MicCom Cables and Wires Ltd

A Legacy of QUALITY Since 1978

The Quality Cable Makers...

CONTENTS

1 NOTICE

As this catalogue is not intended to cover all of MicCom Cables and Wires possibilities in Building wires and flexible cables manufacturing, the hereafter listing of the types of cables is not restrictive but only indicative of the main and most current types we manufacture.

On the other hand, our specification sheets are inspired mainly from International Electrotechnical Commission Specifications (IEC) only in order to conform with the sustained trend, noticed both regionally and worldwide, towards these same IEC supposed to inspire any further standardization approaches.

That is why, while consulting this brochure, it is important to take into account the following points:

- Any combination or change of the constructional details mentioned in this catalogue remain feasible, on base of special conception / development, matching any special or different specifications.
- The possible equivalences between the various specifications listed for custome r / end user choice in the hereafter index.

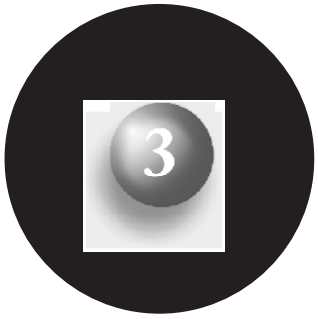
Finally, and within our policy of constant improvement, we reserve the right to alter any par of the information contained in this publication without incurring any obligation. In all cases this brochure being only indicative, and unless expressly agreed upon, it cannot be considered by any mean as contractual document.

INTRODUCTION

2

The history of MicCom Engineering Works Limited started in **1974** when it operation under the name of MicCom Electronics Works. By the time A and O MicCom Works Limited was incorporated on the 24th of June 1977, it had become one of the reputable electrical contracting firms in Nigeria.

The scarcity ofstandard electrical cables and conductors at that time made founders/Directors of MicCom viz **Engr Tunde Ponnle** and **Engr (Mrs) Olu Ponnle** to take the plunge into cable manufacturing. This decision was made in **December of 1978**, hence the birth of MicCom Engineering Works Ltd, which was later, changed to MicCom Cables and Wires Ltd to reflect our commitment to the Cable and Wire Industry.



QUALITY ASSURANCE

Step by step, from raw materials to finished products, quality constitutes a major concern to MicCom Cables.

Raw materials are continuously and respectively tested from trial orders till the last batch received afterwards.

During manufacturing, products are tested within two simultaneous procedures:

- A built in quality control system carried out by the production itself at any step of work in progress.
- A parallel and contradictory procedure is also carried out on the same stages and products by independent inspectors reporting to the quality control service.

In addition to above testing procedures, a final testing is carried out before the delivery to ensure the performance of the finished cable.

End users and/or third part inspection authorities are also constantly commissioning the finished products and assessing the strict conformity to ordered specifications.

MicCom

The Quality Cable Makers

A Legacy of Quality SINCE 1978

QUALITY POLICY

It is our policy at **MICCOM CABLES AND WIRES LTD** to produce and deliver quality cables and wires that meet customers' requirements.

We are also committed to complying with the requirement of the **NIS ISO 9001: 2008** standard and to continually improve the effectiveness of our Quality Management System.

We have set measurable objectives at corporate and department levels which are reviewed as necessary for continual suitability.

WIRES & cables

BUILDING WIRES & FLEXIBLE CABLES

MicCom
The Quality Cable Makers
A Legacy of Quality SINCE 1978

BUILDING WIRES & FLEXIBLE CABLES

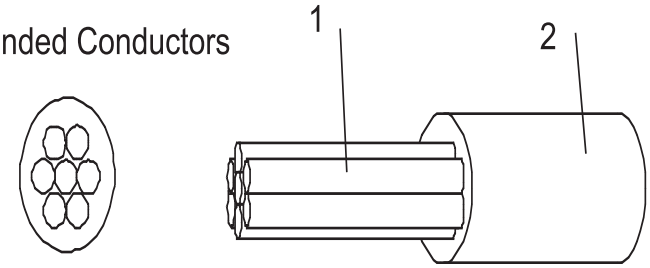
RECOMMENDED ORDERING PARAMETERS

For prompt quotation / supplies, please make sure your inquiries and your orders are securing the following data:

1. International or Special Standard. (Alternatively, the precise usage of the cable.)
2. Constructional details
3. Other requirements
4. Packing
5. Required delivery time
6. Required offer validity

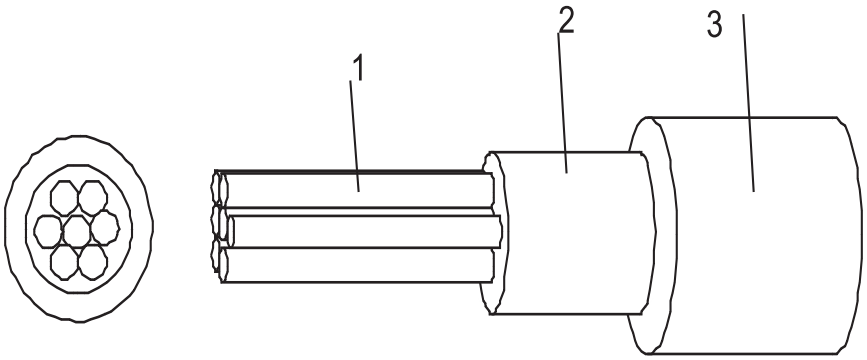
4.2 SINGLE- CORE NON SHEATHED AND SHEATHED PVC INSULATED CABLES

Solid/Stranded Conductors



1. Copper conductor
2. PVC - insulation

NCY



NCYY

1. Copper conductor
2. PVC - insulation
3. PVC - outer sheath

1 – SCOPE

This specification covers single core, non sheathed and sheathed PVC insulated cables, intended for internal wiring in dry locations, concealed in conduits.

2 – CONSTRUCTION

2.1 – Conductor

Plain, annealed, electrolytic copper conductors, solid or stranded, complying with applicable requirements of IEC 60228 Standard.

2.2 – Insulation

PVC based thermoplastic material, conforming to the applicable requirements of IEC 60227 Standard.

2.3 – Sheathing

PVC based thermoplastic material, conforming to the applicable requirements of IEC Standards.

SINGLE CORE PVC INSULATED COPPER CABLES

SPECIFICATION : BS 6004, IEC 60227

TYPE: NCY

IDENTIFICATION : N: Standard cable type
C: Copper conductor
Y: PVC Insulation

APPLICATION: For use in housing, office, switchboards, distribution boards, conduit and general wiring

NOMINAL CROSS SECTIONAL AREA mm^2	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF INSULAT mm	APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM
				in pipe	in air			
0.5	1/0.80	0.6	2.0	5	7	0.8	100	Coil
0.75	1/0.98	0.6	2.2	7	13	1.10	100	Coil
1.0	1/1.13	0.6	2.3	10	16	1.32	100	Coil
1.5	1/1.38	0.7	2.8	13	21	1.82	100	Coil
2.5	1/1.78	0.8	3.4	17	28	2.93	100	Coil
4.0	1/2.25	0.8	3.9	22	37	4.54	100	Coil
6	1/2.76	0.8	4.4	29	48	6.5	100	Coil
6	7/1.04	0.8	4.72	29	48	6.5	100	Coil
10	7/1.35	1.0	6.1	39	64	11.42	100	Coil
16	7/1.70	1.0	7.1	53	85	17.33	100	Coil
25	7/2.14	1.2	8.8	72	112	27.25	100	Coil
35	7/2.50	1.2	9.9	90	138	369	1,000	R8
50	19/1.78	1.4	11.7	115	172	495	1,000	R10
70	19/2.14	1.4	13.5	144	213	670	1,000	R10
95	19/2.52	1.6	15.8	172	254	967	1,000	R12
120	37/2.03	1.6	17.4	205	300	1204	1,000	R12
150	37/2.25	1.8	19.4	--	340	1481	1,000	R12
185	37/2.52	2.0	21.6	--	390	1857	1,000	R12
240	61/2.25	2.2	24.7	--	460	2429	1,000	R14
300	61/2.52	2.4	27.5	--	530	1520	500	R12
400	61/2.85	2.6	30.9	--	631	1937	500	R14
500	61/3.20	2.8	34.4	--	722	2433	500	R14
630	61/2.97	2.8	38.3	--	970	3100	500	R16
800	127/2.85	2.8	42.7	--	1004	3968	500	R18
1000	127/3.20	3.0	47.6	--	1153	6133	500	R20

Solid copper conductor up to 4mm ^{2}

1. At different operating T ^{o}(C) : R = R20 ^{o} C [1 + a (T ^{o} C – 20)]
   a:Temperature coefficient at 20 ^{0}C = 0.00393 for copper
   0.00403 for aluminium
2. Ambient Temperature : 30 ^{0}C

SINGLE CORE PVC INSULATED **COPPER CABLES 300/500V**

SPECIFICATION: BS 6004

TYPE : NCYY

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
Y: PVC Sheath

APPLICATION: Use in installation, in cable dusts/trays and in industrial plants, substations. Can also be used underground with additional protection (where mechanical damage may be expected).

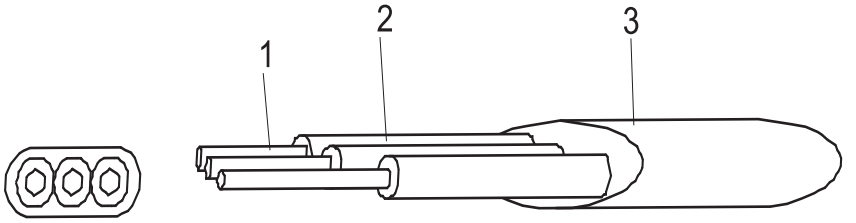
NOMINAL CROSS SECTIONAL AREA mm^2	CONDUCT NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF		APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM
		insulat mm	sheath mm		in ground	in air			
1.5	1/1.38	0.7	0.8	4.4	31	23	3.3	100	Coil
2.5	1/1.78	0.8	0.8	5.0	42	31	4.5	100	Coil
4	1/2.25	0.8	0.9	5.7	55	40	6.6	100	Coil
6	1/2.76	0.8	0.9	6.2	70	51	9.4	100	Coil
10	7/1.35	1.0	0.9	7.9	92	70	14.7	100	Coil
16	7/1.70	1.0	1.0	9·1	122	91	21.7	100	Coil
25	7/2.14	1.2	1.1	11.0	160	122	332	1,000	R10
35	7/2.50	1.2	1.1	12.2	197	152	423	1,000	R10

Solid copper conductor up to $6mm^2$

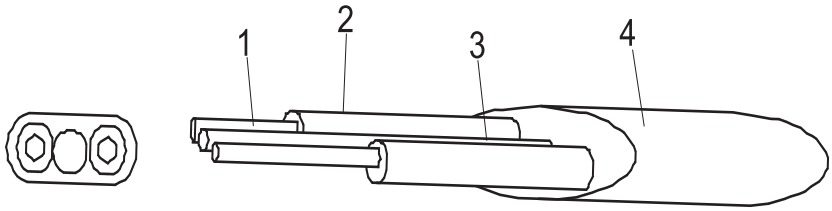
1. At different operating T^o (C) : $R = R20^o\ C\ [1 + a\ (T^oC - 20)]$
   a:Temperature coefficient at 20°C = 0.00393 for copper
   0.00403 for aluminium
2. Ambient Temperature : 30^0C

4.3

FLAT PVC INSULATED AND SHEATHED CABLES



1. Copper conductor
2. PVC - insulation
3. PVC - outer sheath



1. Copper conductor
2. PVC - insulation
3. Earth continuity wire (Bare Copper)
4. PVC - outer sheath

1– SCOPE

This specification covers two or three conductors (or more on special request), P insulated are laid parallel, with or without a bare copper conductor for earth continuity overall PVC sheathed, rated at 300/500V and conforming to BS 6004; for use indoor a wide range of electrical applications, in building, stores, warehouses and excellent electric properties and high resistance to heat, acids, oil, grease, abrasion moisture.

2– CONSTRUCTION

2.1– Conductor

Plain, annealed, electrolytic copper conductors, solid or stranded, complying requirements of IEC 60228.

2.2– Insulation

PVC based thermoplastic material, complying with the applicable requirements of IEC 60811.

2.3– Sheath

PVC based thermoplastic material, complying with the applicable requirements of IEC 60811.

FLAT PVC INSULATED AND SHEATHED COPPER CABLES 300/500V

SPECIFICATION: BS 6004

TYPE : NCYY - F

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
Y: PVC Sheath
F: Flat Wiring Cable

APPLICATION: For use in housing, offices and general installation to be fixed on surface.

NOMINAL CROSS SECTION mm^2	NUMBER OF NOMINAL DIAMETER OF WIRES mm	RADIAL THICKNESS OF INSULATION mm	RADIAL THICKNESS OF SHEATH mm	APPRO X OVERALL DIAMETER UPPERLIMIT mm	APPRO X NET WEIGHT kg/km	STANDARD PACKING	D.C. RESISTANCE AT 20°C (1) S/km	CURRENT CARRYING CAPACITY (2) AMP.
2 x 1.0	1/1.13	0.6	0.9	6.6 x 4.2	55	C	18.1	17
2 x 1.5	1/1.38	0.7	0.9	7.5 x 4.7	75	C	12.1	22
2 x 2.5	1/1.78	0.8	1.0	8.9 x 5.5	110	C	7.41	30
2 x 4	1/2.25	0.8	1.0	10.5 x 6.3	150	C	4.61	40
2 x 6	1/2.76	0.8	1.1	11.8 x 7.1	205	C	3.08	51
2 x 10	7/1.35	1.0	1.2	14.7 x 8.7	325	D	1.83	70
2 x 16	7/1.70	1.0	1.3	17.1 x 10.0	465	D	1.15	94
3 x 1.0	1/1.13	0.6	0.9	8.9 x 4.3	80	C	18.1	14
3 x 1.5	1/1.38	0.7	0.9	10.3 x 4.7	105	C	12.1	19
3 x 2.5	1/1.78	0.8	1.0	12.3 x 5.6	150	C	7.41	25
3 x 4	7/0.85	0.8	1.1	14.9 x 6.6	230	C	4.61	34
3 x 6	7/1.04	0.8	1.1	16.6 x 7.2	300	C	3.08	43
3 x 10	7/1.35	1.0	1.2	20.9 x 8.8	485	D	1.83	60
3 x 16	7/1.70	1.0	1.3	24.3 x 10.1	700	D	1.15	80

Solid copper conductor up to 6mm²
Different cross sections also available.

Standard Packing - C: Coils of 100m
D: Drums 500 or 1000m

1. At different operating T°(C) : $R = R20^{o}C [1 + a (T^{o} C - 20)]$
   a:Temperature coefficient at $20^{0}C$ = 0.00393 for copper
   0.00403 for aluminium
2. Ambient Temperature : $30^{0}C$

FLAT PVC INSULATED AND SHEATHED CABLES WITH EARTH CONTINUITY CONDUCTOR 300/500 V

SPECIFICATION: BS 6004

TYPE: NCYY – F + E

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
Y: PVC Sheath
F + E: Flat Wiring Cable with earth continuity conductor

APPLICATION : General wiring installation to be fixed on surface

NOMINAL CROSS SECTION mm^2	NUMBER OF NOMINAL DIAMETER OF WIRES mm	RADIAL THICKNESS OF INSULATION mm	RADIAL THICKNESS OF SHEATH mm	APPROX. OVERALL DIAMETER UPPERLIMIT mm	APPROX. NET WEIGHT kg/km	SIZEOF ECC mm	STANDARD PACKING	D.C. RESISTANCE AT 20°C (1) Ω/km	CURRENT CARRYING CAPACITY (2) AMP.
			WITH EARTH CONTINUITY CONDUCTOR						
2 x 1.0	1/1.13	0.6	0.9	7.7 x 4.3	75	1/1.13	C	18.1	17
2 x 1.5	1/1.38	0.7	0.9	8.6 x 4.7	90	1/1.13	C	12.1	22
2 x 2.5	1/1.78	0.8	1.0	10.1 x 5.5	130	1/1.13	C	7.41	30
2 x 4	1/2.25	0.8	1.0	11.9 x 6.4	175	1/1.38	C	4.61	40
2 x 6	1/2.76	0.8	1.1	13.6 x 7.1	240	1/1.78	C	3.08	51
2 x 10	7/1.35	1.0	1.2	17.4 x 8.8	390	1/2.25	D	1.83	70
2 x 16	7/1.70	1.0	1.3	20.3 x 10.0	560	1/2.76	D	1.15	94
3 x 1.0	1/1.13	0.6	0.9	10.1 x 4.3	95	1/1.13	C	18.1	14
3 x 1.5	1/1.38	0.7	0.9	11.5 x 4.8	125	1/1.13	C	12.1	19
3 x 2.5	1/1.78	0.8	1.0	13.5 x5.6	170	1/1.13	C	7.41	25
3 x 4	7/0.85	0.8	1.1	16.1 x 6.6	255	1/1.38	C	4.61	34
3 x 6	7/1.04	0.8	1.1	17.8 x 7.2	340	1/1.78	C	3.08	43
3 x 10	7/1.35	1.0	1.2	23.5 x 8.9	550	7/0.85	D	1.83	60
3 x 16	7/1.70	1.0	1.3	27.5 x 10.2	790	7/1.04	D	1.15	80

Solid copper conductor up to 6mm²

Standard Packing - C: Coils of 100m
D: Drums 500 or 1000m

1. At different operating T°(C) : $R = R20^{\circ}\ C\ [1 + a\ (T^{\circ}C - 20)]$
   a:Temperature coefficient at 20°C = 0.00393 for copper
   0.00403 for aluminium

Ambient Temperature : 30°C

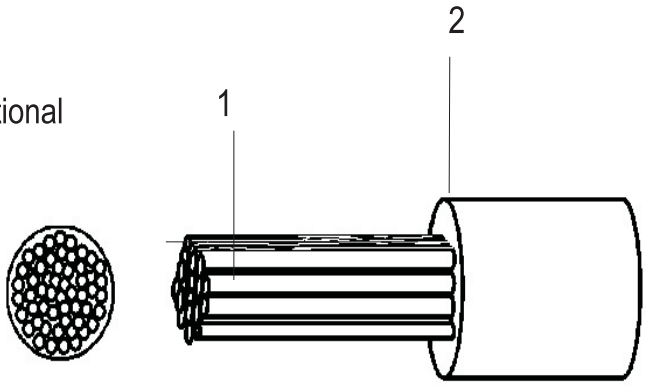
4.4

ORDINARY FLEXIBLE CORDS, PVC INSULATED AND SHEATHED

1 - SCOPE

This specification covers circular, twin and three, four or five core, PVC insulated and sheathed cords, rated at 300 / 500 V. type 227 IEC 53 to International Electrotechnical Commission Publication IEC 60227, for conductor cross-sectional areas up to and including 2.5mm^2

N.B.:
Different cross sectional areas / conductors are also available on special request.



1. Copper conductor
2. PVC - insulation

2 – CONSTRUCTION

2.1 – Conductor

Plain, annealed, electrolytic copper conductor, finely stranded, conforming to IEC 60228 class 5.

2.2 – Insulation

PVC based thermoplastic material conforming to the applicable requirements of IEC 60227.

2.3 – Assembly

Twin, three, four or five insulated conductors are laid up and outer interstices are filled with sheathing compound, for type 227 IEC 53 and filled with soft thermoplastic material.

2.4 - Sheath

PVC based thermoplastic material, conforming to the applicable requirements of IEC 60227.

ORDINARY FLEXIBLE CORDS, PVC INSULATED AND SHEATHED 300/500 V

SPECIFICATION: BS EN 50525/IEC 60227

TYPE: NCYY – R. .f (227 IEC 53 and or H05VVF to HD 21.5S2)

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
R ..f: Round and flexible cord

APPLICATION: Use in light fittings and household appliance and office machine where the mechanical stresses are low.

NOMINAL CROSS SECTIONAL AREA mm 2	MAXIMUM DIAMETER OF CONDUCTOR WIRES mm	RADIAL THICKNESS OF INSULATION mm	RADIAL THICKNESS OF SHEATH mm	APPROXIMATE OVERALL DIAMETER mm	APPROX. NET WEIGHT kg/km	STANDARD PACKING	D.C. Resistance at 20°C (1) S/km	CURRENT CARRYING CAPACITY (2) AMP.
2 x 0.75	0.21	0.6	0.8	7 . 6	57	C	26.0	14
2 x 1	0.21	0.6	0.8	8 . 0	64	C	19.5	17
2 x 1.5	0.26	0.7	0.8	9 . 0	87	C	13.3	22
2 x 2.5	0.26	0.8	1.0	11 . 0	134	C	7.98	30
2 x 4	0.31	0.8	1.1	1 2	172	C	4.95	40
3 x 0.75	0.21	0.6	0.8	8 . 0	67	C	26.0	12
3 x 1	0.21	0.6	0.8	8 . 4	77	C	19.5	14
3 x 1.5	0.26	0.7	0.9	9 . 8	108	C	13.3	18.5
3 x 2.5	0.26	0.8	1.1	1 2 . 0	168	C	7.98	25
3x 4	0.31	0.8	1.2	1 3 . 0	21.9	C	4.95	34
4 x 0.75	0.21	0.6	0.8	8 . 6	81	C	26.0	12
4 x 1	0.21	0.6	0.9	9 . 4	98	C	19.5	14
4 x 1.5	0.26	0.7	1.0	11 . 0	137	C	13.3	18.5
4 x 2.5	0.26	0.8	1.1	1 3 . 0	206	C	7.98	25
4 x 4	0.31	0.8	1.2	1 4 . 0	269	C	4.95	34
5 x 0.75	0.21	0.6	0.9	9 . 6	100	C	26.0	12
5 x 1	0.21	0.6	0.9	1 0 . 0	116	C	19.5	14
5 x 1.5	0.26	0.7	1.1	1 2 . 0	167	C	13.3	18.5
5 x 2.5	0.26	0.8	1.2	1 4 . 0	251	C	7.98	25
5 x 4	0.31	0.8	1.4	1 5 . 5	375	D	4.95	34

Standard Packing - C: Coils of 100m

1. At different operating T°(C) : R = R20°C [1 + a (T°C – 20)]
   a:Temperature coefficient at 20°C = 0.00393 for copper
   0.00403 for aluminium
2. Ambient Temperature : 30°C

Great sizes according to other specifications, like CNOMO for examples, are also available.

FLEXIBLE CABLES, PVC INSULATED AND SHEATHED

SPECIFICATION: BS EN 50525/IEC 60227

TYPE: NCYY – R..f (227 IEC 53 and or H05VVF to HD 21.5S2)

IDENTIFICATION :

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
R ..f: Round and flexible cord

APPLICATION: Use in light fittings, office machines and other indoor electrical installation.

NOMINAL CROSS SECTIONAL AREA mm^2	MAXIMUM DIAMETER OF CONDUCTOR WIRES mm	RADIAL THICKNESS OF INSULATION mm	RADIAL THICKNESS OF SHEATH mm	APPROXIMATE OVERALL DIAMETER mm	APPROX. NET WEIGHT Kg/km	STANDARD PACKING	D.C. Resistance at 20°C (1) S/km	CURRENT CARRYING CAPACITY (2) AMP.
3 x 6	0.31	0.8	1.3	14.8	375	D	3.30	43
3 x 10	0.41	1.0	1.6	18.5	610	D	1.91	60
3 x 16	0.41	1.0	1.9	21.7	875	D	1.21	80
3 x 25	0.41	1.2	2.1	26.1	1320	D	0.780	101
3 x 35	0.41	1.2	2.3	29.8	1720	D	0.554	126
4 x 6	0.31	0.8	1.4	16.3	470	D	3.30	43
4 x 10	0.41	1.0	1.7	20.4	760	D	1.91	60
4 x 16	0.41	1.0	2.0	24.1	1100	D	1.21	80
4 x 25	0.41	1.2	2.3	29.2	1670	D	0.780	101
4 x 35	0.41	1.2	2.6	33.4	2195	D	0.554	126
5 x 6	0.31	0.8	1.5	17.8	575	D	3.30	43
5 x 10	0.41	1.0	2.0	23.1	950	D	1.91	60
5 x 16	0.41	1.0	2.2	26.8	1355	D	1.21	80
5 x 25	0.41	1.2	2.6	32.8	2075	D	0.780	101
5 x 35	0.41	1.2	2.8	37.1	2700	D	0.554	126

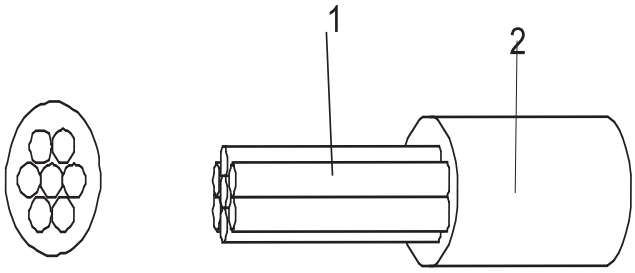
Standard Packing - D : Drums 500 or 1000m

1. At different operating T°(C) : $R = R20°C [1 + a (T°C – 20)]$
   a:Temperature coefficient at 20°C = 0.00393 for copper
   0.00403 for aluminium
2. Ambient Temperature : 30°C

Greater sizes according to other specifications are also available.

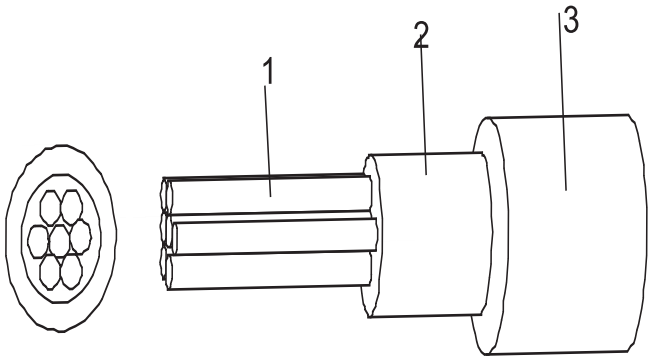
4.5 PVC INSULATED NON SHEATED AND SHEATHED CONSUMER CONNECTION -Aluminum Cables 0.6/1KV

1. Aluminum conductor
2. PVC - insulation



NAY

1. Aluminum conductor
2. PVC - insulation
3. PVC - outer sheath



N A Y Y

1 - SCOPE

The specification cover stranded aluminum conductor PVC insulated non sheathed and sheathed consumer connection rated at 600/1000V.
Type BS 6004 IEC 60502-1, NIS 155
For use in housing, offices and general installations.

2 – CONSTRUCTION

2.1 – Conductor

Circular and compacted circular stranded Aluminum conductors (Class 2) conforming to IEC 60228.

2.2 – Insulation

The insulation shall be polyvinyl chloride compound type PVC/C applied around the stranded aluminum conductor. The insulation shall comply with the specific value given in the next table.

2.3 - Sheath

The sheath shall be polyvinyl chloride compound of type PVC/ST 4 applied around the inner covering shall fit closely and shall be capable of being removed without damage to the insulation (inner covering).

PVC INSULATED CONSUMER CONNECTION
-Aluminum Cables

SPECIFICATION: BS 6004, IEC 60227, NIS 155

TYPE: NAY

IDENTIFICATION:
N: Standard cable type
A: Aluminum conductor
Y: PVC Insulation

APPLICATION: Use in housing, offices and general installation.

NOMINAL CROSS SECTIONAL AREA mm^2	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF INSULATION mm	APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A in air	WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM
4	1/2.25	0.8	3.9	30	2	100	Coil
6	1/2.76	0.8	4.4	36	3	100	Coil
10	1/3.57	1.0	5.6	49	5	100	Coil
16	7/1.70	1.0	7.1	63	7	100	Coil
25	7/2.10	1.2	8.7	82	12	100	Coil
35	7/2.50	1.2	19.9	100	15	100	Coil
50	19/1.80	1.4	11.8	124	197	1000	R10
70	19/2.10	1.4	13.3	125	261	1000	R10
95	19/2.50	1.6	15.7	194	370	1000	R12
120	37/2.03	1.6	17.4	227	447	1000	R12
150	37/2.25	1.8	19.4	259	552	1000	R12
185	37/2.25	2.0	21.5	300	690	1000	R14
240	61/2.25	2.2	24.7	358	893	1000	R14
300	61/2.52	2.4	27.5	414	561	500	R12
400	61/2.85	2.6	30.95	500	711	500	R14
500	61/3.20	2.8	34.4	574	887	500	R14
630	91/2.96	2.8	38.2	657	1099	500	R16
800*	127/2.85	2.8	42.7	772	1386	500	R18
1000*	127/3.20	3.0	47.6	887	1732	500	R20

Solid aluminum conductor up to $10mm^2$
*Adapted to IEC 502

PVC INSULATED AND SHEATHED SINGLE CORE -Aluminum Consumer Connection Cables 0.6/1KV

SPECIFICATION: BS 6004, IEC 60502-1.

TYPE: NAYY

IDENTIFICATION:
N: Standard cable type
A: Aluminum conductor
Y: PVC Insulation
Y: PVC Sheath

APPLICATION: For housing, offices and for laying underground with additional protection (where likely mechanical damage) and also use in switch and distribution boards

NOMINAL CROSS SECTIONAL AREA mm^2	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF Insulat mm	RADIAL THICKNESS OF sheath mm	APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A in air	WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
4	1/2.25	0.8	0.9	5.7	30	4	100	Coil
6	1/2.76	0.8	0.9	6.2	36	5	100	Coil
10	1/3.57	1.0	0.9	7.4	49	7	100	Coil
16	7/1.70	1.0	1.0	9.1	63	11	100	Coil
25	7/2.14	1.2	1.1	11.0	82	17	100	Coil
35	7/2.52	1.2	1.1	12.2	100	103	100	Coil
50	19/1.78	1.4	1.2	14.1	124	269	500	R8drum
70	19/2.14	1.4	1.2	15.9	157	343	1000	R10drum
95	19/2.52	1.6	1.3	18.4	194	473	1000	R12drum
120	37/2.03	1.6	1.4	20.2	227	570	1000	R12drum
150	37/2.25	1.8	1.5	22.4	259	697	1000	R14drum
185	37/2.52	2.0	1.6	24.8	300	863	1000	R14drum
240	61/2.25	2.2	1.7	28.1	358	1101	1000	R16drum
300	61/2.52	2.4	1.8	30.9	414	678	500	R14drum
400	61/2.85	2.6	1.9	34.7	500	849	500	R14drum
500	61/3.20	2.8	2.1	38.6	574	1056	500	R16drum
630	91/2.96	2.8	2.2	42.6	657	1296	500	R18drum
800*	127/2.85	2.8	2.4	47.5	772	1630	500	R20drum

Solid aluminum conductor up to $10mm^2$
*Adapted to IEC 60502-1.

MicCom

The Quality Cable Makers

A Legacy of Quality SINCE 1978

CORE PURPOSE

To provide QUALITY Electrical Cables & W ires that is in conformity with international standard. Thus contributing to the technological and Industrial development of Nigeria and the African continent as a whole.

CORE VALUES

At **MicCom Cables & Wires Ltd** we promise to:

- Deliver quality products & services at all times
- Act with integrity
- Act with urgency and purpose!
- Show respect for others and ourselves!
- Eliminate waste and wasteful practices!
- Take cleanliness as a way of life
- Maintain a safety environment at all times!
- Be disciplined in all we do!
- Be practical in our approach to work
- Continually learn, grow, and improve

LOW TENSION

INDUSTRIAL and DISTRIBUTION LOW TENSION CABLES

cables

MicCom
The Quality Cable Makers
A Legacy of Quality SINCE 1978

5

INDUSTRIAL AND DISTRIBUTION LOW TENSION CABLES

RECOMMENDED

ORDERING PARAMETERS

For prompt quotation/supplies please make sure your inquiries and your orders are securin the following data:

1. International or Special Standard. (Alternatively, the precise usage of the cable.)
2. Rated Voltage
3. Copper or Aluminum Conductors
4. Size of each Conductor
5. Insulation material: general purpose PVC, special PVC, XLPE or others
6. Number of Conductors
7. Other Requirements
8. Packing
9. Required Delivery Time
10. Required Validity

GENERALITIES

5.2.1 CONDUCTORS

The commonly used conductors materials are copper and aluminum meeting the requirements of IEC 60228.

Theoretical characteristics of copper and aluminum are as follows:

	Annealed Copper	Aluminium
Specific Gravity (kg/dm^3)	8.9	2.7
Resistivity at 20°C (Ohm. mm^2/m)	17.241 x 10 - 3	28.264 x 10 - 3
Breaking Load (daN/mm^2)	23 to 25	12 to 15
Elongation at break (%)	20 to 40	1 to 4

Equivalent standardized cross sectional area at equal voltage drop

Copper (mm^2)	Aluminium (mm^2)
6	10
10	16
16	25
25	35
35	50
50	70
70	95
95	150
120	185
150	240
185	300

Solid copper conductor up to $6mm^2$
Solid aluminum conductor up to $10mm^2$

5.2.2 PROPERTIES OF INSULATING MATERIALS

MATERIAL	PVC	PE	XLPE
Specific gravity (Kg/dm³)	1.3 - 1.5	0.92 - 0.97	0.92 - 1.18
Dielectric constant	5 - 8	2.3	2.5
Breaking load (bars) min.	100 - 200	100	125 - 150
Elongation at break min.	150 %	350 %	200 %
Max. continuous operating temperature (°C)	70 - 105	70	90
Max. short circuit temperature (°C)	160	150	250
Moisture proof	Good	Very good	Very good
Flame proof	Very good	Poor	Poor
Flexibility	Good	Poor	Poor
Insulation resistance constant Kiat20°C(Megohm x km)	5000	> 20.000	> 20.000

5.2.3 DETERMINATION OF THE CROSS SECTIONAL AREA

The determination of the cross sectional area depends on the:

- Current carrying capacities in continuous loading
- Voltage drop in continuous loading
- Permissible short-circuit current
- Conditions of installation (temperature, spacing,…)

5.2.4 CURRENT CARRYING CAPACITIES

The heat produced by the cable under the set conditions must be able to dissipate to the ambient environment at any point of the cable installation; therefore the loading of the cabl must be limited accordingly. The current carrying capacities shown in the electrical characteristics tables are calculated according to the internationally adopted method of the IEC publication 60287 for a maximum core temperature of 70 °C for PVC insulated cables and 90°C for XLPE cables, at the following installation conditions:

i. Buried Cables

The stated values are for cables or ducts placed in the ground at a depth of 600mm of average thermal resistivity of 100°C cm/w and spaced so that the temperature rise in each duct has no effect on the other ducts (space being greater than 1 meter), for a soil temperature of 20°C

Where the thermal resistivity is different (not 100°cm/w) the current rating should be multiplied by the correction factors shown in the following table

Correction factor for different soil thermal resistivity

Nature of the soil	Soil thermal resistivity °C.cm/w	Correction factor
Very wet soil	40	1.25
	50	1.21
	70	1.13
Normal soil	85	1.05
	100	1.00
Dry soil	120	0.94
	150	0.86
Very dry soil	200	0.76
	250	0.70
	300	0.65

Where the temperature of the soil is different (not 20°C) the current rating should be multiplied by the following correction factors.

Correction factor for different soil temperatures

Soil temperature (°C)	Carrying core temperature (°C)								
	65	70	75	80	85	90	95	100	105
0	1.20	1.18	1.17	1.15	1.14	1.13	1.13	1.12	1.11
5	1.15	1.14	1.13	1.12	1.11	1.10	1.10	1.09	1.08
10	1.11	1.10	1.09	1.08	1.07	1.07	1.06	1.06	1.06
15	1.05	1.05	1.04	1.04	1.04	1.04	1.03	1.03	1.03
20	1	1	1	1	1	1	1	1	1
25	0.94	0.95	0.95	0.96	0.96	0.96	0.97	0.97	0.97
30	0.88	0.89	0.90	0.91	0.92	0.93	0.93	0.94	0.94
35	0.82	0.84	0.85	0.87	0.88	0.89	0.89	0.90	0.91
40	0.75	0.77	0.80	0.82	0.83	0.85	0.86	0.87	0.87
45	0.67	0.71	0.74	0.76	0.78	0.80	0.82	0.83	0.84
50	0.58	0.63	0.67	0.71	0.73	0.76	0.77	0.79	0.80

When several cables or ducts are laid underground with less than one meter spacing the current rating values should be multiplied by the following correction factors:

Correction factor of proximity effect for underground cables

D = overall outer sheath diameter A = space between cables

Single or multicore cables					
Number of circuits	Touching cables	One diameter spaced cables a = D	a = 0.25m	a = 0.5m	a = 1.0m
2	0.76	0.79	0.84	0.88	0.92
3	0.64	0.67	0.74	0.79	0.85
4	0.57	0.61	0.69	0.75	0.82
5	0.52	0.56	0.65	0.71	0.80
6	0.49	0.53	0.60	0.69	0.78

ii. Cables lain “in air”:

The stated values are for cables or duct laid “in air” with an ambient temperature of 30 °c an out of direct sunlight, spaced so that the temperature rise of individual cables has no influence on others.

The spacing between adjacent cables is at least twice the cable or duct diameter.

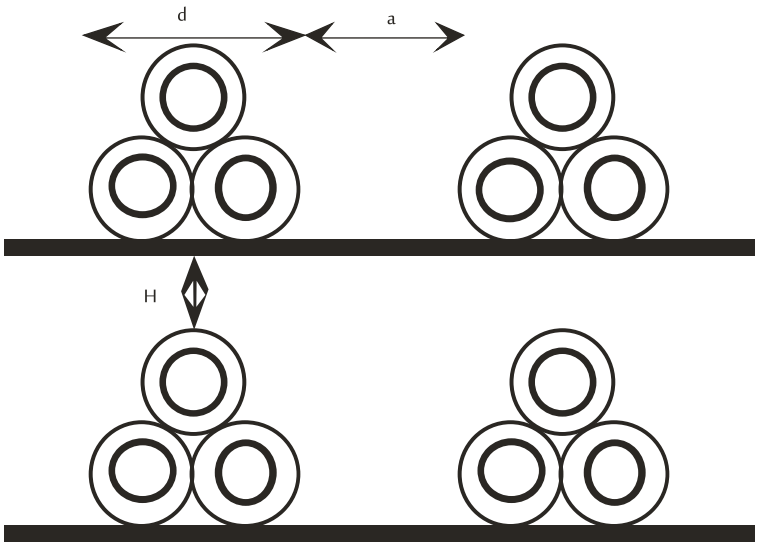
When the ambient temperature is different (not 30°c) the current rating values should be multiplied by the following correction factors:

Correction factor for different ambient temperatures

Ambient temperature (°C)	Carrying core temperature (°C)								
	65	70	75	80	85	90	95	100	105
0	1.36	1.32	1.29	1.26	1.24	1.22	1.21	1.20	1.18
5	1.31	1.27	1.25	1.22	1.21	1.19	1.18	1.16	1.15
10	1.25	1.22	1.20	1.18	1.17	1.15	1.14	1.13	1.13
15	1.20	1.17	1.15	1.14	1.13	1.12	1.11	1.10	1.10
20	1.13	1.12	1.11	1.10	1.09	1.08	1.07	1.07	1.06
25	1.07	1.06	1.05	1.05	1.04	1.04	1.04	1.04	1.03
30	1	1	1	1	1	1	1	1	1
35	0.93	0.94	0.94	0.95	0.95	0.96	0.96	0.96	0.97
40	0.85	0.87	0.88	0.89	0.90	0.91	0.92	0.93	0.93
45	0.76	0.79	0.82	0.84	0.85	0.87	0.88	0.89	0.89
50	0.65	0.71	0.75	0.77	0.80	0.82	0.83	0.85	0.86
55	0.53	0.61	0.67	0.71	0.74	0.76	0.78	0.80	0.82
60	0.38	0.50	0.58	0.63	0.67	0.71	0.73	0.76	0.77
65		0.35	0.47	0.55	0.60	0.65	0.68	0.71	0.73
70			0.33	0.45	0.52	0.58	0.62	0.65	0.68
75				0.32	0.43	0.50	0.55	0.60	0.63
80					0.30	0.41	0.48	0.53	0.58
85						0.29	0.39	0.46	0.52
90							0.28	0.38	0.45
95								0.27	0.37
100									0.26

When several cables are grouped, the current rating values should be corrected as follows

Correction of proximity effect for cables in air



Distance a & H	Number of Layers	Number of cables					
		1	2	3	4	5	6
≥2d		No proximity effect					
1/4d to 2d	1	1.00	0.94	0.91	0.88	0.87	0.87
	2	0.92	0.87	0.84	0.81	0.80	0.80
	3	0.85	0.81	0.78	0.76	0.75	0.75
< 1/4d	4	0.82	0.78	0.74	0.73	0.72	0.72
	5	0.80	0.76	0.72	0.71	0.70	0.70
	6	0.79	0.75	0.71	0.70	0.69	0.69
—	1	1.00	0.80	0.70	0.65	0.60	0.60

5.2.5 VOLTAGE DROP

In addition to the current rating, the determination of the cross sectional area should ensure that the selected cable size is capable to carry the required current between sending and receiving ends of line with a maximum of 3% in voltage drop for lighting purpose circuits and 5% for others.
The voltage drop values shown in the electrical characteristics tables are in V/A x km calculated.

The voltage drop between sending and receiving ends of line is:

$$DU = U^1 - U^2 \text{ in Volts}$$

$$DU = \frac{U^1 - U^2}{U^1} \times 100 \text{ in \%}$$

In D.C :DU = 2 1 RI

In Single Phase :DU = 2 1 I (R cos n + LW sin n)

In three Phase :DU = 1 Iv 3 (R cos n + LW sin n)

Where

DU	=	voltage drop in volt
I	=	cable length in km
i	=	current rating in amper
R	=	conductor resistance at the maximum operating temperature in Ohm/km
L	=	inductance in H/km
W	=	pulsation = $2\pi F$ = 3.14 for F = 50Hz
Cos n	=	power factor

5.2.6 CONDUCTORS SHORT - CIRCUIT CURRENT

Current densities given in the table below are in (A/mm ^{2}), for different insulation materials and different overload time.

material	Temperature of conductors		Current density (A / mm^2)									
			Conductor metal									
			Copper					Aluminium				
	Initial °C	Final °C	overload in secs									
			0.1	0.2	0.5	1	99	0.1	0.2	131	93	2
PE	20	150	446	315	199	141	95	294	208	125	88	66
	30		424	300	189	134	75	278	197	99	70	63
	70		375	237	150	106	102	221	156	135	96	49
PVC	20	160	458	324	205	145	98	304	215	127	90	68
	30		436	309	195	138	79	284	210	104	73	64
	70		351	248	158	111	124	231	163	164	116	52
XLPE	20	250	557	394	249	176	120	367	260	159	112	82
	30		538	380	241	170	98	354	254	129	91	79
	90		439	311	196	139	2	288	203	0.5	1	65

For overload duration (t) different than those figured in the above table, the correspondent current density is given by the following formula:

$$\text{Current density for a duration (t)} = \frac{\text{current density for 1 sec}}{\sqrt{t}}$$

5.2.7 MINIMUM BENDING RADIUS

Listed values represent the permanent bending radius the cables withstand in fixed installation and on dispatching reels. Other constraints may impose greater bending radius.

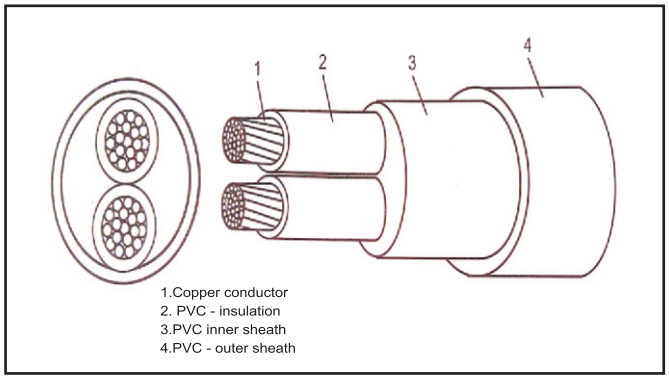
	Cable on drum	Cable during installation	Installed Cable
Unarmoured single core cables	9 D	18 D	9 D
Unarmoured multi core cables	6 D	12 D	6 D
Armoured cables - steel tapes	8 D	16 D	8 D
- steel wires	10 D	20 D	10 D
	D = Overall diameter in mm		

5.3

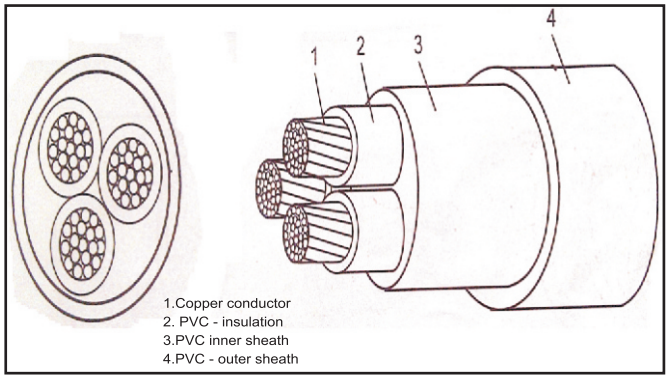
ARMOURED, NON- ARMOURED PVC OR XLPE INSULATED AND PVC SHEATHED CABLES

0.6/1KV POWER CABLES

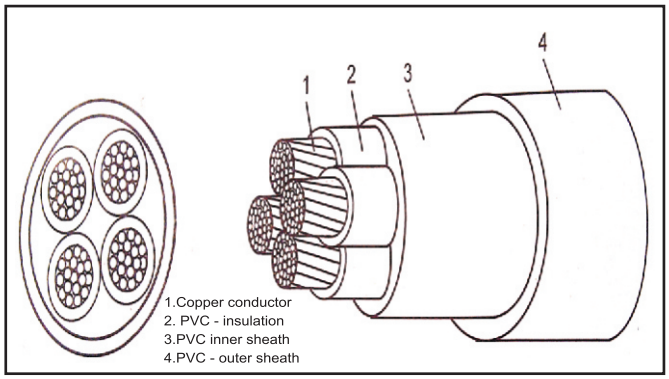
The specification cover single, two, three or four core cables, PVC or XLPE insulated and PVC sheathed, rated at 0.6/1kv, unarmored type to International Electro technical Commission Publication IEC 60502-1 for use in cable ducts - and indoors and for underground burial, where they are not likely to suffer mechanical damage. The cables have excellent thermal properties, high dielectric strength and high resistance to ageing, a brasion, moisture, chemicals, acids and oils.



Plain, annealed electrolytic copper or aluminum conductors, solid, circular stranded, or sectoral stranded; conforming to the applicable requirements of IEC 60228.



PVC based thermoplastic or XLPE thermosetting material, conforming to the applicable requirements of IEC 60502-1.



Insulated conductors are laid up, filled where necessary with non- hygroscopic material and covered with an additional layer of extruded thermoplastic material or non - hygroscopic binding tape.

PVC based thermoplastic material, conforming to the applicable requirements of IEC 60502-1

Conforming to the applicable requirements of IEC 60502-1 either on raw materials or on finished products.

1	Stranded circular copper or aluminium conductor *stranded sectoral copper or aluminium conductor
2	PVC or XLPE insulation
3	PVC Sheath

MicCom

PVC INSULATED AND SHEATHED ONE CORE NON ARMOURED COPPER MAINS CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NCYY 1 - core

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: P VC Insulation
Y: PVC Sheath

APPLICATION: Used in installations, in cable ducts/trays and in industrial plants, substations. Can also be used underground with additional protections (where mechanical damage may be expected).

DIMENSIONAL CHARACTERISTICS

NOMINAL CROSS SECTIONAL AREA mm²	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF		APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM
		Insulation mm	sheath mm		in ground	in air			
1.5	1/1.38	0.8	1.4	5.8	31	23	6.1	100	Coil
2.5	1/1.78	0.8	1.4	6.2	42	31	7.7	100	Coil
4	1/2.25	1.0	1.4	7.1	55	40	10.0	100	Coil
6	1/2.76	1.0	1.4	7.6	70	51	12.4	100	Coil
10	7/1.35	1.0	1.4	8.9	92	70	18.0	100	Coil
16	7/1.70	1.0	1.4	9.9	122	91	24.8	100	Coil
25	7/2.14	1.2	1.4	11.6	160	122	361	1,000	R10
35	7/2.50	1.2	1.4	12.7	197	152	467	1,000	R10
50	19/1.78	1.4	1.4	14.5	235	187	608	1,000	R10
70	19/2.14	1.4	1.4	16.3	294	235	828	1,000	R12
95	19/2.52	1.6	1.5	18.8	353	292	1115	1,000	R12
120	37/2.03	1.6	1.5	20.4	403	339	1365	1,000	R12
150	37/2.25	1.8	1.6	22.6	454	387	1658	1,000	R14
185	37/2.52	2.0	1.7	25.0	521	444	2077	1,000	R16
240	61/2.25	2.2	1.8	28.0	605	539	1338	500	R14
300	61/2.52	2.4	1.9	31.3	689	618	1657	500	R14
400	61/2.85	2.6	2.0	34.9	806	740	2106	500	R14
500	61/3.20	2.8	2.1	38.6	932	870	2636	500	R16
*630	91/2.97	2.8	2.2	42.7	1092	1024	3370	500	R18

Solid copper conductor up to 6mm²

PVC INSULATED AND SHEATHED TWO CORE NON ARMOURED COPPER MAINS CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NCYY 2 - core

IDENTIFICATION:
N: Standard cable type
C: Copper conductor
Y: PVC Insulation
Y: PVC Sheath

APPLICATION: Used in installations, in cable ducts/trays and in industrial plants, substations. Can also be used underground with additional protections (where mechanical damage may be expected).

NOMINAL CROSS SECTONAL AREA mm²	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF			APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
		Insulation mm	inner sheath mm	outer sheath mm		in ground	in air			
1.5	1/1.38	0.8	0.8	1.8	11.2	25	17	154	1000	R8
2.5	1/1.78	0.9	0.8	1.8	12.4	34	23	193	1000	R10
4	1/2.25	1.0	0.8	1.8	13.8	45	30	251	1000	R10
6	1/2.76	1.0	0.8	1.8	14.8	55	40	307	1000	R10
10	7/1.35	1.0	0.8	1.8	17.4	74	55	443	1000	R12
16	7/1.70	1.0	0.8	1.8	19.4	97	74	597	1000	R12
25	7/2.14	1.2	1.2	1.8	23.6	126	98	904	1000	R14
35	7/2.50	1.2	1.2	2.0	26.4	151	120	1176	1000	R14
50	19/1.78	1.4	1.2	2.0	28.8	176	146	1502	1000	R16
70	19/2.14	1.4	1.5	2.0	34.0	218	185	1031	500	R14
95	19/2.52	1.6	1.5	2.2	39.0	265	224	1387	500	R16
120	37/2.03	1.6	1.5	2.2	42.2	302	260	1676	500	R18
150	37/2.25	1.8	1.8	2.6	47.6	336	299	2097	500	R20

Solid copper conductor up to 6mm²
Stranded sectoral conductor for sizes of 50mm² and above

PVC INSULATED AND SHEATHED THREE -CORE NON ARMOURED COPPER MAINS CABLES 0.6/1KV

SPECIFICATION: IEC 60502 -1

TYPE: NCYY 3 - core

IDENTIFICATION:
N: Standard cable type
C: Copper conductor
Y: PVC Insulation
Y: PVC Sheath

APPLICATION: Used in installations, in cable ducts/trays and in industrial plants, substations. Can also be used underground with additional protections (where mechanical damage may be expected).

DIMENSIONAL CHARACTERISTICS

NOMINAL CROSS SECTIONAL AREA mm^2	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF			APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
		Insulation mm	inner sheath mm	outer sheath mm		in ground	in air			
1.5	1/1.38	0.8	0.8	1.8	11.7	23	15	172	1000	R10
2.5	1/1.78	0.9	0.8	1.8	13.0	30	21	222	1000	R10
4	1/2.25	1.0	0.8	1.8	14.5	39	28	291	1000	R10
6	1/2.76	1.0	0.8	1.8	15.5	49	36	362	1000	R12
10	7/1.35	1.0	0.8	1.8	18.3	65	50	533	1000	R12
16	7/1.70	1.0	1.0	1.8	21.3	84	56	775	1000	R12
25	7/2.14	1.2	1.0	1.8	25.4	109	88	1147	1000	R14
35	7/2.50	1.2	1.0	2.0	28.0	130	109	1477	1000	R16
50	19/1.78	1.4	1.2	2.0	32.2	155	131	977	500	R16
70	19/2.14	1.4	1.2	2.0	36.5	193	167	1332	500	R16
95	19/2.52	1.6	1.4	2.2	41.4	231	202	1776	500	R20
120	37/2.03	1.6	1.4	2.2	46.3	265	234	2235	500	R20
150	37/2.25	1.8	1.4	2.6	50.6	298	269	2695	500	R20

Solid copper conductor up to $6mm^2$
Stranded sectoral conductor for sizes of $50mm^2$ and above

PVC INSULATED AND SHEATHED FOUR - CORE NON ARMOURED COPPER MAINS CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NCYY 4- core

IDENTIFICATION:
N: Standard cable type
C: Copper conductor
Y: PVC insulation
Y: PVC Sheet

APPLICATION: Used in installations, in cable ducts/trays and in industrial plants, substations. Can also be used underground with additional protections (where mechanical damage may be expected).

NOMINAL CROSS SECTIONAL AREA mm ≤	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF			APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
		Insulation mm	inner sheath mm	outer sheath mm		in ground	in air			
1.5	1/1.38	0.8	0.8	1.8	12.4	23	15	201	1000	R10
2.5	1/1.78	0.9	0.8	1.8	13.9	30	21	265	1000	R10
4	1/2.25	1.0	0.8	1.8	15.6	39	28	353	1000	R12
6	1/2.76	1.0	0.8	1.8	16.8	49	36	447	1000	R12
10RS	7/1.35	1.0	0.8	1.8	19.9	65	50	667	1000	R12
16RS	7/1.70	1.0	1.0	1.8	22.7	84	66	952	1000	R14
25RS	7/2.14	1.2	1.0	2.0	27.2	109	88	1427	1000	R14
35RS	7/2.50	1.2	1.0	2.0	30.1	130	109	1854	1000	R16
35RS	7/2.58	1.2	1.0	2.0	25.9	130	109	1861	1000	R14
50RS	19/1.78	1.4	1.2	2.2	35.0	155	131	1241	500	R14
50SS	19/1.83	1.4	1.0	2.0	29.1	155	131	2420	1000	R16
70RS	19/2.14	1.4	1.2	2.2	39.4	193	167	1684	500	R18
70SS	19/2.19	1.4	1.2	2.0	32.5	193	167	1657	500	R14
95RS	19/2.25	1.6	1.5	2.6	46.3	231	202	1869	400	R18
95SS	19/2.57	1.6	1.2	2.2	37.4	231	202	2245	500	R18
120SS	37/2.08	1.6	1.2	2.4	40.6	265	234	2881	500	R22
150SS	37/2.28	1.8	1.4	2.5	45.3	298	269	3452	500	R22
185SS	37/2.58	2.0	1.6	2.7	49.1	336	307	4354	500	R22
240SS	61/2.30	2.2	1.6	2.9	55.8	391	361	2775	250	R22

Solid copper conductor up to 6mm^2
Stranded sectoral conductor for sizes of 50mm^2 and above

PVC INSULATED AND SHEATHED FIVE -CORE NON ARMOURED COPPER MAINS CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NCYY 5 - core

IDENTIFICATION:
N: Standard cable type
C: Copper conductor
Y: PVC Insulation
Y: PVC Sheath

APPLICATION: Used in installations, in cable ducts/trays and in industrial plants, substations. Can also be used underground with additional protections (where mechanical damage may be expected).

NOMINAL CROSS SECTIONAL AREA mm^2	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF			APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
		Insulation mm	inner sheath mm	outer sheath mm		in ground	in air			
1.5	1/1.38	0.8	0.8	1.8	13.3	16	11	237	1000	R10
2.5	1/1.78	0.9	0.8	1.8	14.9	21	16	316	1000	R10
4	1/2.25	1.0	0.8	1.8	16.8	27	21	426	1000	R12
6	1/2.76	1.0	0.8	1.8	18.2	34	27	545	1000	R12
10	7/1.35	1.0	1.8	1.8	22.1	46	38	843	1000	R14
16	7/1.70	1.0	1.0	2.0	25.2	59	50	1202	1000	R14
25	7/2.14	1.2	1.0	2.0	29.8	76	66	1775	1000	R16
35	7/2.50	1.2	1.0	2.0	31.2	91	82	2178	1000	R16
50	19/1.78	1.4	1.0	2.2	36.2	109	99	1454	500	R14
70	19/2.14	1.4	1.0	2.6	41.9	135	125	2040	500	R14

Solid copper conductor up to $6mm^2$
Stranded sectoral conductor for sizes of $50mm^2$ and above

PVC INSULATED AND SHEATHED FOUR-CORE NON ARMOURED COPPER MAINS CABLES WITH REDUCE NEUTRAL 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NCYY / NAYY $3^1/_2$ - core

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
Y: PVC Sheath
A: Aluminium

APPLICATION: Used in installations, in cable ducts/trays and in industrial plants, substations. Can also be used underground with additional protections (where mechanical damage may be expected).

Nominal cross section*	Radial Thickness of			APPROXIMATE DIAMETER					Approximative net weight				Length on drum
	Insulation		Outer Sheath	Conductor		Insulation		Overall	Copper cable		Aluminium cable		
									Conductor	Cable	Conductor	Cable	
mm^2	mm		mm	mm		mm		mm	Kg/Km	Kg/Km	Kg/Km	Kg/Km	m
3 x Ph. +N.	Ph.	N.		Ph.	N.	Ph.	N.						
3 x 25+16	1.2	1.0	1.8	6.02	4.83	8.42	6.83	24	817	1320	249	750	500
3 x 35 + 16	1.2	1.0	1.8	7.5	4.83	9.9	6.83	26	1086	1530	333	775	500
3 x 50 + 25	1.4	1.2	1.9	shaped	6.02	shaped	8.42	29	1504	2080	460	1040	500
3 x 70 + 35	1.4	1.2	2.0	shaped		shaped		32	2163	2850	662	1350	500
3 x 95 + 50	1.6	1.4	2.2	shaped		shaped		38	2989	3890	914	1820	500
3 x 120+ 70	1.6	1.4	2.3	shaped		shaped		41	3858	4890	1179	2210	250
3 x 150+ 70	1.8	1.4	2.4	shaped		shaped		44	4595	5800	1404	2610	250
3 x 185+ 95	2.0	1.6	2.6	shaped		shaped		50	5845	7350	1786	3290	250
3 x 240+120	2.2	1.6	2.8	shaped		shaped		56	7638	9500	2334	4200	250
3 x 300+150	2.4	1.8	3.0	shaped		shaped		62	9552	11800	2919	5150	250

Solid aluminum conductor up to $6mm^2$
Stranded sectoral conductor for sizes of $50mm^2$ and above

ELECTRICAL CHARACTERISTICS (Copper and Aluminum)
NON-ARMOURED, PVC INSULATED AND PVC SHEATHED 0.6/1KV

Conforming to IEC 60502-1

Nominal cross section	DC Resistance at 20°C(1)		Voltage Drop(2) Cosn = 0.8		Current carrying capacity(3)			
					Underground Cable		Cables in air	
	Copper	Alu	Copper	Alu	Copper	Alu	Copper	Alu
mm 2	S/Km	S/km	V/A x Km	V/A x Km	Am p	Am p	Am p	Am p
1.5	12.1	...	23.3	...	30	...	22	...
2.5	7.41	...	14.2	...	41	...	30	...
4	4.61	...	9.0	...	53	...	40	...
6	3.08	...	6.1	...	67	...	52	...
10	1.83	3.08	3.7	6.1	91	67	71	55
16	1.15	1.91	2.3	3.8	115	90	96	75
25	0.727	1.20	1.5	2.4	146	114	127	99
35	0.524	0.868	1.1	1.7	176	137	157	125
50	0.387	0.641	0.9	1.4	212	165	190	151
70	0.268	0.443	0.6	1.0	261	204	242	192
95	0.193	0.320	0.5	0.7	313	244	293	232
120	0.153	0.253	0.4	0.6	358	279	339	269
150	0.124	0.206	0.4	0.5	400	312	390	309
185	0.0991	0.164	0.3	0.4	451	352	444	353
240	0.0754	0.125	0.3	0.3	522	407	522	415
300	0.0601	0.100	0.2	0.3	590	460	595	472
400	0.0470	0.0778	0.2	0.2	680	530	695	552
500	0.0366	0.0605	0.2	0.2	769	599	780	618
630	0.0283	0.0469	0.2	0.2	870	678	885	705
800	0.0221	0.0367	0.2	0.2	979	763	990	790

1. At different operating T(°C) : R = R20 °C{1+ α (T°C - 20) }
   α : Temperature coefficient at 20°C = 0.00393 for copper and 0.00403 for aluminum

2. In three phase system decrease above listed voltage drop by 15%

3. a) Laying conditions: - Underground : Temperature of the soil 20°C
   - Thermal resistivity 100°C cm/w
   - In air : Ambient temperature 30°C

   b) In three phase system decrease above listed current ratings by 10%

NON-ARMOURED, XLPE INSULATED, PVC SHEATHED 1-CORE POWER CABLE 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NC2XY 1 - core

IDENTIFICATION:
N: Standard cable type
C: Copper conductor
2X: XLPE Insulation
Y: PVC Sheath

APPLICATION: Used in low voltage distribution system intended for urban and rural electrification schemes, in consumer connections derived from the distribution system.

DIMENSIONAL CHARACTERISTICS

Nominal cross section*	Radial Thickness of		APPROXIMATE DIAMETER			Approximative net weight				Length on drum
	Insulation	Outer Sheath	Conductor	Insulation	Overall	Copper cable		Aluminium cable		
						Conductor	Cable	Conductor	Cable	
mm^2	mm	mm	mm	mm	mm	Kg/Km	Kg/Km	Kg/Km	Kg/Km	m
1 x 1.5	0.7	1.4	1.38	2.78	5.7	13	45	...	...	1000
1 x 2.5	0.7	1.4	1.78	3.18	6.1	22	57	...	...	1000
1 x 4	0.7	1.4	2.25	3.65	6.6	35	74	...	...	1000
1 x 6	0.7	1.4	2.76	4.35	7.3	53	99	...	...	1000
1 x 10	0.7	1.4	3.82	5.22	8.1	89	144	28	83	1000
1 x 16	0.7	1.4	4.83	6.23	9.2	141	206	43	108	1000
1 x 25	0.9	1.4	6.02	7.82	11	223	307	68	152	500
1 x 35	0.9	1.4	7.15	8.95	12	309	406	95	192	500
1 x 50	1.0	1.4	8.30	10.3	14	418	525	128	235	500
1 x 70	1.1	1.4	10.00	12.20	16	604	735	185	316	500
1 x 95	1.1	1.5	11.80	14.00	18	838	1000	256	418	500
1 x 120	1.2	1.5	13.30	15.70	19	1059	1240	324	505	500
1 x 150	1.4	1.6	14.80	17.60	21	1299	1520	398	620	500
1 x 185	1.6	1.6	16.55	19.75	24	1630	1890	499	760	500
1 x 240	1.7	1.7	19.40	22.80	27	2143	2460	655	970	500
1 x 300	1.8	1.8	21.30	24.90	29	2688	3060	822	1190	500
1 x 400	1.9	1.9	24.10	28.10	33	3439	3890	1051	1500	500
1 x 500	2.2	2.0	27.00	31.70	36	4335	4870	1325	1860	500
1 x 630	2.4	2.2	31.00	35.80	41	5597	6250	1710	2370	500
1 x 800	2.6	2.3	37.10	42.30	48	7203	8050	2188	3040	250

NON-ARMOURED, XLPE INSULATED, PVC SHEATHED 2-CORE POWER CABLE 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NC2XY 2 - core

IDENTIFICATION:
N: Standard cable type
C: Copper conductor
2X: XLPE Insulation
Y: PVC Sheath

APPLICATION: Used in low voltage distribution system intended for urban and rural electrification schemes, in consumer connections derived from the distribution system.

DIMENSIONAL CHARACTERISTICS

Nominal cross section*	Radial Thickness of		APPROXIMATE DIAMETER			Approximative net weight				Length on drum
	Insulation	Outer Sheath	Conductor	Insulation	Overall	Copper cable		Alumimium cable		
						Conductor	Cable	Conductor	Cable	
mm^2	mm	mm	mm	mm	mm	Kg/Km	Kg/Km	Kg/Km	Kg/Km	m
2 x 1.5	0.7	1.8	1.38	2.78	10	27	120	...	...	1000
2 x 2.5	0.7	1.8	1.78	3.18	11	44	151	...	...	1000
2 x 4	0.7	1.8	2.25	3.65	12	70	195	...	...	1000
2 x 6	0.7	1.8	2.95	4.35	13	107	262	...	...	1000
2 x 10	0.7	1.8	3.82	5.22	15	179	375	55	251	1000
2 x 16	0.7	1.8	4.83	6.23	17	284	530	87	333	1000
2 x 25	0.9	1.8	6.02	7.82	21	450	795	138	483	500
2 x 35	0.9	1.8	7.15	8.95	23	624	1040	191	605	500

Solid conductor for sizes up to and including $6mm^2$

NON-ARMOURED, XLPE INSULATED, PVC SHEATHED 3-CORE POWER CABLE 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NC2XY 3 - core

IDENTIFICATION:
N: Standard cable type
C: Copper conductor
2X: XLPE Insulation
Y: PVC Sheath

APPLICATION: Used in low voltage distribution system intended for urban and rural electrification schemes, in consumer connections derived from the distribution system.

DIMENSIONAL CHARACTERISTICS

Nominal cross section*	Radial Thickness of		APPROXIMATE DIAMETER			Approximative net weight				Delivery on drum
	Insulation	Outer Sheath	Conductor	Insulation	Overall	Copper cable		Alumimium cable		
						Conductor	Cable	Conductor	Cable	
mm^2	mm	mm	mm	mm	mm	Kg/Km	Kg/Km	Kg/Km	Kg/Km	m
3 x 1.5	0.7	1.8	1.38	2.78	11	40	137	...	...	1000
3 x 2.5	0.7	1.8	1.78	3.18	12	66	178	...	...	1000
3 x 4	0.7	1.8	2.25	3.65	13	105	235	...	...	1000
3 x 6	0.7	1.8	2.95	4.35	14	160	320	...	...	1000
3 x 10	0.7	1.8	3.82	5.22	16	269	470	82	283	1000
3 x 16	0.7	1.8	4.83	6.23	18	426	675	130	379	1000
3 x 25	0.9	1.8	6.02	7.82	22	675	1020	206	550	500
3 x 35	0.9	1.8	circular	circular	22	945	1220	289	565	500
3 x 50	1.0	1.8	shaped	shaped	25	1278	1610	391	725	500
3 x 70	1.1	1.9	shaped	shaped	29	1848	2270	565	985	500
3 x 95	1.1	2.0	shaped	shaped	32	2562	3060	783	1280	500
3 x 120	1.2	2.1	shaped	shaped	36	3242	3840	990	1590	250
3 x 150	1.4	2.3	shaped	shaped	42	3978	4760	1216	2000	250
3 x 185	1.6	2.4	shaped	shaped	44	4990	5900	1525	2440	250
3 x 240	1.7	2.6	shaped	shaped	50	6557	7650	2004	3100	250
3 x 300	1.8	2.8	shaped	shaped	54	8325	9550	2514	3740	250

Solid conductor for sizes up to and including $6mm^2$

NON-ARMOURED, XLPE INSULATED, PVC SHEATHED 4-CORE POWER CABLE 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NC2XY 4 - core

IDENTIFICATION:
N: Standard cable type
C: Copper conductor
2X: XLPE Insulation
Y: PVC Sheath

APPLICATION: Used in low voltage distribution system intended for urban and rural electrification schemes, in consumer connections derived from the distribution system.

DIMENSIONAL CHARACTERISTICS

Nominal cross section*	Radial Thickness of		APPROXIMATE DIAMETER			Approximative net weight				Delivery on drum
	Insulation	Outer Sheath	Conductor	Insulation	Overall	Copper cable		Alumimium cable		
						Conductor	Cable	Conductor	Cable	
mm²	mm	mm	mm	mm	mm	Kg/Km	Kg/Km	Kg/Km	Kg/Km	m
4 x 1.5	0.7	1.8	1.38	2.78	11	53	161	...	...	1000
4 x 2.5	0.7	1.8	1.78	3.18	12	88	212	...	...	1000
4 x 4	0.7	1.8	2.25	3.65	14	140	284	...	...	1000
4 x 6	0.7	1.8	2.95	4.35	15	213	391	...	...	1000
4 x 10	0.7	1.8	3.82	5.22	17	358	580	110	332	1000
4 x 16	0.7	1.8	4.83	6.23	20	568	850	174	456	1000
4 x 25	0.9	1.8	6.02	7.82	24	900	1290	275	665	500
4 x 35	0.9	1.8	7.5	9.9	25	1259	1620	385	745	500
4 x 50	1.0	1.9	shaped	shaped	28	1705	2150	521	965	500
4 x 70	1.1	2.0	shaped	shaped	33	2464	3030	754	1320	500
4 x 95	1.1	2.1	shaped	shaped	37	3417	4100	1044	1730	500
4 x 120	1.2	2.3	shaped	shaped	41	4323	5150	1320	2150	250
4 x 150	1.4	2.4	shaped	shaped	45	5305	6350	1621	2670	250
4 x 185	1.6	2.6	shaped	shaped	50	6654	7950	2023	3330	250
4 x 240	1.7	2.8	shaped	shaped	56	8743	10300	2672	4230	250
4 x 300	1.8	3.0	shaped	shaped	62	10969	12850	3352	5250	250

Solid conductor for sizes up to and including 6mm²

NON -ARMOURED, XLPE INSULATED, PVC SHEATHED 4-CORE POWER CABLE WITH REDUCED NEUTRAL 0.6/1KV

SPECIFICATION: IEC 60502 -1

TYPE: NC2XY / NA2XY $3^1/_2$ - core

IDENTIFICATION:
N: Standard ca ble type
C: Copper condu ctor
2X: XLPE Insulatio n
Y: PVC Sheath
A: Alumin ium

APPLICATION: Used in low voltage distribution system intended for urban and rural electrification schemes, in consumer connections derived from the distribution system.

Nominal cross section*	Radial Thickness of			APPROXIMATE DIAMETER			Approximative net weight				Length on drum
	Insulation		Outer Sheath	Conductor	Insulation	Overall	Copper cable		Aluminium cable		
							Conductor	Cable	Conductor	Cable	
mm^2	mm		mm	mm	mm	mm	Kg/Km	Kg/Km	Kg/Km	Kg/Km	m
3 x Ph. +N.	Ph.	N.		Ph.	N.						
3 x 25+16	0.9	0.7	1.8	6.02	4.83	23	817	1200	249	630	500
3 x 35 + 16	0.9	0.7	1.8	7.5	4.83	24	1086	1420	333	665	500
3 x 50 + 25	1.0	0.9	1.8	shaped	6.02	26	1504	1910	460	865	500
3 x 70 + 35	1.1	0.9	1.9	shaped	shaped	31	2163	2670	662	1170	500
3 x 95 + 50	1.1	1.0	2.1	shaped	shaped	35	2989	3620	914	1500	500
3 x 120+70	1.2	1.1	2.2	shaped	shaped	39	3858	4630	1179	1950	250
3 x 150+70	1.4	1.1	2.3	shaped	shaped	42	4594	5500	1404	2310	250
3 x 185+95	1.6	1.1	2.5	shaped	shaped	47	5845	7000	1786	2940	250
3x240+120	1.7	1.2	2.7	shaped	shaped	53	7638	9000	2334	3700	250
3x300+150	1.8	1.4	2.9	shaped	shaped	59	9552	11200	2919	4570	250

ELECTRICAL CHARACTERISTICS (Copper/Aluminum)
NON-ARMOURED, PVC INSULATED, PVC SHEATHED POWER CABLES 0.6/1KV

Nominal cross section	DC Resistance at 20°C(1)		Voltage Drop(2) Cosn = 0.8		Current carrying capacity(3)			
					Underground Cable		Cables in air	
	Copper	Alu	Copper	Alu	Copper	Alu	Copper	Alu
mm^2	S/Km	S/km	V/A x Km	V/A x Km	Am p	Am p	Am p	Am p
1.5	12.1	...	24.8	...	34	...	27	...
2.5	7.41	...	14.8	...	46	...	37	...
4	4.61	...	9.2	...	59	...	50	...
6	3.08	...	6.2	...	74	...	64	...
10	1.83	3.08	3.7	6.1	101	79	88	69
16	1.15	1.91	2.4	3.9	128	100	119	93
25	0.727	1.20	1.6	2.5	162	126	157	122
35	0.524	0.868	1.2	1.9	195	152	194	151
50	0.387	0.641	0.87	1.4	235	183	235	183
70	0.268	0.443	0.64	1.0	290	226	299	234
95	0.193	0.320	0.48	0.75	347	271	362	282
120	0.153	0.253	0.40	0.60	397	310	419	327
150	0.124	0.206	0.35	0.50	444	346	481	375
185	0.0991	0.164	0.29	0.42	500	390	549	428
240	0.0754	0.125	0.24	0.33	578	452	645	503
300	0.0601	0.100	0.23	0.30	655	512	735	575
400	0.0470	0.0778	0.22	0.28	754	588	859	670
500	0.0366	0.0605	0.22	0.27	852	665	960	750
630	0.0283	0.0469	0.21	0.26	961	750	1096	855
800	0.0221	0.0367	0.21	0.26	1081	844	1235	955

Solid conductor for sizes up to and including 6mm ^{2}

1. At different operating T(°C) : $R = R20°C\{1+ \alpha (T°C - 20)\}$
   α : Temperature coefficient at 20°C = 0.00393 for copper and 0.00403 for aluminum

2. In three phase system decrease above listed voltage drop by 15%

3. a) Laying conditions:
   - Underground : Temperature of the soil 20°C - Thermal resistivity 100°C cm/w
   - In air : Ambient temperature 30°C

   b) In three phase system decrease above listed current ratings by 10%

5.4 ARMOURED, PVC OR XLPE INSULATED AND PVC SHEATHED CABLES

1 - SCOPE

The specification cover PVC or XLPE insulated, circular, twin, three or four conductors armoured cables, rated at 0.6/1 KV to International Electrotechnical Commission Publication IEC 60502-1 for us e indoors, outdoors, in cable ducts, in water and for direct burial underground, where severe mechanical stresses are present. These cables have high dielectric strength, an excellent resistance to deformations under high temperature and pressure, and high resistance to ageing, abrasion, moisture, chemicals, acids and oils.

2 – CONSTRUCTION

2.1 – Conductor

Plain, annealed electrolytic copper or aluminum conductors, solid, circular stranded, or sectoral stranded; conforming to the applicable requirements of IEC 60228.

2.2 – Insulation

PVC based thermoplastic or XLPE thermosetting material, conforming to the applicable requirements of IEC 60502-1.

2.3 - Assembly

Insulated conductors are laid up, filled where necessary with non -hygroscopic material and covered with an extruded thickness of thermoplastic material.

2.4 - Armour

Insulated conductors are laid up, filled where necessary with non -hygroscopic material and covered with extruded thickness of thermoplastic material.

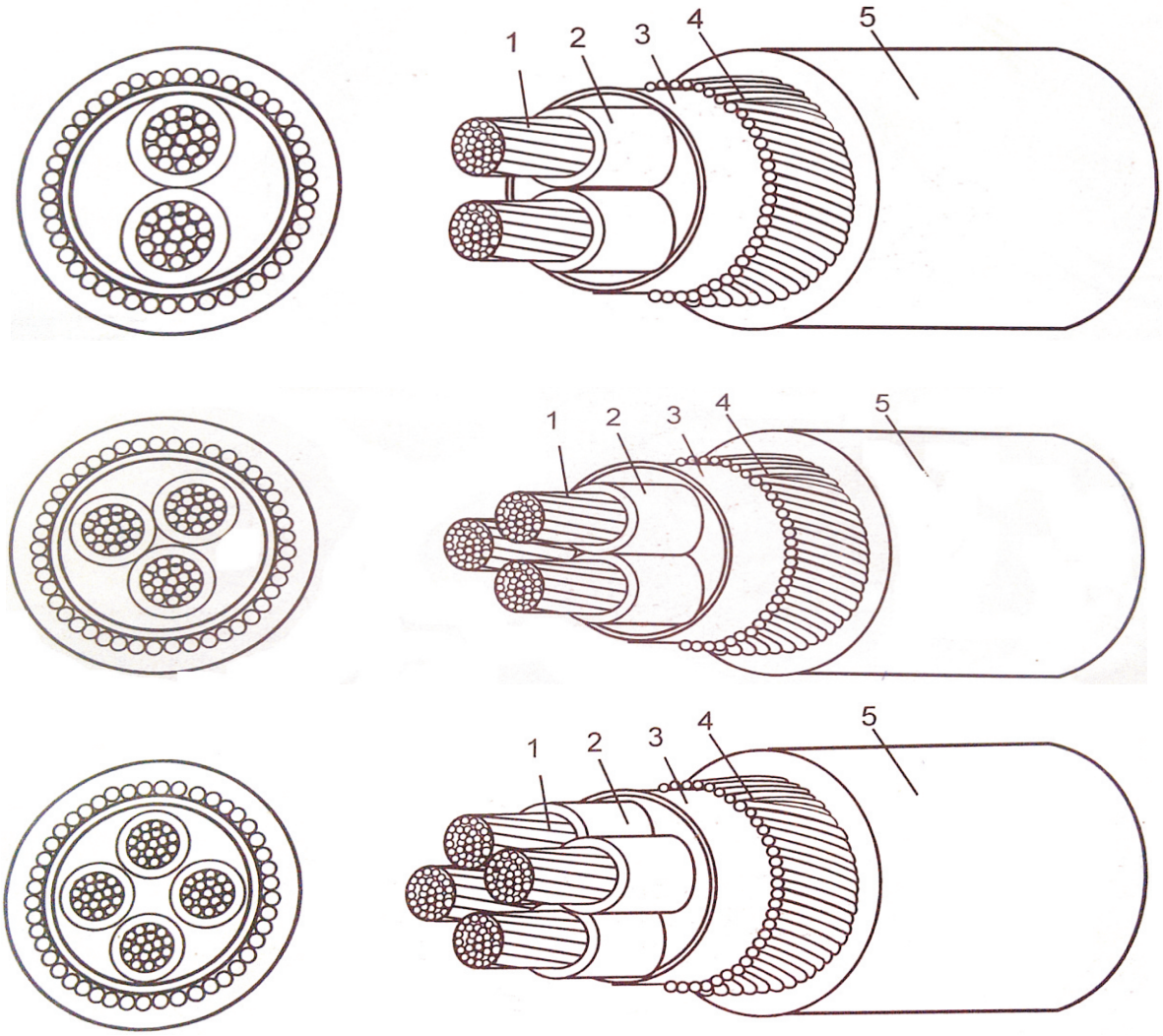
2.5 - Sheath

PVC based thermoplastic material, conforming to the applicable requirements of IEC 60502-1

2.6 - Tests

Conforming to the applicable requirements of IEC 60502 -1 either on raw materials or on finished products.

ARMOURED, PVC OR XLPE INSULATED AND PVC SHEATHED CABLES



1 Stranded circular copper or alum inium conductor

*stranded sectoral copper or alum inium conductor

2 PVC or XLPE insulation

3 Bedding

4 Galvanized flat steel strip arm our with flat steel tape applied in helical form

5 PVC or PE sheath

GALVANISED STEEL WIRE ARMOURED PVC INSULATED, PVC SHEATHED TWO CORE COPPER MAINS CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NCYRY / FY 2- core

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
R: Round galvanize steel wire or
F: Flat galvanize steel wire
Y: PVC Sheath

APPLICATION: General underground electricity supply.

DIMENSION CHARACTERISTICS

NOMINAL CROSS SECTIONAL AREA mm^2	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF			APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
		Insulation mm	inner sheath mm	outer sheath mm		in ground	in air			
1.5	1/1.38	0.8	0.8	1.8	13.0	25	17	291	1000	R10
2.5	1/1.78	0.8	0.8	1.8	14.2	34	23	355	1000	R10
4	1/2.25	1.0	0.8	1.8	16.3	45	31	502	1000	R12
6	1/2.76	1.0	0.8	1.8	17.3	55	40	580	1000	R12
10	7/1.35	1.0	0.8	1.8	19.9	74	55	768	1000	R12
16	7/1.70	1.0	0.8	1.8	22.2	97	74	1003	1000	R14
25	7/2.14	1.2	1.0	2.0	25.2	126	98	1238	1000	R14
35	7/2.50	1.2	1.0	2.0	27.6	151	120	1537	1000	R16
50	19/1.78	1.4	1.0	2.0	31.0	176	146	962	500	R14
70	19/2.14	1.4	1.2	2.2	35.4	218	186	1271	500	R16
95	19/2.52	1.6	1.2	2.2	40.0	265	225	1647	500	R20
120	37/2.03	1.6	1.2	2.2	43.2	302	260	1960	500	R22
150	37/2.25	1.8	1.2	2.6	51.3	336	299	2373	500	R22

GALVANISED STEEL WIRE ARMOURED PVC INSULATED, PVC SHEATHED THREE CORE COPPER MAINS CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NCYRY / FY 3 - core

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
R: Round galvanize steel wire or
F: Flat galvanize steel wire
Y: PVC Sheath

APPLICATION: General underground electricity supply.

NOMINAL CROSS SECTIONAL AREA mm^2	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF			APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
		insulation mm	inner sheath mm	outer sheath mm		in ground	in air			
1.5	1/1.38	0.8	0.8	1.8	13.5	3	15	319	1000	R10
2.5	1/1.78	0.9	0.8	1.8	14.8	30	21	387	1000	R10
4	1/2.25	1.0	0.8	1.8	17.0	39	28	553	1000	R12
6	1/2.76	1.0	0.8	1.8	18.0	49	36	645	1000	R12
10	7/1.35	1.0	0.8	1.8	21.1	65	50	912	1000	R12
16	7/1.70	1.0	1.0	2.0	24.1	84	66	1222	1000	R14
25	7/2.14	1.2	1.0	2.0	26.6	109	88	1484	1000	R14
35	7/2.50	1.2	1.0	2.0	29.2	130	109	1864	1000	R16
50	19/1.78	1.4	1.2	2.0	33.2	155	131	1188	500	R14
70	19/2.14	1.4	1.2	2.2	37.5	193	167	1568	500	R16
95	19/2.52	1.6	1.2	2.2	42.5	231	202	2048	500	R22
120	37/2.03	1.6	1.4	2.6	47.1	265	234	2523	500	R22
150	37/2.25	1.8	1.5	2.6	51.6	298	269	3231	500	R25

- Solid conductor for sizes up to and including $6mm^2$
- Stranded sectoral conductor for sizes of $50mm^2$ and above in three and four core cables.
- Stranded circular conductor for remaining sizes.
- Greater sections also available.

GALVANISED STEEL WIRE ARMOURED PVC INSULATED, PVC SHEATHED FOUR CORE COPPER MAINS CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NCYRY / FY 4 - core

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
R: Round galvanize steel wire or
F: Flat galvanize steel wire
Y: PVC Sheath

APPLICATION: General underground electricity supply.

NOMINAL CROSS SECTIONAL AREA mm^2	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF			APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
		Insulat mm	inner sheath mm	outer sheath mm		in ground	in air			
1.5	1/1.38	0.8	0.8	1.8	14.2	23	15	361	1000	R10
2.5	1/1.78	0.9	0.8	1.8	16.4	30	21	517	1000	R12
4	1/2.25	1.0	0.8	1.8	18.1	39	28	636	1000	R12
6	1/2.76	1.0	0.8	1.8	19.3	49	36	751	1000	R12
10RS	7/1.35	1.0	0.8	1.8	22.7	65	50	1085	1000	R14
16RS	7/1.70	1.0	1.0	2.0	24.7	84	66	1308	1000	R14
25RS	7/2.14	1.2	1.0	2.0	28.8	109	88	1814	1000	R16
35SS	7/2.58	1.2	1.0	2.0	27.5	130	109	2249	1000	R16
50SS	19/1.38	1.4	1.0	2.0	30.7	155	131	1417	500	R14
70SS	19/2.20	1.4	1.2	2.2	34.5	193	167	1920	500	R14
95SS	19/2.57	1.6	1.2	2.2	39.0	231	202	2520	500	R20
120SS	37/2.08	1.6	1.2	2.2	42.2	265	234	3161	500	R22
150SS	37/2.28	1.8	1.4	2.6	47.4	298	269	3740	500	R22
185SS	37/2.58	2.0	1.5	2.6	51.2	336	307	4617	500	R25
240SS	61/2.30	2.2	1.8	3.0	58.0	391	361	2975	250	R22

GALVANISED STEEL WIRE ARMOURED PVC INSULATED, PVC SHEATHED FIVE CORE COPPER MAINS CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NCYRY / FY 5 - core

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
R: Round galvanize steel wire or
F: Flat galvanize steel wire
Y: PVC Sheath

APPLICATION: General underground electricity supply.

NOMINAL CROSS SECTIONAL AREA mm^2	CONDUCTOR NUMBER X DIAMETER OF WIRE mm	RADIAL THICKNESS OF			APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A		WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
		insulation mm	inner sheath mm	outer sheath mm		in ground	in air			
1.5	1/1.38	0.8	0.8	1.8	15.1	16	11	407	1000	R12
2.5	1/1.78	0.9	0.8	1.8	17.4	21	15	588	1000	R12
4	1/2.25	1.0	0.8	1.8	19.3	27	20	730	1000	R12
6	1/2.76	1.0	0.8	1.8	21.0	34	25	925	1000	R14
10	7/1.35	1.0	1.0	2.0	24.1	45	35	1171	1000	R14
16	7/1.70	1.0	1.0	2.0	26.8	59	46	1563	1000	R16
25	7/2.14	1.2	1.0	2.0	31.4	76	62	1108	500	R16
35	7/2.50	1.2	1.2	2.2	35.4	91	82	1567	500	R16
50	19/1.78	1.4	1.2	2.2	40.0	109	99	1993	500	R20
70	19/2.14	1.4	1.5	2.6	46.3	135	125	2536	500	R22

- Solid conductor for sizes up to and including $6mm^2$
- Stranded sectoral conductor for sizes of $50mm^2$ and above in three and four core cables.
- Stranded circular conductor for remaining sizes.
- Greater sections also available

ELECTRICAL CHARACTERISTICS (Copper and Aluminum)
GALVANIZED STEEL WIRE ARMOURED PVC INSULATED, PVC SHEATHED 0.6/1 KV POWER CABLES

Conforming to IEC 60502-1

Nominal cross section*	DC Resistance at 20°C(1)		Voltage Drop(2) Cosn = 0.8		Current carrying capacity(3)			
					Underground Cable		Cables in air	
	Copper	Alu	Copper	Alu	Copper	Alu	Copper	Alu
mm²	S/Km	S/km	V/A x Km	V/A x Km	Am p	Am p	Am p	Am p
1.5	12.1	...	23.3	...	30	...	22	...
2.5	7.41	...	14.2	...	41	...	30	...
4	4.61	...	9.0	...	53	...	40	...
6	3.08	...	6.1	...	67	...	52	...
10	1.83	3.08	3.7	6.1	91	67	71	55
16	1.15	1.91	2.3	3.8	115	90	96	75
25	0.727	1.20	1.5	2.4	146	114	127	99
35	0.524	0.868	1.1	1.7	176	137	157	125
50	0.387	0.641	0.9	1.4	212	165	190	151
70	0.268	0.443	0.6	1.0	261	204	242	192
95	0.193	0.320	0.5	0.7	313	244	293	232
120	0.153	0.253	0.4	0.6	358	279	339	269
150	0.124	0.206	0.4	0.5	400	312	390	309
185	0.0991	0.164	0.3	0.4	451	352	444	353
240	0.0754	0.125	0.3	0.3	522	407	522	415
300	0.0601	0.100	0.2	0.3	590	460	595	472
400	0.0470	0.0778	0.2	0.2	680	530	695	552

Solid copper conductor up to 6mm^2

1. At different operating T(°C) : R = R20°C {1+ α (T°C - 20) }
   α : Temperature coefficient at 20°C = 0.00393 for copper and 0.00403 for aluminum

2. In three phase system decrease above listed voltage drop by 15%

3. a) Laying conditions: -
   - Underground : Temperature of the soil 20°C -Thermal resistivity 100°C cm/w
   - In air : Ambient temperature 30°C

   b) In three phase system decrease above listed current ratings by 10%

ELECTRICAL CHARACTERISTICS (Copper and Aluminum)
GALVANIZED STEEL WIRE ARMOURED XLPE INSULATED, PVC SHEATHED POWER CABLES 0.6/1 KV

Conforming to IEC 60502-1

Nominal cross section*	DC Resistance at 20°C(1)		Voltage Drop(2) Cosn = 0.8		Current carrying capacity(3)			
					Underground Cable		Cables in air	
	Copper	Alu	Copper	Alu	Copper	Alu	Copper	Alu
mm²	S/Km	S/km	V/A x Km	V/A x Km	Am p	Am p	Am p	Am p
1.5	12.1	...	24.8	...	34	...	27	...
2.5	7.41	...	14.8	...	46	...	37	...
4	4.61	...	9.2	...	59	...	50	...
6	3.08	...	6.2	...	74	...	64	...
10	1.83	3.08	3.7	6.1	101	79	88	69
16	1.15	1.91	2.4	3.9	128	100	119	93
25	0.727	1.20	1.6	2.5	162	126	157	122
35	0.524	0.868	1.2	1.9	195	152	194	151
50	0.387	0.641	0.87	1.4	235	183	235	183
70	0.268	0.443	0.64	1.0	290	226	299	234
95	0.193	0.320	0.48	0.75	347	271	362	282
120	0.153	0.253	0.40	0.60	397	310	419	327
150	0.124	0.206	0.35	0.50	444	346	481	375
185	0.0991	0.164	0.29	0.42	500	390	549	428
240	0.0754	0.125	0.24	0.33	578	452	645	503
300	0.0601	0.100	0.23	0.30	655	512	735	575
400	0.0470	0.0778	0.22	0.28	754	588	859	670

Solid copper conductor up to 6mm²

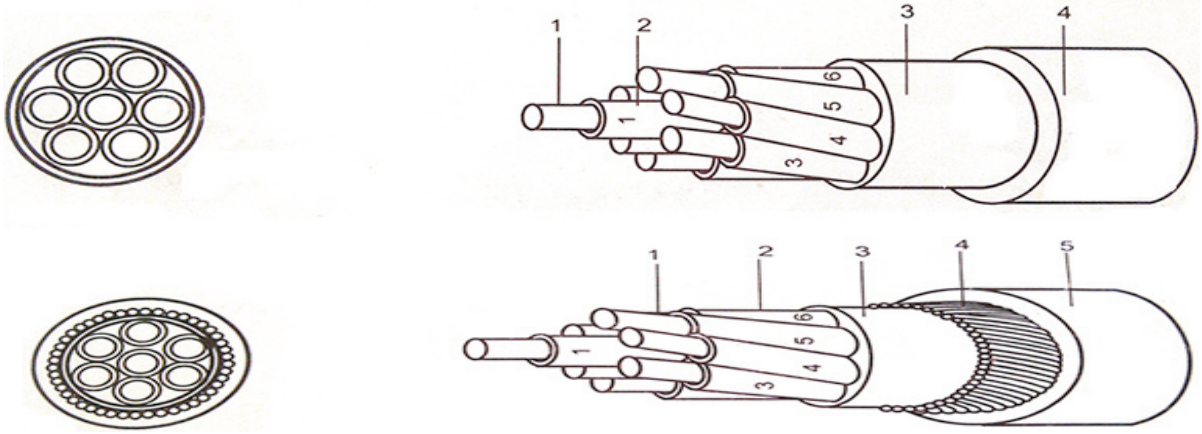
1. At different operating T(°C) : R = R20°C {1+α (T°C - 20) }
   α: Temperature coefficient at 20°C = 0.00393 for copper and 0.00403 for aluminum

2. In three phase system decrease above listed voltage drop by 15%

3. a) Laying conditions:-
   -Underground : Temperature of the soil 20°C -Thermal resistivity 100°C cm/w
   -In air : Ambient temperature 30°C

   b) In three phase system decrease above listed current ratings by 10%

5.5 CONTROL, PVC OR XLPE INSULATED AND PVC SHEATHED MULTICORE CABLES



1 Solid circular copper conductor
2 PVC or XLPE conductor
3 Bedding
4 Outer Sheath
5 Round steel wire armour

1 - SCOPE

The specification covers multicore cables for signalization and control pur-poses, PVC insulated and sheathed, rated at 0.6/1 KV to International Electrotechnical Commission Publication IEC 60502-1 for in cable ducts and indoors and for underground burial. High resistance to deformations under high temperature and pressure, and high resistance to ageing, abrasion, moisture, chemicals, acids and oils.

2 – CONSTRUCTION

2.1 – Conductor

Plain, annealed electrolytic copper conduc tors, solid, circular stranded conforming to the applicable requirements of IEC 60228.

2.2 – Insulation

PVC based thermoplastic or XLPE thermosetting material, conforming to the applicable requirements of IEC 60502-1.

2.3 - Assembly

Insulated conductors are laid up, filled where necessary with non-hygroscopic material or cove red with a layer of non-hygroscopic tape. The assembly is covered with an extruded layer of PVC in armoured cables.

2.4 – Armour (in armoured cables)

Galvanized steel wires or double steel tapes, covering the assembly of cores, complying to the applicable requirements of IEC 60502-1.

2.5 - Sheath

PVC based thermoplastic material, conforming to the applicable requirements of IEC 60502-1.

2.6 - Tests

Conforming to the applicable requirements of IEC 60502 -1 either on raw materials or on finished products.

NON -ARMOURED, PVC INSULATED, PVC SHEATHED CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NCYY - cc

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
Y: PVC Sheath
-cc: Control Cables

APPLICATION: For installation in cable ducts/trays and indoor and for underground burial

Number of Conductors	Radial Thickness of		Approximate Diameters			Approximative net weight		Delivery form drum
	Insulation	Outer Sheath	Conductor	Insulation	Overall	Conductor	Cable	
	mm	mm	mm	mm	mm	kg/km	kg/km	m
CONDUCTOR 1.5 mm²								
5	0.8	1.8	1.38	2.98	13	66	212	1000
7	0.8	1.8	1.38	2.98	14	92	244	1000
8	0.8	1.8	1.38	2.98	15	105	281	1000
10	0.8	1.8	1.38	2.98	17	131	332	1000
12	0.8	1.8	1.38	2.98	17	157	378	1000
14	0.8	1.8	1.38	2.98	18	184	428	1000
19	0.8	1.8	1.38	2.98	20	249	545	1000
24	0.8	1.8	1.38	2.98	23	314	680	1000
30	0.8	1.8	1.38	2.98	24	393	815	1000
37	0.8	1.8	1.38	2.98	26	484	975	1000
40	0.8	1.8	1.38	2.98	27	524	1050	500 R16
48	0.8	1.9	1.38	2.98	29	628	1250	500 R16
CONDUCTOR 2.5 mm²								
5	0.8	1.8	1.78	3.38	14	109	277	1000
7	0.8	1.8	1.78	3.38	15	153	325	1000
8	0.8	1.8	1.78	3.38	16	175	375	1000
10	0.8	1.8	1.78	3.38	18	218	448	1000
12	0.8	1.8	1.78	3.38	19	262	515	1000
14	0.8	1.8	1.78	3.38	20	305	585	1000
19	0.8	1.8	1.78	3.38	22	414	755	1000
24	0.8	1.8	1.78	3.38	25	523	940	1000
30	0.8	1.8	1.78	3.38	26	653	1140	1000
37	0.8	1.9	1.78	3.38	29	806	1390	1000
40	0.8	1.9	1.78	3.38	30	871	1500	500
48	0.8	2.0	1.78	3.38	33	1045	1790	500

Solid copperconductor up to 6mm²
Greater number of conductors also available

IEC 60502 - 1

TYPE: NCYR/FY- cc

N: Standard cable type
C: Copper conductor
Y: PVC Insulation
R: Round galvanized steel wire, or
F: Flat galvanized steel wire
Y: PVC Sheath
cc: Control Cables

As control cable for installation underground, outdoors and indoors.

Number of Conductors	Radial Thickness of			Approximate Diameters			Approximative net weight		Delivery form drum
	Insulation	Outer Sheath		Conductor	Insulation	Overall	Conductor	Cable	
	mm	mm		mm	mm	mm	kg/km	kg/km	m
CONDUCTOR 1.5 mm²									
5	0.8	1.0	1.8	1.38	2.98	17	66	455	1000
7	0.8	1.0	1.8	1.38	2.98	18	92	520	1000
8	0.8	1.0	1.8	1.38	2.98	19	105	575	1000
10	0.8	1.0	1.8	1.38	2.98	21	131	670	1000
12	0.8	1.0	1.8	1.38	2.98	23	147	1030	1000
14	0.8	1.0	1.8	1.38	2.98	24	184	1080	1000
19	0.8	1.0	1.8	1.38	2.98	25	249	1260	1000
24	0.8	1.0	1.8	1.38	2.98	28	314	1500	1000
30	0.8	1.0	1.9	1.38	2.98	30	393	1700	500
37	0.8	1.0	1.9	1.38	2.98	32	484	1920	500
40	0.8	1.0	2.0	1.38	2.98	33	524	2020	500
48	0.8	1.0	2.1	1.38	2.98	36	628	2560	500
CONDUCTOR 2.5 mm²									
5	0.8	1.0	1.8	1.78	3.38	18	109	535	1000
7	0.8	1.0	1.8	1.78	3.38	19	153	625	1000
8	0.8	1.0	1.8	1.78	3.38	20	175	700	1000
10	0.8	1.0	1.8	1.78	3.38	24	218	1110	1000
12	0.8	1.0	1.8	1.78	3.38	25	262	1200	1000
14	0.8	1.0	1.8	1.78	3.38	25	305	1310	1000
19	0.8	1.0	1.8	1.78	3.38	27	414	1550	1000
24	0.8	1.0	1.9	1.78	3.38	31	523	1870	500
30	0.8	1.0	2.0	1.78	3.38	33	653	2130	500
37	0.8	1.0	2.1	1.78	3.38	36	806	2690	500
40	0.8	1.2	2.1	1.78	3.38	37	871	2890	500
48	0.8	1.2	2.2	1.78	3.38	40	1045	3310	500

Solid copper conductor up to 6mm²
Greater number of conductors also available

NON-ARMOURED, XLPE INSULATED, PVC SHEATHED CONTROL CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NC2XY-cc

IDENTIFICATION:

N: Standard cable type
C: Copper conductor
2X: XLPE Insulation
Y: PVC Sheath
cc: Control Cables

APPLICATION: For installation in cable ducts/trays and indoor and for underground burial

DIMENSIONAL CHARACTERISTICS

Number of Conductors	Radial Thickness of		Approximate Diameters			Approximative net weight		Delivery form drum
	Insulation	Outer Sheath	Conductor	Insulation	Overall	Conductor	Cable	
	mm	mm	mm	mm	mm	kg/km	kg/km	m
CONDUCTOR 1.5 mm²								
5	0.7	1.8	1.38	2.78	12	66	189	1000
7	0.7	1.8	1.38	2.78	13	92	216	1000
8	0.7	1.8	1.38	2.78	14	105	246	1000
10	0.7	1.8	1.38	2.78	16	131	293	1000
12	0.7	1.8	1.38	2.78	16	157	355	1000
14	0.7	1.8	1.38	2.78	17	184	375	1000
19	0.7	1.8	1.38	2.78	19	249	515	1000
24	0.7	1.8	1.38	2.78	21	314	635	1000
30	0.7	1.8	1.38	2.78	23	393	710	1000
37	0.7	1.8	1.38	2.78	24	484	845	1000
40	0.7	1.8	1.38	2.78	25	524	910	500
48	0.7	1.8	1.38	2.78	27	628	1070	500
CONDUCTOR 2.5 mm²								
5	0.7	1.8	1.78	3.18	13	109	251	1000
7	0.7	1.8	1.78	3.18	14	153	293	1000
8	0.7	1.8	1.78	3.18	15	175	336	1000
10	0.7	1.8	1.78	3.18	17	218	403	1000
12	0.7	1.8	1.78	3.18	18	262	462	1000
14	0.7	1.8	1.78	3.18	19	305	525	1000
19	0.7	1.8	1.78	3.18	21	414	675	1000
24	0.7	1.8	1.78	3.18	24	523	840	1000
30	0.7	1.8	1.78	3.18	25	653	1020	1000
37	0.7	1.8	1.78	3.18	27	806	1230	1000
40	0.7	1.8	1.78	3.18	28	871	1320	500
48	0.7	1.9	1.78	3.18	30	1045	1570	500

Solid copper conductor up to 6mm²
Greater number of conductors also available

ARMOURED, XLPE INSULATED, PVC SHEATHED CONTROL CABLES 0.6/1KV

SPECIFICATION: IEC 60502-1

TYPE: NC2XR/FY - cc

IDENTIFICATION:

N:	Standard cable type
C:	Copper conductor
2X:	XLPE Insulation
R:	Round galvanized steel wire, or
F:	Flat galvanized steel wire
Y:	PVC Sheath
-cc:	Control Cables

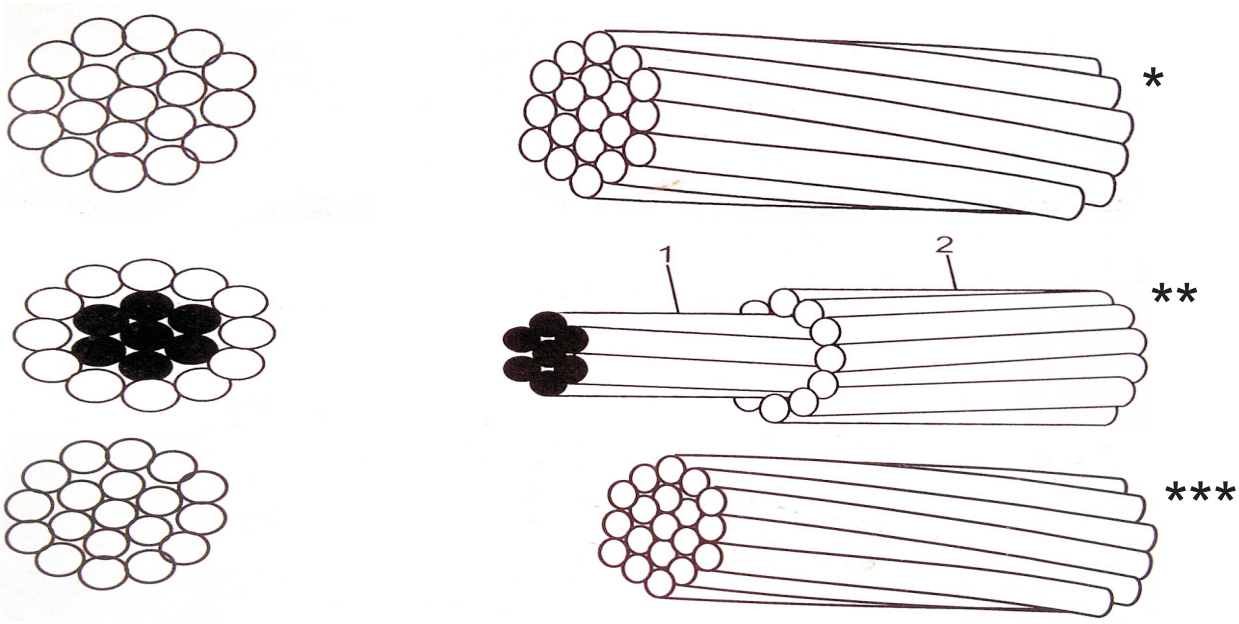
APPLICATION: As control cable for installation underground, outdoors and indoors.

DIMENSIONAL CHARACTERISTICS

Number of Conductors	Radial Thickness of			Approximate Diameters			Approximative net weight		Delivery form drum
	Insulation	Outer Sheath		Conductor	Insulation	Overall	Conductor	Cable	
	mm	mm		mm	mm	mm	kg/km	kg/km	m
CONDUCTOR 1.5 mm²									
5	0.7	1.0	1.8	1.38	2.78	16	66	433	1000
7	0.7	1.0	1.8	1.38	2.78	17	92	493	1000
8	0.7	1.0	1.8	1.38	2.78	18	105	530	1000
10	0.7	1.0	1.8	1.38	2.78	20	131	615	1000
12	0.7	1.0	1.8	1.38	2.78	20	157	685	1000
14	0.7	1.0	1.8	1.38	2.78	23	184	1000	1000
19	0.7	1.0	1.8	1.38	2.78	24	249	1160	1000
24	0.7	1.0	1.8	1.38	2.78	27	314	1370	1000
30	0.7	1.0	1.8	1.38	2.78	28	393	1530	500
37	0.7	1.0	1.8	1.38	2.78	30	484	1740	500
40	0.7	1.0	1.9	1.38	2.78	31	524	1840	500
48	0.7	1.0	2.0	1.38	2.78	34	628	2320	500
CONDUCTOR 2.5 mm²									
5	0.7	1.0	1.8	1.78	3.18	17	109	505	1000
7	0.7	1.0	1.8	1.78	3.18	18	153	580	1000
8	0.7	1.0	1.8	1.78	3.18	19	175	645	1000
10	0.7	1.0	1.8	1.78	3.18	23	218	1040	1000
12	0.7	1.0	1.8	1.78	3.18	24	262	1120	1000
14	0.7	1.0	1.8	1.78	3.18	25	305	1210	1000
19	0.7	1.0	1.8	1.78	3.18	26	414	1430	1000
24	0.7	1.0	1.8	1.78	3.18	30	523	1720	500
30	0.7	1.0	1.8	1.78	3.18	31	653	1950	500
37	0.7	1.0	1.8	1.78	3.18	34	806	2460	500
40	0.7	1.0	2.0	1.78	3.18	35	871	2570	500
48	0.7	1.2	2.2	1.78	3.18	38	1045	3040	500

Solid copper conductor up to 6mm²
* Greater number of conductors also available

5.6 OVERHEAD LINE CONDUCTORS



*BS 215 PART 1, NIS 231 1987 AOHL
**BS 215 1970 ACSR
***BS 125 /1970 COHL

1:Steel wire
2:Aluminum Wire

1 - SCOPE

The specification covers aluminum and copper overhead lines and aluminum conductor steel reinforced to give added strength and for obtaining a high strength weight ratio Overhead line conductors have its benefit in the urban distribution system where the spacing is short and supports are close. The principal advantage of ACSR conductor is tensile strength with longer spans as well as lesser support.

2 – CONSTRUCTION

2.1 – Conductor

Plain, unannealed electrolytic copper or aluminum conductors, solid or circular strand conforming with BS 215, NIS 231, NIS 234, BS 7884

The conductor is made up of three or more aluminum or copper wires of the same diameter twisted together in concentric layer consisting of more than one layer in some cases. Successive layers are twisted in opposite direction. The ACSR is manufactured galvanized steel wires as center core to give added strength.

ALUMINUM OVERHEAD LINE

SPECIFICATION: BS 215 Part 1, NIS 231

TYPE: AOHL

IDENTIFICATION:
A: Aluminum
OH: Overhead
L: Line (Conductor)

APPLICATION: For use in low voltage lines (sometimes up to 66kv) and also as flexible bus bar connections in High voltage substations.

DIMENSIONAL CHARACTERISTICS

NOMINAL CROSS SECTIONAL AREA mm	CONDUCTOROR NUMBER X DIAMETER OF WIRE mm	APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A in air	WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
16	7/1.70	5.1	81	608	14,000	R12
25	7/2.10	6.3	107	398	6,000	R10
35	7/2.50	7.5	133	329	3,500	R10
50	19/1.80	9.0	167	797	6,000	R12
70	19/2.10	10.5	200	723	4,000	R12
95	19/2.50	12.5	252	769	3,000	R12
100	19/2.67	13.4	259	877	3,000	R12
120	19/2.80	14.0	289	804	2,500	R12
150	19/3.25	16.3	337	866	2,000	R12
185	37/2.50	17.5	385	1500	3,000	R12
240	61/2.25	20.3	463	1338	2,000	R16
300	61/2.50	22.5	525	1652	2,000	R16
400	61/2.89	26.0	633	1104	1,000	R16
500	61/3.23	29.1	733	1379	1,000	R14
630	91/2.96	32.6	844	1732	1,000	R18
800	91/3.35	36.9	992	2220	1,000	R20
1000	91/3.74	41.1	1140	2770	1,000	R22

Solid aluminum conductor up to 10 mm^2
*Greater number of conductors also available

ALUMINUM CONDUCTOR STEEL RE-INFORCED

SPECIFICATION: BS 215 Part 2, NIS 234

TYPE: ACSR

IDENTIFICATION:
A: Aluminum
C: Conductor
S: Steel
R: Re-inforced

APPLICATION: For use in over head lines of medium, high and very high voltage.

DIMENSIONAL CHARACTERISTICS

NOMINAL CROSS SECTIONAL AREA mm	CONDUCTOROR NUMBER X DIAMETER OF WIRE mm	APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A	WEIGHT kg/ STANDARD LENGTH		STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
			in air	Al/S t	TOTAL		
100/15 “Dog”	7/1.57St 6/4.72 Al	14.2	273	719/ 267	986	2,500	R12
150/35 “Wolf”	7/2.59 St 30/2.59 Al	18.1	348	1308/ 872	2180	3,000	R16
200/50 “Panther”	7/3.00St 30/3.00Al	21.0	428	1170/ 780	1950	2,000	R16
264/62 “Bear”	7/3.35St 30/3.35Al	23.5	525	1459/ 973	2432	2,000	R18
382/50 “Bison”	7/3.00St 54/3.00Al	27.0	625	2107/ 780	2887	2,000	R18
429/ 100 “Deer”	7/4.27St 30/4.27Al	29.9	658	1185/ 790	1975	1,000	R18

Solid aluminum conductor up to 10mm²
*Greater number of conductors also available

COPPER OVERHEAD LINE (STRANDED)

SPECIFICATION: BS 7884

TYPE: COHL

IDENTIFICATION:
C: Copper
OH: Overhead
L: Line (conductor)

APPLICATION: For use in earthing of electrical installations, in lightening protection and for over head lines distribution.

DIMENSIONAL CHARACTERISTICS

NOMINAL CROSS SECTIONAL AREA mm	CONDUCTOROR NUMBER X DIAMETER OF WIRE mm	APPROXIMATE OVERALL DIAMETER mm	MAXIMUM CURRENT RATING A in air	WEIGHT kg/ STANDARD LENGTH kg	STANDARD DELIVERY LENGTH m	DELIVERY FORM drum
6	7/1.04	3.1	40	540	10000	R8
10	7/1.35	4.1	67	181	2000	R8
16	7/1.70	5.1	93	286	2000	R10
25	7/2.14	6.42	118	437	2000	R10
35	7/2.50	7.5	148	619	2000	R10
50	19/1.87	8.9	186	876	2000	R10
50	7/3.00	9.0	186	892	2000	R10
70	19/2.14	10.7	229	1192	2000	R10
95	19/2.52	2.6	281	1689	2000	R12
120	19/2.80	14.0	326	2646	2500	R14
150	37/2.25	15.8	377	2670	2000	R14
185	37/2.52	17.6	433	3296	2000	R16
240	61/2.25	20.3	518	2205	1000	R14
300	61/2.52	22.7	592	2722	1000	R14
400	61/2.85	25.7	710	3638	1000	R16
500	61/3.23	29.1	821	4544	1000	R18
630	91/2.97	32.7	1035	2874	500	R16
800	127/2.85	37.1	1310	2966	400	R18
1000	127/3.20	41.6	1640	2337	250	R20

XLPE INSULATED AND PVC SHEATHED MEDIUM VOLTAGE 6/10(12) KV

SINGLE CORE COPPER CONDUCTORS
XLPE INSULATED AND PVC SHEATHED 6/10 (12) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
				Trefoil	Flat	Laid in Ground		Laid in Free Air			
	DC at 20 °C	AC at 90 °C				Trefoil	Flat	Trefoil	Flat		
mm^2	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
25	0.7270	0.9271	0.200	0.450	0.635	139	145	143	173	20.0	665
35	0.5240	0.6683	0.224	0.426	0.611	166	174	174	211	21.1	770
50	0.3870	0.4937	0.251	0.393	0.578	197	206	209	255	22.5	905
70	0.2680	0.3420	0.291	0.370	0.554	242	252	262	319	24.3	1135
95	0.1930	0.2465	0.316	0.357	0.542	287	299	317	384	25.5	1390
120	0.1530	0.1956	0.345	0.344	0.529	326	339	366	443	26.9	1655
150	0.1240	0.1588	0.374	0.336	0.521	364	375	416	498	28.7	2015
185	0.0991	0.1272	0.409	0.322	0.507	411	422	478	570	30.4	2390
240	0.0754	0.0973	0.456	0.310	0.494	475	484	565	669	33.0	2950
300	0.0601	0.0781	0.512	0.301	0.487	535	542	650	765	35.8	3590
400	0.0470	0.0618	0.565	0.292	0.477	599	591	745	853	38.6	4510
500	0.0366	0.0490	0.635	0.282	0.467	674	659	859	975	42.2	5610
630	0.0283	0.0391	0.704	0.275	0.460	752	728	981	1103	45.9	6940
800	0.0221	0.0319	0.795	0.268	0.453	869	979	1160	1480	50.8	9195
1000	0.0176	0.0234	0.983	0.266	0.451	1084	1188	1515	1864	61.2	11105

This data is applicable for 6.35 / 11 kv cables.
The ampacity for single core sizes 800 & 1000mm2 was based on a single end bonding
The above data is approximate and subjected to manufacturing tolerance

6.1

THREE CORE COPPER CONDUCTORS
XLPE INSULATED AND PVC SHEATHED 6/10 (12) KV

Application: These cables are generally suitable for direct burial or for installation on ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
				Trefoil	Flat	Laid in Ground		Laid in Free Air			
	DC at 20°C	AC at 90°C				Trefoil 	Flat 	Trefoil 	Flat 		
mm²	Ω/km	Ω/km	µf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
25	0.7270	0.9271	0.200	0.403	-	140	-	141	-	37.7	1795
35	0.5240	0.6684	0.224	0.382	-	167	-	171	-	40.3	2150
50	0.3870	0.4938	0.251	0.351	-	197	-	206	-	43.5	2655
70	0.2680	0.3423	0.291	0.330	-	241	-	257	-	47.2	3390
95	0.1930	0.2469	0.316	0.316	-	286	-	309	-	50.0	4165
120	0.1530	0.1961	0.345	0.309	-	325	-	356	-	53.6	5140
150	0.1240	0.1595	0.374	0.302	-	364	-	405	-	56.9	5965
185	0.0991	0.1282	0.409	0.290	-	410	-	463	-	60.9	7210
240	0.0754	0.0986	0.456	0.280	-	475	-	546	-	66.3	9020
300	0.0601	0.0799	0.512	0.271	-	535	-	626	-	71.9	11095

This data is applicable for 6.35 / 11 kv cables.
The ampacity for single core sizes 800 & 1000mm^2 was based on a single end bonding
The above data is approximate and subjected to manufacturing tolerance

6.2

SINGLE CORE ALUMINIUM CONDUCTORS
XLPE INSULATED AND PVC SHEATHED 6/10 (12) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
				Trefoil	Flat	Laid in Ground		Laid in Free Air			
	DC at 20 °C	AC at 90 °C				Trefoil	Flat	Trefoil	Flat		
mm^2	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
25	1.2000	1.5390	0.200	0.450	0.635	108	113	111	135	20.0	510
35	0.8680	1.1130	0.224	0.426	0.611	129	135	135	164	21.1	560
50	0.6410	0.8220	0.251	0.393	0.578	153	160	162	198	22.4	610
70	0.4430	0.5681	0.291	0.370	0.554	188	196	204	248	24.0	715
95	0.3200	0.4105	0.316	0.357	0.542	222	233	246	299	25.5	815
120	0.2530	0.3247	0.345	0.344	0.529	254	265	284	346	26.9	915
150	0.2060	0.2645	0.374	0.336	0.521	283	295	324	391	28.7	1115
185	0.1640	0.2107	0.409	0.322	0.507	321	333	373	449	30.4	1250
240	0.1250	0.1610	0.456	0.310	0.494	372	385	443	530	32.9	1475
300	0.1000	0.1291	0.512	0.301	0.487	421	433	511	608	35.5	1700
400	0.0778	0.1009	0.565	0.292	0.477	478	483	593	693	38.6	2120
500	0.0605	0.0791	0.635	0.282	0.467	544	545	693	802	42.2	2505
630	0.0469	0.0621	0.704	0.275	0.460	617	612	803	921	45.8	3000
800	0.0367	0.0495	0.795	0.268	0.453	715	786	954	1188	50.8	3670
1000	0.0291	0.0376	0.983	0.266	0.451	862	937	1205	1468	61.2	4755

This data is applicable for 6.35 / 11 kv cables.
The ampacity for single core sizes 800 & 1000mm2 was based on a single end bonding
The above data is approximate and subjected to manufacturing tolerance

6.3

THREE CORES ALUMINIUM CONDUCTORS
XLPE INSULATED AND PVC SHEATHED 6/10 (12) KV

Application: These cables are generally suitable for direct burial or for installation on trays ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
				Trefoil	Flat	Laid in Ground		Laid in Free Air			
	DC at 20°C	AC at 90°C				Trefoil	Flat	Trefoil	Flat		
mm^2	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
25	1.2000	1.5390	0.200	0.403	-	108	-	110	-	37.7	1335
35	0.8680	1.1130	0.224	0.382	-	129	-	133	-	40.3	1530
50	0.6410	0.8220	0.251	0.351	-	153	-	160	-	42.9	1800
70	0.4430	0.5683	0.291	0.330	-	187	-	200	-	46.5	2100
95	0.3200	0.4107	0.316	0.316	-	222	-	240	-	50.0	2440
120	0.2530	0.3250	0.345	0.309	-	253	-	277	-	53.2	2780
150	0.2060	0.2649	0.374	0.302	-	283	-	314	-	56.9	3280
185	0.1640	0.2114	0.409	0.290	-	320	-	361	-	60.9	3790
240	0.1250	0.1618	0.456	0.280	-	371	-	427	-	66.1	4555
300	0.1000	0.1302	0.512	0.271	-	420	-	491	-	71.3	5360

This data is applicable for 6.35 / 11 kv cables.
The ampacity for single core sizes 800 & 1000mm2 was based on a single end bonding
The above data is approximate and subjected to manufacturing tolerance

6.4

THREE CORES COPPERS OR ALUMINUM CONDUCTORS
XLPE INSULATED, STEEL TAPE ARMOUREDAND PVC SHEATHED 6/10 (12) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Max. Conductor Resistance		Approx. Overall Diameter	Approx. Weight
	DC at 20 °C	AC at 90 °C			Laid in ground	Laid direct in free air		
mm^2	Ω/km	Ω/km	μf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables								
25	0.7270	0.9271	0.2000	0.403	132	133	41.9	2625
35	0.5240	0.6684	0.2240	0.382	157	160	44.5	3035
50	0.3870	0.4938	0.2510	0.352	185	192	47.9	3625
70	0.2680	0.3423	0.2910	0.330	226	237	51.8	4470
95	0.1930	0.2469	0.3160	0.316	269	286	54.6	5305
120	0.1530	0.1961	0.3450	0.311	306	328	57.8	6205
150	0.1240	0.1595	0.3740	0.302	342	371	61.7	7290
185	0.0991	0.1282	0.4090	0.290	386	424	65.5	8595
240	0.0754	0.0986	0.4560	0.280	446	497	71.3	10595
300	0.0601	0.0799	0.5120	0.272	502	566	77.1	12835
Three Cores, Aluminium Conductor Cables								
25	1.2000	1.5390	0.2000	0.403	102	103	41.9	2165
35	0.8680	1.1130	0.2240	0.382	122	124	44.5	2410
50	0.6410	0.8220	0.2510	0.351	144	149	47.3	2760
70	0.4430	0.5683	0.2910	0.330	176	184	51.1	3170
95	0.3200	0.4107	0.3160	0.316	209	222	54.6	3585
120	0.2530	0.3250	0.3450	0.309	238	255	57.8	3995
150	0.2060	0.2649	0.3740	0.302	266	288	61.7	4605
185	0.1640	0.2114	0.4090	0.290	301	331	65.5	5175
240	0.1250	0.1618	0.4560	0.280	349	389	71.1	6120
300	0.1000	0.1302	0.5120	0.271	394	444	76.5	7085

This data is applicable for 6.35 / 11 kv cables.
The above data is approximate and subjected to manufacturing tolerance

6.5

THREE CORES COPPERS OR ALUMINUMCONDUCTORS XLPE INSULATED, STEEL WIRE ARMOUREDAND PVC SHEATHED 6/10 (12) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Max. Conductor Resistance		Approx. Overall Diameter	Approx. Weight
	DC at 20 °C	AC at 90 °C			Laid in ground	Laid direct in free air		
mm^2	Ω/km	Ω/km	μf/km	mh/km	A	A	mm	kg/km
Three Cores, CopperConductor Cables								
25	0.7270	0.9271	0.200	0.403	133	136	45.1	3910
35	0.5240	0.6684	0.224	0.382	158	164	47.7	4410
50	0.3870	0.4938	0.251	0.352	187	195	51.1	5085
70	0.2680	0.3423	0.291	0.330	227	241	55.0	6000
95	0.1930	0.2469	0.316	0.316	269	289	57.8	6920
120	0.1530	0.1961	0.345	0.311	305	331	61.4	8090
150	0.1240	0.1595	0.374	0.302	340	372	64.9	9130
185	0.991	0.1282	0.409	0.290	381	423	68.9	10630
240	0.0754	0.0986	0.456	0.280	436	494	76.6	13700
300	0.0601	0.0799	0.512	0.272	485	556	82.2	16165
Three Cores, Aluminium Conductor Cables								
25	1.2000	1.5390	0.200	0.403	103	106	45.1	3415
35	0.8680	1.1130	0.224	0.382	123	127	47.7	3750
50	0.6410	0.8220	0.251	0.351	145	152	50.5	4185
70	0.4430	0.5683	0.291	0.330	177	188	54.3	4705
95	0.3200	0.4107	0.316	0.316	210	225	57.8	5195
120	0.2530	0.3250	0.345	0.309	238	259	61.0	5725
150	0.2060	0.2649	0.374	0.302	265	291	64.9	6445
185	0.1640	0.2114	0.409	0.290	300	332	68.9	7160
240	0.1250	0.1618	0.456	0.280	356	391	76.4	9130
300	0.1000	0.1302	0.512	0.271	387	442	81.6	10315

This data is applicable for 6.35 / 11 kv cables.
The above data is approximate and subjected to manufacturing tolerance

6.6

SINGLE and THREE CORE COPPER CONDUCTORS XLPE INSULATED AND PVC SHEATHED 8.7/15 (17.5) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
				Trefoil	Flat	Laid in Ground		Laid in Free Air			
	DC at 20 °C	AC at 90 °C				Trefoil	Flat	Trefoil	Flat		
mm²	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
25	0.7270	0.9271	0.165	0.469	0.654	139	145	143	173	22.0	729
35	0.5240	0.6683	0.183	0.446	0.631	166	174	174	211	23.3	846
50	0.3870	0.4937	0.204	0.412	0.597	197	206	209	255	24.7	999
70	0.2680	0.3420	0.234	0.387	0.572	242	252	262	319	26.5	1230
95	0.1930	0.2465	0.253	0.373	0.558	287	299	317	384	27.7	1479
120	0.1530	0.1956	0.275	0.361	0.546	326	339	366	443	29.3	1761
150	0.1240	0.1588	0.297	0.351	0.536	364	375	416	498	30.9	2111
185	0.0991	0.1272	0.324	0.338	0.522	411	422	478	570	32.8	2512
240	0.0754	0.0973	0.360	0.324	0.509	475	484	565	669	35.4	3083
300	0.0601	0.0781	0.402	0.313	0.498	535	542	650	765	38.0	3718
400	0.0470	0.0618	0.442	0.304	0.489	599	591	745	853	41.0	4661
500	0.0366	0.0490	0.495	0.293	0.478	674	659	859	975	44.6	5808
630	0.0283	0.0391	0.548	0.285	0.470	752	728	981	1103	48.3	7127
800	0.0221	0.0319	0.616	0.277	0.462	869	979	1160	1480	53.2	9010
1000	0.0176	0.0234	0.759	0.274	0.459	1084	1188	1515	1864	63.6	11341
Three Core Cables											
25	0.7270	0.9271	0.165	0.431	-	140	-	141	-	42.9	2105
35	0.5240	0.6684	0.183	0.408	-	167	-	171	-	45.5	2485
50	0.3870	0.4938	0.204	0.376	-	197	-	206	-	48.3	2990
70	0.2680	0.3423	0.234	0.354	-	241	-	257	-	52.3	3725
95	0.1930	0.2469	0.253	0.340	-	286	-	309	-	55.1	4505
120	0.1530	0.1961	0.275	0.329	-	325	-	356	-	58.4	5410
150	0.1240	0.1595	0.297	0.320	-	364	-	405	-	62.0	6415
185	0.0991	0.1282	0.324	0.308	-	410	-	463	-	65.9	7685
240	0.0754	0.0956	0.360	0.295	-	475	-	546	-	71.0	9540
300	0.0601	0.0799	0.402	0.288	-	535	-	626	-	76.9	11590

The ampacity for single core sizes 800 & 1000mm² was based on a single end bonding
The above data is approximate and subjected to manufacturing tolerance

6.7

SINGLE and THREE CORE ALUMINUM CONDUCTORS
XLPE INSULATED AND PVC SHEATHED 8.7/15 (17.5) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
				Trefoil	Flat	Laid in Ground		Laid in Free Air			
	DC at 20 °C	AC at 90 °C				Trefoil	Flat	Trefoil	Flat		
mm^2	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
25	1.2000	1.5390	0.165	0.469	0.654	108	113	111	135	22.0	575
35	0.8680	1.1130	0.183	0.446	0.631	129	135	135	164	23.3	635
50	0.6410	0.8220	0.204	0.412	0.597	153	160	162	198	24.6	700
70	0.4430	0.5681	0.234	0.387	0.572	188	196	204	248	26.2	800
95	0.3200	0.4105	0.253	0.373	0.558	222	233	246	299	27.7	905
120	0.2530	0.3247	0.275	0.361	0.546	254	265	284	346	29.3	1020
150	0.2060	0.2645	0.297	0.351	0.536	283	295	324	391	30.9	1215
185	0.1640	0.2107	0.324	0.338	0.522	321	333	373	449	32.8	1370
240	0.1250	0.1610	0.360	0.324	0.509	372	385	443	530	35.3	1595
300	0.1000	0.1291	0.402	0.313	0.498	421	433	511	608	37.7	1825
400	0.0778	0.1009	0.442	0.304	0.489	478	483	593	693	41.0	2270
500	0.0605	0.0791	0.495	0.293	0.478	544	545	693	802	44.6	2670
630	0.0469	0.0621	0.548	0.288	0.470	617	612	803	921	48.2	3180
800	0.0367	0.0495	0.616	0.277	0.462	715	786	954	1188	53.2	3870
1000	0.0291	0.0376	0.759	0.274	0.459	862	937	1205	1468	63.6	4990
Three Core Cables											
25	1.2000	1.5390	0.165	0.431	-	108	-	110	-	42.5	1605
35	0.8680	1.1130	0.183	0.408	-	129	-	133	-	45.1	1815
50	0.6410	0.8220	0.204	0.376	-	153	-	160	-	47.6	2040
70	0.4430	0.5683	0.234	0.354	-	187	-	200	-	51.3	2375
95	0.3200	0.4107	0.253	0.340	-	222	-	240	-	54.7	2730
120	0.2530	0.3250	0.275	0.329	-	253	-	277	-	58.0	3120
150	0.2060	0.2649	0.297	0.320	-	283	-	314	-	61.6	3645
185	0.1640	0.2114	0.324	0.308	-	320	-	361	-	65.7	4205
240	0.1250	0.1618	0.360	0.295	-	371	-	427	-	70.4	4975
300	0.1000	0.1302	0.402	0.288	-	420	-	491	-	76.0	5775

The ampacity for single core sizes 800 & 1000mm^2 was based on a single end bonding
The above data is approximate and subjected to manufacturing tolerance

6.8

THREE CORES COPPERS OR ALUMINUM CONDUCTORS XLPE INSULATED, STEEL TAPE ARMOURED AND PVC SHEATHED 8.7/15 (17.5) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Max. Conductor Resistance		Approx. Overall Diameter	Approx. Weight
	DC at 20 °C	AC at 90 °C			Laid in ground	Laid direct in free air		
mm^2	Ω/km	Ω/km	μf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables								
25	0.7270	0.9271	0.165	0.431	140	141	47.3	3070
35	0.5240	0.6684	0.183	0.408	167	171	49.7	3475
50	0.3870	0.4938	0.204	0.376	197	206	52.7	4055
70	0.2680	0.3423	0.234	0.354	241	257	56.7	4875
95	0.1930	0.2469	0.253	0.340	286	309	59.9	5790
120	0.1530	0.1961	0.275	0.330	325	356	63.4	6790
150	0.1240	0.1595	0.297	0.320	364	405	67.0	7865
185	0.0991	0.1282	0.324	0.308	410	463	70.9	9220
240	0.0754	0.0986	0.360	0.296	475	546	76.2	11225
300	0.0601	0.0799	0.402	0.288	535	626	83.7	14265
Three Cores, Aluminium Conductor Cables								
25	1.2000	1.5390	0.165	0.431	102	103	47.3	2610
35	0.8680	1.1130	0.183	0.408	122	124	49.7	2850
50	0.6410	0.8220	0.204	0.376	144	149	52.4	3160
70	0.4430	0.5683	0.234	0.354	176	184	56.1	3575
95	0.3200	0.4107	0.253	0.340	209	222	59.7	4040
120	0.2530	0.3250	0.275	0.329	238	255	63.2	4530
150	0.2060	0.2649	0.297	0.320	266	288	67.0	5180
185	0.1640	0.2114	0.324	0.308	301	331	70.9	5800
240	0.1250	0.1618	0.360	0.295	349	389	76.0	6755
300	0.1000	0.1302	0.402	0.288	394	444	83.0	8500

The above data is approximate and subjected to manufacturing tolerance.

6.9

THREE CORES COPPERS OR ALUMINUMCONDUCTORS XLPE INSULATED, STEEL WIRE ARMOUREDAND PVC SHEATHED8.7/15 (17.5) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Max. Conductor Resistance		Approx. Overall Diameter	Approx. Weight
	DC at 20 °C	AC at 90 °C			Laid in ground	Laid direct in free air		
mm^2	Ω/km	Ω/km	μf/km	mh/km	A	A	mm	kg/km
Three Cores,Copper Conductor Cables								
25	0.7270	0.9271	0.165	0.431	133	136	50.5	4530
35	0.5240	0.6684	0.183	0.408	158	164	52.9	5010
50	0.3870	0.4938	0.204	0.376	187	195	55.9	6715
70	0.2680	0.3423	0.234	0.354	227	241	59.9	6650
95	0.1930	0.2469	0.253	0.340	269	289	63.1	7655
120	0.1530	0.1961	0.275	0.330	305	331	66.6	8765
150	0.1240	0.1595	0.297	0.320	340	372	72.3	10935
185	0.991	0.1282	0.324	0.308	381	423	76.2	12450
240	0.0754	0.0986	0.360	0.296	436	494	81.5	14735
300	0.0601	0.0799	0.402	0.288	485	556	87.6	17230
Three Cores, Aluminium Conductor Cables								
25	1.2000	1.5390	0.165	0.431	103	106	50.5	4030
35	0.8680	1.1130	0.183	0.408	123	127	52.9	4325
50	0.6410	0.8220	0.204	0.376	145	152	55.6	4715
70	0.4430	0.5683	0.234	0.354	177	188	59.3	5245
95	0.3200	0.4107	0.253	0.340	210	225	62.9	5825
120	0.2530	0.3250	0.275	0.329	238	259	66.4	6400
150	0.2060	0.2649	0.297	0.320	265	291	72.3	8095
185	0.1640	0.2114	0.324	0.308	300	332	76.2	8865
240	0.1250	0.1618	0.360	0.295	356	391	81.1	9850
300	0.1000	0.1302	0.402	0.288	387	442	86.9	11135

This data is applicable for 6.35 / 11 kv cables.
The above data is approximate and subjected to manufacturing tolerance

6.10

SINGLE and THREE CORE COPPER CONDUCTORS XLPE INSULATED AND PVC SHEATHED 12/20 (24) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
				Trefoil	Flat	Laid in Ground		Laid in Free Air			
	DC at 20 °C	AC at 90 °C				Trefoil	Flat	Trefoil	Flat		
mm^2	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable											
35	0.5240	0.6683	0.159	0.463	0.648	166	174	174	211	25.3	915
50	0.3870	0.4937	0.177	0.428	0.613	197	206	209	255	26.7	1070
70	0.2680	0.3420	0.202	0.403	0.588	242	252	262	319	28.7	1320
95	0.1900	0.2465	0.217	0.389	0.573	287	299	317	384	29.9	1575
120	0.1530	0.1956	0.236	0.376	0.561	326	339	366	443	31.5	1860
150	0.1240	0.1588	0.254	0.365	0.550	364	375	416	498	33.1	2220
185	0.0991	0.1272	0.276	0.350	0.535	411	422	478	570	35.0	2625
240	0.0754	0.0973	0.305	0.335	0.520	475	484	565	669	37.4	3185
300	0.0601	0.0781	0.340	0.325	0.510	535	542	650	765	40.2	3845
400	0.0470	0.0618	0.373	0.313	0.498	599	591	745	853	43.0	4780
500	0.0366	0.0490	0.417	0.302	0.487	674	659	859	975	46.6	5930
630	0.0283	0.0391	0.460	0.293	0.478	752	728	981	1103	50.3	7265
800	0.0221	0.0319	0.516	0.285	0.470	869	979	1160	1480	55.4	9200
1000	0.0176	0.0234	0.633	0.281	0.466	1084	1188	1515	1864	65.8	11570
Three Core Cables											
35	0.5240	0.6684	0.159	0.427	-	167	-	171	-	49.5	2745
50	0.3870	0.4938	0.177	0.394	-	197	-	206	-	52.8	3255
70	0.2680	0.3423	0.202	0.370	-	241	-	257	-	56.9	4035
95	0.1930	0.2469	0.217	0.357	-	286	-	309	-	59.7	4865
120	0.1530	0.1961	0.236	0.345	-	325	-	356	-	63.1	5800
150	0.1240	0.1595	0.254	0.336	-	364	-	405	-	66.7	6835
185	0.0991	0.1282	0.276	0.321	-	410	-	463	-	70.2	8110
240	0.0754	0.0986	0.305	0.308	-	475	-	546	-	75.6	9960
300	0.0601	0.0799	0.340	0.299	-	535	-	626	-	81.6	12085

The ampacity for single core sizes 800 & 1000mm^2 was based on a single end bonding
This data is applicable for 12.7/22kv cables.
The above data is approximate and subjected to manufacturing tolerance

SINGLE and THREE CORE ALUMINUM CONDUCTORS XLPE INSULATED AND PVC SHEATHED12/20 (24) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
				Trefoil	Flat	Laid in Ground		Laid in Free Air			
	DC at 20 °C	AC at 90 °C				Trefoil	Flat	Trefoil	Flat		
mm^2	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable											
35	0.8680	1.1130	0.159	0.463	0.648	129	135	135	164	25.3	705
50	0.6410	0.8220	0.177	0.428	0.613	153	160	162	198	26.6	775
70	0.4430	0.5681	0.202	0.403	0.588	188	196	204	248	28.4	890
95	0.3200	0.4105	0.217	0.389	0.573	222	233	246	299	29.9	1000
120	0.2530	0.3247	0.236	0.376	0.561	254	265	284	346	31.5	1125
150	0.2060	0.2645	0.254	0.365	0.550	283	295	324	391	33.1	1320
185	0.1640	0.2107	0.276	0.350	0.535	321	333	373	449	35.0	1475
240	0.1250	0.1610	0.305	0.335	0.520	372	385	443	530	37.3	1700
300	0.1000	0.1291	0.340	0.325	0.510	421	433	511	608	39.9	1945
400	0.0778	0.1009	0.373	0.313	0.498	478	483	593	693	43.0	2390
500	0.0605	0.0791	0.417	0.302	0.487	544	545	693	802	46.6	2800
630	0.0469	0.0621	0.460	0.293	0.478	617	612	803	921	50.2	3325
800	0.0367	0.0495	0.516	0.285	0.470	715	786	954	1188	55.4	4060
1000	0.0291	0.0376	0.633	0.281	0.466	862	937	1205	1468	65.8	5220
Three Core Cables											
35	0.8680	1.1130	0.159	0.427	-	129	-	133	-	48.9	2050
50	0.6410	0.8220	0.177	0.394	-	153	-	160	-	52.0	2295
70	0.4430	0.5683	0.202	0.370	-	187	-	200	-	55.6	2650
95	0.3200	0.4107	0.217	0.357	-	222	-	240	-	59.1	3060
120	0.2530	0.3250	0.236	0.345	-	253	-	277	-	62.3	3470
150	0.2060	0.2649	0.254	0.336	-	283	-	314	-	65.9	4025
185	0.1640	0.2114	0.276	0.321	-	320	-	361	-	70.0	4605
240	0.1250	0.1618	0.305	0.308	-	371	-	427	-	75.2	5420
300	0.1000	0.1302	0.340	0.299	-	420	-	491	-	80.3	6175

The ampacity for single core sizes 800 & 1000mm^2 was based on a single end bonding
This data is applicable for 12.7/22kv cables.
The above data is approximate and subjected to manufacturing tolerance

THREE CORES COPPERS OR ALUMINUM CONDUCTORS XLPE INSULATED, STEEL TAPE ARMOURED AND PVC SHEATHED 12/20 (24) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Max. Conductor Resistance		Approx. Overall Diameter	Approx. Weight
	DC at 20 °C	AC at 90 °C			Laid in ground	Laid direct in free air		
mm^2	Ω/km	Ω/km	μf/km	mh/km	A	A	mm	kg/km
Three Cores, CopperConductor Cables								
35	0.5240	0.6684	0.159	0.427	167	171	54.1	3875
50	0.3870	0.4938	0.177	0.394	197	206	57.6	4490
70	0.2680	0.3423	0.202	0.370	241	257	61.6	5360
95	0.1930	0.2469	0.217	0.357	286	309	64.7	6290
120	0.1530	0.1961	0.345	0.236	325	356	67.9	7265
150	0.1240	0.1595	0.254	0.336	364	405	71.5	8380
185	0.0991	0.1282	0.276	0.321	410	463	75.4	9810
240	0.0754	0.0986	0.305	0.308	475	546	82.4	12590
300	0.0601	0.0799	0.340	0.299	535	626	88.4	14920
Three Cores, Aluminium Conductor Cables								
35	0.8680	1.1130	0.159	0.427	122	124	54.1	3250
50	0.6410	0.8220	0.177	0.394	144	149	57.2	3570
70	0.4430	0.5683	0.202	0.370	176	184	60.8	4010
95	0.3200	0.4107	0.217	0.357	209	222	64.5	4535
120	0.2530	0.3250	0.345	0.236	238	255	68.1	5085
150	0.2060	0.2649	0.254	0.336	266	288	71.7	5730
185	0.1640	0.2114	0.276	0.321	301	331	75.4	6390
240	0.1250	0.1618	0.305	0.308	349	389	82.1	8110
300	0.1000	0.1302	0.340	0.299	394	444	87.9	9180

This data is applicable for 12.7/22kV cables.
The above data is approximate and subjected to manufacturing tolerance.

THREE CORES COPPERS OR ALUMINUM CONDUCTORS XLPE INSULATED , STEEL WIRE ARMOURED AND PVC SHEATHED 12/20 (24) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Max. Conductor Resistance		Approx. Overall Diameter	Approx. Weight
	DC at 20 °C	AC at 90 °C			Laid in ground	Laid direct in free air		
mm^2	Ω/km	Ω/km	μf/km	mh/km	A	A	mm	kg/km
Three Cores, Copper Conductor Cables								
35	0.5240	0.6684	0.159	0.427	158	164	57.3	5560
50	0.3870	0.4938	0.177	0.394	187	195	60.8	6295
70	0.2680	0.3423	0.202	0.370	227	241	64.9	7280
95	0.1930	0.2469	0.217	0.357	269	289	67.9	8300
120	0.1530	0.1961	0.236	0.345	305	331	73.2	10350
150	0.1240	0.1595	0.254	0.336	340	372	76.8	11670
185	0.991	0.1282	0.276	0.321	381	423	80.5	13225
240	0.0754	0.0986	0.305	0.308	436	494	86.3	15515
300	0.0601	0.0799	0.340	0.299	485	556	92.5	18095
Three Cores, Aluminium Conductor Cables								
35	0.8680	1.1130	0.159	0.427	123	127	57.3	4870
50	0.6410	0.8220	0.177	0.394	145	152	60.4	5270
70	0.4430	0.5683	0.202	0.370	177	188	64.0	5820
95	0.3200	0.4107	0.217	0.357	210	225	67.7	6460
120	0.2530	0.3250	0.236	0.345	238	259	73.2	8045
150	0.2060	0.2649	0.254	0.336	265	291	76.8	8815
185	0.1640	0.2114	0.276	0.321	300	332	81.1	9675
240	0.1250	0.1618	0.305	0.308	346	391	86.0	10775
300	0.1000	0.1302	0.340	0.299	387	442	91.8	12050

This data is applicable for 12.7/22kV cables.
The above data is approximate and subjected to manufacturing tolerance.

6.14

SINGLE and THREE CORE COPPER CONDUCTORS XLPE INSULATED AND PVC SHEATHED 18/30 (36) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
				Trefoil	Flat	Laid in Ground		Laid in Free Air			
	DC at 20 °C	AC at 90 °C				Trefoil 	Flat 	Trefoil 	Flat 		
mm^2	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable											
50	0.3870	0.4937	0.138	0.465	0.649	197	206	209	255	32.1	1325
70	0.2680	0.3420	0.156	0.436	0.621	242	252	262	319	33.9	1575
95	0.1930	0.2465	0.167	0.422	0.607	287	299	317	384	35.3	1855
120	0.1530	0.1956	0.180	0.406	0.591	326	339	366	443	36.7	2140
150	0.1240	0.1588	0.192	0.395	0.580	364	375	416	498	38.5	2525
185	0.0991	0.1272	0.208	0.378	0.563	411	422	478	570	40.2	2930
240	0.0754	0.0973	0.228	0.362	0.547	475	484	565	669	42.8	3540
300	0.0601	0.0781	0.252	0.350	0.535	535	542	650	765	45.6	4225
400	0.0470	0.0618	0.275	0.337	0.522	599	591	745	853	48.4	5165
500	0.0366	0.0490	0.306	0.324	0.509	674	659	859	975	52.0	6350
630	0.0283	0.0391	0.336	0.313	0.498	752	728	981	1103	55.7	7715
800	0.0221	0.0319	0.374	0.303	0.488	869	979	1160	1480	60.6	9660
1000	0.0176	0.0234	0.455	0.297	0.481	1084	1188	1515	1864	71.2	12135
Three Core Cables											
50	0.3870	0.4938	0.138	0.436	-	197	-	206	-	63.0	3990
70	0.2680	0.3423	0.156	0.410	-	241	-	257	-	67.1	4835
95	0.1930	0.2469	0.167	0.395	-	286	-	309	-	69.9	5705
120	0.1530	0.1961	0.180	0.381	-	325	-	356	-	73.1	6645
150	0.1240	0.1595	0.192	0.368	-	364	-	405	-	76.3	7645
185	0.0991	0.1282	0.208	0.353	-	410	-	463	-	82.2	9385
240	0.0754	0.0986	0.228	0.338	-	475	-	546	-	85.8	10865
300	0.0601	0.0799	0.252	0.327	-	535	-	626	-	91.8	13115

This data is applicable for 19/33kv cables.
The ampacity for single core sizes 800 & 1000mm^2 was based on a single end bonding
The above data is approximate and subjected to manufacturing tolerance

6.15

SINGLE and THREE CORE ALUMINUM CONDUCTORS XLPE INSULATED AND PVC SHEATHED18/30 (36) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance		Current Rating				Approx. Overall Diameter	Approx. Weight
				Trefoil	Flat	Laid in Ground		Laid in Free Air			
	DC at 20 °C	AC at 90 °C				Trefoil	Flat	Trefoil	Flat		
mm^2	Ω/km	Ω/km	μf/km	mh/km	mh/km	A	A	A	A	mm	kg/km
Single Core Cable											
50	0.6410	0.8220	0.138	0.465	0.649	153	160	162	198	32.0	1025
70	0.4430	0.5681	0.156	0.436	0.621	188	196	204	248	33.6	1140
95	0.3200	0.4105	0.167	0.422	0.607	222	233	246	299	35.3	1270
120	0.2530	0.3247	0.180	0.406	0.591	254	265	284	346	36.7	1400
150	0.2060	0.2645	0.192	0.395	0.580	283	295	324	391	38.5	1630
185	0.1640	0.2107	0.208	0.378	0.563	321	333	373	449	40.2	1790
240	0.1250	0.1610	0.228	0.362	0.547	372	385	443	530	42.7	2050
300	0.1000	0.1291	0.252	0.350	0.535	421	433	511	608	45.3	2320
400	0.0778	0.1009	0.275	0.337	0.522	478	483	593	693	48.4	2775
500	0.0605	0.0791	0.306	0.324	0.509	544	545	693	802	52.0	3215
630	0.0469	0.0621	0.336	0.313	0.498	617	612	803	921	55.6	3765
800	0.0367	0.0495	0.374	0.303	0.488	715	786	954	1188	60.6	4515
1000	0.0291	0.0376	0.455	0.297	0.481	862	937	1205	1468	71.2	5790
Three Core Cables											
50	0.6410	0.8220	0.138	0.436	-	153	-	160	-	62.8	3095
70	0.4430	0.5683	0.156	0.410	-	187	-	200	-	66.4	3525
95	0.3200	0.4107	0.167	0.395	-	222	-	240	-	69.9	3985
120	0.2530	0.3250	0.180	0.381	-	253	-	277	-	73.1	4435
150	0.2060	0.2649	0.192	0.368	-	283	-	314	-	76.3	4960
185	0.1640	0.2114	0.208	0.353	-	320	-	361	-	80.4	5555
240	0.1250	0.1618	0.228	0.338	-	371	-	427	-	85.5	6390
300	0.1000	0.1302	0.252	0.327	-	420	-	491	-	91.1	7350

This data is applicable for 19/33kv cables.
The ampacity for single core sizes 800 & 1000mm^2 was based on a single end bonding
The above data is approximate and subjected to manufacturing tolerance

6.16

THREE CORES COPPERS OR ALUMINUMCONDUCTORS XLPE INSULATED, STEEL TAPE ARMOUREDAND PVC SHEATHED 18/30 (36) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Max. Conductor Resistance		Approx. Overall Diameter	Approx. Weight
	DC at 20 °C	AC at 90 °C			Laid in ground	Laid direct in free air		
mm^2	Ω/km	Ω/km	μf/km	mh/km	A	A	mm	kg/km
Three Cores, CopperConductor Cables								
50	0.3870	0.4938	0.138	0.436	185	192	69.4	5730
70	0.2680	0.3423	0.156	0.410	226	237	73.7	6725
95	0.1930	0.2469	0.167	0.395	269	286	76.7	7705
120	0.1530	0.1961	0.180	0.381	306	328	81.3	9720
150	0.1240	0.1595	0.192	0.368	342	371	84.7	10680
185	0.0991	0.1282	0.208	0.353	386	424	88.6	12120
240	0.0754	0.0986	0.229	0.338	446	497	94.4	14310
300	0.0601	0.0799	0.252	0.327	502	566	100.4	16790
Three Cores, Aluminium Conductor Cables								
50	0.6410	0.8220	0.138	0.436	144	149	69.2	4830
70	0.4430	0.5683	0.156	0.410	176	184	73.0	5395
95	0.3200	0.4107	0.167	0.395	209	222	76.7	5980
120	0.2530	0.3250	0.180	0.381	238	255	81.3	7310
150	0.2060	0.2649	0.192	0.368	266	288	84.7	7995
185	0.1640	0.2114	0.208	0.353	301	331	88.6	8700
240	0.1250	0.1618	0.228	0.338	349	389	94.1	9820
300	0.1000	0.1302	0.252	0.327	394	444	99.7	11000

This data is applicable for 19/33kv cables.
The above data is approximate and subjected to manufacturing tolerance.

6.17

THREE CORES COPPERS OR ALUMINUMCONDUCTORS XLPE INSULATED, STEEL WIRE ARMOUREDAND PVC SHEATHED18/30 (36) KV

Application: These cables are generally suitable for direct burial or for installation on trays or ducts.

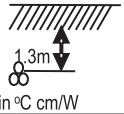
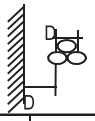
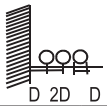
Nominal Cross Sectional Area	Max. Conductor Resistance		Operating Capacitance	Inductance	Max. Conductor Resistance		Approx. Overall Diameter	Approx. Weight
	DC at 20 °C	AC at 90 °C			Laid in ground	Laid direct in free air		
mm^2	Ω/km	Ω/km	μf/km	mh/km	A	A	mm	kg/km
Three Cores, CopperConductor Cables								
50	0.3870	0.4938	0.138	0.436	187	195	74.7	8910
70	0.2680	0.3423	0.156	0.410	227	241	78.8	10025
95	0.1930	0.2469	0.167	0.395	269	289	81.8	11175
120	0.1530	0.1961	0.180	0.381	305	331	85.2	12500
150	0.1240	0.1595	0.192	0.368	340	372	88.4	13595
185	0.991	0.1282	0.208	0.353	381	423	92.5	15255
240	0.0754	0.0986	0.228	0.338	436	494	98.3	17665
300	0.0601	0.0799	0.252	0.327	485	556	104.5	20405
Three Cores, Aluminium Conductor Cables								
50	0.6410	0.8220	0.138	0.436	145	152	74.3	7810
70	0.4430	0.5683	0.156	0.410	177	188	78.3	8560
95	0.3200	0.4107	0.167	0.395	210	225	81.8	9265
120	0.2530	0.3250	0.180	0.381	238	259	85.2	9995
150	0.2060	0.2649	0.192	0.368	265	291	88.6	10800
185	0.1640	0.2114	0.208	0.353	300	332	92.5	11615
240	0.1250	0.1618	0.228	0.338	346	391	98.0	12880
300	0.1000	0.1302	0.252	0.327	387	442	103.8	14300

This data is applicable for 19/33kv cables.
The above data is approximate and subjected to manufacturing tolerance.

COPPER / XLPE / CW / HDPE

Constructional Data (Nominal Values)

Conductor		Thickness of Insulation Screen Approx.	Thickness of Insulation	Thickness of Insulation Screen Approx.	No. of Wires x Wire Dia	Thickness of Outer Sheath	Approx. Outer Diameter of Cable	Approx. Weight of Cable	Max. DC Conductor Resistance at 20°C	Capacitance
Cross–Sectional Area	Shape									
mm^2		mm	mm	mm	mm	mm	mm	kg/km	(Ω/km)	μf/km
150	Compact Round (R) Stranded	1.0	10	1.0	50 x1.43	3.5	50.8	3650	0.1240	0.173
185		1.0	10	1.0	50 x1.43	3.5	52.7	4075	0.0991	0.186
240		1.0	10	1.0	50 x1.43	3.5	55.1	4700	0.0754	0.203
300		1.0	10	1.0	50 x1.43	3.5	57.5	5400	0.0601	0.221
400		1.0	10	1.0	50 x1.43	3.5	60.1	6260	0.0470	0.239
500		1.0	10	1.0	50 x1.43	4.0	64.5	7570	0.0366	0.263
630		1.0	10	1.0	50 x1.43	4.0	68.0	8910	0.0283	0.288
800		1.0	10	1.0	50 x1.43	4.0	72.3	10895	0.0221	0.319
1000	Segmental Stranded (S) (Milliken)	1.5	10	1.2	50 x1.43	4.0	81.6	13280	0.0176	0.380
1200		1.5	10	1.2	50 x1.43	4.5	84.5	15300	0.0151	0.395
1600		1.5	10	1.2	50 x1.43	4.5	92.9	19670	0.0113	0.453

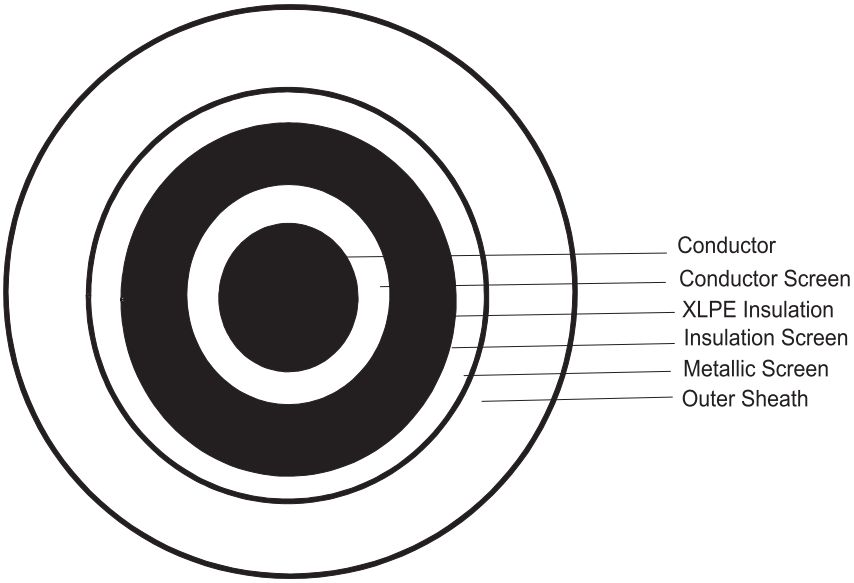
Continuous Current Ratings Load Factor = 100% for one circuit in operation (Amperes)											
Laying conditions: trefoil formation						Laying condition: flat formation					
Earthing conditions induced current in the metallic screen	Nominal Section Area	Direct burial  P_T in °C cm/W		In air 		Earthing conditions induced current in the metallic screen	Nominal Section Area	Direct burial  P_T in °C cm/W		In air 	
	mm^2	P_T=1.2 T = 25°C	P_T=1.2 T = 35°C	T = 35°C	T = 40°C		mm^2	P_T=1.2 T = 25°C	P_T=1.2 T = 35°C	T = 35°C	T = 40°C
With Circulating Currents	150 R	357	300	485	438	With Circulating Currents	150 R	378	318	557	504
	185 R	400	336	553	499		185 R	427	360	639	578
	240 R	459	385	648	584		240 R	496	417	756	684
	300 R	514	430	738	665		300 R	561	471	871	787
	400 R	577	482	845	761		400 R	639	536	1010	913
	500 R	643	538	966	871		500 R	729	611	1175	1061
With Circulating Currents	630 R	774	647	1168	1052		630 R	829	694	1363	1232
	800 R	863	720	1332	1199		800 R	935	782	1573	1421
	1000 S	1040	868	1658	1494		1000 S	1112	929	1926	1740
	1200 S	1119	933	1797	1618		1200 S	1200	1002	2095	1893
	1600 S	1283	1068	2131	1919		1600 S	1394	1394	2517	2273

** R: Round Conductor*
** S: Segmental Conductor*

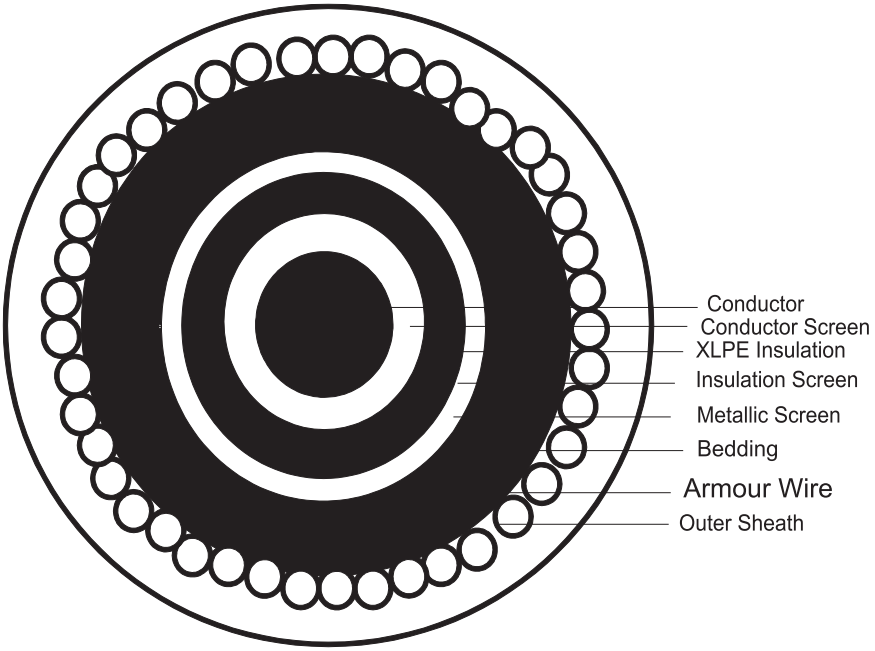
Note: Copper wires cross section area and dimensions are based on the required earth fault current

MEDIUM VOLTAGE SINGLE CORE XLPE INSULATED POWER CABLE

UNARMOURED CABLE



ARMOURED CABLE



BASIC CONSTRUCTION

CONDUCTOR - COPPER OR ALUMINIUM

CONDUCTOR SHAPE - COMPACTED CIRCULAR STRANDED

INSULATION - XLPE

BEDDING - PVC OR POLYETHYLENE

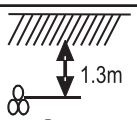
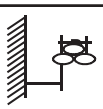
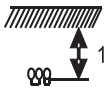
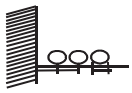
ARMOUR WIRE - ALUMINIUM WIRES

SHEATH MATERIAL - PVC OR POLYETHYLENE

COPPER / XLPE / Lead / HDPE

Constructional Data (Nominal Values)

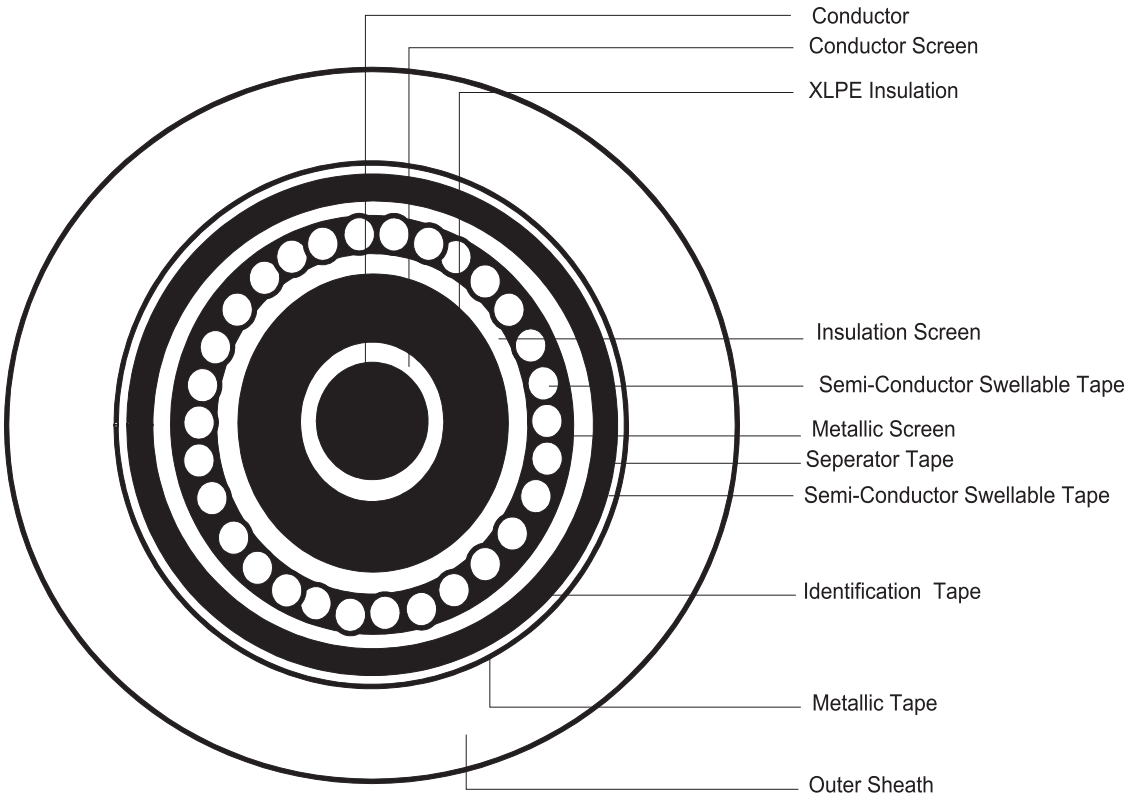
Conductor		Thickness of Insulation Screen Approx.	Thickness of Insulation	Thickness of Insulation Screen Approx.	No. of Wires x Wire Dia	Thickness of Outer Sheath	Approx. Outer Diameter of Cable	Approx. Weight of Cable	Max. DC Conductor Resistance at 20°C	Capacitance
Cross-Sectional Area	Shape									
mm²		mm	mm	mm	mm	mm	mm	kg/km	(Ω/km)	µf/km
150	Compact Round (R) Stranded	1.0	10	1.0	2.0	3.5	50.3	5720	0.1240	0.173
185		1.0	10	1.0	2.0	3.5	52.0	6260	0.0991	0.186
240		1.0	10	1.0	2.1	3.5	54.6	7215	0.0754	0.203
300		1.0	10	1.0	2.2	3.5	57.2	8265	0.0601	0.221
400		1.0	10	1.0	2.3	3.5	60.0	9515	0.0470	0.239
500		1.0	10	1.0	2.4	4.0	64.6	11295	0.0366	0.263
630		1.0	10	1.0	2.4	4.0	68.1	13190	0.0283	0.288
800		1.0	10	1.0	2.6	4.0	72.8	15725	0.0221	0.319
1000	Segmental Stranded (S) (Milliken)	1.5	10	1.2	2.7	4.0	82.3	19220	0.0176	0.380
1200		1.5	10	1.2	2.8	4.5	85.3	21690	0.0151	0.395
1600		1.5	10	1.2	3.0	4.5	94.2	27485	0.0113	0.453

Continuous Current Ratings Load Factor = 100% for one circuit in operation (Ampe											
Laying conditions: trefoil formation						Laying condition: flat formation					
Earthing conditions induced current in the metallic screen	Nominal Section Area	Direct burial  1.3m P_T in °C cm/W		In air  D		Earthing conditions induced current in the metallic screen	Nominal Section Area	Direct burial  1.3m P_T in °C cm/W		In air  D 2D D	
	mm²	P_T=1.2 T = 25°C	P_T=1.2 T = 35°C	T = 35°C	T = 40°C		mm²	P_T=1.2 T = 25°C	P_T=1.2 T = 35°C	T = 35°C	T = 40°C
With Circulating Currents	150 R	364	306	495	446	With Circulating Currents	150 R	379	319	560	506
	185 R	410	344	565	510		185 R	428	360	642	581
	240 R	473	397	665	600		240 R	497	417	760	687
	300 R	532	445	761	686		300 R	562	472	875	791
	400 R	600	502	876	789		400 R	640	537	1016	918
	500 R	674	563	1007	908		500 R	730	611	1181	1067
With Circulating Currents	630 R	770	644	1171	1055		630 R	829	694	1369	1237
	800 R	856	715	1334	1202		800 R	934	780	1580	1427
	1000 S	1022	852	1646	1483		1000 S	1105	923	1927	1741
	1200 S	1095	913	1778	1602		1200 S	1190	994	2088	1886
	1600 S	1239	1031	2087	1880		1600 S	1372	1144	2495	2254

** R: Round Conductor*
** S: Segmental Conductor*

Note: Lead alloy thickness is based on the required earth fault current.

SINGLE CORE COPPER WIRE SCREEN CABLE



BASIC CONSTRUCTION

CONDUCTOR - COPPER OR ALUMINIUM

CONDUCTOR SHAPE - COMPACTED CIRCULAR STRANDED

INSULATION - XLPE

METALLIC SCREEN - COPPER WIRE SCREEN

METALLIC TAPE - LAMINATED ALUMINIUM TAPE

SHEATH MATERIAL - POLYETHYLENE

7.1 Formulae

Ohms law	$U=RI$
Joules law	$W= RI^2 t$
Resistance of a line (feed and return)	$R=\frac{2L}{\chi S}$
DC Power	$P\ (W) = UI$
Single phase Power	$P(W) = UI \cos n$
Three phase Power	$P\ (W)= \sqrt{3} U\ I \cos n$
DC Current	$I = \frac{P\ (W)}{U}$
AC Single core current	$I = \frac{P\ (VA)}{U} = \frac{P\ (W)}{U \cos n}$
AC Three phase current	$I = \frac{P\ (VA)}{U\sqrt{3}} = \frac{P(W)}{U\sqrt{3}\cos n}$
Efficiency	$e = P\ \frac{output}{P\ input}$

U = Rated Voltage in V (volts) (between phase in three phase system).
I = Current in A (Amperes).
R = Resistance in (ohms).
W = Energy in Ws (Watt second).
t = Time in s (second)
L = Length of cable in m (meter).
χ = Conductivity (56 for copper and 34 for Aluminium).
S = Cross sectional area in mm^2
P = Power in W (Watt) or VA (Volt Ampere).
Cosφ Power factor.
e = Efficiency
$U\triangle$ = Voltage drop sending to receiving end of line in V(Volts).

Voltage Drop

Nature of the current	Voltage drop)u(v)	Size mm^2
Single phase AC/DC systems	If current Known	
	$)u = \frac{2LI}{\chi S}$	$S = \frac{2LI}{\chi) u}$
	If power known	
	$)u = \frac{2L\ P(w)}{\chi S U}$	$S = \frac{2L\ P(w)}{\chi\ )u U}$
Three phase system	If current Known	
	$)u\ \frac{1.73LI \cos n}{\chi S}$	$S= \frac{1.73LI \cos n}{\chi) u}$
	If power known	
	$)U = \frac{L\ P(w)}{\chi S U}$	$S = \frac{L\ P(w)}{\chi) uU}$

Solid copper conductor up to $6mm^2$

7.2 CONVERSION FACTORS AND UNITS

Length : The SI unit for length is the m

1 m = 10^2cm = 10^3mm = 10^{-3} Km

1 m = 39.37 in = 3.28 ft = 1.0936 Yd = 0.6214 x 10^{-3} miles

1 in = 0.0254 m = 0.0833 ft = 0.0277 Yd = 0.0158 x 10^{-3} miles

1 ft = 0.3048 m = 12 in = 0.333 Yd = 0.189 x 10^{-3} miles

1 Yd = 0.9144 m = 36 in = 3ft = 0.568 x 10^{-3} miles

1 mile = 1609 m = 63360 in = 5280 ft = 1760 Yd

m = meters, in = inches, ft = feet, Yd = Yards

Weight : The SI unit for weight is the Kg

1 kg = 10^3g = 10^{-3} T (metric ton)

1 kg = 2.20462 lb = 35.27 oz

1 oz = 28.349 x 10^{-3} kg = 0.0625 lb

Kg = Kilograms, lb = pounds, oz = ounces

Volume : The SI unit for volume is m^3

1m^3 = 10 dm^3 = 10^6 cm^3 = 10^9 mm^3

1m^3 = 1000 L = 35.315 ft^3 = 219.97 l.gal = 264.17 U.S. gal

1L = 0.0001 m^3 = 0.0353 ft^3 = 0.21997 l.gal = 0.26417 U.S. gal

1 ft^3 = 28.317 x10^{-3} m^3 = 28.317 L = 6.2288 l.gal = 7.479 U.S. gal

1 l.gal = 4.546 x10^{-3} m^3 = 4.546 L = 0.1605 ft^3 = 1.2009 U.S. gal

1 U.S. gal = 3.7853 x10^{-3} m^3 = 3.785 L = 0.1366 ft^3 =0.8327 l. gal

L = liters, ft = feet, l. gal = Imperial gallon, U.S. gal = United States gallon

Force : The SI Unit for force is the N

1N = 0.10197 Kgf = 0.2248 Lbf

1 Kgf = 9.80665 N = 2.2046 Lbf

1 Lbf = 4.4482 N = 0.4536 Kgf

N = Newton, Kgf = Kilogram force, Lbf = poundforce

Power : The SI Unit for power is the W

1W = 0.102 Kgm/s = 1.359x10^{-3} HP = 3.412 BTU/h

1 Kgm/s = 9.81 W = 0.0133 HP = 33.47 BTU/h

1 HP = 735.5 W = 75 Kgm/s = 2510 Btu/h

1 Btu/h = 0.2931 W = 0.0298 Kgm/s = 0.393x10^{-3} HP

W = watt, Kgm/s = Kilogramme meter per second,

HP = metric Horse power, BTU/h = British thermal unit per hour

7.2 CONVERSION FACTORS AND UNITS

Pressure: The SI Unit for pressure is the Pa = 1 N/m^2

$1N/m^2 = 10^{-5}$ $Kgf/cm^2 = 10^{-5}$ bar

$1Kgf/cm^2 = 10^5$ N/m^2 = 1 bar

Pa = Pascal, N/m^2 = Newton per square meter

Kgf/cm^2 = Kilogramme force per square centimeter

Work: The SI Unit for work is the J

1J = 1Ws (watt second) = 1Nm (Newton meter)

$1J = 0.2778x10^{-6}$ Kwh = $0.239x10^{-3}$ Kcal

$1Kwh = 3.6x10^6$J = 859.8 Kcal

$1Kcal = 4186.8J = 1.163x10^{-3}$ Kwh

J = Joules, Kwh = Kilowatt hour, Kcal = kilocalories

Temperature: The SI Unit for temperature is the Kelvin (K)

Temperature in ^oC = Temperature in ^oK -273 = 5/9 (Temperature in ^oF -23)

Temperature in ^oK = Temperature in ^oC +273

^oC = degree Celsius, ^oK = degree Kelvin, ^oF= degree Fahrenheit

CURRENT CARRYING Tables

CURRENT - CARRYING CAPACITIES AND OTHER TECHNICAL TABLES

8 TABLE 1

Current- Carrying capacities and associated voltage drops for single -core p.v.c. insulated cable, non-armoured, with or without sheath (copper conductors)

Conductor operating temperature 70°c

Conductor cross-sectional area	2 cable, single-phase a.c., or d.c.		3 or 4 cables, three-phase a.c.		2 cable, single-phase a.c., or d.c.		3 or 4 cables, three-phase a.c.		Flat or ver cables, single-phase a.c., or d.c., or 3 or 4 cables three-phase)				Trefoil (3 cables three phase)	
	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre			Current Carrying Capacity	Volt drop per ampere per metre
										Single phase	d.c	Three phase		
mm^2	A	mV	A	mV	A	mV	A	mV	A	mV	mV	mV	A	mV
1.0	14	42.0	12	37.0	17	42.0	16	37.0	–	–	–	–	–	–
1.5	17	28.0	14	24.0	21	28.0	20	24.0	–	–	–	–	–	–
2.5	24	17.0	21	15.0	30	17.0	26	15.0	–	–	–	–	–	–
4.0	32	11.0	29	9.2	40	11.0	36	9.2	–	–	–	–	–	–
6.0	41	7.1	37	6.2	50	7.1	45	6.2	–	–	–	–	–	–
10.0	55	4.2	51	3.7	68	4.2	61	3.7	–	–	–	–	–	–
16.0	74	2.7	66	2.3	90	2.7	81	2.3	–	–	–	–	–	–
25.0	97	1.7	87	1.5	118	1.7	106	1.5	–	–	–	–	–	–
35.0	119	1.3	106	1.1	145	1.3	130	1.1	–	–	–	–	–	–
		a.c d.c				a.c d.c								
50.0	145	0.97 0.91	125	0.84	175	0.93 0.91	160	0.82	195	0.95	0.91	0.85	170	0.80
70.0	185	0.71 0.63	160	0.62	220	0.65 0.63	200	0.59	240	0.68	0.63	0.62	210	0.59
95.0	230	0.56 0.45	195	0.48	270	0.48 0.45	240	0.45	300	0.52	0.45	0.49	260	0.42
120.0	260	0.48 0.36	220	0.42	310	0.40 0.36	280	0.38	350	0.44	0.36	0.43	300	0.34
150.0	–	– –	–	–	355	0.34 0.29	320	0.34	410	0.39	0.29	0.39	350	0.29
185.0	–	– –	–	–	405	0.29 0.24	365	0.30	470	0.35	0.24	0.36	400	0.25
240.0	–	– –	–	–	480	0.24 0.18	430	0.27	560	0.36	0.18	0.38	480	0.22
300.0	–	– –	–	–	560	0.22 0.14	500	0.25	660	0.33	0.14	0.35	570	0.19
400.0	–	– –	–	–	680	0.20 0.12	610	0.24	800	0.30	0.12	0.33	680	0.17
500.0	–	– –	–	–	800	0.18 0.086	710	0.23	910	0.28	0.086	0.31	770	0.16
630.0	–	– –	–	–	910	0.17 0.068	820	0.22	1040	0.26	0.068	0.30	880	0.15

Correction Factors:

For Ambient Temperature

Ambient temperatures	25°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C
Correction factor	1.06	0.94	0.87	0.79	0.71	0.61	0.50	0.35

8.1 TABLE II

Current-carrying capacities and associated voltage drops for twin and multicore p.v.c. insulated cables, non armoured, (copper conductors)

Conductor operating temperature 70°c

Conductor cross-sectional area	One twin cable, with or without protective conductor single-phase a.c., or d.c.		One three-core cable, with or without protective conductor, or one four-core cable, three-phase		One twin cable, with or without protective conductor single-phase a.c., or d.c.		One three-core cable, with or without protective conductor, or one four-core cable, three-phase		One twin cable, with or without protective conductor single-phase a.c., or d.c.		One three-core cable, with or without protective conductor, or one four-core cable, three-phase	
	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre
mm^2	A	mV	A	mV	A	mV	A	mV	A	mV	A	mV
1.0	14	42.0	12	37.0	16	42.0	13	37.0	–	–	–	-flat
1.5	18	28.0	16	24.0	20	28.0	17	24.0	–	–	–	-cables
2.5	24	17.0	21	15.0	28	17.0	24	15.0	–	–	–	-only
4.0	32	11.0	29	9.2	36	11.0	32	9.2	–	–	–	– "
6.0	40	7.1	36	6.2	46	7.1	40	6.2	–	–	–	– "
10.0	53	4.2	49	3.7	64	4.2	54	3.7	–	–	–	– "
16.0	70	2.7	62	2.3	85	2.7	71	2.3	–	–	–	– "
25.0	79	1.8	70	1.6	108	1.8	90	1.6	114	1.8	95	1.6
35.0	98	1.3	86	1.1	132	1.3	115	1.1	139	1.3	122	1.1
50.0	–	–	–	–	163	0.92	140	0.81	172	0.92	148	0.81
						a.c. d.c				a.c. d.c		
70.0	–	–	–	–	207	0.65 0.64	176	0.57	218	0.65 0.64	186	0.57
95.0	–	–	–	–	251	0.48 0.46	215	0.42	265	0.48 0.46	227	0.42
120.0	–	–	–	–	290	0.40 0.36	251	0.34	306	0.40 0.36	265	0.34
150.0	–	–	–	–	330	0.32 0.25	287	0.29	348	0.32 0.25	302	0.29
185.0	–	–	–	–	380	0.29 0.23	330	0.24	400	0.29 0.23	348	0.24
240.0	–	–	–	–	450	0.25 0.18	392	0.20	474	0.25 0.18	413	0.20
300.0	–	–	–	–	520	0.23 0.14	450	0.18	548	0.23 0.14	474	0.18
400.0	–	–	–	–	600	0.22 0.11	520	0.17	632	0.22 0.11	548	0.17

Correction Factors:

For Ambient Temperature

Ambient temperatures	25°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C
Correction factor	1.06	0.94	0.87	0.79	0.71	0.61	0.50	0.35

8.2 TABLE III

Current – carrying capacities and associated voltage drops for twin and multicore cables insulated with impregnated paper (BS 6480), lead-sheathed or aluminium-sheathed, armoured, with or without serving (copper conductor)

Conductor operating temperature 80°c

Normal cross-sectional area of conductor*2	One twin cable, single-phase a.c., or d.c.			One three- or four-core cable, three-phase		One twin cable, single-phase a.c., or d.c.			One three- or four-core cable, three-phase	
	Current Carrying Capacity	Volt drop per ampere per metre		Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre		Current Carrying Capacity	Volt drop per ampere per metre
		a.c.	d.c.				a.c.	d.c.		
mm^2	A	mV	mV	A	mV	A	mV	mV	A	mV
50	165	0.95	0.95	145	0.82	200	0.95	0.95	170	0.82
70	205	0.66	0.66	180	0.58	250	0.66	0.66	215	0.58
95	255	0.49	0.47	225	0.43	305	0.49	0.47	265	0.43
120	295	0.40	0.36	260	0.35	355	0.40	0.36	305	0.35
150	335	0.33	0.30	300	0.28	405	0.33	0.30	350	0.28
185	390	0.28	0.24	345	0.24	465	0.28	0.24	405	0.24
240	460	0.24	0.19	410	0.20	555	0.24	0.19	480	0.20
300	525	0.21	0.15	470	0.18	635	0.21	0.15	550	0.18
400	610	0.20	0.12	545	0.17	735	0.20	0.12	640	0.17

Correction Factors:

For Ambient Temperature

Ambient temperatures	25°C	35 °C	40 °C	45 °C	50°C	55 °C	60 °C	65 °C	70°C	75°C
Correction factor	1.05	0.95	0.89	0.82	0.75	0.68	0.61	0.53	0.43	0.30

8.3 TABLE IV

Current – carrying capacities and associated volt drops and masses supported, for flexible cords to BS 6500

Norm al cross-sectional area of conductor	Maxim um diam eter of wires form ing conductor	Current-carrying Capacity, d.c. Or Single-phase a.c, or three-phrase a.c.	Volt drop per ampere per metre		Maxim um mass supportable by twin flexible cord (see IEE Regulation 523-32)
			d.c. or single-phase a.c.	three-phase a.c.	
mm^2	mV	A	mV	mV	Kg
0.5	0.21	3	83	72.0	2
0.75	0.21	6	56	48.0	3
1.0	0.21	10	43	37.0	5
1.25	0.26	13	35	29.0	5
1.5	0.26	15	31	26.0	5
2.5	0.26	20	18	16.0	5
4.0	0.31	25	11	9.6	5

Correction factor for ambient temperature						
60°C rubber and p.v.c cords						
Ambient temperature	35°C	40°C	45°C	50°C	55°C	
Correction factor	0.96	0.92	0.87	0.71	0.50	
85°C rubber cords having a ho..f..r sheath or a heat-resisting vp c sheath						
Ambient temperature	35°C To 50°C	55°C	60°C	65°C	70°C	
Correction factor	1.0	0.96	0.83	0.67	0.47	
150°C rubber cords						
Ambient temperature	35°C To 120°C	125°C	130°C	135°C	140°C	145°C
Correction factor	1.0	0.96	0.85	0.74	0.60	0.42
Glass-fibre cords						
Ambient temperature	35°C To 150°C	155°C	160°C	165°C	170°C	175°C
Correction factor	1.0	0.96	0.85	0.74	0.60	0.42

8.4 TABLE V

Current-carrying capacities and associated voltage drops for single -core p.v.c insulated cables, non-armoured, with sheathed (aluminium conductors)

Conductor operating temperature 70^{0}c

Normal cross-sectional area of conductor	2 cable, single phase a.c., or d.c.		3 or4 cables, three-phase a.c.		2 cable, single phase a.c., or d.c.		3 or 4 cables, three-phase a.c.		Flat or vertical (2 cables, single-phase a.c., or d.c., or 3 or 4 cables three-phase)				Trefoil (3 cables three-phase)	
	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre			Current Carrying Capacity	Volt drop per ampere per metre
		a.c d.c								1ph	d.c.	3ph		
mm ^{2}	A	m V m V	A	mV	A	m V m V	A	mV	A	m V	m V	m V	A	mV
16	60	4.5 4.5	52	3.9	72	4.5 4.5	65	3.9	–	–	–	–	–	–
25	78	2.9 2.8	67	2.5	94	2.8 2.8	85	2.5	–	–	–	–	–	–
35	96	2.1 2.0	83	1.8	115	2.1 2.0	105	1.8	–	–	–	–	–	–
50	120	1.6 1.5	100	1.4	143	1.5 1.5	123	1.3	155	1.5	1.5	1.34	140	1.3
70	150	1.2 1.0	125	1.0	181	1.1 1.0	156	0.93	190	1.1	1.0	0.95	170	0.90
95	175	0.93 0.75	150	0.80	223	0.77 0.75	193	0.69	235	0.80	0.75	0.72	205	0.67
120	205	0.80 0.60	175	0.70	261	0.62 0.60	225	0.56	275	0.65	0.60	0.60	235	0.54
150	235	0.73 0.49	200	0.64	298	0.51 0.49	259	0.48	320	0.55	0.49	0.51	270	0.45
185	–	– –	–	–	345	0.42 0.39	290	0.40	370	0.46	0.39	0.45	310	0.37
240	–	– –	–	–	411	0.34 0.29	361	0.34	440	0.43	0.29	0.43	370	0.30
300	–	– –	–	–	476	0.29 0.23	419	0.30	510	0.38	0.23	0.39	435	0.25
380	–	– –	–	–	554	0.26 0.19	465	0.28	584	0.35	0.19	0.37	490	0.22
480	–	– –	–	–	643	0.23 0.15	541	0.26	677	0.32	0.15	0.34	570	0.20
600	–	– –	–	–	737	0.21 0.12	616	0.24	776	0.30	0.12	0.33	648	0.18

Correction Factors:	25°C	35 °C	40 °C	45 °C	50°C	55 °C	60 °C	65 °C	70C^0	75C
For Ambient Temperature										
Ambient temperatures	25C^0	35C^0	40C^0	45C^0	50C^0	55C^0	60C^0	65C^0		
Correction factor	1.06	0.94	0.87	0.79	0.71	0.61	0.50	0.35		

8.5 TABLE VI

Current-carrying capacities and associated voltage drops for twin and multicore armoured p.v.c insulated cables (aluminium conductors)

Conductor operating temperature 70°c

Normal cross-sectional area of conductor*2	One twin cable, single-phase a.c., or d.c.			One three- or four-core cable, three-phase		One twin cable, single-phase a.c., or d.c.			One three- or four-core cable, three-phase	
	Current Carrying Capacity	Volt drop per ampere per metre		Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre		Current Carrying Capacity	Volt drop per ampere per metre
		a.c.	d.c.				a.c.	d.c.		
mm^2	A	mV	mV	A	mV	A	mV	mV	A	mV
16	63	4.5	4..5	55	3..9	66	4..5	4..3	58	3..9
25	83	2.9	2.9	67	2.5	87	2.1	2..9	71	2..5
35	100	2.1	2.0	88	1.8	105	2..9	2.0	93	1..8
50	124	1.6	1.5	105	1.3	130	1.6	1..5	110	1..3
70	157	1.1	1.0	138	0.93	165	1.1	1.0	145	0..93
95	185	0.79	0.77	166	0.68	195	0.79	0.77	175	0.68
120	–	–	–	195	0.54	–	–	–	205	0.54
150	–	–	–	219	0.45	–	–	–	230	0.45
185	–	–	–	257	0.37	–	–	–	270	0.37
240	–	–	–	304	0.30	–	–	–	320	0.30
300	–	–	–	347	0.25	–	–	–	365	0.25

Correction Factors:

For Ambient Temperature

Ambient temperatures	25°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C
Correction factor	1.06	0.94	0.87	0.79	0.71	0.61	0.50	0.35

8.6 TABLE VII

Cureent-carrying capacities and associated voltage drops for twin and multicore armoured p.v.c insulated cables (copper conductors)

Conductor operating temperature 70^{0}c

Conductor cross-sectional area	One twin cable, single-phase a.c., or d.c.			One three- or four-core cable, three-phase		One twin cable, single-phase a.c., or d.c.			One three- or four-core cable, three-phase	
	Current Carrying Capacity	Volt drop per ampere per metre		Current Carrying Capacity	Volt drop per ampere per metre	Current Carrying Capacity	Volt drop per ampere per metre		Current Carrying Capacity	Volt drop per ampere per metre
mm ^{2}	A	mV		A	mV	A	mV		A	mV
1.5	20	29.0		18	25.0	–	–		–	–
2.5	29	18.0		24	16.0	–	–		–	–
4.0	37	12.0		31	9.6	–	–		–	–
6.0	48	7.4		41	6.3	50	7.3		42	6.3
10.0	66	4.3		56	3.8	69	4.3		58	3.8
16.0	86	2.7		73	2.3	90	2.7		77	2.3
25.0	115	1.8		97	1.6	121	1.8		102	1.6
35.0	142	1.3		119	1.1	149	1.3		125	1.1
50.0	168	0.92		147	0.81	180	0.92		155	1.81
		a.c.	d.c.				a.c.	d.c.		
70.0	209	0.65	0.64	180	0.57	220	0.65	0.64	190	0.57
95.0	257	0.48	0.46	219	0.42	270	0.48	0.46	230	0.42
120.0	295	0.40	0.36	257	0.34	310	0.40	0.36	270	0.34
150.0	337	0.32	0.25	295	0.29	355	0.32	0.25	310	0.29
185.0	390	0.29	0.23	333	0.24	410	0.29	0.23	350	0.24
240.0	461	0.25	0.18	399	0.20	485	0.25	0.18	420	0.20
300.0	523	0.23	0.14	451	0.18	550	0.23	0.14	475	0.18
400.0	589	0.22	0.11	523	0.17	620	0.22	0.11	550	0.17

Correction Factors:

For Ambient Temperature

Ambient temperatures	25C^0	35C^0	40C^0	45C^0	50C^0	55C^0	60C^0	65C^0
Correction factor	1.06	0.94	0.87	0.79	0.71	0.61	0.50	0.35

8.7 TABLE VIII

LAY RATIO FOR ALUMINIUM STANDARD CONDUCTOR

1	2	3	4	5	6	7	8	9	10	11
Number of wires in Conductor	Lay ratio									
	6 wire layer		12 wire layer		18-wire layer		24- wire layer		30 wire layer	
	min	max	min	max	min	max	min	max	min	max
7	10	14	-	-	-	-	-	-	-	-
19	10	16	10	14	-	-	-	-	-	-
37	10	17	10	16	10	14	-	-	-	-
61	10	17	10	16	10	15	10	14	-	-
91	10	17	10	16	10	15	10	14	10	13

8.8 TABLE IX

Standard Diameter mm	Cross Sectional Area of Standard diameter wire mm^2	Mass Per Km kg	Tensile strength N/mm^2	Standard Resistance at 20° Per Km	Minimum Breaking Load for Diameter Wire. N
1.70	2.27	6.13	211.5	12.451	480
1.80	2.55	6.87	196.5	11.106	500
2.10	3.46	9.35	210.7	8.159	730
2.25	3.98	10.7	182.1	7.100	714
2.50	4.91	13.26	175.5	5.758	862
2.67	5.60	15.117	205	5.048	1150
2.80	6.16	16.63	201.4	4.590	1240
2.89	6.56	17.72	198.2	4.309	1300
2.96	6.88	18.58	193.2	4.107	1320
3.10	7.55	20.40	178.8	3.745	1350
3.23	8.19	22.13	166.6	3.449	1365
3.25	8.30	22.42	165.1	3.407	1370
3.40	9.08	24.54	163.7	3.113	1490
3.78	11.22	30.33	160.4	2.519	1800
4.22	13.99	37.81	160.1	2.021	2240
4.39	15.14	40.91	160.1	1.867	2410
4.65	16.98	45.90	159.0	1.664	2700

8.9 TABLE X

NOMINAL ALUMINIUM AREA mm^2	STANDING & WIRE DIAMETER mm	SECTIONAL AREA mm^2	APPROXIMATE OVERALL DIAMETER mm	APPROXIMATE MASS PER kg	CALCULATION DC RESISTANCE AT 20°C/km	CALCULATION BREAKING LOAD N	TENSILE STRENGHT N/mm^2
16	7/1.70	15.88	5.1	44.0	1.802	3,192	201.0
25	7/2.10	24.23	6.3	66.0	1.181	4,854	200.3
35	7/2.50	34.34	7.5	94.0	0.833	5,732	166.9
50	7/3.10	52.83	9.3	145.0	0.5419	8,977	166.9
50	19/1.80	48.32	9.0	133.0	0.595	9,025	186.8
70	19/2.10	65.77	10.5	181.0	0.437	13,1761	200.3
95	19/2.50	93.22	12.5	256.0	0.308	15.559	166.9
100	7/4.39	106.0	13.17	290.0	0.2702	16.026	151.1
100	19/2.67	106.33	13.35	292.0	0.2699	20,759	195.2
120	19/2.80	116.93	14.0	322.0	0.246	22,382	191.4
150	19/3.25	157.6	16.25	434.0	0.1825	24,728	156.9
150	37/2.25	147.04	15.74	405.0	0.196	25,097	170.7
185	37/2.50	181.53	17.50	500.0	0.159	30,299	166.9
240	61/2.25	242.42	20.25	670.0	0.119	39,199	161.7
300	19/4.65	322.7	23.25	888.0	0.08916	48,735	151.0
300	61/2.50	299.28	22.50	827.0	0.097	47,324	158.1
400	37/3.78	415.2	26.45	1145.0	0.6944	63,270	152.4
400	61/2.89	399.94	26.01	1105.0	0.72	71,370	178.5
500	61/3.23	499.58	29.07	1380.0	0.058	74,938	150.0
630	91/2.96	625.88	32.56	1733.0	0.046	108,108	172.72

8.10 TABLE XI

Test Method	Property under test	Requirements			
		Insulation		Sheath	
		1	2	1A	2A
A, B	Minimum tensile strength (N/mm²)	12.5	10	12.5	10
, B	Minimum elongation at break (%)	125	150	125	150
C. 1	Properties after ageing in air 7 days at 80 + 2°C Tensile strength Minimum value (N/mm²) Minimum variation from unaged Value (%)	 12.5 20	 10 20	 12.5 20	 10 20
C.1 C.2, C.3	Elongation at break Minimum V alue (%) Maximum Variation from unaged value (%) Loss of mass (max) (mg/cm²)	 125 20 2.0	 150 20 2.0	 125 20 2.0	 150 20 2.0
D. 1, D2,) D,3_)	Hot pressure test temperature(°C) Maximum deformation (%) 80+2	80 +2 50	70+2 50	80+2 50	70+2 50
E.1, E2	Heat shock test Temperature at which specimen shall not crack (°C)	 150+2	 150+2	 150+2	 150+2
  C.4	Non - contamination test 7 days at 80 +2°C Tensile strength				
	Minimum value (N/mm ²) Maximum variation from unaged value (%)	12.5 20	10 20	-- --	-- --
	Elongation at break Minimum Value (%) Maximum variation from unaged value (%)	 125 20	 150 20	 --- ---	 --- ---
	Minimum insulation resistance constant (K value) at 20°C (M?KM) at 70°C	 70 0.037	 380 0.037	 -- --	 -- --

8.11 TABLE XII

	Property under test	Type of insulation or sheath						
Method		3	4	5	6	7	8	9
B	Minimum tensile strength (N/mm^2)	18.5	7.5	12.5	6	7.5	7.5	12.5
	Minimum elongation at Break (%)	125	150	100	125	125	150	150
C.2,	Loss of mass after ageing 7 days at 80+ 2 °C	-	-	-	-	-	-	-
C.3	(mg/cm^2)	2.0	-	-	2.0	2.0	2.0	-
C.1	Elongation at break after ageing 7 Days at 135 +2°C Minimum value (%)	-	65	65	-	-	-	-
	Tensile strength after ageing 7 days at 100 +2°C Minimum value (N/mm^2)	-	-	-	-	-	-	12.5
	Maximum variation From unaged value (%)	-	-	-	-	-	-	25
	Elongation at break After ageing 7 days at 100+2C	-	-	-	-	-	-	-
	Minimum value (%)	-	-	-	-	-	-	150
	Variation from Unaged value (%)							25
D.4	Maximum hot deformation (%)	30	65	30	65	65	65	40
E.1	Heat shock test Temperature at which specimen shall not crack (C)	150	150	150	150	100	120	150
F.2	Minimum insulation resistance constant (K value) at 20C m Skm	350	0.35	180	0.0035	0.0035	0.0035	0.0035