Caledonian

Low Voltage cables to IEC 60502 Standard

www.caledonian-cables.co.uk
www.caledonian-cables.net

Addison

Company Profile

Caledonian. established in 1978.offers one of the most complete lines of fiber and copper cabling system solutions with over hundreds of different cabling system products. . Our superior products provide leading edge within every cable series and for every application.

Among the national and international standards with which our cables could comply are: BS - British Standard; LPCB Fire Performance Standard. ISO Standard etc. Caledonian Cables offers a comprehensive stock of cables and cabling products through its nationwide network of resellers and distributors. Caledonian Cables has continually expanded its global presence in Europe and Asia.

Caledonian & Addison. produces a wide range of cables for communication. power and electronics in its primary plants in UK. Italy and Spain. To stay in front. we continually keep expanding our manufacturing capabilities in more low cost region such as Romania. Taiwan. Malaysia etc. This low-cost manufacturing facilities enable us provide a flexible. scalable global system that delivers superior operational performance and optimal results for our customers.

Our extensive global network of manufacturing facilities gives us significant scale and the flexibility to fulfill our customer requirements. This global presence provides design and consultancy solutions that are combined with core cable manufacturing. logistic services. and vertically integrated with our E commerce technologies. to optimize customer operations by lowering costs and reducing time to market.

Caledonian & Addison has been respected for its high standards of quality. excellent service level. competitive pricing and a unique and innovative spirit. With our latest technologies. we are both inspired and well-positioned to meet the changing needs of our customers. We have the resources to diversify and to enhance our product lines and services. We understand the need for change and with our accurate planning. we are ready for the future and the promise of new marketing opportunities. Our tradition of growth through excellence is assured.

Our Design Centers work closely with customers to constantly improve its standard range of products and technologies and to develop customized. country and industry-specific solutions. Caledonian & Addison has established an extensive network of design. manufacturing. and logistics facilities in the world’s major markets to serve the growing outsourcing needs of both multinational and regional customers.

Our Certificate

QAS International

REGISTRATION CERTIFICATE

This document certifies that the administration systems of

Caledonian Cables Limited / Addison Technology Limited

Marchants Industrial Centre, Mill Lane, Laughton, Lewes, Sussex, BN8 6AJ, United Kingdom

have been assessed and approved by QAS International to the following management systems, standards and guidelines:

ISO 9001 : 2008

With the permitted exclusion of clauses 7.3 Design and Development

The approved administration systems apply to the following:

The manufacture and supply of electrical cables and ancillary power equipment to customers internationally.

Original Approval	6th September 1997
Current Certificate	7th February 2014
Certificate Expiry	7th February 2015
Certificate Number	A6211

Signed: Certification Officer

On behalf of QAS International

This certificate remains valid while the holder maintains their quality administration systems in accordance with the standards and guidelines stated above, which will be audited annually by QAS International. The holder is entitled to display the above registration mark for the duration of this certificate, which should be returned to QAS International upon reasonable request.
Issuing Office: QAS International, 20A Oxford Street, Malmesbury, Wiltshire SN16 9AX, UK

QAS INTERNATIONAL

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600/1000V, PVC Insulated Cables according to IEC 60502-1

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Four core(armoured)

600/1000V,PVC Insulated Cables according to IEC 60502-1

Application:

These cables are used for electricity supply in low voltage installation system, They are suitable for installation in indoors and outdoors, in cable ducts, under ground, in power and switching stations, local energy distributions, industrial plants, where there is no risk of mechanical damage.

Construction:

Conductors The conductors shall be either of Class 1 or Class 2 of plain or metal-coated annealed copper or of plain aluminium or aluminium alloy, or of Class 5 of plain or metal-coated copper in accordance with IEC 60228.

Insulation PVC Insulation material and thickness shall be as per IEC 60502-1, PVC material shall be Type A as per IEC 60502-1.

Colour Code

Colour Code (1) :

1 Core	:	Red or Black
2 Cores	:	Red, Black
3 Cores	:	Red, Yellow, Blue
4 Cores	:	Red, Yellow, Blue, Black
5 Cores	:	Red, Yellow, Blue, Black, Green
Above 5 Cores:		Black Cores with White numerals

Colour Code (2) :

1 Core :		Brown or Blue
2 Cores	:	Brown, Blue
3 Cores	:	Brown, Black, Grey
4 Cores	:	Blue, Brown, Black, Grey
5 Cores	:	Green/Yellow, Blue, Brown, Black, Grey
Above 5 Cores:		Black Cores with White numerals

Other colours can be manufactured upon request.

Assembly / Inner Covering

The inner coverings may be extruded or lapped. For cables with circular cores, except cables with more than five cores, a lapped inner covering shall be permitted only if the interstices between the cores are substantially filled. A suitable binder is permitted before application of an extruded inner covering. The materials used for inner coverings and fillers shall be suitable for the operating temperature of the cable and compatible with the insulating material.For halogen free cables, the inner covering and fillers shall also be halogen free compound.

Armour

Aluminum/galvanized steel/steel wires applied helically over the Inner Covering as per IEC 60502-1, or double aluminum/steel tapes and copper/tinned copper wire can also be manufactured upon request.

Outer Sheath

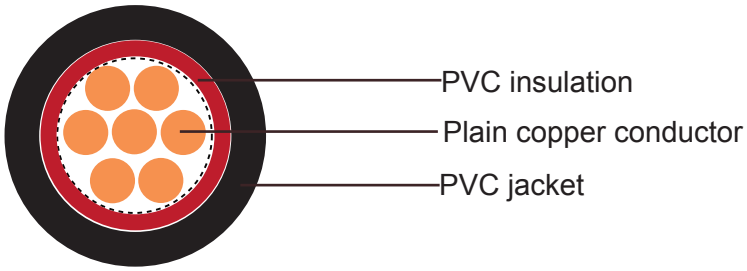
Outer sheath shall be of extruded PVC Type ST1/ST2 as per IEC 60502-1, Polyethylene type ST3/ST7, Halogen free compound ST8, Polychloroprene, chlorosulfonated polyethylene or similar polymers, type SE1 are also available on request.

Fire Performance of Cable Sheaths

Cables can be supplied with special flame retardant PVC outer sheath to comply with the flame test requirements of IEC 60332-3-22, IEC 60332-3-23 and IEC 60332-3-24, Halogen Free material comply to IEC60754-1/2 and IEC 60684-2.

Parameters:

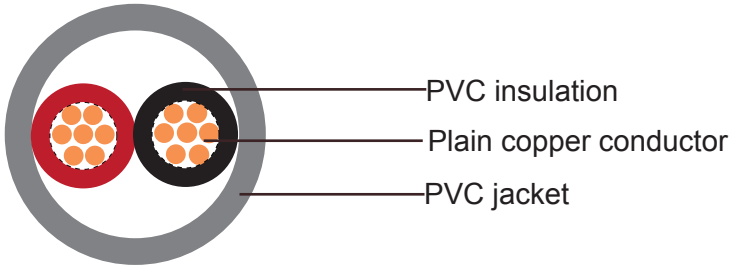
Single core(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
1x4	2.3	1	1.4	7.1
1x6	2.8	1	1.4	7.6
1x10	3.6	1	1.4	8.4
1x16	4.5	1	1.4	9.3
1x25	5.6	1.2	1.4	10.8
1x35	6.7	1.2	1.4	11.9
1x50	8	1.4	1.4	13.6
1x70	9.4	1.4	1.4	15.1

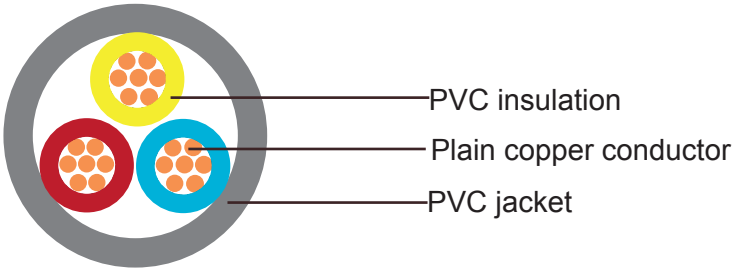
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
1x95	11	1.6	1.5	17.2
1x120	12.4	1.6	1.5	18.7
1x150	13.8	1.8	1.6	20.6
1x185	15.3	2	1.7	22.7
1x240	17.5	2.2	1.8	25.4
1x300	19.5	2.4	1.9	28.0
1x400	22.6	2.6	2.0	31.7
1x500	25.2	2.8	2.1	35.0
1x630	28.3	2.8	2.2	38.3

Two cores(unarmoured)



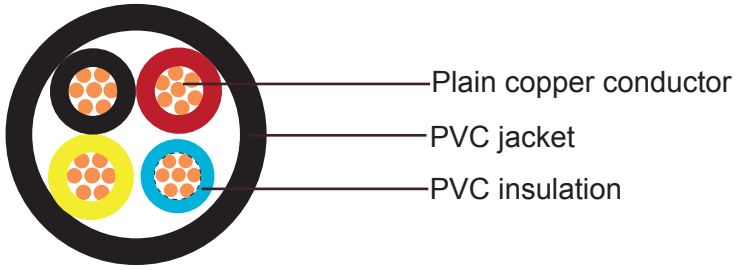
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
2x1.5	1.4	0.8	1.8	9.6
2x2.5	1.8	0.8	1.8	10.4
2x4	2.3	1	1.8	12.2
2x6	2.8	1	1.8	13.2
2x10	3.6	1	1.8	14.8
2x16	4.5	1	1.8	16.6
2x25	5.6	1.2	1.8	19.6
2x35	6.7	1.2	1.8	21.8
2x50	8	1.4	1.8	25.2
2x70	9.4	1.4	1.9	28.1
2x95	11	1.6	2.0	32.4
2x120	12.4	1.6	2.1	35.4
2x150	13.8	1.8	2.2	39.2
2x185	15.3	2	2.4	43.3
2x240	17.5	2.2	2.5	48.9
2x300	19.5	2.4	2.7	54.0
2x400	22.6	2.6	2.9	61.5

Three cores(unarmoured)



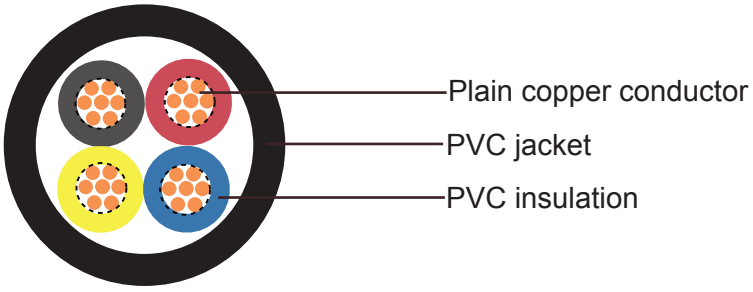
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
3x1.5	1.4	0.8	1.8	10.1
3x2.5	1.8	0.8	1.8	10.9
3x4	2.3	1	1.8	12.9
3x6	2.8	1	1.8	13.9
3x10	3.6	1	1.8	15.7
3x16	4.5	1	1.8	17.6
3x25	5.6	1.2	1.8	20.8
3x35	6.7	1.2	1.8	23.2
3x50	8	1.4	1.8	26.9
3x70	9.4	1.4	1.9	30.1
3x95	11	1.6	2.1	34.7
3x120	12.4	1.6	2.2	38.0
3x150	13.8	1.8	2.3	42.1
3x185	15.3	2	2.5	46.5
3x240	17.5	2.2	2.7	52.5
3x300	19.5	2.4	2.8	58.0
3x400	22.6	2.6	3.1	66.1

Three cores+1(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)		Nominal Insulation Thickness		Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	(3)mm	(1)mm	(3)mm	(1)mm	mm	mm
3x 16/10	4.5	3.6	1	1	1.8	19.0
3x 25/16	5.6	4.5	1.2	1	1.8	22.6
3x 35/16	6.7	4.5	1.2	1	1.8	25.3
3x 50/25	8.0	5.6	1.4	1.2	1.9	29.6
3x 70/35	9.4	6.7	1.4	1.2	2.0	33.2
3x 95/50	11.0	8.0	1.6	1.4	2.2	38.4
3x120/70	12.4	9.4	1.6	1.4	2.3	42.0
3x150/70	13.8	9.4	1.8	1.4	2.5	46.6
3x185/95	15.3	11.0	2	1.6	2.6	51.6
3x240/120	17.5	12.4	2.2	1.6	2.9	58.3
3x300/150	19.5	13.8	2.4	1.8	3.1	64.5
3x400/185	22.6	15.3	2.6	2	3.3	73.5

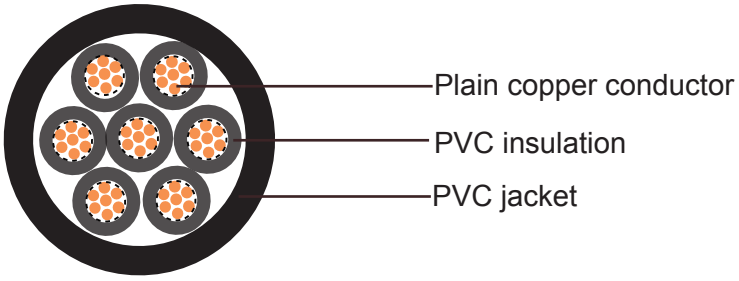
Four cores(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
4x1.5	1.4	0.8	1.8	10.8
4x2.5	1.8	0.8	1.8	11.8
4x4	2.3	1	1.8	14.0
4x6	2.8	1	1.8	15.2
4x10	3.6	1	1.8	17.1
4x16	4.5	1	1.8	19.3
4x25	5.6	1.2	1.8	22.9
4x35	6.7	1.2	1.8	25.6
4x50	8	1.4	1.9	29.9

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
4x70	9.4	1.4	2.0	33.5
4x95	11	1.6	2.2	38.7
4x120	12.4	1.6	2.3	42.3
4x150	13.8	1.8	2.5	46.9
4x185	15.3	2	2.6	51.9
4x240	17.5	2.2	2.9	58.6
4x300	19.5	2.4	3.1	64.8
4x400	22.6	2.6	3.3	73.8

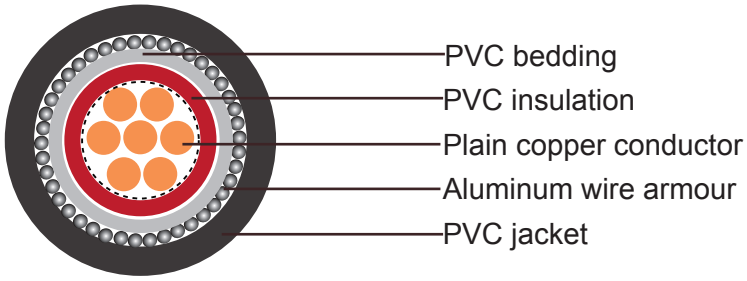
Multi-cores(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
5x1.5	1.4	0.8	1.8	11.7
7x1.5	1.4	0.8	1.8	12.6
10x1.5	1.4	0.8	1.8	15.6
12x1.5	1.4	0.8	1.8	16.1
14x1.5	1.4	0.8	1.8	16.8
19x1.5	1.4	0.8	1.8	18.6
21x1.5	1.4	0.8	1.8	19.5
24x1.5	1.4	0.8	1.8	21.6
30x1.5	1.4	0.8	1.8	22.8
40x1.5	1.4	0.8	1.8	27.7
48x1.5	1.4	0.8	1.9	28.2
61x1.5	1.4	0.8	1.9	30.9
5x2.5	1.8	0.8	1.8	12.8
7x2.5	1.8	0.8	1.8	13.8

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
10x2.5	1.8	0.8	1.8	17.2
12x2.5	1.8	0.8	1.8	17.7
14x2.5	1.8	0.8	1.8	18.6
19x2.5	1.8	0.8	1.8	20.6
21x2.5	1.8	0.8	1.8	21.6
24x2.5	1.8	0.8	1.8	24.0
30x2.5	1.8	0.8	1.8	25.4
40x2.5	1.8	0.8	2.0	31.1
48x2.5	1.8	0.8	2.0	31.7
61x2.5	1.8	0.8	2.1	34.7

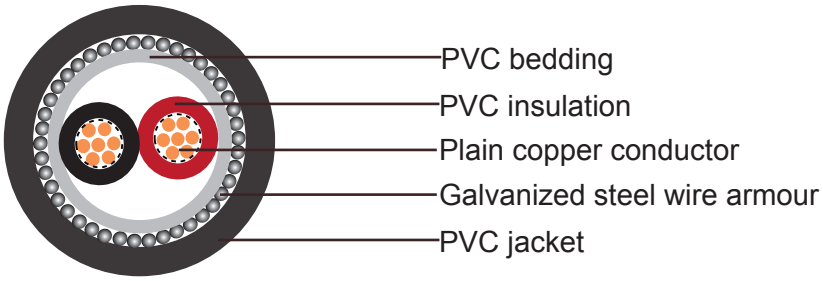
Single core(aluminum wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Alum Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
1x4	2.3	1	1.0	0.8	1.8	11.5
1x6	2.8	1	1.0	0.8	1.8	12.0
1x10	3.6	1	1.0	0.8	1.8	12.8
1x16	4.5	1	1.0	0.8	1.8	13.7
1x25	5.6	1.2	1.0	0.8	1.8	15.2
1x35	6.7	1.2	1.0	1.25	1.8	17.2
1x50	8.0	1.4	1.0	1.25	1.8	18.9
1x70	9.4	1.4	1.0	1.25	1.8	20.3
1x95	11.0	1.6	1.0	1.6	1.8	23.0
1x120	12.4	1.6	1.0	1.6	1.8	24.4
1x150	13.8	1.8	1.0	1.6	1.8	26.2
1x185	15.3	2	1.0	1.6	1.9	28.2

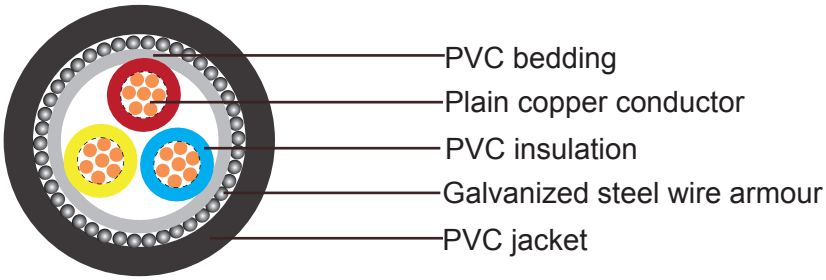
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Alum Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
1x240	17.5	2.2	1.0	1.6	1.9	31.0
1x300	19.5	2.4	1.0	2.0	2.1	34.4
1x400	22.6	2.6	1.2	2.0	2.2	38.6
1x500	25.2	2.8	1.2	2.0	2.3	41.8
1x630	28.3	2.8	1.2	2.5	2.4	46.2

Two cores(Galvanized steel wire armoured)



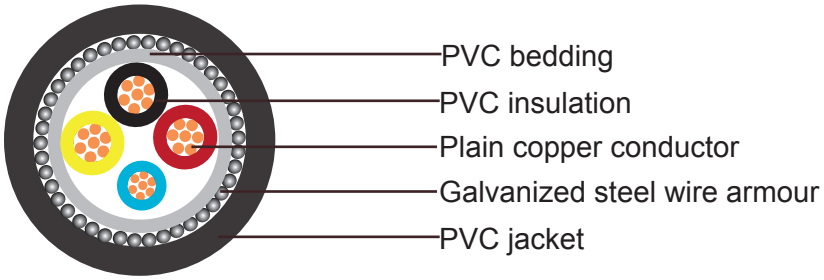
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Steel Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
2x2.5	1.8	0.8	1.0	0.8	1.8	14.0
2x4	2.3	1	1.0	1.25	1.8	16.7
2x6	2.8	1	1.0	1.25	1.8	17.7
2x10	3.6	1	1.0	1.25	1.8	19.3
2x16	4.5	1	1.0	1.25	1.8	21.1
2x25	5.6	1.2	1.0	1.6	1.8	24.8
2x35	6.7	1.2	1.0	1.6	1.8	27.0
2x50	8	1.4	1.0	1.6	1.9	30.7
2x70	9.4	1.4	1.0	2.0	2.1	34.5
2x95	11	1.6	1.2	2.0	2.2	39.2
2x120	12.4	1.6	1.2	2.0	2.3	42.2
2x150	13.8	1.8	1.2	2.5	2.5	47.2
2x185	15.3	2	1.4	2.5	2.6	51.6
2x240	17.5	2.2	1.4	2.5	2.8	57.2
2x300	19.5	2.4	1.6	2.5	3.0	62.8
2x400	22.6	2.6	1.6	2.5	3.2	70.3

Three cores(Galvanized steel wire armoured)



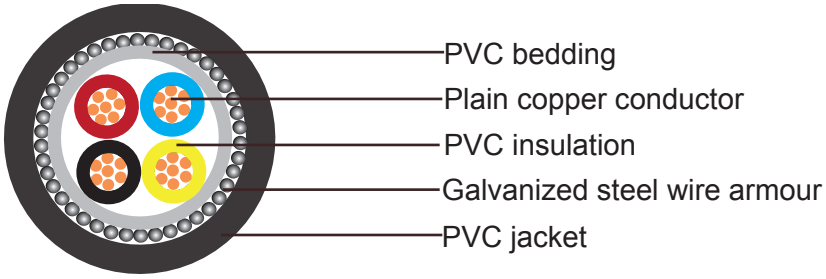
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Steel Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
3x2.5	1.8	0.8	1.0	0.8	1.8	14.5
3x4	2.3	1	1.0	1.25	1.8	17.4
3x6	2.8	1	1.0	1.25	1.8	18.4
3x10	3.6	1	1.0	1.25	1.8	20.2
3x16	4.5	1	1.0	1.6	1.8	22.8
3x25	5.6	1.2	1.0	1.6	1.8	26.0
3x35	6.7	1.2	1.0	1.6	1.9	28.5
3x50	8.0	1.4	1.0	2	2.0	33.3
3x70	9.4	1.4	1.2	2	2.1	37.0
3x95	11.0	1.6	1.2	2	2.3	41.6
3x120	12.4	1.6	1.2	2.5	2.4	45.9
3x150	13.8	1.8	1.4	2.5	2.6	50.4
3x185	15.3	2	1.4	2.5	2.7	54.8
3x240	17.5	2.2	1.5	2.5	2.9	61.2
3x300	19.5	2.4	1.6	2.5	3.1	66.8
3x400	22.6	2.8	1.6	3.15	3.4	76.7
3x500	25.2	2.8	1.8	3.15	3.7	83.6

Three cores+1(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)		Nominal Insulation thickness		Nominal Inner Covering thickness	Nominal Steel Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
3x10/6	3.6	2.8	1	1	1	1.25	1.8	21.9
3x16/10	4.5	3.6	1	1	1	1.6	1.8	24.2
3x25/16	5.6	4.5	1.2	1	1	1.6	1.8	27.9
3x35/16	6.7	4.5	1.2	1	1	1.6	1.9	30.8
3x50/25	8.0	5.6	1.4	1.2	1	2.0	2.0	36.4
3x70/35	9.4	6.7	1.4	1.2	1.2	2.0	2.1	40.1
3x95/50	11.0	8.0	1.6	1.4	1.2	2.5	2.3	46.3
3x120/70	12.4	9.4	1.6	1.4	1.4	2.5	2.4	50.3
3x150/70	13.8	9.4	1.8	1.4	1.4	2.5	2.6	55.0
3x185/95	15.3	11.0	2	1.6	1.4	2.5	2.7	60.3
3x240/120	17.5	12.4	2.2	1.6	1.6	2.5	2.9	67.0
3x300/150	19.5	13.8	2.4	1.8	1.6	3.15	3.1	74.6
3x400/185	22.6	15.3	2.6	2	1.8	3.15	3.4	84.1
3x500/240	25.2	17.5	2.8	2.2	2	3.15	3.7	91.8

Four cores(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Steel Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
4x4	2.3	1	1	1.25	1.8	18.5
4x6	2.8	1	1	1.25	1.8	19.7
4x10	3.6	1	1	1.25	1.8	22.3
4x16	4.5	1	1	1.6	1.8	24.5
4x25	5.6	1.2	1	1.6	1.9	28.2
4x35	6.7	1.2	1	1.6	2.0	31.1
4x50	8.0	1.4	1	2.0	2.1	36.7
4x70	9.4	1.4	1.2	2.0	2.3	40.4
4x95	11.0	1.6	1.2	2.5	2.5	46.6
4x120	12.4	1.6	1.4	2.5	2.6	50.6
4x150	13.8	1.8	1.4	2.5	2.7	55.3
4x185	15.3	2	1.4	2.5	2.9	60.6
4x240	17.5	2.2	1.6	2.5	3.1	67.3
4x300	19.5	2.4	1.6	3.15	3.4	74.9
4x400	22.6	2.6	1.8	3.15	3.7	84.4
4x500	25.2	2.8	2	3.15	3.9	92.1

600/1000V, XLPE Insulated Cables according to IEC 60502-1

Single core(unarmoured)

Two core(unarmoured)

Three core(unarmoured)

Three core +1(unarmoured)

Four core(unarmoured)

Multi- core(unarmoured)

Single core(armoured)

Two core(armoured)

Three core(armoured)

Three core +1(armoured)

Four core(armoured)

600/1000V, XLPE Insulated Cables according to IEC 60502-1

Application:

These cables are used for electricity supply in low voltage installation system, They are suitable for installation in indoors and outdoors, in cable ducts, under ground, in power and switching stations, local energy distributions, industrial plants, where there is no risk of mechanical damage.

Construction:

Conductors The conductors shall be either of Class 1 or Class 2 of plain or metal-coated annealed copper or of plain aluminium or aluminium alloy, or of Class 5 of plain or metal-coated copper in accordance with IEC 60228.

Insulation XLPE material and thickness shall be as per IEC 60502-1, rated for 90°C continuous operation.

Colour Code

Colour Code (1) :

1 Core	:	Red or Black
2 Cores	:	Red, Black
3 Cores	:	Red, Yellow, Blue
4 Cores	:	Red, Yellow, Blue, Black
5 Cores	:	Red, Yellow, Blue, Black, Green
Above 5 Cores:		Black Cores with White numerals

Colour Code (2) :

1 Core :		Brown or Blue
2 Cores	:	Brown, Blue
3 Cores	:	Brown, Black, Grey
4 Cores	:	Blue, Brown, Black, Grey
5 Cores	:	Green/Yellow, Blue, Brown, Black, Grey
Above 5 Cores:		Black Cores with White numerals

Other colours can be manufactured upon request.

Assembly / Inner Covering

The inner coverings may be extruded or lapped. For cables with circular cores, except cables with more than five cores, a lapped inner covering shall be permitted only if the interstices between the cores are substantially filled. A suitable binder is permitted before application of an extruded inner covering. The material is compatible with the insulating material,The materials used for inner coverings and fillers shall be suitable for the operating temperature of the cable and compatible with the insulating material.For halogen free cables, the inner covering and fillers shall also be halogen free compound.

Armour

Aluminum/galvanized steel/steel wires applied helically over the Inner Covering as per IEC 60502-1, or double aluminum/steel tapes and copper/tinned copper wire can also be manufactured upon request.

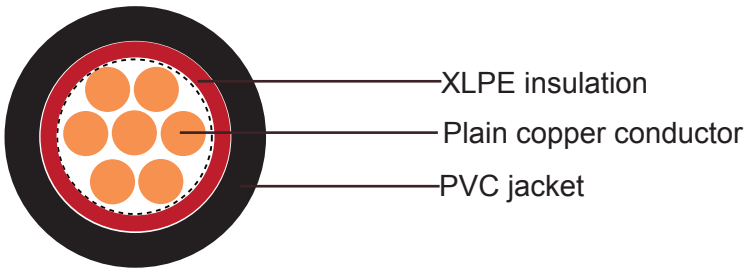
Outer Sheath

Outer sheath shall be of extruded PVC Type ST1/ST2 as per IEC 60502-1, Polyethylene type ST3/ST7, Halogen free compound ST8, Polychloroprene, chlorosulfonated polyethylene or similar polymers, type SE1 are also available on request.

Fire Performance of Cable Sheaths

Cables can be supplied with special flame retardant PVC outer sheath to comply with the flame test requirements of IEC 60332-3-22, IEC 60332-3-23 and IEC 60332-3-24, Halogen Free material comply to IEC60754-1/2 and IEC 60684-2.

Cable Parameters:

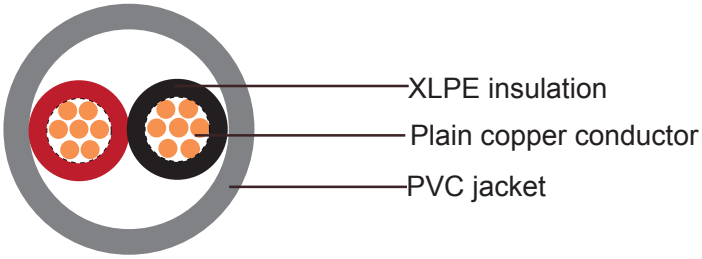


Single core(unarmoured)

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
1x1.5	1.4	0.7	1.4	5.6
1x2.5	1.8	0.7	1.4	6.0
1x4	2.3	0.7	1.4	6.5
1x6	2.8	0.7	1.4	7.0
1x10	3.6	0.7	1.4	7.8
1x16	4.5	0.7	1.4	8.7
1x25	5.6	0.9	1.4	10.2
1x35	6.7	0.9	1.4	11.3
1x50	8.0	1	1.4	12.8

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
1x70	9.4	1.1	1.4	14.4
1x95	11.0	1.1	1.5	16.1
1x120	12.4	1.2	1.5	17.8
1x150	13.8	1.4	1.6	19.8
1x185	15.3	1.6	1.6	21.8
1x240	17.5	1.7	1.7	24.4
1x300	19.5	1.8	1.8	26.7
1x400	22.6	2	1.9	30.5
1x500	25.2	2.2	2.0	33.7
1x630	28.3	2.4	2.2	37.4
1x800	31.9	2.6	2.3	41.7
1x1000	35.7	2.8	2.4	46.2

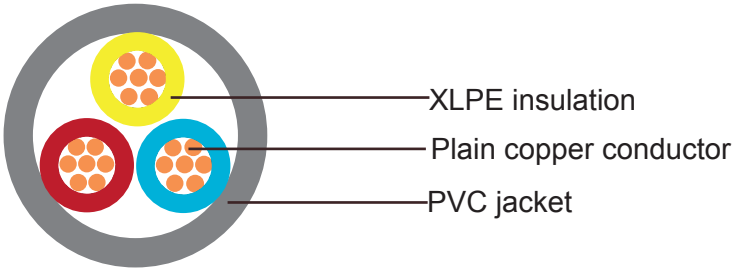
Two cores(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
2x1.5	1.4	0.7	1.8	9.2
2x2.5	1.8	0.7	1.8	10.0
2x4	2.3	0.7	1.8	11.0
2x6	2.8	0.7	1.8	12.0
2x10	3.6	0.7	1.8	13.6
2x16	4.5	0.7	1.8	15.4
2x25	5.6	0.9	1.8	18.4
2x35	6.7	0.9	1.8	20.6
2x50	8.0	1	1.8	23.6
2x70	9.4	1.1	1.8	26.8
2x95	11.0	1.1	1.9	30.2

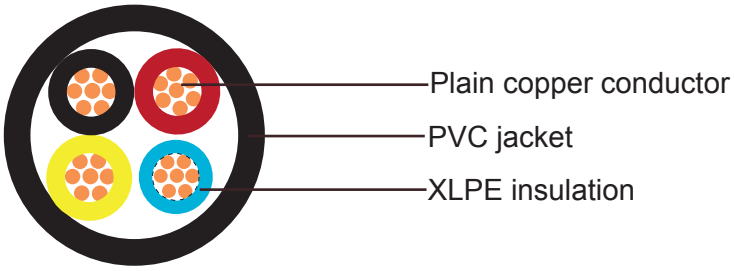
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
2x120	12.4	1.2	2.0	33.7
2x150	13.8	1.4	2.2	37.5
2x185	15.3	1.6	2.3	41.6
2x240	17.5	1.7	2.5	46.7
2x300	19.5	1.8	2.6	51.4
2x400	22.6	2	2.9	58.9

Three cores(unarmoured)



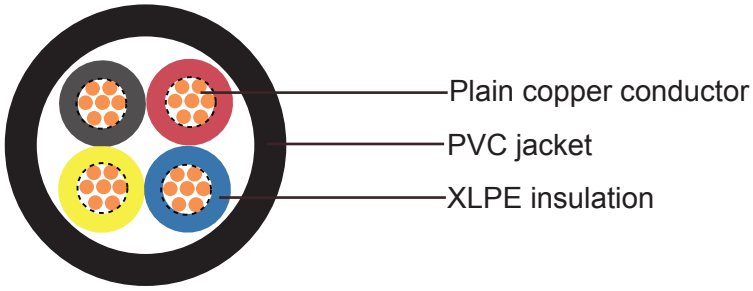
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
3x1.5	1.4	0.7	1.8	9.6
3x2.5	1.8	0.7	1.8	10.5
3x4	2.3	0.7	1.8	11.6
3x6	2.8	0.7	1.8	12.6
3x10	3.6	0.7	1.8	14.4
3x16	4.5	0.7	1.8	16.3
3x25	5.6	0.9	1.8	19.5
3x35	6.7	0.9	1.8	21.9
3x50	8.0	1	1.8	25.1
3x70	9.4	1.1	1.9	28.7
3x95	11.0	1.1	2.0	32.4
3x120	12.4	1.2	2.1	36.1
3x150	13.8	1.4	2.3	40.3
3x185	15.3	1.6	2.4	44.6
3x240	17.5	1.7	2.6	50.2
3x300	19.5	1.8	2.7	55.2
3x400	22.6	2	3.0	63.3

Three cores+1(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)		Nominal Insulation Thickness		Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	(3)mm	(1)mm	(3)mm	(1)mm	mm	mm
3x 16/10	4.5	3.6	0.7	0.7	1.8	17.5
3x 25/16	5.6	4.5	0.9	0.7	1.8	21.2
3x 35/16	6.7	4.5	0.9	0.7	1.8	23.8
3x 50/25	8	5.6	1	0.9	1.8	27.5
3x 70/35	9.4	6.7	1.1	0.9	2.0	31.7
3x 95/50	11	8	1.1	1	2.1	35.8
3x120/70	12.4	9.4	1.2	1.1	2.3	39.9
3x150/70	13.8	9.4	1.4	1.1	2.4	44.6
3x185/95	15.3	11	1.6	1.1	2.6	49.5
3x240/120	17.5	12.4	1.7	1.2	2.8	55.7
3x300/150	19.5	13.8	1.8	1.4	3.0	61.4
3x400/185	22.6	15.3	2	1.6	3.2	70.4

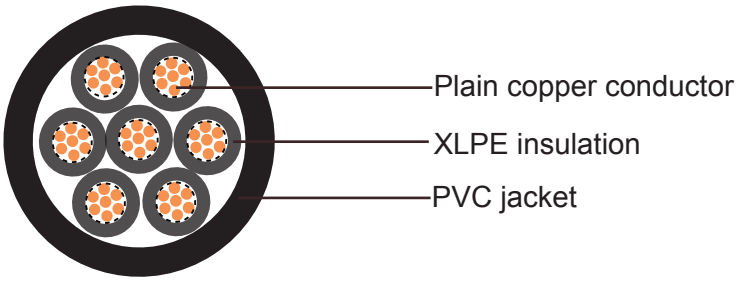
Four cores(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
4x1.5	1.4	0.7	1.8	10.4
4x2.5	1.8	0.7	1.8	11.3

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
4x4	2.3	0.7	1.8	12.5
4x6	2.8	0.7	1.8	13.7
4x10	3.6	0.7	1.8	15.7
4x16	4.5	0.7	1.8	17.8
4x25	5.6	0.9	1.8	21.5
4x35	6.7	0.9	1.8	24.1
4x50	8.0	1	1.8	27.8
4x70	9.4	1.1	2.0	32.0
4x95	11.0	1.1	2.1	36.1
4x120	12.4	1.2	2.3	40.2
4x150	13.8	1.4	2.4	44.9
4x185	15.3	1.6	2.6	49.8
4x240	17.5	1.7	2.8	56.0
4x300	19.5	1.8	3.0	61.7
4x400	22.6	2	3.2	70.7

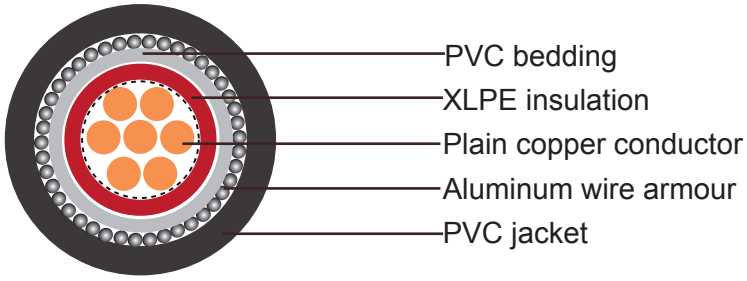
Multi-cores(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
5x1.5	1.4	0.7	1.8	11.2
7x1.5	1.4	0.7	1.8	12.0
10x1.5	1.4	0.7	1.8	14.8
12x1.5	1.4	0.7	1.8	15.2
14x1.5	1.4	0.7	1.8	16.0
19x1.5	1.4	0.7	1.8	17.6
21x1.5	1.4	0.7	1.8	18.4

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm
24x1.5	1.4	0.7	1.8	20.4
30x1.5	1.4	0.7	1.8	21.6
40x1.5	1.4	0.7	1.8	26.0
48x1.5	1.4	0.7	1.8	26.4
61x1.5	1.4	0.7	1.9	29.0
5x2.5	1.8	0.7	1.8	12.2
7x2.5	1.8	0.7	1.8	13.2
10x2.5	1.8	0.7	1.8	16.4
12x2.5	1.8	0.7	1.8	16.9
14x2.5	1.8	0.7	1.8	17.7
19x2.5	1.8	0.7	1.8	19.6
21x2.5	1.8	0.7	1.8	20.6
24x2.5	1.8	0.7	1.8	22.8
30x2.5	1.8	0.7	1.8	24.1
40x2.5	1.8	0.7	1.9	29.4
48x2.5	1.8	0.7	1.9	29.9
61x2.5	1.8	0.7	2.0	32.8

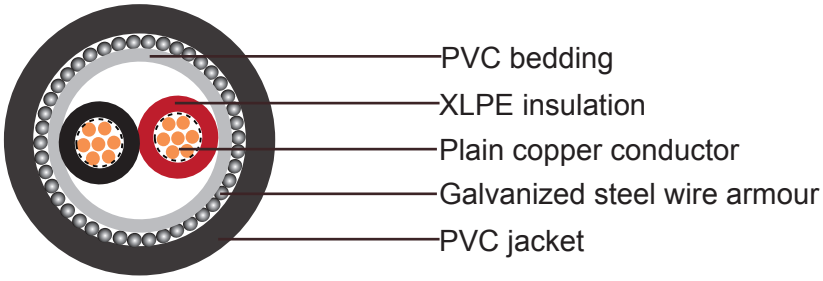
Single core(aluminum wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Alum Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
1x4	2.3	0.7	1.0	0.8	1.8	10.9
1x6	2.8	0.7	1.0	0.8	1.8	11.4
1x10	3.6	0.7	1.0	0.8	1.8	12.2
1x16	4.5	0.7	1.0	0.8	1.8	13.1
1x25	5.6	0.9	1.0	0.8	1.8	14.6

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Alum Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
1x35	6.7	0.9	1.0	1.25	1.8	16.6
1x50	8.0	1	1.0	1.25	1.8	18.1
1x70	9.4	1.1	1.0	1.25	1.8	19.7
1x95	11.0	1.1	1.0	1.6	1.8	22.0
1x120	12.4	1.2	1.0	1.6	1.8	23.6
1x150	13.8	1.4	1.0	1.6	1.8	25.4
1x185	15.3	1.6	1.0	1.6	1.8	27.4
1x240	17.5	1.7	1.0	1.6	1.9	29.9
1x300	19.5	1.8	1.0	2.0	2.0	33.1
1x400	22.6	2	1.2	2.0	2.2	37.3
1x500	25.2	2.2	1.2	2.0	2.3	40.5

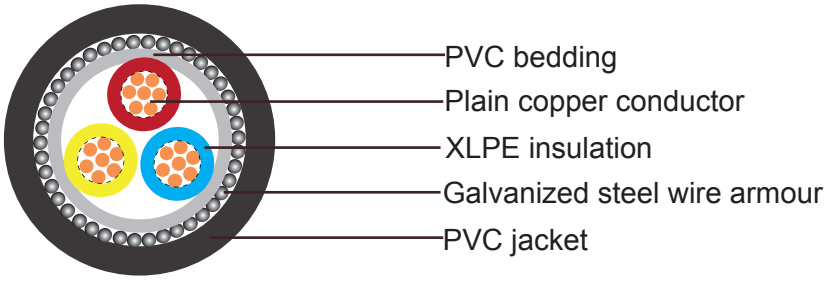
Two cores(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Steel Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
2x1.5	1.4	0.7	1.0	0.8	1.8	12.8
2x2.5	1.8	0.7	1.0	0.8	1.8	13.6
2x4	2.3	0.7	1.0	0.8	1.8	14.6
2x6	2.8	0.7	1.0	1.25	1.8	16.5
2x10	3.6	0.7	1.0	1.25	1.8	18.1
2x16	4.5	0.7	1.0	1.25	1.8	19.9
2x25	5.6	0.9	1.0	1.6	1.8	23.6
2x35	6.7	0.9	1.0	1.6	1.8	25.8
2x50	8.0	1	1.0	1.6	1.9	29.0
2x70	9.4	1.1	1.0	2.0	2.0	33.2

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Steel Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
2x95	11.0	1.1	1.2	2.0	2.1	37.1
2x120	12.4	1.2	1.2	2.0	2.3	40.5
2x150	13.8	1.4	1.2	2.5	2.4	45.4
2x185	15.3	1.6	1.4	2.5	2.6	49.9
2x240	17.5	1.7	1.4	2.5	2.7	55.1
2x300	19.5	1.8	1.6	2.5	2.9	60.2
2x400	22.6	2	1.6	2.5	3.1	67.7

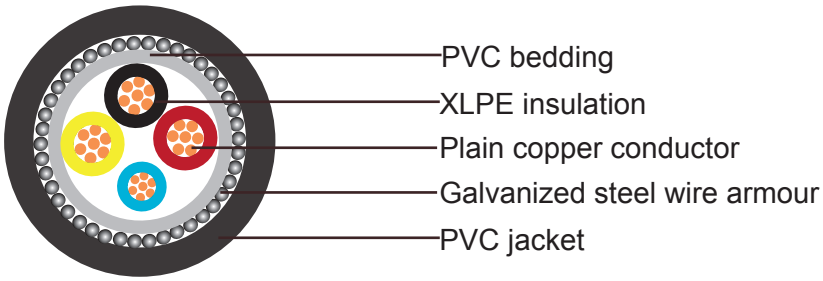
Three cores(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Steel Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
3x1.5	1.4	0.7	1.0	0.8	1.8	13.2
3x2.5	1.8	0.7	1.0	0.8	1.8	14.1
3x4	2.3	0.7	1.0	0.8	1.8	15.2
3x6	2.8	0.7	1.0	1.25	1.8	17.1
3x10	3.6	0.7	1.0	1.25	1.8	18.9
3x16	4.5	0.7	1.0	1.25	1.8	20.8
3x25	5.6	0.9	1.0	1.6	1.8	24.7
3x35	6.7	0.9	1.0	1.6	1.8	27.2
3x50	8.0	1	1.0	1.6	1.9	30.6
3x70	9.4	1.1	1.0	2.0	2.1	35.2
3x95	11.0	1.1	1.2	2.0	2.2	39.3
3x120	12.4	1.2	1.2	2.0	2.3	43.0
3x150	13.8	1.4	1.4	2.5	2.5	48.6
3x185	15.3	1.6	1.4	2.5	2.7	53.0

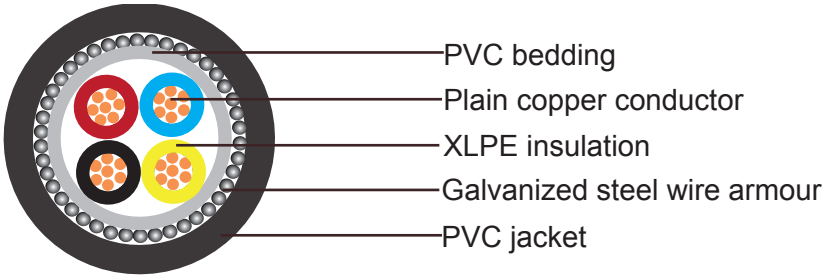
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Steel Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
3x240	17.5	1.7	1.4	2.5	2.8	58.5
3x300	19.5	1.8	1.6	2.5	3.0	64.0
3x400	22.6	2	1.6	3.15	3.3	73.5

Three cores+1(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)		Nominal Insulation thickness		Nominal Inner Covering thickness	Nominal Steel Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	(3) mm	(1) mm	(3) mm	(1) mm	mm	mm	mm	mm
3x 16/10	4.5	3.6	0.7	0.7	1	1.6	1.8	22.7
3x 25/16	5.6	4.5	0.9	0.7	1	1.6	1.8	26.5
3x 35/16	6.7	4.5	0.9	0.7	1	1.6	1.9	29
3x 50/25	8.0	5.6	1	0.9	1	1.6	2.1	33
3x 70/35	9.4	6.7	1.1	0.9	1.2	2	2.2	38
3x 95/50	11.0	8.0	1.1	1	1.2	2	2.3	42.4
3x120/70	12.4	9.4	1.2	1.1	1.2	2	2.5	48.0
3x150/70	13.8	9.4	1.4	1.1	1.4	2.5	2.7	52
3x185/95	15.3	11.0	1.6	1.1	1.4	2.5	2.8	57.2
3x240/120	17.5	12.4	1.7	1.2	1.6	2.5	3.1	64
3x300/150	19.5	13.8	1.8	1.4	1.6	2.5	3.2	69.8
3x400/185	22.6	15.3	2	1.6	1.6	3.15	3.6	78.6

Four cores(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation thickness	Nominal Inner Covering thickness	Nominal Steel Wire dia.	Nominal Sheath thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
4x1.5	1.4	0.7	1.0	0.8	1.8	14.0
4x2.5	1.8	0.7	1.0	0.8	1.8	14.9
4x4	2.3	0.7	1.0	1.25	1.8	17.0
4x6	2.8	0.7	1.0	1.25	1.8	18.2
4x10	3.6	0.7	1.0	1.25	1.8	20.2
4x16	4.5	0.7	1.0	1.6	1.8	23.0
4x25	5.6	0.9	1.0	1.6	1.8	26.7
4x35	6.7	0.9	1.0	1.6	1.9	29.5
4x50	8.0	1	1.0	2.0	2.1	34.2
4x70	9.4	1.1	1.2	2.0	2.2	38.8
4x95	11.0	1.1	1.2	2.0	2.3	42.9
4x120	12.4	1.2	1.4	2.5	2.5	48.6
4x150	13.8	1.4	1.4	2.5	2.7	53.2
4x185	15.3	1.6	1.4	2.5	2.8	58.1
4x240	17.5	1.7	1.6	2.5	3.1	64.8
4x300	19.5	1.8	1.6	2.5	3.2	70.4
4x400	22.6	2	1.8	3.15	3.6	81.3

600/1000V, PVC Insulated and Lead Sheathed Cables according to IEC 60502-1

Single core(unarmoured)

Two core(unarmoured)

Three core(unarmoured)

Four core(unarmoured)

Single core(armoured)

Two core(armoured)

Three core(armoured)

Four core(armoured)

600/1000V, PVC Insulated and Lead Sheathed Cables, according to IEC 60502-1

Application:

These cables are used for electricity supply in low voltage installation system, They are suitable for installation in indoors and outdoors, in cable ducts, under ground, in power and switching stations, local energy distributions, industrial plants, where there is no risk of mechanical damage. The lead sheath brings an enhanced resistance to aromatic hydrocarbons.

Construction:

Conductors

The conductors shall be either of Class 1 or Class 2 of plain or metal-coated annealed copper or of plain aluminium or aluminium alloy, or of Class 5 of plain or metal-coated copper in accordance with IEC 60228.

Insuation

PVC Insulation material and thickness shall be as per IEC 60502-1, PVC material shall be Type A as per IEC 60502-1.

Colour Code

Colour Code (1) :

1 Core	:	Red or Black
2 Cores	:	Red, Black
3 Cores	:	Red, Yellow, Blue
4 Cores	:	Red, Yellow, Blue, Black
5 Cores	:	Red, Yellow, Blue, Black, Green
Above 5 Cores:		Black Cores with White numerals

Colour Code (2) :

1 Core	:	Brown or Blue
2 Cores	:	Brown, Blue
3 Cores	:	Brown, Black, Grey
4 Cores	:	Blue, Brown, Black, Grey
5 Cores	:	Green/Yellow, Blue, Brown, Black, Grey
Above 5 Cores:		Black Cores with White numerals

Other colours can be manufactured upon request.

PVC Insulation with Lead Sheath

Assembly / Inner Covering
The inner coverings may be extruded or lapped. For cables with circular cores, except cables with more than five cores, a lapped inner covering shall be permitted only if the interstices between the cores are substantially filled. A suitable binder is permitted before application of an extruded inner covering. The materials used for inner coverings and fillers shall be suitable for the operating temperature of the cable and compatible with the insulating material.For halogen free cables, the inner covering and fillers shall also be halogen free compound.

Lead Sheath
lead or lead alloy and shall be applied as a reasonably tight-fitting seamless tube

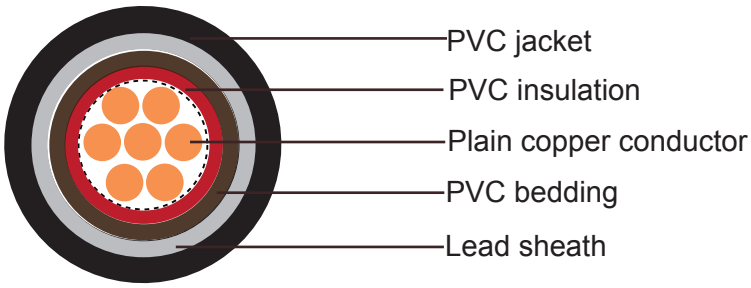
Seperation Sheath
The seperation sheath shall be of extruded PVC Type ST2 as per IEC 60502-1, or other material refer to outer sheath material.

Armour
Aluminum/galvanized steel/steel wires applied helically over the Inner Covering as per IEC 60502-1, or double aluminum/steel tapes and copper/tinned copper wire can also be manufactured upon request.

Outer Sheath
Outer sheath shall be of extruded PVC Type ST1/ST2 as per IEC 60502-1, Polyethylene type ST3/ST7, Halogen free compound ST8, Polychloroprene, chlorosulfonated polyethylene or similar polymers, type SE1 are also available on request.

Cable Parameters:

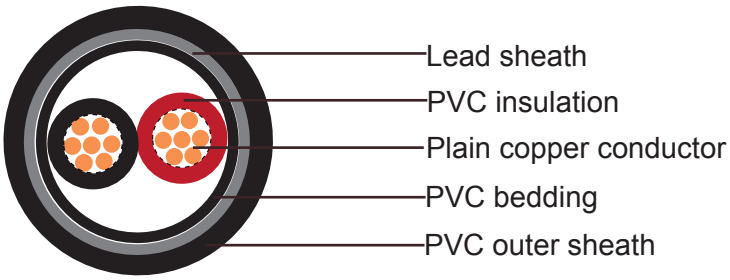
Single core(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
1x10	3.6	1.0	1.0	1.2	1.4	12.8
1x16	4.5	1.0	1.0	1.2	1.4	13.7
1x25	5.6	1.2	1.0	1.2	1.4	15.3
1x35	6.7	1.2	1.0	1.2	1.5	16.4

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
1x50	8	1.4	1.0	1.2	1.5	18.3
1x70	9.4	1.4	1.0	1.2	1.6	19.8
1x95	11	1.6	1.0	1.3	1.7	22.1
1x120	12.4	1.6	1.0	1.3	1.7	23.7
1x150	13.8	1.8	1.0	1.4	1.8	25.7
1x185	15.3	2.0	1.0	1.4	1.8	27.9
1x240	17.5	2.2	1.0	1.5	1.9	30.8
1x300	19.5	2.4	1.0	1.6	2.0	33.5
1x400	22.6	2.6	1.2	1.7	2.2	38.0
1x500	25.2	2.8	1.2	1.8	2.3	41.4
1x630	28.3	2.8	1.2	1.9	2.4	44.9

Two cores(unarmoured)

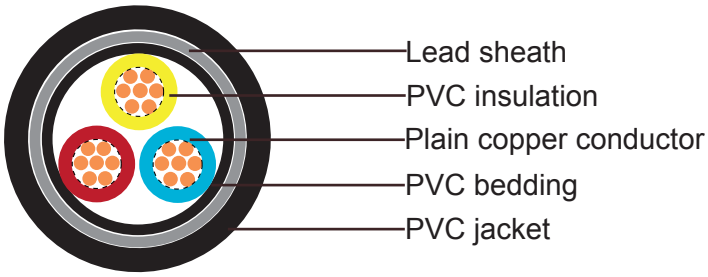


Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
2x2.5	1.8	0.8	1.0	1.2	1.8	14.8
2x4	2.3	1.0	1.0	1.2	1.8	16.6
2x6	2.8	1.0	1.0	1.2	1.8	17.6
2x10	3.6	1.0	1.0	1.2	1.8	19.2
2x16	4.5	1.0	1.0	1.2	1.8	21.0
2x25	5.6	1.2	1.0	1.2	1.8	24.1
2x35	6.7	1.2	1.0	1.3	1.8	26.4
2x50	8	1.4	1.0	1.4	1.9	30.3
2x70	9.4	1.4	1.0	1.5	2.0	33.4
2x95	11	1.6	1.2	1.6	2.2	38.4

PVC Insulation with Lead Sheath

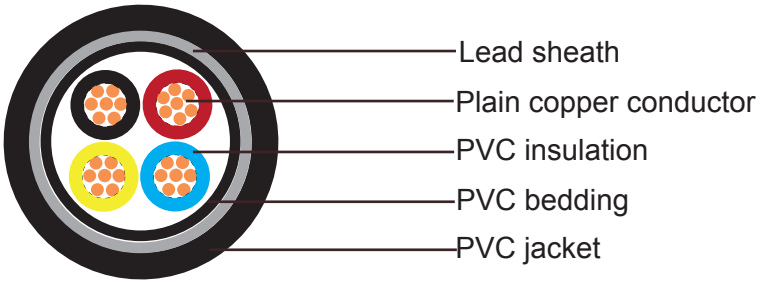
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
2x120	12.4	1.6	1.2	1.7	2.3	41.6
2x150	13.8	1.8	1.2	1.8	2.4	45.7
2x185	15.3	2.0	1.4	1.9	2.6	50.5
2x240	17.5	2.2	1.4	2.1	2.8	56.4
2x300	19.5	2.4	1.6	2.3	3.0	62.2

Three cores(unarmoured)



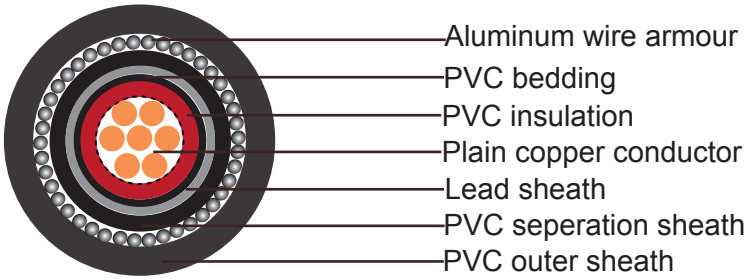
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
3x1.5	1.4	0.8	1.0	1.2	1.8	14.5
3x2.5	1.8	0.8	1.0	1.2	1.8	15.3
3x4	2.3	1.0	1.0	1.2	1.8	17.3
3x6	2.8	1.0	1.0	1.2	1.8	18.3
3x10	3.6	1.0	1.0	1.2	1.8	20.1
3x16	4.5	1.0	1.0	1.2	1.8	22.0
3x25	5.6	1.2	1.0	1.3	1.8	25.4
3x35	6.7	1.2	1.0	1.3	1.9	28.0
3x50	8	1.4	1.0	1.5	2.0	32.2
3x70	9.4	1.4	1.2	1.6	2.1	36.0
3x95	11	1.6	1.2	1.7	2.3	40.9
3x120	12.4	1.6	1.2	1.8	2.4	44.3
3x150	13.8	1.8	1.4	1.9	2.5	49.2
3x185	15.3	2.0	1.4	2.0	2.7	53.8
3x240	17.5	2.2	1.6	2.2	2.9	60.6
3x300	19.5	2.4	1.6	2.4	3.1	66.5

Four cores(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
4x1.5	1.4	1.0	1.0	1.2	1.8	15.2
4x2.5	1.8	1.0	1.0	1.2	1.8	16.2
4x4	2.3	1.0	1.0	1.2	1.8	18.4
4x6	2.8	1.0	1.0	1.2	1.8	19.6
4x10	3.6	1.0	1.0	1.2	1.8	21.5
4x16	4.5	1.0	1.0	1.2	1.8	23.8
4x25	5.6	1.0	1.0	1.3	1.8	27.7
4x35	6.7	1.0	1.0	1.4	1.9	30.7
4x50	8	1.2	1.2	1.6	2.1	35.8
4x70	9.4	1.2	1.2	1.7	2.2	39.6
4x95	11	1.2	1.2	1.8	2.4	45.1
4x120	12.4	1.4	1.4	1.9	2.6	49.4
4x150	13.8	1.4	1.4	2.0	2.7	54.3
4x185	15.3	1.6	1.6	2.2	2.9	60.0
4x240	17.5	1.6	1.6	2.4	3.1	67.1
4x300	19.5	1.6	1.6	2.6	3.3	73.7

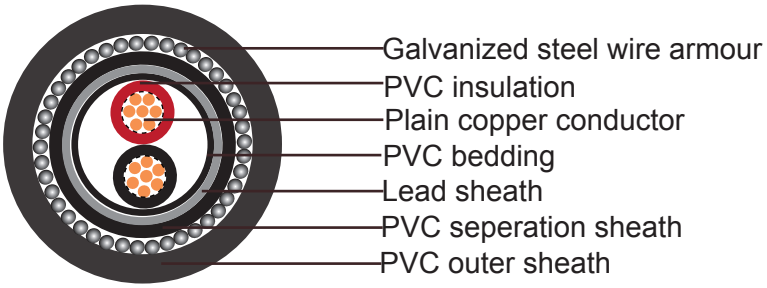
Single core(aluminum wire armoured)



PVC Insulation with Lead Sheath

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Aluminium wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
1x35	6.7	1.2	1.0	1.2	1.0	1.6	1.8	22.0
1x50	8	1.4	1.0	1.2	1.0	1.6	1.8	23.8
1x70	9.4	1.4	1.0	1.2	1.0	1.6	1.8	25.3
1x95	11	1.6	1.0	1.3	1.0	1.6	1.8	27.6
1x120	12.4	1.6	1.0	1.3	1.0	1.6	1.9	29.2
1x150	13.8	1.8	1.0	1.4	1.0	1.6	2.0	31.4
1x185	15.3	2.0	1.0	1.4	1.1	2.0	1.9	29.1
1x240	17.5	2.2	1.0	1.5	1.1	2.0	2.0	31.9
1x300	19.5	2.4	1.0	1.6	1.2	2.0	2.1	34.4
1x400	22.6	2.6	1.2	1.7	1.3	2.5	2.2	39.7
1x500	25.2	2.8	1.2	1.8	1.3	2.5	2.3	42.9
1x630	28.3	2.8	1.2	1.9	1.4	2.5	2.4	46.2

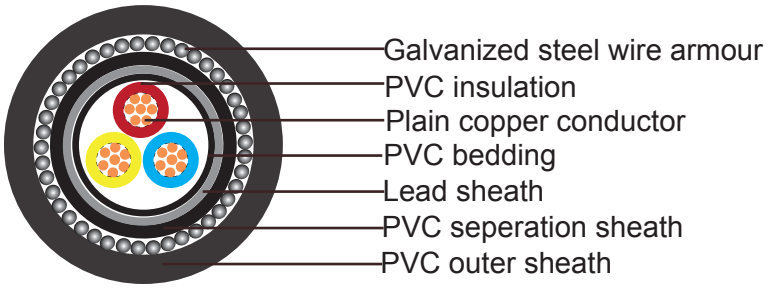
Two cores(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Steel wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
2x2.5	1.8	0.8	1.0	1.2	1.0	1.25	1.8	14.9
2x4	2.3	1.0	1.0	1.2	1.0	1.25	1.8	16.7
2x6	2.8	1.0	1.0	1.2	1.0	1.6	1.8	18.4
2x10	3.6	1.0	1.0	1.2	1.0	1.6	1.8	20.0
2x16	4.5	1.0	1.0	1.2	1.0	1.6	1.8	21.8
2x25	5.6	1.2	1.0	1.2	1.0	1.6	1.8	24.8
2x35	6.7	1.2	1.0	1.3	1.1	1.6	1.8	27.0
2x50	8	1.4	1.0	1.4	1.1	2.0	2.0	31.5
2x70	9.4	1.4	1.0	1.5	1.2	2.0	2.1	34.5
2x95	11	1.6	1.2	1.6	1.3	2.5	2.3	40.3

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Steel wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
2x120	12.4	1.6	1.2	1.7	1.3	2.5	2.4	43.3
2x150	13.8	1.8	1.2	1.8	1.4	2.5	2.5	47.2
2x185	15.3	2.0	1.4	1.9	1.5	2.5	2.6	51.6
2x240	17.5	2.2	1.4	2.1	1.6	2.5	2.8	57.2
2x300	19.5	2.4	1.6	2.3	1.7	2.5	3.0	62.8

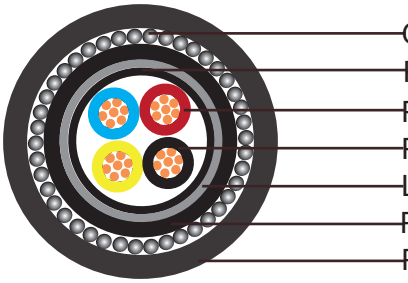
Three cores(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Steel wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
3x1.5	1.4	0.8	1.0	1.2	1.0	1.25	1.8	14.6
3x2.5	1.8	0.8	1.0	1.2	1.0	1.25	1.8	15.4
3x4	2.3	1.0	1.0	1.2	1.0	1.6	1.8	18.1
3x6	2.8	1.0	1.0	1.2	1.0	1.6	1.8	19.1
3x10	3.6	1.0	1.0	1.2	1.0	1.6	1.8	20.9
3x16	4.5	1.0	1.0	1.2	1.0	1.6	1.8	22.8
3x25	5.6	1.2	1.0	1.3	1.0	1.6	1.8	26.0
3x35	6.7	1.2	1.0	1.3	1.1	2.0	1.9	29.4
3x50	8	1.4	1.0	1.5	1.2	2.0	2.0	33.3
3x70	9.4	1.4	1.2	1.6	1.2	2.0	2.1	37.0
3x95	11	1.6	1.2	1.7	1.3	2.5	2.3	42.6
3x120	12.4	1.6	1.2	1.8	1.4	2.5	2.4	45.9
3x150	13.8	1.8	1.4	1.9	1.5	2.5	2.6	50.4
3x185	15.3	2.0	1.4	2.0	1.6	2.5	2.7	54.8
3x240	17.5	2.2	1.6	2.2	1.7	2.5	2.9	61.2
3x300	19.5	2.4	1.6	2.4	1.8	3.15	3.2	68.2

PVC Insulation with Lead Sheath

Four cores(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Steel wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
4x1.5	1.4	0.8	1.0	1.2	1.0	1.25	1.8	15.3
4x2.5	1.8	0.8	1.0	1.2	1.0	1.25	1.8	16.3
4x4	2.3	1.0	1.0	1.2	1.0	1.6	1.8	19.2
4x6	2.8	1.0	1.0	1.2	1.0	1.6	1.8	20.4
4x10	3.6	1.0	1.0	1.2	1.0	1.6	1.8	22.3
4x16	4.5	1.0	1.0	1.2	1.0	1.6	1.8	24.5
4x25	5.6	1.2	1.0	1.3	1.1	2.0	1.9	29.1
4x35	6.7	1.2	1.0	1.4	1.1	2.0	2.0	31.9
4x50	8	1.4	1.2	1.6	1.2	2.0	2.1	36.7
4x70	9.4	1.4	1.2	1.7	1.3	2.5	2.3	41.4
4x95	11	1.6	1.2	1.8	1.4	2.5	2.5	46.6
4x120	12.4	1.6	1.4	1.9	1.5	2.5	2.6	50.6
4x150	13.8	1.8	1.4	2.0	1.6	2.5	2.7	55.3
4x185	15.3	2.0	1.6	2.2	1.7	2.5	2.9	60.6
4x240	17.5	2.2	1.6	2.4	1.8	3.15	3.2	68.7
4x300	19.5	2.4	1.6	2.6	1.9	3.15	3.4	74.9

600/1000V, XLPE Insulated and Lead Sheathed Cables according to IEC 60502-1

Single core(unarmoured)

Two core(unarmoured)

Three core(unarmoured)

Four core(unarmoured)

Single core(armoured)

Two core(armoured)

Three core(armoured)

Four core(armoured)

600/1000V, XLPE Insulated and Lead Sheathed Cables, according to IEC 60502-1

Application:

These cables are used for electricity supply in low voltage installation system, They are suitable for installation in indoors and outdoors, in cable ducts, under ground, in power and switching stations, local energy distributions, industrial plants, where there is no risk of mechanical damage. The lead sheath brings an enhanced resistance to aromatic hydrocarbons.

Construction:

Conductors The conductors shall be either of Class 1 or Class 2 of plain or metal-coated annealed copper or of plain aluminium or aluminium alloy, or of Class 5 of plain or metal-coated copper in accordance with IEC 60228.

Insulation XLPE material and thickness shall be as per IEC 60502-1, rated for 90°C continuous operation.

Colour Code Colour Code (1) :

1 Core	:	Red or Black
2 Cores	:	Red, Black
3 Cores	:	Red, Yellow, Blue
4 Cores	:	Red, Yellow, Blue, Black
5 Cores	:	Red, Yellow, Blue, Black, Green
Above 5 Cores:		Black Cores with White numerals

Colour Code (2) :

1 Core :		Brown or Blue
2 Cores	:	Brown, Blue
3 Cores	:	Brown, Black, Grey
4 Cores	:	Blue, Brown, Black, Grey
5 Cores	:	Green/Yellow, Blue, Brown, Black, Grey
Above 5 Cores:		Black Cores with White numerals

Other colours can be manufactured upon request.

Assembly / Inner Covering
The inner coverings may be extruded or lapped. For cables with circular cores, except cables with more than five cores, a lapped inner covering shall be permitted only if the interstices between the cores are substantially filled. A suitable binder is permitted before application of an extruded inner covering. The material is compatible with the insulating material,The materials used for inner coverings and fillers shall be suitable for the operating temperature of the cable and compatible with the insulating material.For halogen free cables, the inner covering and fillers shall also be halogen free compound.

Lead Sheath
lead or lead alloy and shall be applied as a reasonably tight-fitting seamless tube

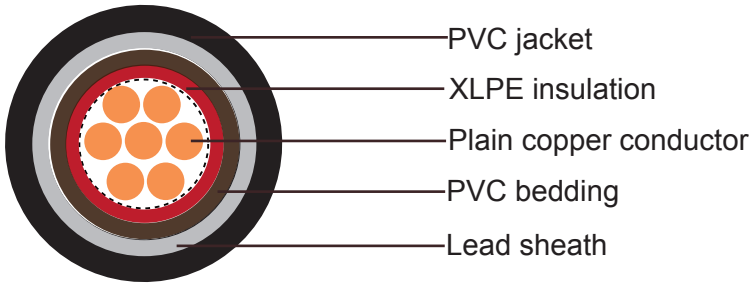
Seperation Sheath
The seperation sheath shall be of extruded PVC Type ST2 as per IEC 60502-1, or other material refer to outer sheath material.

Armour
Aluminum/galvanized steel/steel wires applied helically over the Inner Covering as per IEC 60502-1, or double aluminum/steel tapes and copper/tinned copper wire can also be manufactured upon request.

Outer Sheath
Outer sheath shall be of extruded PVC Type ST1/ST2 as per IEC 60502-1, Polyethylene type ST3/ST7, Halogen free compound ST8, Polychloroprene, chlorosulfonated polyethylene or similar polymers, type SE1 are also available on request.

Cable Parameters:

Single core(unarmoured)

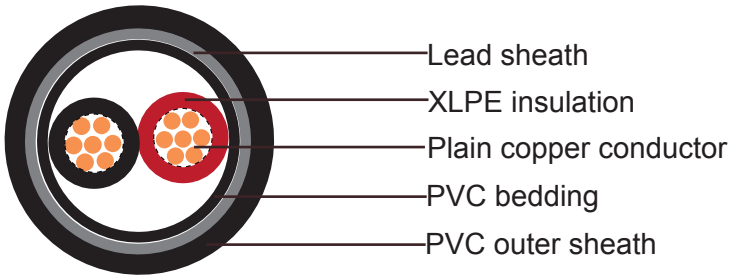


Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
1x10	3.6	0.7	1.0	1.2	1.4	12.2
1x16	4.5	0.7	1.0	1.2	1.4	13.1
1x25	5.6	0.9	1.0	1.2	1.4	14.6
1x35	6.7	0.9	1.0	1.2	1.5	15.8
1x50	8	1.0	1.0	1.2	1.5	17.4
1x70	9.4	1.1	1.0	1.2	1.6	19.1
1x95	11	1.1	1.0	1.3	1.6	21.0

XLPE Insulation with Lead Sheath

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
1x120	12.4	1.2	1.0	1.3	1.7	22.8
1x150	13.8	1.4	1.0	1.4	1.7	24.8
1x185	15.3	1.6	1.0	1.4	1.8	27.0
1x240	17.5	1.7	1.0	1.5	1.9	29.7
1x300	19.5	1.8	1.0	1.6	2.0	32.2
1x400	22.6	2.0	1.2	1.7	2.1	36.6
1x500	25.2	2.2	1.2	1.8	2.2	40.0
1x630	28.3	2.4	1.2	1.9	2.4	44.0

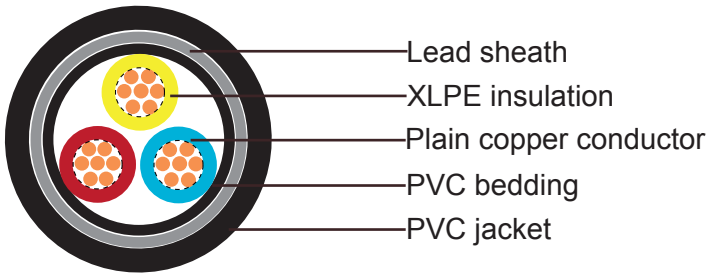
Two cores(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
2x2.5	1.8	0.7	1.0	1.2	1.8	14.4
2x4	2.3	0.7	1.0	1.2	1.8	15.4
2x6	2.8	0.7	1.0	1.2	1.8	16.4
2x10	3.6	0.7	1.0	1.2	1.8	18.0
2x16	4.5	0.7	1.0	1.2	1.8	19.8
2x25	5.6	0.9	1.0	1.2	1.8	22.8
2x35	6.7	0.9	1.0	1.3	1.8	25.1
2x50	8	1.0	1.0	1.4	1.9	28.5
2x70	9.4	1.1	1.0	1.5	2.0	32.1
2x95	11	1.1	1.2	1.6	2.1	36.2
2x120	12.4	1.2	1.2	1.7	2.2	39.8
2x150	13.8	1.4	1.2	1.8	2.4	43.9
2x185	15.3	1.6	1.4	1.9	2.5	48.6

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
2x240	17.5	1.7	1.4	2.0	2.7	54.1
2x300	19.5	1.8	1.6	2.2	2.9	59.5

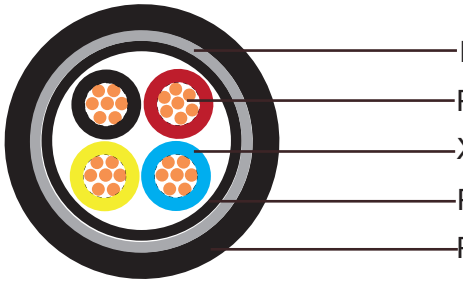
Three cores(unarmoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
3x1.5	1.4	0.7	1.0	1.2	1.8	14.0
3x2.5	1.8	0.7	1.0	1.2	1.8	14.9
3x4	2.3	0.7	1.0	1.2	1.8	16.0
3x6	2.8	0.7	1.0	1.2	1.8	17.0
3x10	3.6	0.7	1.0	1.2	1.8	18.8
3x16	4.5	0.7	1.0	1.2	1.8	20.7
3x25	5.6	0.9	1.0	1.2	1.8	24.0
3x35	6.7	0.9	1.0	1.3	1.8	26.5
3x50	8	1.0	1.0	1.4	1.9	30.2
3x70	9.4	1.1	1.0	1.5	2.1	34.1
3x95	11	1.1	1.2	1.6	2.2	38.5
3x120	12.4	1.2	1.2	1.7	2.3	42.4
3x150	13.8	1.4	1.4	1.9	2.5	47.2
3x185	15.3	1.6	1.4	2.0	2.6	51.9
3x240	17.5	1.7	1.4	2.1	2.8	57.7
3x300	19.5	1.8	1.6	2.3	3.0	63.6

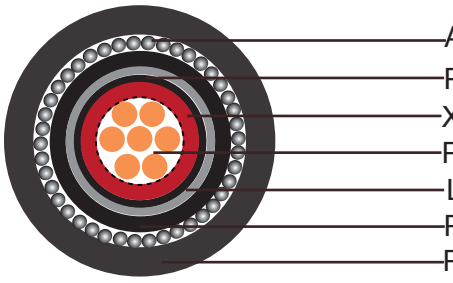
XLPE Insulation with Lead Sheath

Four cores(unarmoured)



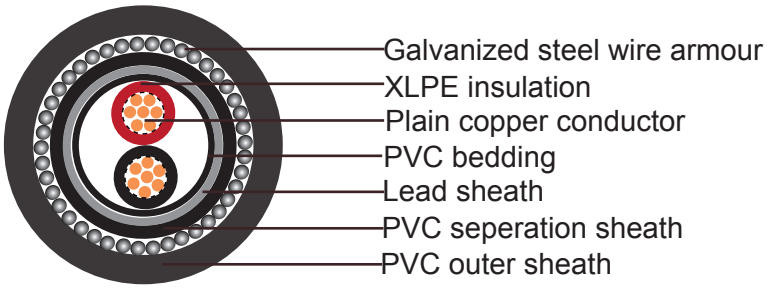
Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm
4x1.5	1.4	0.7	1.0	1.2	1.8	15.2
4x2.5	1.8	0.7	1.0	1.2	1.8	16.2
4x4	2.3	0.7	1.0	1.2	1.8	18.4
4x6	2.8	0.7	1.0	1.2	1.8	19.6
4x10	3.6	0.7	1.0	1.2	1.8	21.5
4x16	4.5	0.7	1.0	1.2	1.8	23.8
4x25	5.6	0.9	1.0	1.3	1.8	27.7
4x35	6.7	0.9	1.0	1.4	1.9	30.7
4x50	8	1.0	1.0	1.5	2.1	35.8
4x70	9.4	1.1	1.2	1.6	2.2	39.6
4x95	11	1.1	1.2	1.7	2.4	45.1
4x120	12.4	1.2	1.4	1.9	2.6	49.4
4x150	13.8	1.4	1.4	2.0	2.7	54.3
4x185	15.3	1.6	1.4	2.1	2.9	60.0
4x240	17.5	1.7	1.6	2.3	3.1	67.1
4x300	19.5	1.8	1.6	2.5	3.3	73.7

Single core(aluminum wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Aluminium wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
1x35	7.4	1.2	1.0	1.2	1.0	1.25	1.8	16.6
1x50	8.8	1.4	1.0	1.2	1.0	1.6	1.8	18.8
1x70	10.6	1.4	1.0	1.2	1.0	1.6	1.8	20.4
1x95	12.4	1.6	1.0	1.3	1.0	1.6	1.8	22.0
1x120	14	1.6	1.0	1.3	1.0	1.6	1.8	23.6
1x150	15.5	1.8	1.0	1.4	1.0	1.6	1.8	25.4
1x185	17.4	2.0	1.0	1.4	1.1	2.0	1.9	28.2
1x240	20.3	2.2	1.0	1.5	1.1	2.0	1.9	30.8
1x300	22.7	2.4	1.0	1.6	1.2	2.0	2.0	33.1
1x400	25.4	2.6	1.2	1.7	1.2	2.0	2.2	37.3
1x500	28.8	2.8	1.2	1.8	1.3	2.5	2.3	41.6
1x630	30.4	2.8	1.2	1.9	1.4	2.5	2.4	45.3

Two cores(Galvanized steel wire armoured)

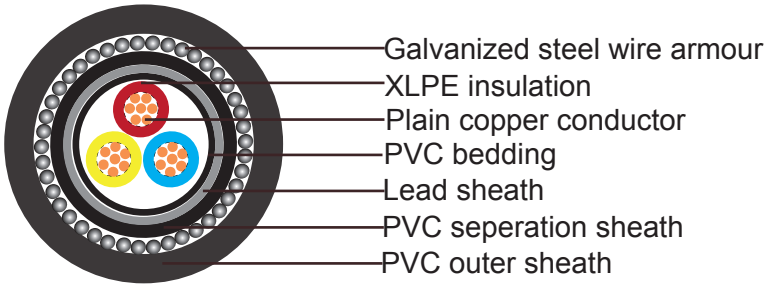


Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Steel wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
2x2.5	1.8	0.7	1.0	1.2	1.0	1.25	1.8	14.5
2x4	2.3	0.7	1.0	1.2	1.0	1.25	1.8	15.5
2x6	2.8	0.7	1.0	1.2	1.0	1.25	1.8	16.5
2x10	3.6	0.7	1.0	1.2	1.0	1.6	1.8	18.8
2x16	4.5	0.7	1.0	1.2	1.0	1.6	1.8	20.6
2x25	5.6	0.9	1.0	1.2	1.0	1.6	1.8	23.6
2x35	6.7	0.9	1.0	1.3	1.0	1.6	1.8	25.8
2x50	8	1.0	1.0	1.4	1.1	2.0	1.9	29.8

XLPE Insulation with Lead Sheath

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Steel wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
2x70	9.4	1.1	1.0	1.5	1.2	2.0	2.0	33.2
2x95	11	1.1	1.2	1.6	1.2	2.0	2.1	37.1
2x120	12.4	1.2	1.2	1.7	1.3	2.5	2.3	41.6
2x150	13.8	1.4	1.2	1.8	1.4	2.5	2.4	45.4
2x185	15.3	1.6	1.4	1.9	1.5	2.5	2.6	49.9
2x240	17.5	1.7	1.4	2.0	1.6	2.5	2.7	55.1
2x300	19.5	1.8	1.6	2.2	1.7	2.5	2.9	60.2

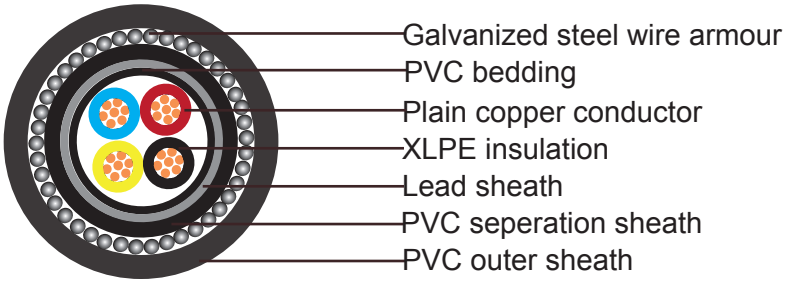
Three cores(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Steel wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
3x1.5	1.4	0.7	1.0	1.2	1.0	1.25	1.8	14.1
3x2.5	1.8	0.7	1.0	1.2	1.0	1.25	1.8	15.0
3x4	2.3	0.7	1.0	1.2	1.0	1.25	1.8	16.1
3x6	2.8	0.7	1.0	1.2	1.0	1.6	1.8	17.8
3x10	3.6	0.7	1.0	1.2	1.0	1.6	1.8	19.6
3x16	4.5	0.7	1.0	1.2	1.0	1.6	1.8	21.5
3x25	5.6	0.9	1.0	1.2	1.0	1.6	1.8	24.7
3x35	6.7	0.9	1.0	1.3	1.1	1.6	1.8	27.2
3x50	8	1.0	1.0	1.4	1.1	2.0	2.0	31.5
3x70	9.4	1.1	1.0	1.5	1.2	2.0	2.1	35.2
3x95	11	1.1	1.2	1.6	1.3	2.5	2.3	40.3
3x120	12.4	1.2	1.2	1.7	1.4	2.5	2.4	44.0
3x150	13.8	1.4	1.4	1.9	1.4	2.5	2.5	48.6

Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Steel wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
3x185	15.3	1.6	1.4	2.0	1.5	2.5	2.7	53.0
3x240	17.5	1.7	1.4	2.1	1.6	2.5	2.8	58.5
3x300	19.5	1.8	1.6	2.3	1.8	3.15	3.1	65.4

Four cores(Galvanized steel wire armoured)



Nominal Cross Section	Diameter of Conductor (Approx.)	Nominal Insulation Thickness	Nominal Inner Covering Thickness	Nominal Lead Sheath Thickness	Nominal Seperation Thickness	Nominal dia. of Steel wire armour	Nominal Sheath Thickness	Overall Diameter (Approx.)
mm²	mm	mm	mm	mm	mm	mm	mm	mm
4x1.5	1.4	0.7	1.0	1.2	1.0	1.25	1.8	14.9
4x2.5	1.8	0.7	1.0	1.2	1.0	1.25	1.8	15.8
4x4	2.3	0.7	1.0	1.2	1.0	1.6	1.8	17.7
4x6	2.8	0.7	1.0	1.2	1.0	1.6	1.8	18.9
4x10	3.6	0.7	1.0	1.2	1.0	1.6	1.8	20.9
4x16	4.5	0.7	1.0	1.2	1.0	1.6	1.8	23.0
4x25	5.6	0.9	1.0	1.3	1.0	1.6	1.8	26.7
4x35	6.7	0.9	1.0	1.4	1.1	2.0	1.9	30.4
4x50	8	1.0	1.0	1.5	1.2	2.0	2.1	34.2
4x70	9.4	1.1	1.2	1.6	1.3	2.5	2.2	39.9
4x95	11	1.1	1.2	1.7	1.4	2.5	2.4	44.0
4x120	12.4	1.2	1.4	1.9	1.4	2.5	2.5	48.6
4x150	13.8	1.4	1.4	2.0	1.5	2.5	2.7	53.2
4x185	15.3	1.6	1.4	2.1	1.6	2.5	2.8	58.1
4x240	17.5	1.7	1.6	2.3	1.8	3.15	3.1	66.1
4x300	19.5	1.8	1.6	2.5	1.9	3.15	3.3	71.8

Technical Referrence

Insulation Options

Insulation Thickness

Mechnical Characteristics of Insulation

Mechnical Characteristics of Jacket Materials

Thickness of lapped inner coverings

Dimensions of the armour wires and armour tapes

Insulation Options

EPR and HEPR can be offered upon request

Insulation Thickness

Nominal thickness of PVC/A insulation

Nominal cross-sectional area of conductor	Nominal thickness of insulation at rated voltage U0/U (Um)
mm2	0.6/1 (1.2) kV mm
1.5 and 2.5	0.8
4 and 6	1.0
10 and 16	1.0
25 and 35	1.2
50 and 70	1.4
95 and 120	1.6
150	1.8
185	2.0
240	2.2
300	2.4
400	2.6
500 to 800	2.8
1 000	3.0

Nominal thickness of cross-linked polyethylene (XLPE) insulation

Nominal cross-sectional area of conductor	Nominal thickness of insulation at rated voltage U0/U (Um)
mm2	0.6/1 (1.2) kV mm
1.5 and 2.5	0.7
4 and 6	0.7
10 and 16	0.7
25 and 35	0.9
50	1.0
70 and 95	1.1
120	1.2
150	1.4

Nominal cross-sectional area of conductor	Nominal thickness of insulation at rated voltage U0/U (Um)
mm2	0.6/1 (1.2) kV mm
185	1.6
240	1.7
300	1.8
400	2.0
500	2.2
630	2.4
800	2.6
1 000	2.8

Nominal thickness of ethylene propylene rubber (EPR) and hard ethylene propylene rubber (HEPR) insulation

Nominal cross-sectional area of conductor	Nominal thickness of insulation at rated voltage U0/U (Um)	
mm^2	0,6/1 (1,2) kV	
	ERP mm	HEPR mm
1,5 and 2,5	1,0	0,7
4 and 6	1,0	0,7
10 and 16	1,0	0,7
25 and 35	1,2	0,9
50	1,4	1,0
70	1,4	1,1
95	1,6	1,1
120	1,6	1,2
150	1,8	1,4
185	2,0	1,6
240	2,2	1,7
300	2,4	1,8
400	2,6	2,0
500	2,8	2,2
630	2,8	2,4
800	2,8	2,6
1 000	3,0	2,8

Mechanical Characteristics of Insulation Materials

Mechanical characteristics of insulating compounds with copper conductor (before and after aging)

Designation of compounds	Unit	PVC/A	EPR		HEPR		XLPE	
			0,6/1(1,2) kV cables	All other cables	0,6/1(1,2) kV cables	All other cables	0,6/1(1,2) kV cables	All other cables
Maximum conductor temperature in normal operation	°C	70	90	90	90	90	90	90
Without ageing (IEC 60811-1-1,)								
Tensile strength, minimum	N/mm^2	12,5	4,2	4,2	8,5	8,5	12,5	12,5
Elongation-at-break, minimum	%	150	200	200	200	200	200	200
After ageing without conductor								
Treatment:								
– temperature	°C	100	135	135	135	135	135	135
– tolerance	°C	±2	±3	±3	±3	±3	±3	±3
– duration	h	168	168	168	168	168	168	168
Tensile strength								
a) value after ageing, minimum	N/mm^2	12,5	–	–	–	–	–	–
b) variation a, maximum	%	±25	±30	±30	±30	±30	±25	±25
Elongation-at-break:								
a) value after ageing, minimum	%	150	–	–	–	–	–	–
b) variation a, maximum	%	±25	±30	±30	±30	±30	±25	±25
After ageing with copper conductor followed by the tensile test b								
Treatment:								
– temperature	°C	–	135	–	135	–	135	–
– tolerance	°C	–	±3	–	±3	–	±3	–
– duration	h	–	168	–	168	–	168	–
Tensile strength:								
Variation a, maximum	%	–	±30	–	±30	–	±30	–
Elongation-at-break:								
Variation a, maximum	%	–	±30	–	±30	–	±30	–
After ageing with copper conducto r followed by bending test (only if the tensile test is not practicable) b								
Treatment:								
– temperature	°C	–	150	–	150	–	150	–
– tolerance	°C	–	±3	–	±3	–	±3	–
– duration	h	–	240	–	240	–	240	–
Results to be obtained		–	No cracks	–	No cracks	–	No cracks	–

Mechanical Characteristics of Jacket Materials

Mechanical characteristics of sheathing compounds (before and after aging)

Designation of compounds	Unit	ST1	ST2	ST3	ST7	ST8	SE1
Maximum conductor temperature in normal operation	°C	80	90	80	90	90	85
Without ageing (IEC 60811-1-1) Tensile strength, minimum Elongation-at-break, minimum	N/mm^2 %	12,5 150	12,5 150	10,0 300	12,5 300	9,0 125	10,0 300
After ageing in an air oven (IEC 60811-1-2) **Treatment:** – temperature (tolerance ±2 °C) – duration **Tensile strength:** a) value after ageing, minimum b) variation a, maximum **Elongation-at-break:** a) value after ageing, minimum b) variation a, maximum	 °C h N/mm^2 % % %	 100 168 12,5 ±25 150 ±25	 100 168 12,5 ±25 150 ±25	 100 240 – – 300 –	 110 240 – – 300 –	 100 168 9,0 ±40 100 ±40	 100 168 – ±30 250 ±40

Mechanical characteristics for PVC sheathing compounds

Designation of compound	Unit	ST1	ST2
Use of the PVC compound		Sheath	
Loss of mass in an air oven (IEC 60811-3-2) **Treatment:** – temperature (tolerance ±2 °C) – duration **Maximum loss of mass**	 °C h g/cm^2	 – – –	 100 168 1,5
Pressure test at high temperature (IEC 60811-3-1) - temperature (tolerance ±2 °C)	°C	80	90
Behaviour at low temperature a (IEC 60811-1-4) **Test to be carried out without previous ageing:** **-** cold bending test for diameter <12,5 mm - temperature (tolerance ±2 °C) **Cold elongation test on dumb-bells:** **-** temperature (tolerance ±2 °C) **Cold impact test:** **-** temperature (tolerance ±2 °C)	 °C °C °C	 –15 –15 –15	 –15 –15 –15
Heat shock test (IEC 60811-3-1) **Treatment:** – temperature (tolerance ±3 °C) – duration	 °C h	 150 1	 150 1

Mechanical characteristics of thermoplastic PE sheathing compounds

Designation of compounds	Unit	ST3	ST7
Density (IEC 60811-1-3)			
Carbon black content (for black oversheaths only) (IEC 60811-4-1) Nominal value Tolerance	 % %	 2,5 ±0,5	 2,5 ±0,5
Shrinkage test (IEC 60811-1-3) **Treatment:** – temperature (tolerance ±2 °C) – heating, duration – heating, cycles **Maximum shrinkage**	 °C h %	 80 5 5 3	 80 5 5 3
Pressure test at high temperature (IEC 60811-3-1) – temperature (tolerance ±2 °C)	°C	–	110

Mechanical characteristics of halogen free sheathing compound

Designation of compound	Unit	ST8
Behaviour at low temperature a (IEC 60811-1-4) **Test to be carried out without previous ageing:** – cold bending test for diameter <12,5 mm – temperature (tolerance ±2 °C) **Cold elongation test on dumb-bells:** – temperature (tolerance ±2 °C) **Cold impact test:** – temperature (tolerance ±2 °C)	 °C °C °C	 -15 -15 -15
Pressure test at high temperature (IEC 60811-3-1) – temperature (tolerance ±2 °C)	°C	80
Water absorption (IEC 60811-1-3) **Gravimetric method:** **Treatment:** – temperature (tolerance ±2 °C) – duration **Maximum increase of mass**	 °C h g/cm^2	 70 24 10

Mechanical characteristics of elastomeric sheathing compound

Designation of compound	Unit	SE1
Oil immersion test followed by a determination of the mechanical properties (IEC 60811-2-1 and IEC 60811-1-1)		
Treatment:		
– oil temperature (tolerance ±2 °C)	°C	100
– duration	H	24
Maximum variation aof:		
a) tensile strength b)	%	±40
elongation-at-break	%	±40
Hot set test (IEC 60811-2-1)		
Treatment:		
– temperature (tolerance ±3 °C)	°C	200
– time under load	min	15
– mechanical stress	N/cm^2	20
Maximum elongation under load	%	175
Maximum permanent elongation after cooling	%	15

Thickness of lapped inner coverings(optional)

The approximate thickness of lapped inner coverings shall be 0,4 mm for fictitious diameters over laid-up cores up to and including 40 mm and 0,6 mm for larger diameters.

Dimensions of the armour wires and armour tapes

The nominal dimensions of the armour wires and armour tapes shall preferably consist of one of the following values:

Round wires:

0,8 -1,25 -1,6 -2,0 -2,5 - 3,15 mm diameter;

Flat wires:

0,8 mm thickness;

Tapes of steel:

0,2 - 0,5 - 0,8 mm thickness;

Tapes of aluminium or aluminium alloy:

0,5 - 0,8 mm thickness.

Correlation between cable diameters and armour dimensions

The nominal diameters of round armour wires and the nominal thicknesses of the armour tapes shall be not less than the values given in Tables 1 and 2, respectively.

Nominal diameter of round armour wires(table 1)

Fictitious diameter under the armour		"Nominal diameter of armour wire
Above mm	Up to and including mm	mm
	10	0.8
10	15	1.25
15	25	1.6
25	35	2.0
35	60	2.5
60		3.15

Nominal thickness of armour tapes(table 2)

Fictitious diameter under the armour		Nominal thickness of tape	
Above mm	Up to and including mm	Steel or galvanized steel mm	Aluminium or aluminium alloy mm
	30	0.2	0.5
30	70	0.5	0.5
70		0.8	0.8

*For flat armour wires and fictitious diameters under the armour greater than 15 mm, the nominal thickness of the flat steel wire shall be 0,8 mm. Cables with fictitious diameters underthe armour up to and including 15 mm shall not be armoured with flat wires.

Round or flat wire armour

The wire armour shall be closed, i.e. with a minimum gap between adjacent wires. An open helix consisting of galvanized steel tape with a nominal thickness of at least 0,3 mm may be provided over flat steel wire armour and over round steel wire armour, if necessary. Tolerances on this steel tape shall refer :

- 5 % for round wires;
- 8 % for flat wires;
- 10 % for tapes.

Double tape armour

When a tape armour and an inner covering are used, the inner covering shall be reinforced by a taped bedding. The total thickness of the inner covering and the additional taped bedding shall 0.4mm/0.6mm plus 0,5 mm if the armour tape thickness is 0,2 mm, and plus 0,8 mm if the armour tape thickness is more than 0,2 mm.

The total thickness of the inner covering and the additional taped bedding shall be not less than these values by more than 0,2 mm with a tolerance of + 20 %. If a separation sheath is required or if the inner covering is extruded, the additional taped bedding is not required.The tape armour shall be applied helically in two layers so that the outer tape is approximately central over the gap of the inner tape. The gap between adjacent turns of each tape shall not exceed 50 % of the width of the tape.

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