 ⁰ C		ohm/km	-	-	-	-	-	1.383	0.874	0.632	0.471	0.330
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	0.4	0.6	1.0	1.5	2.4	3.9	6.1	8.5	12.2	17.1
	for 1.0 Sec	kA	0.2	0.3	0.4	0.7	1.1	1.7	2.7	3.8	5.5	7.6
	for 3.0 Sec	kA	0.1	0.2	0.3	0.4	0.6	1.0	1.6	2.2	3.2	4.4
Approximate overall diameter		mm	11.9	13.8	15.8	17.5	21.7	24.6	29.6	32.7	38.2	43.3
Approximate Cable weight		kg/km	225.5	318.1	444.5	586.4	935.3	1310.6	1982.1	2575.1	3467.3	4738.5
Minimum bending radius		mm	72	83	95	105	130	148	178	196	229	260

2 Core Unarmoured Cables - Cu / PVC / PVC

With Circular Conductors

600 / 1000 V
BS 6346 : 1989

ITEM CODE		UNIT	C-95	C-96	C-97	C-98
Nominal Area of Conductor		sq.mm	10	16	25	35
Nominal Thickness of insulation		mm	1	1.0	1.2	1.2
Thickness of oversheath		mm	1.8	1.8	1.8	1.8
Maximum resistance of conductor	D.C. at 20 ⁰ C	ohm/km	1.83	1.15	0.727	0.524
	A.C. at 70 ⁰ C	ohm/km	-	1.380	0.870	0.627
Inductance		mH/km	-	0.269	0.266	0.258
Reactance at 50Hz		ohm/km	-	0.085	0.084	0.081
Impedance at 70 ⁰ c		ohm/km	-	1.383	0.874	0.632
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	2.4	3.9	6.1	8.5
	for 1.0 Sec	kA	1.1	1.7	2.7	3.8
	for 3.0 Sec	kA	0.6	1.0	1.6	2.2
Approximate overall diameter		mm	15.7	17.8	21.2	23.5
Approximate Cable weight		kg/km	443.1	615.8	916.4	1186
Minimum bending radius		mm	94	107	127	141

3 Core Unarmoured Cables - Cu / PVC / PVC
With Circular Conductors

600 / 1000 V
BS 6346 : 1989

ITEM CODE		UNIT	C-99	C-100	C-101	C-102
Nominal Area of Conductor		sq.mm	10	16	25	35
Nominal Thickness of insulation		mm	1	1.0	1.2	1.2
Thickness of oversheath		mm	1.8	1.8	1.8	1.8
Maximum resistance of conductor	D.C. at 20° C	ohm/km	1.83	1.15	0.727	0.524
	A.C. at 70° C	ohm/km	—	1.380	0.87	0.627
Inductance		mH/km	—	0.269	0.266	0.258
Reactance at 50Hz		ohm/km	—	0.085	0.084	0.081
Impedance at 70°c		ohm/km	—	1.383	0.874	0.632
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	2.4	3.9	6.1	8.5
	for 1.0 Sec	kA	1.1	1.7	2.7	3.8
	for 3.0 Sec	kA	0.6	1.0	1.6	2.2
Approximate overall diameter		mm	16.6	18.9	22.6	25.1
Approximate Cable weight		kg/km	553.5	782.4	1175.8	1536.4
Minimum bending radius		mm	100	113	136	151

3 Core Unarmoured Cables - Cu / PVC / PVC

With Sector Shaped Conductors

600 / 1000 V
BS 6346 : 1989

ITEM CODE	UNIT	C-103	C-104	C-105	C-106	C-107	C-108	C-109	C-110	C-111	C-112	C-113
Nominal Area of Conductor	sq.mm	25	35	50	70	95	120	150	185	240	300	400
Nominal Thickness of insulation	mm	1.2	1.2	1.4	1.4	1.6	1.6	1.8	2	2.2	2.4	2.6
Thickness of oversheath	mm	1.8	1.8	1.8	1.9	2.1	2.2	2.3	2.5	2.6	2.8	3.1
Maximum resistance of conductor	D.C. at 20° C	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601
	A.C. at 70° C	ohm/km	0.87	0.627	0.464	0.321	0.232	0.184	0.15	0.121	0.093	0.075
Inductance	mH/km	0.271	0.263	0.262	0.244	0.243	0.239	0.239	0.233	0.235	0.234	0.232
Reactance at 50Hz	ohm/km	0.085	0.083	0.082	0.077	0.076	0.075	0.075	0.073	0.074	0.073	0.073
Impedance at 70° C	ohm/km	0.874	0.632	0.471	0.330	0.244	0.199	0.168	0.141	0.119	0.105	0.095
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	6.1	8.5	12.2	17.1	23.2	29.3	36.6	45.2	58.6	73.2
	for 1.0 Sec	kA	2.7	3.8	5.5	7.6	10.4	13.1	16.4	20.2	26.2	32.7
	for 3.0 Sec	kA	1.6	2.2	3.2	4.4	6.0	7.6	9.5	11.7	15.1	18.9
Approximate overall diameter	mm	20.2	22.0	25.0	28.2	32.4	34.8	38.4	42.8	48.0	52.8	59.0
Approximate Cable weight	kg/km	977.5	1274.5	1695.5	2349.7	3235.4	3943.7	4847.7	6067.8	7870.6	9787	12411.9
Minimum bending radius	mm	162	176	200	226	259	278	307	342	384	422	472

4 Core Unarmoured Cables - Cu / PVC / PVC

With Circular Conductors

600 / 1000 V
BS 6346 : 1989

ITEM CODE		UNIT	C-114	C-115	C-116	C-117
Nominal Area of Conductor		sq.mm	10	16	25	35
Nominal Thickness of insulation		mm	1	1.0	1.2	1.2
Thickness of oversheath		mm	1.8	1.8	1.8	1.8
Maximum resistance of conductor	D.C. at 20 ⁰ C	ohm/km	1.83	1.15	0.727	0.524
	A.C. at 70 ⁰ C	ohm/km	—	1.380	0.87	0.627
Inductance		mH/km	—	0.269	0.266	0.258
Reactance at 50Hz		ohm/km	—	0.085	0.084	0.081
Impedance at 70 ⁰ C		ohm/km	—	1.383	0.874	0.632
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	2.4	3.9	6.1	8.5
	for 1.0 Sec	kA	1.1	1.7	2.7	3.8
	for 3.0 Sec	kA	0.6	1.0	1.6	2.2
Approximate overall diameter		mm	18.8	21.3	25.5	28.2
Approximate Cable weight		kg/km	654.5	931.1	1389.4	1820.3
Minimum bending radius		mm	113	128	153	169

1 Core Unarmoured Cables - Cu / PVC / PVC

600 / 1000 V
BS 6346 : 1989

ITEM CODE		UNIT	C-82	C-83	C-84	C-85	C-86	C-87	C-88	C-89	C-90	C-91	C-92	C-93	C-94
Nominal Area of Conductor		sq.mm	50	70	95	120	150	185	240	300	400	500	630	800	1000
Nominal Thickness of insulation		mm	1.4	1.4	1.6	1.6	1.8	2.0	2.2	2.4	2.6	2.8	2.8	2.8	3.0
Thickness of oversheath		mm	1.4	1.4	1.5	1.5	1.6	1.7	1.8	1.9	2	2.1	2.2	2.3	2.5
Maximum resistance of conductor	D.C. at 20 ⁰ C	ohm/km	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
	A.C. at 70 ⁰ C	ohm/km	0.464	0.321	0.232	0.184	0.150	0.121	0.093	0.075	0.060	0.049	0.041	0.034	0.030
Inductance		mH/km	0.292	0.278	0.274	0.264	0.264	0.261	0.257	0.254	0.252	0.249	0.243	0.239	0.237
Reactance at 50Hz		ohm/km	0.092	0.087	0.086	0.083	0.083	0.082	0.081	0.080	0.079	0.078	0.077	0.075	0.074
Impedance at 70 ⁰ c		ohm/km	0.473	0.333	0.247	0.202	0.171	0.146	0.123	0.110	0.099	0.092	0.087	0.082	0.080
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	12.2	17.1	23.2	29.3	36.6	45.3	58.6	73.2	85.7	107.2	135.0	171.5	214.3
	for 1.0 Sec	kA	5.5	7.6	10.4	13.1	16.4	20.2	26.2	32.7	38.3	47.9	60.4	76.7	95.8
	for 3.0 Sec	kA	3.2	4.4	6.0	7.6	9.5	11.7	15.1	18.9	22.1	27.7	34.9	44.3	55.3
Approximate overall diameter		mm	14.5	16.3	18.8	20.4	22.6	25.0	28.3	31.3	34.9	38.6	43.0	47.3	52.6
Approximate Cable weight		kg/km	593	812.7	1109.5	1358.9	1666.1	2076.5	2693	3351.4	4243.9	5301.7	6808.3	8446.5	10592.3
Minimum bending radius		mm	87	98	113	122	136	150	170	188	209	232	258	284	316

5 Core Armoured Cables - Cu / PVC / SWA / PVC With Circular Conductors

**600 / 1000 V
BS 6346 : 1997**

ITEM CODE		UNIT	C-72	C-73	C-74	C-75	C-76	C-77	C-78	C-79	C-80	C-81
Nominal Area of Conductor		sq.mm	1.5	2.5	4	6	10	16	25	35	50	70
Nominal Thickness of insulation		mm	0.6	0.7	0.8	0.8	1	1.0	1.2	1.2	1.4	1.4
Thickness of Extruded bedding		mm	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.2	1.2
Galvanized Steel Armour wire diameter		mm	0.9	0.9	1.25	1.25	1.6	1.6	1.6	1.6	2.0	2.0
Thickness of oversheath		mm	1.4	1.5	1.5	1.6	1.7	1.7	1.9	1.9	2.1	2.2
Maximum armour resistance at 20°C		ohm/km	8.2	6.8	4.1	3.8	2.3	2	1.7	1.5	1.1	0.89
Gross armour wire area		sq.mm	19	22	38	41	68	78	94	106	153	175
Maximum resistance of conductor	D.C. at 20° C	ohm/km	12.1	7.41	4.61	3.08	1.83	1.15	0.727	0.524	0.387	0.268
	A.C. at 70° C	ohm/km	-	-	-	-	-	1.380	0.87	0.627	0.464	0.321
Inductance		mH/km	-	-	-	-	-	0.269	0.266	0.258	0.249	0.241
Reactance at 50Hz		ohm/km	-	-	-	-	-	0.085	0.084	0.081	0.078	0.076
Impedance at 70°C		ohm/km	-	-	-	-	-	1.383	0.874	0.632	0.471	0.330
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	0.4	0.6	1.0	1.5	2.4	3.9	6.1	8.5	12.2	17.1
	for 1.0 Sec	kA	0.2	0.3	0.4	0.7	1.1	1.7	2.7	3.8	5.5	7.6
	for 3.0 Sec	kA	0.1	0.2	0.3	0.4	0.6	1.0	1.6	2.2	3.2	4.4
Maximum earth - fault short - circuit current ratings	for 0.2 Sec	kA	2.0	2.3	3.9	4.3	7.0	8.0	9.6	10.8	15.9	18.1
	for 1.0 Sec	kA	0.9	1.0	1.7	1.9	3.1	3.6	4.3	4.8	7.1	8.1
	for 3.0 Sec	kA	0.5	0.6	1.23.0	1.1	1.8	2.1	2.5	2.8	4.1	4.7
Approximate overall diameter		mm	13.7	15.6	18.3	20.0	24.9	27.8	32.8	35.9	42.2	47.3
Approximate Cable weight		kg/km	393	512.8	765.5	941.9	1511	1965.1	2767.6	3446.7	4750.7	6192.9
Minimum bending radius		mm	82	94	110	120	149	167	197	215	253	284

4 Core Armoured Cables - Cu / PVC / SWA / PVC
With Sector Shaped Conductors

600 / 1000 V
BS 6346 : 1997

ITEM CODE		UNIT	C-49	C-50	C-51	C-52	C-53	C-54	C-55	C-56	C-57	C-58	C-59
Nominal Area of Conductor		sq.mm	25	35	50	70	95	120	150	185	240	300	400
Nominal Thickness of insulation		mm	1.2	1.2	1.4	1.4	1.6	1.6	1.8	2	2.2	2.4	2.6
Thickness of Extruded bedding		mm	1.0	1.0	1.2	1.2	1.2	1.4	1.4	1.6	1.6	1.6	1.8
Galvanized Steel Armour wire diameter		mm	1.6	1.6	2	2.0	2.0	2.5	2.5	2.5	2.5	2.5	3.15
Thickness of oversheath		mm	1.8	1.9	2	2.1	2.2	2.4	2.5	2.6	2.8	3	3.3
Maximum armour resistance at 20°C		ohm/km	2.1	1.9	1.3	1.2	0.98	0.71	0.65	0.59	0.52	0.47	0.34
Gross armour wire area		sq.mm	76	84	122	138	160	220	240	265	299	333	467
Maximum resistance of conductor	D.C. at 20° C	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
	A.C. at 70° C	ohm/km	0.87	0.627	0.464	0.321	0.232	0.184	0.15	0.121	0.093	0.075	0.0604
Inductance		mH/km	0.271	0.263	0.262	0.244	0.243	0.239	0.239	0.233	0.235	0.234	0.232
Reactance at 50Hz		ohm/km	0.085	0.083	0.082	0.077	0.076	0.075	0.075	0.073	0.074	0.073	0.073
Impedance at 70°C		ohm/km	0.874	0.632	0.471	0.330	0.244	0.199	0.168	0.141	0.119	0.105	0.095
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	6.1	8.5	12.2	17.1	23.2	29.3	36.6	45.2	58.6	73.2	85.7
	for 1.0 Sec	kA	2.7	3.8	5.5	7.6	10.4	13.1	16.4	20.2	26.2	32.7	38.3
	for 3.0 Sec	kA	1.6	2.2	3.2	4.4	6.0	7.6	9.5	11.7	15.1	18.9	22.1
Maximum earth - fault short - circuit current ratings	for 0.2 Sec	kA	8.2	9.0	13.4	15.0	16.8	23.4	25.8	28.7	31.6	35.0	50.2
	for 1.0 Sec	kA	3.7	4.0	6.0	6.7	7.5	10.4	11.5	12.8	14.2	15.7	22.5
	for 3.0 Sec	kA	2.1	2.3	3.5	3.9	4.3	6.0	6.7	7.4	8.2	9.0	13.0
Approximate overall diameter		mm	28.7	31.3	36.7	40.4	45.2	50.2	54.9	60.0	66.5	72.7	83.1
Approximate Cable weight		kg/km	2066.9	2559.2	3557	4578.7	5911	7490.1	8917	10829.9	13538.3	16431.5	21348.7
Minimum bending radius		mm	230	250	294	323	362	402	439	480	532	582	665

2 Core Armoured Cables - Cu / PVC / SWA / PVC

With Circular Conductors

600 / 1000 V
BS 6346 : 1997

ITEM CODE	UNIT	C-14	C-15	C-16	C-17	C-18	C-19	C-20	C-21
Nominal Area of Conductor	sq.mm	1.5	2.5	4	6	10	16	25	35
Nominal Thickness of insulation	mm	0.6	0.7	0.8	0.8	1	1	1.2	1.2
Thickness of Extruded bedding	mm	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1.0
Galvanized Steel Armour wire diameter	mm	0.9	0.9	0.9	0.9	1.25	1.25	1.6	1.6
Thickness of oversheath	mm	1.4	1.4	1.4	1.5	1.6	1.6	1.7	1.8
Maximum armour resistance at 20°C	ohm/km	10.2	8.8	7.5	6.8	3.9	3.4	2.6	2.4
Gross armour wire area	sq.mm	15	17	20	22	40	46	60	66
Maximum resistance of conductor	D.C. at 20°C	ohm/km	12.1	7.41	4.61	3.08	1.83	1.15	0.727
	A.C. at 70°C	ohm/km	-	-	-	-	1.380	0.87	0.627
Inductance	mH/km	-	-	-	-	-	0.269	0.266	0.258
Reactance at 50Hz	ohm/km	-	-	-	-	-	0.085	0.084	0.081
Impedance at 70°C	ohm/km	-	-	-	-	-	1.383	0.874	0.632
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	0.4	0.6	1.0	1.5	2.4	3.9	6.1
	for 1.0 Sec	kA	0.2	0.3	0.4	0.7	1.1	1.7	2.7
	for 3.0 Sec	kA	0.1	0.2	0.3	0.4	0.6	1.0	1.6
Maximum earth - fault short - circuit current ratings	for 0.2 Sec	kA	1.6	1.8	2.1	2.3	4.0	4.6	7.3
	for 1.0 Sec	kA	0.7	0.8	0.9	1.0	1.8	2.1	3.3
	for 3.0 Sec	kA	0.4	0.5	0.5	0.6	1.0	1.2	1.9
Approximate overall diameter	mm	11.8	13	14.5	15.8	19.4	21.5	26.2	28.7
Approximate Cable weight	kg/km	279.1	344.4	429.5	523.2	830.9	1059	1629.6	1986.9
Minimum bending radius	mm	71	78	87	95	116	129	157	172

3 Core Armoured Cables - Cu / PVC / SWA / PVC With Circular Conductors

600 / 1000 V
BS 6346 : 1997

ITEM CODE	UNIT	C-22	C-23	C-24	C-25	C-26	C-27	C-28	C-29
Nominal Area of Conductor	sq.mm	1.5	2.5	4	6	10	16	25	35
Nominal Thickness of insulation	mm	0.6	0.7	0.8	0.8	1	1.0	1.2	1.2
Thickness of Extruded bedding	mm	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1.0
Galvanized Steel Armour wire diameter	mm	0.9	0.9	0.9	1.25	1.25	1.25	1.6	1.6
Thickness of oversheath	mm	1.4	1.4	1.4	1.5	1.6	1.6	1.7	1.8
Maximum armour resistance at 20°C	ohm/km	9.5	8.2	7	4.6	3.7	3.1	2.4	2.1
Gross armour wire area	sq.mm	16	19	22	34	42	50	66	74
Maximum resistance of conductor	D.C. at 20°C	ohm/km	12.1	7.41	4.61	3.08	1.83	1.15	0.727
	A.C. at 70°C	ohm/km	-	-	-	-	1.380	0.87	0.627
Inductance	mH/km	-	-	-	-	-	0.269	0.266	0.258
Reactance at 50Hz	ohm/km	-	-	-	-	-	0.085	0.084	0.081
Impedance at 70°C	ohm/km	-	-	-	-	-	1.383	0.874	0.632
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	0.4	0.6	1.0	1.5	2.4	3.9	6.1
	for 1.0 Sec	kA	0.2	0.3	0.4	0.7	1.1	1.7	2.7
	for 3.0 Sec	kA	0.1	0.2	0.3	0.4	0.6	1.0	1.6
Maximum earth - fault short - circuit current ratings	for 0.2 Sec	kA	1.6	1.9	2.2	3.5	4.3	5.0	7.8
	for 1.0 Sec	kA	0.7	0.8	1.0	1.6	1.9	2.2	3.5
	for 3.0 Sec	kA	0.4	0.5	0.6	0.9	1.1	1.2	2.0
Approximate overall diameter	mm	12.2	13.6	15.1	17.3	20.3	22.6	27.6	30.3
Approximate Cable weight	kg/km	305.9	382	488.8	692.8	963.3	1257.5	1926.2	2391.8
Minimum bending radius	mm	73	82	91	104	122	136	166	182

3 Core Armoured Cables - Cu / PVC / SWA / PVC With Sector Shaped Conductors

**600 / 1000 V
BS 6346 : 1997**

ITEM CODE		UNIT	C-30	C-31	C-32	C-33	C-34	C-35	C-36	C-37	C-38	C-39	C-40
Nominal Area of Conductor		sq.mm	25	35	50	70	95	120	150	185	240	300	400
Nominal Thickness of insulation		mm	1.2	1.2	1.4	1.4	1.6	1.6	1.8	2	2.2	2.4	2.6
Thickness of Extruded bedding		mm	1.0	1.0	1.0	1.2	1.2	1.2	1.4	1.4	1.6	1.6	1.6
Galvanized Steel Armour wire diameter		mm	1.6	1.6	1.6	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
Thickness of oversheath		mm	1.7	1.8	1.9	2.0	2.1	2.2	2.4	2.5	2.6	2.8	3.0
Maximum armour resistance at 20°C		ohm/km	2.40	2.10	1.90	1.40	1.20	1.10	0.74	0.68	0.60	0.54	0.49
Gross armour wire area		sq.mm	66	74	84	119	138	150	211	230	260	289	319
Maximum resistance of conductor	D.C. at 20°C	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
	A.C. at 70°C	ohm/km	0.87	0.627	0.464	0.321	0.232	0.184	0.15	0.121	0.093	0.075	0.0604
Inductance		mH/km	0.271	0.263	0.262	0.244	0.243	0.239	0.239	0.233	0.235	0.234	0.232
Reactance at 50Hz		ohm/km	0.085	0.083	0.082	0.077	0.076	0.075	0.075	0.073	0.074	0.073	0.073
Impedance at 70°C		ohm/km	0.874	0.632	0.471	0.330	0.244	0.199	0.168	0.141	0.119	0.105	0.095
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	6.1	8.5	12.2	17.1	23.2	29.3	36.6	45.2	58.6	73.2	85.7
	for 1.0 Sec	kA	2.7	3.8	5.5	7.6	10.4	13.1	16.4	20.2	26.2	32.7	38.3
	for 3.0 Sec	kA	1.6	2.2	3.2	4.4	6.0	7.6	9.5	11.7	15.1	18.9	22.1
Maximum earth - fault short - circuit current ratings	for 0.2 Sec	kA	7.0	7.6	8.8	12.5	14.3	15.3	21.4	23.4	26.3	28.7	32.1
	for 1.0 Sec	kA	3.1	3.4	3.9	5.6	6.4	6.8	9.6	10.4	11.8	12.8	14.4
	for 3.0 Sec	kA	1.8	2.0	2.3	3.2	3.7	3.9	5.5	6.0	6.8	7.4	8.3
Approximate overall diameter		mm	25.2	27.2	30.4	34.8	38.8	41.2	46.4	50.6	56.2	61.0	67.0
Approximate Cable weight		kg/km	1651.5	2016.8	2561.9	3566	4612.6	5411.3	6901.3	8289.5	10411.3	12563.6	15483.9
Minimum bending radius		mm	202	218	243	278	310	330	371	405	450	488	536

4 Core Armoured Cables - Cu / PVC / SWA / PVC
With Circular Conductors

600 / 1000 V
BS 6346 : 1997

ITEM CODE	UNIT	C-41	C-42	C-43	C-44	C-45	C-46	C-47	C-48
Nominal Area of Conductor	sq.mm	1.5	2.5	4	6	10	16	25	35
Nominal Thickness of insulation	mm	0.6	0.7	0.8	0.8	1	1	1.2	1.2
Thickness of Extruded bedding	mm	0.8	0.8	0.8	0.8	0.8	1.0	1.0	1.0
Galvanized Steel Armour wire diameter	mm	0.9	0.9	1.25	1.25	1.25	1.6	1.6	1.6
Thickness of oversheath	mm	1.4	1.4	1.5	1.5	1.6	1.7	1.8	1.9
Maximum armour resistance at 20°C	ohm/km	8.8	7.7	4.6	4.1	3.4	2.2	2.1	1.9
Gross armour wire area	sq.mm	17	20	34	38	46	72	76	84
Maximum resistance of conductor	D.C. at 20° C	ohm/km	12.1	7.41	4.61	3.08	1.15	0.727	0.524
	A.C. at 70° C	ohm/km	-	-	-	-	1.380	0.87	0.627
Inductance	mH/km	-	-	-	-	-	0.269	0.266	0.258
Reactance at 50Hz	ohm/km	-	-	-	-	-	0.085	0.084	0.081
Impedance at 70°C	ohm/km	-	-	-	-	-	1.383	0.874	0.632
Maximum symmetrical short - circuit current ratings	for 0.2 Sec	kA	0.4	0.6	1.0	1.5	2.4	3.9	6.1
	for 1.0 Sec	kA	0.2	0.3	0.4	0.7	1.1	1.7	2.7
	for 3.0 Sec	kA	0.1	0.2	0.3	0.4	0.6	1.0	1.6
Maximum earth - fault short - circuit current ratings	for 0.2 Sec	kA	1.8	2.1	3.5	3.9	4.9	7.4	9.8
	for 1.0 Sec	kA	0.8	0.9	1.6	1.7	2.2	3.3	4.4
	for 3.0 Sec	kA	0.5	0.5	0.9	1.0	1.3	1.9	2.5
Approximate overall diameter	mm	12.9	14.4	17.1	18.5	22.5	26.3	30.7	33.6
Approximate Cable weight	kg/km	349.1	438.5	668.3	806.1	1116.3	1639.3	2256.8	2779.9
Minimum bending radius	mm	77	86	103	111	135	158	184	202

1.5 mm² Armoured Auxiliary Cables - Cu / PVC / SWA /PVC

600 / 1000 V
BS 6346 : 1997

ITEM CODE	UNIT	C-141 _b	C-141	C-142 _c	C-142	C-143 _b	C-143 _d	C-143	C-144 _e	C-144	C-145 _c	C-145	C-146 _g	C-146
Number of Cores	Nos.	6	7	10	12	14	16	19	24	27	30	37	44	48
Nominal Area of Conductor	sq.mm	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Nominal Thickness of insulation	mm	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Thickness of Extruded bedding	mm	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.0
Galvanized Steel Armour wire diameter	mm	0.9	0.9	1.25	1.25	1.25	1.25	1.25	1.6	1.6	1.6	1.6	1.6	1.6
Thickness of oversheath	mm	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.8	1.8	1.9	1.9
Maximum armour resistance at 20 ⁰ C	ohm/km	7.5	7.5	7.5	4.0	4.0	4.0	3.5	3.5	2.3	2.3	2.0	2.0	1.8
Gross armour wire area	sq.mm	20	20	20	39	39	39	45	45	70	70	78	78	90
Maximum resistance of conductor	D.C. at 20 ⁰ C	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1
Approximate overall diameter	mm	15.2	15.2	18.9	19.3	20.3	21.1	21.9	26	27.1	27.3	29	32.0	32.4
Approximate Cable weight	kg/km	439.1	460.1	706.3	753.1	833.2	903.2	995.7	1382.6	1492.7	1568.5	1770.1	2050.1	2156.1
Minimum bending radius	mm	91	91	113	116	122	127	131	156	163	164	174	192	194

2.5 mm² Armoured Auxiliary Cables - Cu / PVC / SWA /PVC

600 / 1000 V
BS 6346 : 1997

ITEM CODE	UNIT	C-147 _b	C-147	C-148 _c	C-148	C-149 _b	C-149 _d	C-149	C-150 _e	C-150	C-151 _c	C-151	C-152 _g	C-152
Number of Cores	Nos.	6	7	10	12	14	16	19	24	27	30	37	44	48
Nominal Area of Conductor	sq.mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Nominal Thickness of insulation	mm	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Thickness of Extruded bedding	mm	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2
Galvanized Steel Armour wire diameter	mm	1.25	1.25	1.25	1.25	1.6	1.6	1.6	1.6	1.6	1.6	1.6	2.0	2.0
Thickness of oversheath	mm	1.5	1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	2.1	2.1
Maximum armour resistance at 20°C	ohm/km	4.6	4.6	4.6	3.5	3.5	3.5	2.3	2.3	1.9	1.9	1.7	1.7	1.2
Gross armour wire area	sq.mm	34	34	34	45	45	45	70	70	84	84	92	92	138
Maximum resistance of conductor	D.C. at 20° C ohm/km	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41
Approximate overall diameter	mm	17.9	17.9	21.5	22.1	22.4	25.2	26.3	29.9	31.3	31.5	33.5	38.5	39
Approximate Cable weight	kg/km	652.3	685	909.3	990.4	1266.3	1359.3	1502.6	1820.5	1985.4	2098.2	2403.1	3094.9	3258.7
Minimum bending radius	mm	107	107	129	133	134	151	158	179	188	189	201	231	234

4.0 mm² Armoured Auxiliary Cables - Cu / PVC / SWA /PVC

600 / 1000 V
BS 6346 : 1997

ITEM CODE	UNIT	C-153 _b	C-153	C-154 _c	C-154	C-155 _b	C-155 _d	C-155	C-156 _e	C-156	C-157 _c	C-157	C-158 _g	C-158
Number of Cores	Nos.	6	7	10	12	14	16	19	24	27	30	37	44	48
Nominal Area of Conductor	sq.mm	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Nominal Thickness of insulation	mm	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Thickness of Extruded bedding	mm	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2
Galvanized Steel Armour wire diameter	mm	1.25	1.25	1.6	1.6	1.6	1.6	1.6	2	2	2.0	2.0	2.0	2.0
Thickness of oversheath	mm	1.6	1.6	1.7	1.7	1.8	1.8	1.8	2.0	2.0	2.1	2.1	2.2	2.2
Maximum armour resistance at 20°C	ohm/km	3.9	3.9	3.9	2.2	2.2	2.2	1.9	1.9	1.3	1.3	1.1	1.1	0.96
Gross armour wire area	sq.mm	40	40	40	72	72	72	84	84	128	128	144	144	163
Maximum resistance of conductor	D.C. at 20° C ohm/km	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61
Approximate overall diameter	mm	20.4	20.4	25.8	26.4	27.6	28.9	30.2	35.9	37	37.2	39.7	44.0	44.6
Approximate Cable weight	kg/km	844.4	895.3	1368.3	1494.1	1656.5	1804.8	2022.1	2747.7	2942.4	3112.3	3607.1	4199.4	4437.9
Minimum bending radius	mm	122	122	155	158	166	173	181	215	222	223	238	264	268

1.5 mm² Unarmoured Auxiliary Cables - Cu / PVC / PVC

600 / 1000 V
BS 6346 : 1989

ITEM CODE		UNIT	C-195 _b	C-195	C-196 _c	C-196	C-197 _b	C-197 _d	C-197	C-198 _e	C-198	C-199 _c	C-199	C-200 _h	C-200
Number of Cores		Nos.	6	7	10	12	14	16	19	24	27	30	37	44	48
Nominal Area of Conductor		sq.mm	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Nominal Thickness of insulation		mm	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Thickness of Extruded bedding		mm	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.0
Thickness of oversheath		mm	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.8	1.8	1.9	1.9
Maximum resistance of conductor	D.C. at 20 ⁰ C	ohm/km	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1
Approximate overall diameter		mm	13.4	13.4	16.4	16.8	17.8	18.5	19.4	22.7	23.9	24.1	25.7	28.7	29.1
Approximate Cable weight		kg/km	245.5	266.6	367.4	414.2	473.7	524.2	597.2	766.8	844.9	919.3	1089	1287.7	1377.8
Minimum bending radius		mm	80	80	98	101	107	111	116	136	143	145	154	172	175

2.5 mm² Unarmoured Auxiliary Cables - Cu / PVC / PVC

600 / 1000 V
BS 6346 : 1989

ITEM CODE		UNIT	C-201 _b	C-201	C-202 _c	C-202	C-203 _b	C-203 _d	C-203	C-204 _e	C-204	C-205 _c	C-205	C-206 _g	C-206
Number of Cores		Nos.	6	7	10	12	14	16	19	24	27	30	37	44	48
Nominal Area of Conductor		sq.mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Nominal Thickness of insulation		mm	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Thickness of Extruded bedding		mm	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2
Thickness of oversheath		mm	1.4	1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	2.1	2.1
Maximum resistance of conductor	D.C. at 20° C	ohm/km	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41
Approximate overall diameter		mm	15.4	15.4	19	19.6	21.1	22.0	23.1	26.7	28.1	28.3	30.3	34.5	35
Approximate Cable weight		kg/km	342.6	375.3	520.5	591.9	698.3	775.4	886.8	1107.4	1224.5	1335.8	1592.8	1933.7	2072.6
Minimum bending radius		mm	92	92	114	118	127	132	139	160	169	170	182	207	210

1 Core Cu / PVC / PVC CABLES

**300/500 V
BS 6004:2012**

ITEM CODE	UNIT	A-95	A-96	A-96 _{SUB}	A-97	A-97 _{SUB}	A-98	A-99	A-100	A-101	A-102	A-103
Nominal Area of Conduct	sq.mm	1	1.5	1.5 *	2.5	2.5*	4	6	10	16	25	35
Conductor construction	wires/mm	1/1.13	1/1.38	7/0.53	1/1.78	7/0.67	7/0.85	7/1.04	7/1.35	7/1.70	19/1.35	19/1.53
Nominal Thickness of insulation	mm	0.6	0.7	0.7	0.8	0.8	0.8	0.8	1	1	1.2	1.2
Thickness of oversheath	mm	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1	1	1.1
Maximum D.C. resistanc at 20 ⁰ C	ohm/km	18.1	12.1	12.1	7.41	7.41	4.61	3.08	1.83	1.15	0.727	0.524
Approximate overall diameter	mm	3.83	4.29	4.48	4.89	5.1	5.9	6.5	7.9	9.1	11.4	12.3
Approximate Cable weight	kg/km	24	32	34	46	48	69	94	147	215	349	431
Current carrying capacity- enclosed in conduit on a wall or in trunking- 2 cables single phase a.c./ voltage Drop	A	13.9	18	18	24.7	24.7	33	42.2	58.7	78.3	104	128.8
	mV/A/m	44	29.0	29	18	18	11	7.3	4.4	2.8	1.8	1.3
Current carrying capacity- enclosed in conduit on a wall or in trunking- 3 or 4 cables three phase a.c./ voltage Drop	A	12.4	16	16	21.6	21.6	28.8	37.1	51.5	70.0	91.7	113.3
	mV/A/m	38	25	25	15	15	10	6.4	3.8	2.4	1.6	1.1

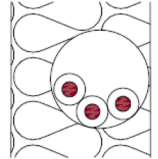
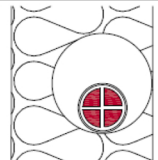
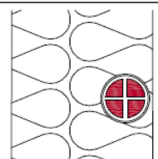
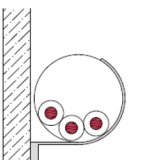
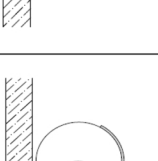
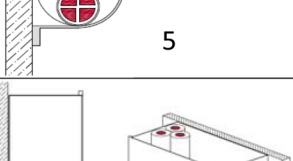
* MANUFACTURING IS BASED ON CUSTOMER REQUEST ONLY

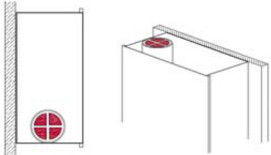
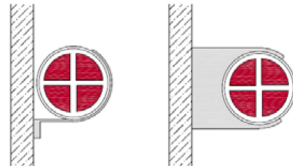
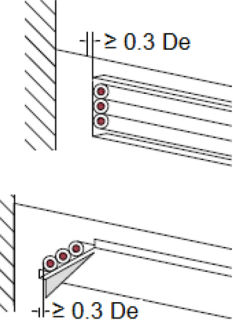
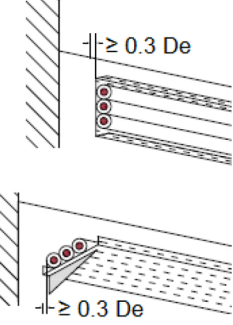
4.0 mm² Unarmoured Auxiliary Cables - Cu / PVC /PVC

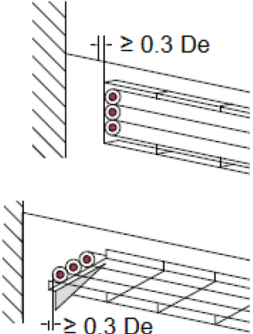
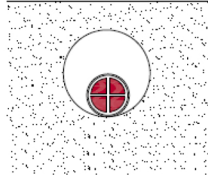
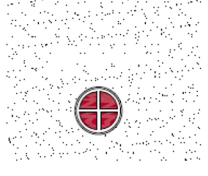
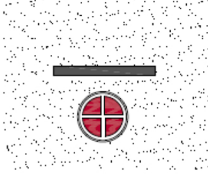
**600 / 1000 V
BS 6346 : 1989**

ITEM CODE		UNIT	C-207 _b	C-207	C-208 _c	C-208	C-209 _b	C-209 _d	C-209	C-210 _e	C-210	C-211 _c	C-211	C-212 _g	C-212
Number of Cores		Nos.	6	7	10	12	14	16	19	24	27	30	37	44	48
Nominal Area of Conductor		sq.mm	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Nominal Thickness of insulation		mm	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Thickness of Extruded bedding		mm	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2
Thickness of oversheath		mm	1.6	1.6	1.7	1.7	1.8	1.8	1.8	2.0	2.0	2.1	2.1	2.2	2.2
Maximum resistance of conductor	D.C. at 20° C	ohm/km	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61	4.61
Approximate overall diameter		mm	17.9	17.9	22.6	23.2	24.6	25.7	27.0	31.9	33.6	33.8	36.3	40.6	41.2
Approximate Cable weight		kg/km	484.9	535.7	768.4	878.3	1007.3	1123.7	1293.1	1663.2	1842	2010.4	2405.4	2846.5	3060.1
Minimum bending radius		mm	107	107	136	139	148	154	162	191	202	203	218	244	247

Schedule of installation methods of cables for determining current carrying capacity.

Installation Method		Reference method to be used to determine current carrying capacity
Examples	Description	
 1	Room Side Non-sheathed cables in conduit In a thermally insulated wall with an inner skin having a thermal conductance of not less than 10 W/m ² K ^c	A
 2	Room Side Multi core cables in conduit In a thermally insulated wall with an inner skin having a thermal conductance of not less than 10 W/m ² K ^c	A
 3	Room Side Multi core cables direct in a thermally insulated wall with an inner skin having a thermal conductance of not less than 10 W/m ² K ^c	A
 4	Non-sheathed cables in conduit on a wooden or masonry wall ^c	B
 5	Multi core cable in conduit on a wooden or masonry wall ^c	B
 6	Non-sheathed cables in cable trunking on a wooden or masonry wall. run horizontally (left) ^b run vertically (Right) ^{b,c}	B

 7	Multi core cable in cable trunking on a wooden or masonry wall run horizontally (left)^b run vertically (Right)^{b,c}	B*
 8	Single core or multi core cables: Fixed on (clipped direct), or spaced less than 0.3 x cable diameter from a wooden or masonry wall.^c	C
 9	Single-core or multi core cables: Fixed directly under a wooden or masonry ceiling.	C
 10	Single-core or multi core cables: on unperforated tray run horizontally or vertically^c De = the external diameter of a cable. The space between wall and cable tray will be , 2.2x De ; When 3 single core cables are bound in trefoil , 3.0 x De ; When 3 single core cables are laid in flat .	C
 11	Single-core or multi core cables: On perforated tray Run horizontally or vertically^c The space between wall and cable tray will be , 2.2x De ; When 3 single core cables are bound in trefoil , 3.0 x De ; When 3 single core cables are laid in flat formation.	D

 12	Single core or multi core cables: on ladder bracket type tray or on a wire mesh tray run horizontally or vertically ^c The space between wall and cable tray will be , 2.2x De ; When 3 single core cables are bound in trefoil , 3.0 x De ; When 3 single core cables are laid in flat formation.	D
 13	Multi core armoured cable in conduit or in cable ducting in the ground	E for multi core armoured cable only.
 14	Sheathed, armoured or multi core cables direct in the ground: without added mechanical protection.	E
 15	Sheathed, armoured or multi core cables direct in the ground: with added mechanical protection (e.g. Concrete cover)	E

- b –Values given for Installation Methods are for a single circuit. Where there is more than one circuit in the trunking the group rating factor given in Adjustment Table -7 is applicable, irrespective of the presence of an internal barrier or partition.
- c- Care is needed where the cable runs vertically and ventilation is restricted. The ambient temperature at the top of the vertical section can be much higher.
- The inclusion of directly buried cables is satisfactory where the soil thermal resistivity is of the order of 2.5K.m/W. For lower soil resistivities, the current-carrying capacity for directly buried cables is appreciably higher than for cables in ducts.
- * Still under consideration in IEC.

Single core unarmoured Cu/PVC Cables with or without sheath

Ambient temperature: 30°C

CURRENT-CARRYING CAPACITY (amperes) & VOLTAGE DROP

Conductor operating temperature: 70°C

	Reference method											
	A		B		C		D					
Conductor Cross sectional Area	Enclosed in conduit in thermally insulating wall		enclosed in conduit on a wall or in trunking		clipped direct		in free air or on a perforated cable tray etc horizontal or vertical etc) Touching			in free air -Spaced by one cable diameter		Voltage Drop
	2 cables.sin gle-phase ac. or d.c.	3 or 4cables.thr ee-phase ac.	2 cables.single phase ac. or dc.	3 or 4cables.thr ee-phase ac.	2 cables.singl e-phase ac. or dc. flat and touching	3 or 4cables.thre e-phase a.c. flat and touching or trefoil	2 cables.sin gle- phaseac. or dc. flat	3 cables.thre e-phase ac. flat	3 cables.thr ee- phaseac trefoil	2 cables, single- phasea.c. or d.c.or 3 cables three-phase ac flat		clipped direct, on tray or in free air
										Horizontal	Vertical	3or 4 cables,three phase a,c, touching Flat
mm ²	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(mV/A/m)
50	119	108	151	134	182	167	196	174	167	219	197	0.84
70	151	136	192	171	234	214	251	225	216	281	254	0.6
95	182	164	232	207	284	261	304	275	264	341	311	0.47
120	210	188	269	239	330	303	352	321	308	396	362	0.4
150	240	216	300	262	381	349	406	372	356	456	419	0.34
185	273	245	341	296	436	400	463	427	409	521	480	0.31
240	321	286	400	346	515	472	546	507	485	615	569	0.27
300	367	328	458	394	594	545	629	587	561	709	659	0.25
400	-	-	546	467	694	634	754	689	656	852	795	0.24
500	-	-	626	533	792	723	868	789	749	982	920	0.23
630	-	-	720	611	904	826	1005	905	855	1138	1070	0.22
800	-	-	-	-	1030	943	1086	1020	971	1265	1188	0.22
1000	-	-	-	-	1154	1058	1216	1149	1079	1420	1337	0.21

Multi core unarmoured Cu/ PVC insulated PVC Sheathed Cables

Ambient temperature: 30°C

CURRENT-CARRYING CAPACITY (amperes) & VOLTAGE DROP

Conductor operating temperature: 70°C

Conductor Cross sectional Area	Reference method								Voltage Drop
	A		B		C		D		
	Enclosed in conduit in thermally insulating wall		enclosed in conduit on a wall or in trunking		clipped direct		free air or on a perforated cable tray etc, horizontal or vertical		
	1 two-co re cable, single-phase a.c. or d.c.	1 three- or four-co re cable three-phase a.c.	1 two-core cable, single-phase a.c. or d.c.	1 three- orfour-core cable, three-phase a.c.	1 two-core cable, single-phase a.c. or d.c.	1 three- or four-core cable. three-phase a.c.	1 two-core cable, single-phase a.c. or d.c.	I three- or four-core cable, three-phase a.c.	three- or four-core cable
									three-phase a.c.
mm ²	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(mV/A/m)
1	11	10	13	11.5	15	13.5	17	14.5	38
1.5	14	13	16.5	15	19.5	17.5	22	18.5	25
2.5	18.5	17.5	23	20	27	24	30	25	15
4	25	23	30	27	36	32	40	34	9.5
6	32	29	38	34	46	41	51	43	6.4
10	43	39	52	46	63	57	70	60	3.8
16	57	52	69	62	85	76	94	80	2.4
25	75	68	90	80	112	96	119	101	15
35	92	83	111	99	138	119	148	126	1.1
50	110	99	133	118	168	144	180	153	0.81
70	139	125	168	149	213	184	232	196	0.57
95	167	150	201	179	258	223	282	238	0.43
120	192	172	232	206	299	259	328	276	0.35
150	219	196	258	225	344	299	379	319	0.29
185	248	223	294	255	392	341	434	364	0.25
240	291	261	344	297	461	403	514	430	0.21
300	334	298	394	339	530	464	593	497	0.185
400	-	-	470	402	634	557	715	597	0.16

Single core armoured Cu/PVC insulated Cables (non magnetic armour)

Ambient temperature: 30°C

CURRENT-CARRYING CAPACITY (amperes) & VOLTAGE DROP

Conductor operating temperature: 70°C

Conductor Cross sectional Area	Reference method											Voltage Drop
	C		D									
	clipped direct		in free air or , on a perforated cable tray, horizontal or vertical									
	Touching		Touching			Spaced by one cable diameter						(clipped direct, on tray or in free air
						2 cables, d.c.		2 cables, single-phase a.c.		3 or 4 cables, three- phase a.c.		
	2 cables, singlephas e a.c. or d.c. flat	3 or 4 cables, three- phase a.c. flat	2 cables, singlephas e a.c. or d.c. flat	3 cables. three- phase a.c. flat	3 cables. three- phase a.c. trefoil	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	3 or 4 cables, three-phase a.c.
											flat and touching	
mm ²	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(mV/A/m)
50	193	179	205	189	181	229	216	229	217	230	212	0.84
70	245	225	259	238	231	294	279	287	272	286	263	0.62
95	296	269	313	285	280	357	340	349	332	338	313	0.5
120	342	309	360	327	324	415	396	401	383	385	357	0.43
150	393	352	413	373	373	479	458	449	429	436	405	0.38
185	447	399	469	422	425	548	525	511	489	490	456	0.34
240	525	465	550	492	501	648	622	593	568	566	528	0.3
300	594	515	624	547	567	748	719	668	640	616	578	0.28
400	687	575	723	618	657	885	851	737	707	674	632	0.26
500	763	622	805	673	731	1035	997	810	777	721	676	0.25
630	843	669	891	728	809	1218	1174	893	856	771	723	0.23
800	919	710	976	777	886	1441	1390	943	905	824	772	0.22
1000	975	737	1041	808	945	1685	1627	1008	967	872	816	0.21

Multi core armoured Cu/ PVC insulated PVC Sheathed Cables

Ambient temperature: 30°C

Ground Ambient temperature: 20°C

CURRENT-CARRYING CAPACITY (amperes) & VOLTAGE DROP

Conductor operating temperature: 70°C

Conductor Cross sectional Area	Reference method						Voltage Drop
	C		D		E		
	clipped direct		in free air or on a perforated cable tray etc, horizontal or vertical		direct in ground or in ducting in ground in or around building		
	1 two-core cable.single-phase a.c. or d.c.	1 three- or 1 four-core cable.three-phase a.c.	1 two-core cable.single-phase a.c. or d.c.	1 three- or 1 four-core cable.three-phase a.c.	1 two-core cable.single-phase a.c. or d.c.	1 three- or 1 four-core cable.three-phase a.c.	Three or four-core cable
							three-phase a.c.
mm ²	(A)	(A)	(A)	(A)	(A)	(A)	(mV/A/m)
1.5	21	18	22	19	22	18	25
2.5	28	25	31	26	29	24	15
4	38	33	41	35	37	30	9.5
6	49	42	53	45	46	38	6.4
10	67	58	72	62	60	50	3.8
16	89	77	97	83	78	64	2.4
25	118	102	128	110	99	82	1.5
35	145	125	157	135	119	98	1.1
50	175	151	190	163	140	116	0.81
70	222	192	241	207	173	143	0.57
95	269	231	291	251	204	169	0.43
120	310	267	336	290	231	192	0.35
150	356	306	386	332	261	217	0.29
185	405	348	439	378	292	243	0.25
240	476	409	516	445	336	280	0.21
300	547	469	592	510	379	316	0.185
400	621	540	683	590	-	-	0.16

Single core unarmoured Al/PVC Cables with or without sheath

Ambient temperature: 30°C

CURRENT-CARRYING CAPACITY (amperes) & VOLTAGE DROP

Conductor operating temperature: 70°C

Conductor Cross sectional Area	Reference method											Voltage Drop
	A		B		C		D					clipped direct, on tray or in free air
	Enclosed in conduit in thermally insulating wall		enclosed in conduit on a wall or in trunking		clipped direct		in free air or on a perforated cable tray etc horizontal or vertical etc) Touching			in free air -Spaced by one cable diameter		
	2 cables.singl e-phase ac. or d.c.	3 or 4cables.thr ee-phase ac.	2 cables.singl e-phase ac. or dc.	3 or 4cables.thr ee-phase ac.	2 cables.singl e-phase ac. or dc. flat and touching	3 or 4cables.thr ee-phase a.c. flat and touching or trefoil	2 cables.singl e-phaseac. or dc. flat	3 cables.thre e-phase ac. flat	3 cables.thre e-phase ac. trefoil	2 cables, single-phasea.c. or d.c.or 3 cables three- phase ac flat		
										Horizontal	Vertical	3or 4 cables,three phase a,c, touching Flat
mm ²	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(mV/A/m)
50	93	84	118	104	125	110	149	133	128	169	152	1.35
70	118	107	150	133	160	140	192	173	166	217	196	0.94
95	142	129	181	161	195	170	235	212	203	265	241	0.71
120	164	149	210	186	226	197	273	247	237	308	282	0.58
150	189	170	234	204	261	227	316	287	274	356	327	0.48
185	215	194	266	230	298	259	363	330	316	407	376	0.41
240	252	227	312	269	352	305	430	392	375	482	447	0.35
300	289	261	358	306	406	351	497	455	434	557	519	0.31
380			413	352	511	472	543	502	507	625	584	0.28
480			477	405	591	546	629	582	590	726	680	0.26
600			545	462	679	626	722	669	680	837	787	0.24
740					771	709	820	761	776	956	902	0.23
960					900	823	953	886	907	1125	1066	0.22
1200					1022	926	1073	999	1026	1293	1229	0.22

Multi core unarmoured Al/ PVC insulated PVC Sheathed Cables

Ambient temperature: 30°C

CURRENT-CARRYING CAPACITY (amperes) & VOLTAGE DROP

Conductor operating temperature: 70°C

Conductor Cross sectional Area	Reference method								Voltage Drop
	A		B		C		D		
	Enclosed in conduit in thermally insulating wall		enclosed in conduit on a wall or in trunking		clipped direct		in free air or on a perforated cable tray etc, horizontal or vertical		three- or four-core cable
	1 two-co recable, single-phase a.c. or d.c.	1 three- or four-core cable three-phase a.c.	1 two-core cable, single-phase a.c. or d.c.	1 three- or four-core cable, three-phase a.c.	1 two-core cable, single-phase a.c. or d.c.	1 three- or four-core cable three-phase a.c.	1 two-core cable, single-phase a.c. or d.c.	1 three- or four-core cable, three-phase a.c.	three-phase a.c.
mm ²	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(mV/A/m)
16	44	41	54	48	66	59	73	61	3.9
25	58	53	71	62	83	73	89	78	2.5
35	71	65	86	77	103	90	111	96	1.8
50	86	78	104	92	125	110	135	117	1.35
70	108	98	131	116	160	140	173	150	0.92
95	130	118	157	139	195	170	210	183	0.68
120		135		160		197		212	0.55
150		155		176		227		245	0.44
185		176		199		259		280	0.37
240		207		232		305		330	0.3
300		237		265		351		381	0.25

Single core armoured Al/PVC insulated Cables (non magnetic armour)

Ambient temperature: 30°C

CURRENT-CARRYING CAPACITY (amperes) & VOLTAGE DROP

Conductor operating temperature: 70°C

Conductor Cross sectional Area	Reference method											Voltage Drop	
	C		D										
	clipped direct		in free air or , on a perforated cable tray, horizontal or vertical										
	Touching		Touching			Spaced by one cable diameter						(clipped direct, on tray or in free air	
	2 cables, single phase a.c. or d.c. flat	3 or 4 cables, three-phase a.c. flat	2 cables, single phase a.c. or d.c. flat	3 cables. three-phase a.c. flat	3 cables. three-phase a.c. trefoil	2 cables, d.c.		2 cables, single-phase a.c.		3 or 4 cables, three-phase a.c.		3 or 4 cables, three-phase a.c.	
Horizontal						Vertical	Horizontal	Vertical	Horizontal	Vertical	flat and touching		
mm ²	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(mV/A/m)	
50	143	133	152	141	131	167	157	168	159	169	155	1.35	
70	183	168	194	178	168	214	202	212	200	213	196	0.96	
95	221	202	234	214	205	261	247	259	245	255	236	0.75	
120	255	233	270	246	238	303	288	299	285	293	272	0.62	
150	294	267	310	282	275	349	333	340	323	335	312	0.52	
185	334	303	352	319	315	400	382	389	371	379	354	0.45	
240	393	354	413	374	372	472	452	457	437	443	415	0.38	
300	452	405	474	427	430	545	523	520	498	505	475	0.34	
380	518	452	543	479	497	638	613	583	559	551	518	0.32	
480	586	501	616	534	568	742	715	655	629	604	568	0.29	
600	658	550	692	589	642	859	828	724	696	656	618	0.27	
740	728	596	769	642	715	986	952	802	770	707	666	0.26	
960	819	651	868	706	808	1171	1133	866	832	770	726	0.24	
1200	893	692	952	756	880	1360	1317	938	902	822	774	0.22	

Multi core armoured Al/ PVC insulated PVC Sheathed Cables

Ambient temperature: 30°C

Ground Ambient Temperature: 20°C

CURRENT-CARRYING CAPACITY (amperes) & VOLTAGE DR

Conductor operating temperature: 70°C

Conductor Cross sectional Area	Reference method						Voltage Drop
	C		D		E		
	clipped direct		in free air or on a perforated cable tray etc, horizontal or vertical		direct in ground or in ducting in ground in or around building		
	1 two-core cable.single- phase a.c. or d.c.	1 three- or 1 four-core cable.three- phase a.c.	1 two-core cable.single- phase a.c. or d.c.	1 three- or 1 four-core cable.three- phase a.c.	1 two-core cable.single- phase a.c. or d.c.	1 three- or 1 four-core cable.three- phase a.c.	Three or four- core cable
							three-phase a.c.
mm ²	(A)	(A)	(A)	(A)	(A)	(A)	(mV/A/m)
16	68	58	71	61	-	-	3.9
25	89	76	94	80	77	64	2.5
35	109	94	115	99	93	77	1.8
50	131	113	139	119	109	91	1.35
70	165	143	175	151	135	112	0.92
95	199	174	211	186	159	132	0.68
120		202		216		150	0.55
150		232		250		169	0.44
185		265		287		190	0.37
240		312		342		218	0.3
300		360		399		247	0.25

VARIATION IN AMBIENT TEMPERATURE

ADJUSTMENT TABLE - 1

Correction factors for ambient temperature where protection is against short -circuit

Type of Insulation	Operating Temperature	AMBIENT TEMPERATURE (°C)							
		25	30	35	40	45	50	55	60
Thermoplastic (PVC)	70°C	1.03	1	0.94	0.87	0.79	0.71	0.61	0.5

VARIATION IN GROUND TEMPERATURE

ADJUSTMENT TABLE - 2

Insulation & Conductor Temperature (°C)	GROUND TEMPERATURE (°C)										
	10	15	20	25	30	35	40	45	50	55	60
PVC - 70	1.1	1.05	1	0.95	0.89	0.84	0.77	0.71	0.63	0.55	0.45

ADJUSTMENT TABLE - 3

VARIATION IN SOIL THERMAL RESISTIVITY

Rating factors for cables buried direct in the ground or in an underground conduit system to BS EN 50086-2-4 for soil thermal resistivities other than 2.5K.m/W to be applied to the current carrying capacities for reference method E

Thermal resistivity, K.m/W	0.5	0.8	1	1.2	1.5	2	2.5	3
Rating factor for cables in buried ducts	1.28	1.2	1.18	1.13	1.1	1.05	1	0.96
Rating factor for direct buried cables	1.88	1.62	1.5	1.4	1.28	1.12	1	0.9

NOTE 1: The rating factors given have been averaged over the range of conductor sizes and types of installation included in the relevant tables in this appendix. The overall accuracy of rating factors is within $\pm 5\%$.

NOTE 2: Where more precise values are required they may be calculated by methods given in BS7769 (BS IEC 60287)

NOTE 3: The rating factors are applicable to ducts buried at depths of up to 0.8 m.

ADJUSTMENT TABLE - 4

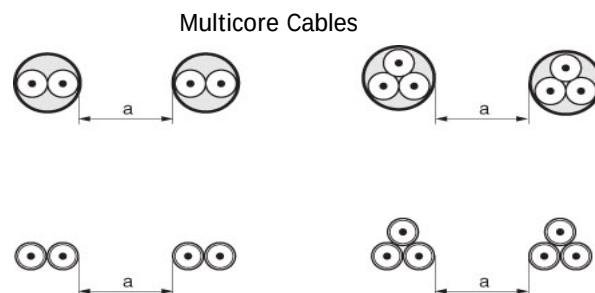
Rating factors of depth of burial for depths of laying other than 0.7 m for direct buried cables and cables in buried ducts

Depth of laying, m	Buried direct	In buried ducts
0.50	1.03	1.02
0.70	1.00	1
1	0.97	0.98
1.25	0.95	0.96
1.50	0.94	0.95
1.75	0.93	0.94
2	0.92	0.93
2.5	0.90	0.92
3	0.89	0.91

ADJUSTMENT TABLE - 5

Rating factors for more than one circuit, cables buried directly in the ground

Number of circuits	Cable-to-cable clearance (a)				
	Nil (cables touching)	One cable diameter	0.125 m	0.25 m	0.5 m
2	0.75	0.8	0.85	0.9	0.9
3	0.65	0.7	0.75	0.8	0.85
4	0.6	0.6	0.7	0.75	0.8
5	0.55	0.55	0.65	0.7	0.8
6	0.5	0.55	0.6	0.7	0.8



NOTE 1: Values given apply to an installation depth of 0.7 m and a soil thermal resistivity of 2.5 K.m/W.

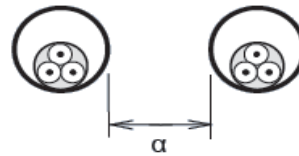
NOTE 2: In case of a thermal resistivity lower than 2.5 K.m/W the rating factors can, in general be increased and can be calculated by the methods given in BS 7769 (BS IEC 60287).

ADJUSTMENT TABLE - 6

Rating factors for more than one circuit, cables in ducts buried in the ground

Number of cables	Duct-to-duct clearance (a)			
	Nil (ducts touching)	0.25 in	0.5 m	1.0 m
2	0.85	0.9	0.95	0.95
3	0.75	0.85	0.9	0.95
4	0.7	0.8	0.85	0.9
5	0.65	0.8	0.85	0.9
6	0.6	0.8	0.8	0.9

Multicore cables



NOTE 1: Values given apply to an installation depth of 0.7 m and a soil thermal resistivity of 2.5 K..m/W.

NOTE 2: In case of a thermal resistivity lower than 2.5 K.m/W the rating factors can, in general, be increased and can be calculated by the methods given in BS 7769 (BS I EC 60287).

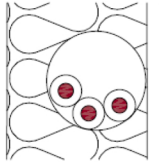
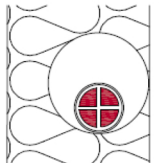
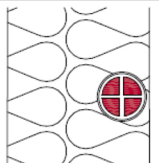
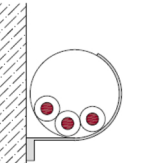
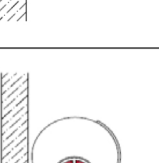
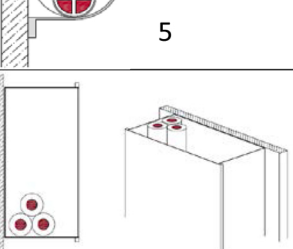
ADJUSTMENT TABLE - 7

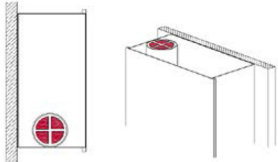
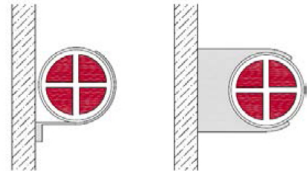
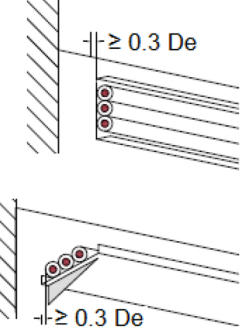
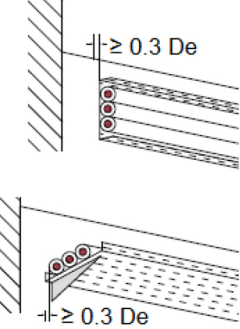
Rating factors for one circuit or one multicore cable or for a group of circuits, or a group of multicore cables

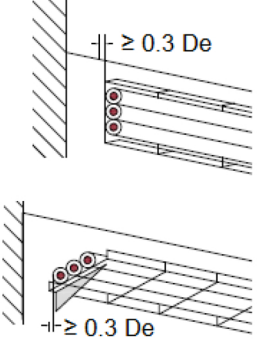
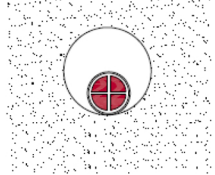
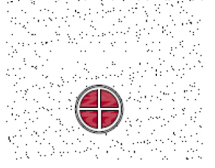
Arrangement (cables touching)	Number of circuits or multicore cables											
	1	2	3	4	5	6	7	8	9	12	16	20
Bunched in air, on a surface, embedded or enclosed	1	0.8	0.7	0.65	0.6	0.57	0.54	0.52	0.5	0.45	0.41	0.38
Single layer on wall or floor	1	0.85	0.79	0.75	0.73	0.72	0.72	0.71	0.7	0.7	0.7	0.7
Single layer multicore on a perforated horizontal or vertical cable tray system	1	0.88	0.82	0.77	0.75	0.73	0.73	0.72	0.72	0.72	0.72	0.72
Single layer multi core on cable ladder system or cleats etc..	1	0.87	0.82	0.8	0.8	0.79	0.79	0.78	0.78	0.78	0.78	0.78

ADJUSTMENT TABLE 7

Schedule of installation methods of cables for determining current carrying capacity.

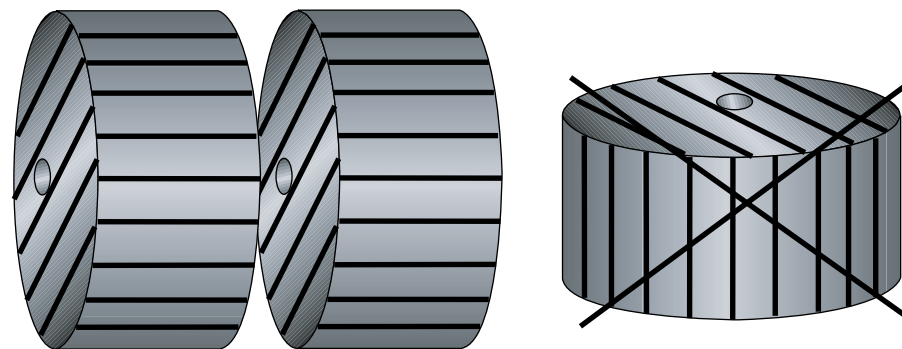
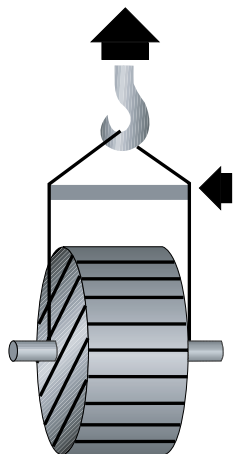
Installation Method		Reference method to be used to determine current carrying capacity
Examples	Description	
 1	Room Side Non-sheathed cables in conduit In a thermally insulated wall with an inner skin having a thermal conductance of not less than $10 \text{ W/m}^2\text{K}^c$	A
 2	Room Side Multi core cables in conduit In a thermally insulated wall with an inner skin having a thermal conductance of not less than $10 \text{ W/m}^2\text{K}^c$	A
 3	Room Side Multi core cables direct in a thermally insulated wall with an inner skin having a thermal conductance of not less than $10 \text{ W/m}^2\text{K}^c$	A
 4	Non-sheathed cables in conduit on a wooden or masonry wall ^c	B
 5	Multi core cable in conduit on a wooden or masonry wall ^c	B
 6	Non-sheathed cables in cable trunking on a wooden or masonry wall. run horizontally (left) ^b run vertically (Right) ^{b,c}	B

 7	Multi core cable in cable trunking on a wooden or masonry wall run horizontally (left) ^b run vertically (Right) ^{b,c}	B*
 8	Single core or multi core cables: Fixed on (clipped direct), or spaced less than 0.3 x cable diameter from a wooden or masonry wall. ^c	C
 9	Single-core or multi core cables: Fixed directly under a wooden or masonry ceiling.	C
 10	Single-core or multi core cables: on unperforated tray run horizontally or vertically ^c De = the external diameter of a cable. The space between wall and cable tray will be , 2.2x De ; When 3 single core cables are bound in trefoil , 3.0 x De ; When 3 single core cables are laid in flat .	C
 11	Single-core or multi core cables: On perforated tray Run horizontally or vertically ^c The space between wall and cable tray will be , 2.2x De ; When 3 single core cables are bound in trefoil , 3.0 x De ; When 3 single core cables are laid in flat formation.	D

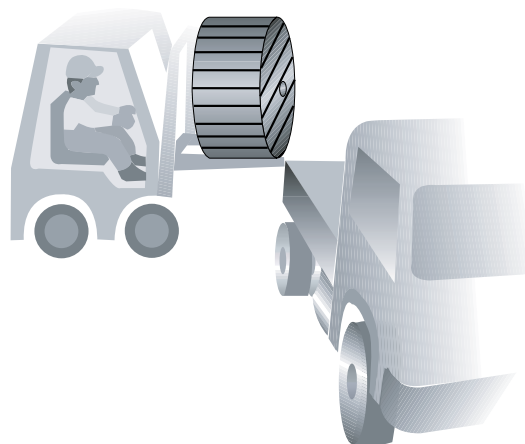
 12	Single core or multi core cables: on ladder bracket type tray or on a wire mesh tray run horizontally or vertically ^c The space between wall and cable tray will be , 2.2x De ; When 3 single core cables are bound in trefoil , 3.0 x De ; When 3 single core cables are laid in flat formation.	D
 13	Multi core armoured cable in conduit or in cable ducting in the ground	E for multi core armoured cable only.
 14	Sheathed, armoured or multi core cables direct in the ground: without added mechanical protection.	E
 15	Sheathed, armoured or multi core cables direct in the ground: with added mechanical protection (e.g. Concrete cover)	E

- b –Values given for Installation Methods are for a single circuit. Where there is more than one circuit in the trunking the group rating factor given in Adjustment Table -7 is applicable, irrespective of the presence of an internal barrier or partition.
- c- Care is needed where the cable runs vertically and ventilation is restricted. The ambient temperature at the top of the vertical section can be much higher.
- The inclusion of directly buried cables is satisfactory where the soil thermal resistivity is of the order of 2.5K.m/W. For lower soil resistivities, the current-carrying capacity for directly buried cables is appreciably higher than for cables in ducts.
- * Still under consideration in IEC.

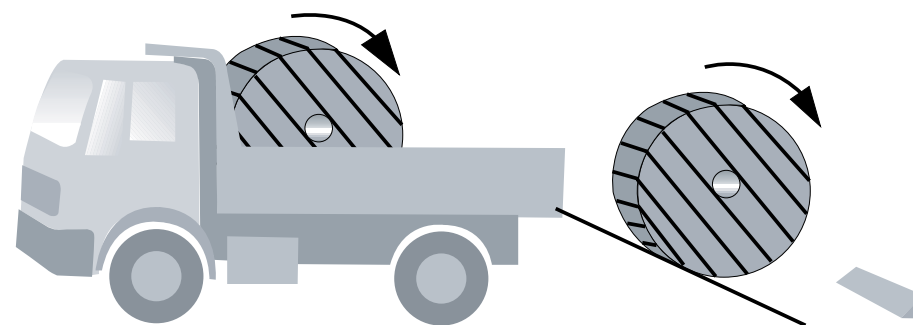
HANDLING INSTRUCTIONS FOR ACL CABLES DRUMS



Storage Position



Move by Crane or Fork Lift



Transport direction Do not drop

ALLOWABLE CABLE LENGTHS ON DRUMS

APPROX.CABLE OD (mm)	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14
10.0	1588													
11.0	1313													
12.0	1103													
13.0	940	1749												
14.0	810	1508												
15.0	706	1314												
16.0	620	1155												
17.0	550	1023												
18.0	490	912	1493	1241										
19.0	440	819	1340	1114										
20.0	397	739	1209	1005										
21.0	360	670	1097	912										
22.0	328	611	999	831										
23.0	300	559	914	760	1503	1401	1117							
24.0	276	513	840	698	1380	1287	1026							
25.0	254	473	774	643	1272	1186	945							
26.0	235	437	716	595	1176	1097	874							
27.0	218	405	664	552	1091	1017	810							
28.0	203	377	617	513	1014	946	754	1191						
29.0	189	351	575	478	945	881	702	1111						
30.0	176	328	537	447	883	824	656	1038						
31.0	165	308	503	418	827	771	615	972						
32.0	155	289	472	393	776	724	577	912						
33.0	146	271	444	369	730	681	542	858						
34.0	137	256	418	348	688	641	511	808						
35.0	130	241	395	328	649	605	482	763						
36.0	123	228	373	310	613	572	456	721						
37.0	116	216	353	294	581	542	432	682	572					
38.0	110	205	335	279	551	513	409	647	543					
39.0	104	194	318	264	523	487	388	614	515					
40.0	99	185	302	251	497	463	369	584	490					
41.0	94	176	288	239	473	441	351	556	466					
42.0	90	168	274	228	451	420	335	530	444					
43.0	-	-	-	218	430	401	319	505	424					
44.0	-	-	-	208	411	383	305	482	405	646				
45.0	-	-	-	199	393	366	292	461	387	618				

Note : Highlighted figures can be used only for cables which are having circular conductors.
All other figures can be used for cables which are having circular or sector shaped conductors.

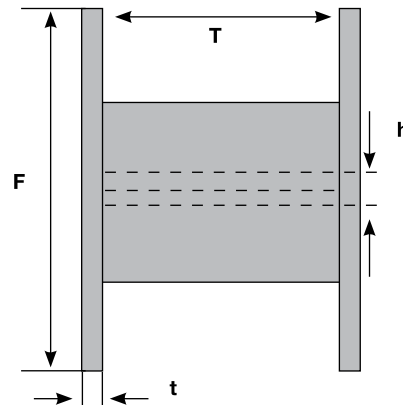
ALLOWABLE CABLE LENGTHS ON DRUMS

APPROX.CABLE OD (mm)	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14
46.0	-	-	-	190	376	350	279	441						
47.0	-	-	-	182	360	336	267	423						
48.0	-	-	-	175	345	322	256	405	340	543	478			
49.0	-	-	-	168	331	309	246	389	326	521	458			
50.0	-	-	-	161	318	297	236	374	313	500	440			
51.0	-	-	-	-	306	285	227	359	301	481	423			
52.0	-	-	-	-	294	274	218	345	290	463	407			
53.0	-	-	-	-	283	264	210	333	279	445	392			
54.0	-	-	-	-	273	254	203	320	269	429	377			
55.0	-	-	-	-	263	245	195	309	259	414	364			
56.0	-	-	-	-	254	236	188	298	250	399	351	295		
57.0	-	-	-	-	245	228	182	287	241	385	339	285		
58.0	-	-	-	-	236	220	176	278	233	372	327	275		
59.0	-	-	-	-	228	213	170	268	225	359	316	266		
60.0	-	-	-	-	-	206	164	259	218	347	306	257	355	
61.0	-	-	-	-	-	199	159	251	211	336	296	249	343	
62.0	-	-	-	-	-	193	154	243	204	325	286	241	332	
63.0	-	-	-	-	-	187	149	235	197	315	277	233	322	
64.0	-	-	-	-	-	-	144	-	191	-	269	226	312	138
65.0	-	-	-	-	-	-	140	-	185	-	260	219	302	134
66.0	-	-	-	-	-	-	136	-	180	-	253	213	293	130
67.0	-	-	-	-	-	-	132	-	175	-	245	206	284	126
68.0	-	-	-	-	-	-	128	-	169	-	238	200	276	122
69.0	-	-	-	-	-	-	124	-	165	-	231	195	268	119
70.0	-	-	-	-	-	-	121	-	160	-	225	189	261	115
71.0	-	-	-	-	-	-	117	-	155	-	218	184	253	112
72.0	-	-	-	-	-	-	114	-	151	-	212	179	246	109
73.0	-	-	-	-	-	-	111	-	147	-	206	174	240	106
74.0	-	-	-	-	-	-	108	-	143	-	201	169	233	103
75.0	-	-	-	-	-	-	-	-	-	-	-	165	227	100
76.0	-	-	-	-	-	-	-	-	-	-	-	160	221	98
77.0	-	-	-	-	-	-	-	-	-	-	-	156	215	95
78.0	-	-	-	-	-	-	-	-	-	-	-	152	210	93
79.0	-	-	-	-	-	-	-	-	-	-	-	148	205	91
80.0	-	-	-	-	-	-	-	-	-	-	-	145	200	88

Note : Highlighted figures can be used only for cables which are having circular conductors.
All other figures can be used for cables which are having circular or sector shaped conductors.

DRUMS DIMENSIONS

DRUM NO	DRUM SIZES IN					DRUM SIZES IN				
	inches					mm				
	(F	X	B	X	T)	(F	X	B	X	T)
D1	37	X	20	X	22	940	X	508	X	559
D2	44	X	20	X	22	1118	X	508	X	559
D3	44	X	20	X	36	1118	X	508	X	914
D4	44	X	24	X	36	1118	X	610	X	914
D5	56	X	28	X	36	1422	X	711	X	914
D6	56	X	30	X	36	1422	X	762	X	914
D7	56	X	35	X	36	1422	X	889	X	914
D8	60	X	30	X	36	1524	X	762	X	914
D9	60	X	35	X	36	1524	X	889	X	914
D10	66	X	30	X	36	1676	X	762	X	914
D11	66	X	35	X	36	1676	X	889	X	914
D12	66	X	40	X	36	1676	X	1016	X	914
D13	72	X	40	X	36	1829	X	1016	X	914
D14	72	X	56	X	36	1829	X	1422.4	X	914



- F - Flange Diameter
- B - Barrel Diameter
- T - Inner Traverse
- t - Thickness of Flange
- h - Spindle Hole Diameter

Note : t = 76.2 mm & h = 95 mm for all above drums except for D 1 which t= 51 mm. H= 90mm..

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