

OREL

Empowering
Humanity

ORANGE[®]
ELECTRIC



Powering the world around you

OREL



Empowering Humanity

We are a multinational company, in Electrical, Lighting and Digital infrastructure products, we employ in excess of 5317 personnel across 6 continents.

We empower humanity by creating a brighter, cleaner and smarter future for everyone. From switches to smart techs to water saving, our products, technologies and services are class leading solutions for buildings and the built environment in both developed and developing countries, for today and creating a sustainable environment for the future generations.

What We Do



**Artificial
Intelligence**



Transportation



Health Care



Education



**Internet
of Things**



**Building
Infrastructure**



**Digital
Infrastructure**



**Digital
Commerce**



Our Brands

Orel has a wide portfolio of global brands across Electrical, Lighting and Digital infrastructure.



Energy Enhanced

Orange Electric provides solutions in the sphere of energy with special attention to design and efficiency.



Connecting the World

Offering complete end-to-end Network & Connectivity Solutions for industrial, commercial, medical and military sectors.



Transforming Life's with Technology

Transforming the life's and inspiring the new generation through our wide portfolio of IT solutions including Image Annotation, Image Segmentation, Data Collection, OCR, Object Tracking, Classification, Comparison and many others.



Smarter Habitat

Qbus develops products & technologies that turn homes, offices, hotels, factories & even hospitals into smart buildings. Smart solutions for convenience and energy-savings.



Reliable & Affordable

Offering quality solutions with unsurpassed functionality and fashion for a discerning customer.



Seamless Mobile Payments

OrelPay allows users to link their bank accounts and credit cards with the OrelPay mobile app and carry out transactions by simply scanning a QR code.



Smart Options for Smart People

OrelBuy is focused on providing the unequivocal online shopping experience for both consumer and retail partners at an unrivalled level of service from the first point of sale to the point of delivery including dedicated after sales support.



Electrical Busduct Solutions

Superbar Offers world class Low Voltage Electrical Busbar Trunking Systems to meet the ever demanding and complex global.



Energy Enhanced

Our wide portfolio of Building Infrastructure products are innovative and of outstanding quality and value, intended to Empower Humanity by creating a brighter, cleaner and smarter future for everyone across the globe.

Orange Electric provides solutions in the sphere of energy with special attention to design and efficiency. We have a range of batteries, home appliances, allied accessories, switches, sockets, wires, cables, circuit breakers, plugs and connectors. In addition we have industrial products under Cable Management, Switchgears, Enclosures, Busbar Trunking, Power D/Boards, Energy Optimizer, Generators, Solar, Elevators, and Electronic Robots.



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POWERING ALL

Orel Corporation has been manufacturing wires and cables for over a decade and our obsession for quality and continuous improvements have made us one of the leading cable manufacturers in Sri Lanka. Our portfolio of products includes domestic, industrial armored, and data cables.

The majority of our cables are produced in-house, right down to the making of our own copper that makes up our conductors. We manufacture conductors with cross-sectional areas of up to 1000mm² for single-core cables and 4 x 400mm² for four-core cables.

Our newly-commissioned cable manufacturing facility boasts of state-of-the-art machinery and a highly-skilled workforce. We carry out extensive testing at every step of our manufacturing process, ensuring superior performance and peerless quality in every cable and wire that comes out of our factory.

Our cables and wires are designed to exceed the most stringent of quality standards and are manufactured to comply with Sri Lankan and International standard requirements.

Cable Category	Voltage Range
PVC insulated and PVC sheathed cables	up to and including 300/500 V
Flexible cables with thermoplastic PVC insulation	up to and including 450/750 V
Single Core non-sheathed cables with thermoplastic PVC insulation	up to and including 450/750 V
XLPE insulated,armoured cables	voltages of 600/1000 V
PVC insulated,armoured cables	voltages of 600/1000 V
Thermosetting insulated,armoured having low emission of smoke and corrosive gases when affected by fire	voltages of 600/1000 V
Single core PVC insulated flexible cables for switchgear and controlgear wiring	voltages of 600/1000 V
Single core Auto cables	voltages of 60/600 V
Coaxial cables for television receptions and similar applications	-

BUILDING CABLES

SINGLE CORE SHEATHED & FLAT TWIN

- Type : Cu/ PVC/ PVC
- Standard : SLS 733 :2016
- Nominal voltage : 300/500V
- Conductor : Solid or Circular stranded copper conductor
- Insulation : 70°C rated PVC compound
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Sheath Thickness	Max. overall Diameter	Approx. Weight	Max. d.c. Resistance at 20°C	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
mm ²	x/mm	mm	mm	mm	kg/km	Ω/km	
Single Core							
1	1/1.13	0.6	0.8	4.5	26	18.1	XK- 01113-BXXX
1.5	1/1.38	0.7	0.8	5.0	34	12.1	XK- 07138-BXXX
1.5	7/0.53	0.7	0.8	5.2	36	12.1	XK- 07053-BXXX
2.5	7/0.67	0.8	0.8	5.9	50	7.41	XK- 07067-BXXX
4	7/0.85	0.8	0.9	6.7	71	4.61	XK- 07085-BXXX
6	7/1.04	0.8	0.9	7.3	94	3.08	XK- 07104-BXXX
10	7/1.35	1.0	0.9	8.8	147	1.83	XK- 07135-BXXX
16	7/1.70	1.0	1.0	10.1	215	1.15	XK- 07170-BXXX
25	7/2.14	1.2	1.1	12.1	310	0.727	XK- 07214-BXXX
25	19/1.35	1.2	1.1	12.1	329	0.727	XK- 19135-BXXX
35	19/1.53	1.2	1.1	13.5	433	0.524	XK- 19153-BXXX
Flat Twin							
1.5 - FT	7/0.53	0.7	0.9	5.3 x 8.5	66	12.1	XK- 07053-CXXX
2.5 - FT	7/0.67	0.8	1.0	6.2 x 10.1	102	7.41	XK- 07067-CXXX
4 - FT	7/0.85	0.8	1.0	6.9 x 11.5	141	4.61	XK- 07085-CXXX
6 - FT	7/1.04	0.8	1.1	7.8 x 13.0	192	3.08	XK- 07104-CXXX
10 - FT	7/1.35	1.0	1.2	9.5 x 16.2	308	1.83	XK- 07135-CXXX
16 - FT	7/1.70	1.0	1.3	10.8 x 18.6	447	1.15	XK- 07170-CXXX

BUILDING CABLES SINGLE CORE INSULATION ONLY

- Type : Cu/ PVC
- Standard : SLS 1504-2-31 :2015
- Nominal voltage : 450/750V
- Conductor : Solid or Circular stranded copper conductor
- Insulation : 70°C rated PVC compound



Conductor		Nominal Insulation Thickness	Max. overall Diameter	Approx. Weight	Max. d.c. Resistance at 20°C	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires					
mm ²	x/mm	mm	mm	kg/km	Ω/km	
Solid Copper Conductor						
1.5	1/1.38	0.7	3.2	20	12.1	XK-01138-AXXX
2.5	1/1.78	0.8	3.9	32	7.41	XK-01178-AXXX
Circular Stranded Copper Conductor						
1.5	7/0.53	0.7	3.3	22	12.1	XK-07053-AXXX
2.5	7/0.67	0.8	4.0	34	7.41	XK-07067-AXXX
4	7/0.85	0.8	4.6	50	4.61	XK-07085-AXXX
6	7/1.04	0.8	5.2	70	3.08	XK-07104-AXXX
10	7/1.35	1.0	6.7	117	1.83	XK-07135-AXXX
16	7/1.70	1.0	7.8	177	1.15	XK-07170-AXXX
25	19/1.35	1.2	9.7	278	0.727	XK-19135-AXXX
35	19/1.53	1.2	10.9	376	0.524	XK-19153-AXXX
50	19/1.78	1.4	12.8	509	0.387	XK-19178-AXXX
70	19/2.14	1.4	14.6	717	0.268	XK-19214-AXXX
95	19/2.52	1.6	17.1	990	0.193	XK-19252-AXXX
120	37/2.03	1.6	18.8	1226	0.153	XK-37203-AXXX
150	37/2.25	1.8	20.9	1509	0.124	XK-37225-AXXX
185	37/2.52	2.0	23.3	1891	0.0991	XK-37252-AXXX
240	61/2.25	2.2	26.6	2465	0.0754	XK-61225-AXXX
300	61/2.52	2.4	29.6	3084	0.0601	XK-61252-AXXX
400	61/2.85	2.6	33.2	3928	0.0470	XK-61285-AXXX
500	61/3.20	2.8	36.9	4932	0.0366	XK-61320-AXXX
630	127/2.52	2.8	41.1	6311	0.0283	XK-12725-AXXX

EARTH CABLES

- Type : Cu/ PVC
- Standard : SLS 1504-2-31: 2015
- Nominal voltage : 450/750V
- Conductor : Solid or Circular stranded copper conductor
- Insulation : 70°C rated PVC compound



Conductor		Nominal Insulation Thickness	Max. overall Diameter	Approx. Weight	Max. d.c. Resistance at 20°C	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires					
mm ²	x/mm	mm	mm	kg/km	Ω/km	
1.5	1/1.38	0.7	3.2	20	12.1	XK-01138-PGRX
2.5	1/1.78	0.8	3.9	32	7.41	XK-01178-PGRX
1.5	7/0.53	0.7	3.3	22	12.1	XK-07053-PGRX
2.5	7/0.67	0.8	4.0	34	7.41	XK-07067-PGRX
4	7/0.85	0.8	4.6	50	4.61	XK-07085-PGRX
6	7/1.04	0.8	5.2	70	3.08	XK-07104-PGRX
10	7/1.35	1.0	6.7	117	1.83	XK-07135-PGRX
16	7/1.70	1.0	7.8	177	1.15	XK-07170-PGRX
25	19/1.35	1.2	9.7	278	0.727	XK-19135-PGRX
35	19/1.53	1.2	10.9	376	0.524	XK-19153-PGRX
50	19/1.78	1.4	12.8	509	0.387	XK-19178-PGR9
70	19/2.14	1.4	14.6	717	0.268	XK-19214-PGR9
95	19/2.52	1.6	17.1	990	0.193	XK-19252-PGR9
120	37/2.03	1.6	18.8	1226	0.153	XK-37203-PGR9
150	37/2.25	1.8	20.9	1509	0.124	XK-37225-PGR9
185	37/2.52	2.0	23.3	1891	0.0991	XK-37252-PGR9
240	61/2.25	2.2	26.6	2465	0.0754	XK-61225-PGR9
300	61/2.52	2.4	29.6	3084	0.0601	XK-61252-PGR9
400	61/2.85	2.6	33.2	3928	0.0470	XK-61285-PGR9
500	61/3.20	2.8	36.9	4932	0.0366	XK-61320-PGR9
630	127/2.52	2.8	41.1	6311	0.0283	XK-12725-PGR9
2x0.5*	16/0.2TT	0.6	2.5 Each	19	39.0	XK-1620T-FBBX

*Nominal Voltage 300/500V

FLEXIBLE CABLES

- Type : Cu/ PVC/ PVC
- Standard : SLS 1504-2-11: 2015
- Nominal voltage : 300/300V Light duty or 300/500V Ordinary duty
- Conductor : Annealed copper conductor - Class 5
- Insulation : 70°C rated PVC compound
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Sheath Thickness	Max. overall Diameter	Approx. Weight	Max. d.c. Resistance at 20°C	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
mm ²	x/mm	mm	mm	mm	kg/km	Ω/km	
Light Duty Flexible Cords							
2X0.5	16/0.20	0.5	0.6	5.9	37	39.0	XK- 16202-FXXX
3X0.5	16/0.20	0.5	0.6	6.3	43	39.0	XK- 16203-FXXX
2X0.75	24/0.20	0.5	0.6	6.3	46	26.0	XK- 24202-FXXX
3X0.75	24/0.20	0.5	0.6	6.7	54	26.0	XK- 24203-FXXX
4X0.75	24/0.20	0.5	0.6	7.3	67	26.0	XK- 24204-FXXX
Ordinary Duty Flexible Cords							
2X0.75	24/0.20	0.6	0.8	7.2	57	26.0	XK- 24202-FXXX
3X0.75	24/0.20	0.6	0.8	7.6	67	26.0	XK- 24203-FXXX
4X0.75	24/0.20	0.6	0.8	8.3	81	26.0	XK- 24204-FXXX
2X1	32/0.20	0.6	0.8	7.5	66	19.5	XK- 32202-FXXX
3X1	32/0.20	0.6	0.8	8.0	80	19.5	XK- 32203-FXXX
4X1	32/0.20	0.6	0.9	9.0	95	19.5	XK- 32204-FXXX
2X1.5	30/0.25	0.7	0.8	8.6	89	13.3	XK- 30252-FXXX
3X1.5	30/0.25	0.7	0.9	9.4	109	13.3	XK- 30253-FXXX
4X1.5	30/0.25	0.7	1.0	10.5	138	13.3	XK- 30254-FXXX
5X1.5	30/0.25	0.7	1.1	11.6	169	13.3	XK- 30255-FXXX
2X2.5	50/0.25	0.8	1.0	10.6	137	7.98	XK- 50252-FXXX
3X2.5	50/0.25	0.8	1.1	11.4	163	7.98	XK- 50253-FXXX
4X2.5	50/0.25	0.8	1.1	12.5	207	7.98	XK- 50254-FXXX
5X2.5	50/0.25	0.8	1.2	13.9	253	7.98	XK- 50255-FXXX
2X4	56/0.30	0.8	1.1	12.1	170	4.95	XK- 56252-FXXX
3X4	56/0.30	0.8	1.2	13.1	255	4.95	XK- 56253-FXXX
4X4	56/0.30	0.8	1.2	14.3	273	4.95	XK- 56254-FXXX
5X4	56/0.30	0.8	1.4	16.1	348	4.95	XK- 56255-FXXX

AUTO CABLES

- Type : Cu/PVC Thick wall Class B
- Standard : SLS 412 – 1: 2011
- Nominal voltage : 600V
- Insulation rating : 100° C rated PVC compound
- Sheathing : PVC compound
- Conductor : Soft annealed copper



Conductor		Nominal Insulation Thickness	Max. overall Diameter	Approx. Weight	Max. d.c. Resistance at 20°C	Core Colours	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
mm ²	x/mm	mm	mm	kg/km	Ω/km		
0.50	16/0.20	0.60	2.30	9	37.1	Red	XK-16020-AXXX
0.75	24/0.20	0.60	2.50	12	24.7	Black	XK-24020-AXXX
1	32/0.20	0.60	2.70	15	18.5	Blue	XK-32020-AXXX
1.5	30/0.25	0.60	3.00	20	12.7	Yellow	XK-30025-AXXX
2	28/0.30	0.60	3.30	25	9.42	Purple	XK-28020-AXXX
2.5	50/0.25	0.70	3.60	32	7.60	Brown	XK-50025-AXXX
3	44/0.30	0.70	4.10	39	6.15	Green	XK-44030-AXXX
4	56/0.30	0.80	4.40	49	4.71	White	XK-56030-AXXX
5	70/0.30	0.80	4.90	59	3.94	Orange	XK-70030-AXXX

ORANGE[®] ELECTRIC CABLES

Powering
the World



SINGLE CORE ARMoured - THERMOSETTING (XLPE) INSULATED CABLES

- Type : Cu/ XLPE/ AWA/ PVC
- Standard : BS 5467: 2016
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 90°C rated XLPE compound
- Armour : Aluminium nonmagnetic armour
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Bedding Thickness	Nominal Aluminium Armour wire Diameter	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires								
mm ²	x/mm	mm	mm	mm	mm	mm	Ω/km	kg/km	
50	19/1.78	1.0	0.8	0.9	1.5	17.5	0.387	702	XK-19178-JXXX
70	19/2.14	1.1	0.8	1.25	1.5	20.2	0.268	981	XK-19214-JXXX
95	19/2.52	1.1	0.8	1.25	1.6	22.3	0.193	1278	XK-19252-JXXX
120	37/2.03	1.2	0.8	1.25	1.6	24.2	0.153	1548	XK-37203-JXXX
150	37/2.25	1.4	1.0	1.6	1.7	27.4	0.124	1950	XK-37225-JXXX
185	37/2.52	1.6	1.0	1.6	1.8	30.0	0.0991	2381	XK-37252-JXXX
240	61/2.25	1.7	1.0	1.6	1.8	32.8	0.0754	2993	XK-61225-JXXX
300	61/2.52	1.8	1.0	1.6	1.9	35.6	0.0601	3658	XK-61262-JXXX
400	61/2.85	2.0	1.2	2.0	2.0	40.5	0.0470	4705	XK-61285-JXXX
500	61/3.20	2.2	1.2	2.0	2.1	44.2	0.0366	5793	XK-61320-JXXX
630	127/2.52	2.4	1.2	2.0	2.2	48.8	0.0283	7310	XK-12725-JXXX
800	127/2.85	2.6	1.4	2.5	2.4	55.4	0.0221	9299	XK-12728-JXXX
1000	127/3.20	2.8	1.4	2.5	2.5	60.6	0.0176	11359	XK-12732-JXXX

FOUR-CORE ARMoured THERMOSETTING (XLPE) INSULATED CABLES

- Type : Cu/ XLPE/ SWA/ PVC
- Standard : BS 5467: 2016
- Nominal voltage : 600/1000V
- Conductor : Class 2 copper
- Insulation : 90°C rated XLPE compound
- Armour : Steel Wire Armour
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Bedding Thickness	Nominal Steel Armour wire Diameter	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No.of Dia.of Wires								
mm ²	x/mm	mm	mm	mm	mm	mm	Ω/km	kg/km	
Circular Stranded Conductor - Class 2 Copper									
1.5	7/0.53	0.6	0.8	0.9	1.3	13.3	12.1	336	XK-07053-RX41
2.5	7/0.67	0.7	0.8	0.9	1.4	15.0	7.41	424	XK-07067-RX41
4	7/0.85	0.7	0.8	0.9	1.4	16.4	4.61	520	XK-07085-RX41
6	7/1.04	0.7	0.8	0.9	1.5	18.7	3.08	746	XK-07104-RX41
10	7/1.35	0.7	0.8	1.25	1.5	21.1	1.83	982	XK-07135-RX41
16	7/1.70	0.7	0.8	1.25	1.6	23.4	1.15	1307	XK-07170-RX41
25	7/2.14	0.9	1.0	1.6	1.7	28.9	0.727	2041	XK-07214-RX41
35	7/2.52	0.9	1.0	1.6	1.8	31.9	0.524	2558	XK-07252-RX41
Shaped Stranded Conductor - Class 2 Copper									
25	7/2.14	0.9	1.0	1.6	1.7	26.1	0.727	1907	XK-07214-RX41
35	7/2.52	0.9	1.0	1.6	1.8	28.6	0.524	2373	XK-07252-RX41
50	19/1.78	1.0	1.0	1.6	1.9	32.0	0.387	2996	XK-19178-RX41
70	19/2.14	1.1	1.2	2.0	2.1	37.7	0.268	4320	XK-19214-RX41
95	19/2.52	1.1	1.2	2.0	2.2	41.7	0.193	5530	XK-19252-RX41
120	37/2.03	1.2	1.4	2.5	2.3	47.1	0.153	7254	XK-37203-RX41
150	37/2.25	1.4	1.4	2.5	2.4	51.4	0.124	8430	XK-37225-RX41
185	37/2.52	1.6	1.4	2.5	2.6	56.6	0.0991	10285	XK-37252-RX41
240	61/2.25	1.7	1.6	2.5	2.7	63.0	0.0754	12819	XK-61225-RX41
300	61/2.52	1.8	1.6	2.5	2.9	68.8	0.0601	15693	XK-61252-RX41
400	61/2.85	2.0	1.8	3.15	3.2	78.1	0.0470	20086	XK-61285-RX41

MULTI CORE ARMoured - THERMOSETTING (XLPE) INSULATED CABLES (2 CORE/3 CORE/5 CORE)



- Type : Cu/ XLPE/ SWA/ PVC
- Standard : BS 5467: 2016
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 90°C rated XLPE compound
- Armour : Steel Wire Armour
- Sheathing : PVC compound

Conductor		Nominal Insulation Thickness	Nominal Bedding Thickness	Nominal Steel Armour wire Diameter	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires								
mm ²	x/mm	mm	mm	mm	mm	mm	Ω/km	kg/km	
2 Core Armoured Cables									
1.5	7/0.53	0.6	0.8	0.9	1.3	12.1	12.1	268	XK-07053-RX29
2.5	7/0.67	0.7	0.8	0.9	1.4	13.6	7.41	328	XK-07067-RX29
4	7/0.85	0.7	0.8	0.9	1.4	14.7	4.61	388	XK-07085-RX29
6	7/1.04	0.7	0.8	0.9	1.4	15.9	3.08	458	XK-07104-RX29
10	7/1.35	0.7	0.8	0.9	1.5	18.0	1.83	597	XK-07135-RX29
16	7/1.70	0.7	0.8	1.25	1.5	20.4	1.15	883	XK-07170-RX29
25	7/2.14	0.9	0.8	1.25	1.6	24.1	0.727	1200	XK-07214-RX29
35	7/2.52	0.9	1.0	1.6	1.7	27.7	0.524	1680	XK-07252-RX29
3 Core Armoured Cables									
1.5	7/0.53	0.6	0.8	0.9	1.3	12.6	12.1	298	XK-07053-RX39
2.5	7/0.67	0.7	0.8	0.9	1.4	14.1	7.41	372	XK-07067-RX39
4	7/0.85	0.7	0.8	0.9	1.4	15.3	4.61	449	XK-07085-RX39
6	7/1.04	0.7	0.8	0.9	1.4	16.6	3.08	541	XK-07104-RX39
10	7/1.35	0.7	0.8	1.25	1.5	19.5	1.83	831	XK-07135-RX39
16	7/1.70	0.7	0.8	1.25	1.6	21.6	1.15	1089	XK-07170-RX39
25	7/2.14	0.9	1.0	1.6	1.7	26.7	0.727	1696	XK-07214-RX39
35	7/2.52	0.9	1.0	1.6	1.8	29.4	0.524	2105	XK-07252-RX39
5 Core Armoured Cables									
1.5	7/0.53	0.6	0.8	0.9	1.4	14.3	12.1	382	XK-07053-RX59
2.5	7/0.67	0.7	0.8	0.9	1.4	16.1	7.41	479	XK-07067-RX59
4	7/0.85	0.7	0.8	0.9	1.5	17.8	4.61	603	XK-07085-RX59
6	7/1.04	0.7	0.8	1.25	1.5	20.0	3.08	853	XK-07104-RX59
10	7/1.35	0.7	0.8	1.25	1.6	22.9	1.83	1148	XK-07135-RX59
16	7/1.70	0.7	1.0	1.6	1.7	26.6	1.15	1726	XK-07170-RX59
25	7/2.14	0.9	1.0	1.6	1.8	31.5	0.727	2407	XK-07214-RX59
35	7/2.52	0.9	1.0	1.6	1.9	34.8	0.524	3036	XK-07252-RX59

SINGLE CORE ARMoured - THERMOPLASTIC (PVC) INSULATED CABLES

- Type : Cu/ PVC/ AWA/ PVC
- Standard : BS 6346:1997
- Nominal voltage : 600/1000V
- Conductor : Class 2 copper
- Insulation : 70°C rated PVC compound
- Armour : Aluminium Wire Armour
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Bedding Thickness	Nominal Aluminium Armour wire Diameter	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires								
mm ²	x/mm	mm	mm	mm	mm	mm	Ω/km	kg/km	
50	19/1.78	1.4	0.8	1.25	1.5	19.1	0.387	797	XK-19178-JXXX
70	19/2.14	1.4	0.8	1.25	1.6	21.1	0.268	1050	XK-19214-JXXX
95	19/2.52	1.6	0.8	1.25	1.6	23.4	0.193	1368	XK-19252-JXXX
120	37/2.03	1.6	1.0	1.6	1.7	26.3	0.153	1727	XK-37203-JXXX
150	37/2.25	1.8	1.0	1.6	1.7	28.3	0.124	2055	XK-37225-JXXX
185	37/2.52	2.0	1.0	1.6	1.8	30.8	0.0991	2505	XK-37252-JXXX
240	61/2.25	2.2	1.0	1.6	1.9	34.1	0.0754	3167	XK-61225-JXXX
300	61/2.52	2.4	1.0	1.6	1.9	37.0	0.0601	3854	XK-61262-JXXX
400	61/2.85	2.6	1.2	2.0	2.1	42.0	0.0470	4959	XK-61285-JXXX
500	61/3.20	2.8	1.2	2.0	2.1	45.6	0.0366	6065	XK-61320-JXXX
630	127/2.52	2.8	1.2	2.0	2.2	49.7	0.0283	7582	XK-12725-JXXX
800	127/2.85	2.8	1.4	2.5	2.4	55.8	0.0221	9569	XK-12728-JXXX
1000	127/3.20	3.0	1.4	2.5	2.5	61.0	0.0176	11678	XK-12732-JXXX

FOUR-CORE ARMoured - THERMOPLASTIC (PVC) INSULATED CABLES

- Type : Cu/ PVC/ SWA/ PVC
- Standard : BS 6346: 1997
- Nominal voltage : 600/1000V
- Conductor : Class 2 copper
- Insulation : 70°C rated PVC compound
- Armour : Steel Wire Armour
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Bedding Thickness	Nominal Steel Armour wire Diameter	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires								
mm ²	x/mm	mm	mm	mm	mm	mm	Ω/km	kg/km	
Circular Stranded Conductor - Class 2 Copper									
1.5	7/0.53	0.6	0.8	0.9	1.4	13.5	12.1	352	XK-07053-RP49
2.5	7/0.67	0.7	0.8	0.9	1.4	15.0	7.41	439	XK-07067-RP49
4	7/0.85	0.8	0.8	1.25	1.5	17.8	4.61	663	XK-07085-RP49
6	7/1.04	0.8	0.8	1.25	1.5	19.2	3.08	792	XK-07104-RP49
10	7/1.35	1.0	0.8	1.25	1.6	22.8	1.83	1102	XK-07135-RP49
16	7/1.70	1.0	1.0	1.6	1.7	26.3	1.15	1623	XK-07170-RP49
25	7/2.14	1.2	1.0	1.6	1.8	30.7	0.727	2221	XK-07214-RP49
35	7/2.52	1.2	1.0	1.6	1.9	33.7	0.524	2759	XK-07252-RP49
Shaped Stranded Conductor - Class 2 Copper									
25	7/2.14	1.2	1.0	1.6	1.8	27.8	0.727	2022	XK-07214-RP49
35	7/2.52	1.2	1.0	1.6	1.9	30.3	0.524	2539	XK-07252-RP49
50	19/1.78	1.4	1.2	2.0	2.0	35.4	0.387	3496	XK-19178-RP49
70	19/2.14	1.4	1.2	2.0	2.1	39.2	0.268	4541	XK-19214-RP49
95	19/2.52	1.6	1.2	2.0	2.2	44.3	0.193	5872	XK-19252-RP49
120	37/2.03	1.6	1.4	2.5	2.4	49.3	0.153	7627	XK-37203-RP49
150	37/2.25	1.8	1.4	2.5	2.5	53.6	0.124	8857	XK-37225-RP49
185	37/2.52	2.0	1.6	2.5	2.6	59.0	0.0991	10826	XK-37252-RP49
240	61/2.25	2.2	1.6	2.5	2.8	65.7	0.0754	13459	XK-61225-RP49
300	61/2.52	2.4	1.6	2.5	3.0	72.0	0.0601	16491	XK-61252-RP49
400	61/2.85	2.6	1.8	3.15	3.3	81.3	0.0470	21027	XK-61285-RP49

MULTI CORE ARMoured - THERMOPLASTIC (PVC) INSULATED CABLES (2 CORE/3 CORE/5 CORE)

- Type : Cu/ PVC/ SWA/ PVC
- Standard : BS 6346: 1997
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 70°C rated PVC compound
- Armour : Steel Wire Armour
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Bedding Thickness	Nominal Steel Armour wire Diameter	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires								
mm ²	x/mm	mm	mm	mm	mm	mm	Ω/km	kg/km	
2 Core Armoured Cables									
1.5	7/0.53	0.6	0.8	0.9	1.4	12.3	12.1	279	XK-07053-RP29
2.5	7/0.67	0.7	0.8	0.9	1.4	13.6	7.41	335	XK-07067-RP29
4	7/0.85	0.8	0.8	0.9	1.4	15.1	4.61	411	XK-07085-RP29
6	7/1.04	0.8	0.8	0.9	1.5	16.5	3.08	491	XK-07104-RP29
10	7/1.35	1.0	0.8	1.25	1.6	20.1	1.83	778	XK-07135-RP29
16	7/1.70	1.0	0.8	1.25	1.6	21.9	1.15	970	XK-07170-RP29
25	7/2.14	1.2	1.0	1.6	1.7	26.7	0.727	1488	XK-07214-RP29
35	7/2.52	1.2	1.0	1.6	1.8	29.2	0.524	1803	XK-07252-RP29
3 Core Armoured Cables									
1.5	7/0.53	0.6	0.8	0.9	1.4	12.8	12.1	284	XK-07053-RP39
2.5	7/0.67	0.7	0.8	0.9	1.4	14.1	7.41	352	XK-07067-RP39
4	7/0.85	0.8	0.8	0.9	1.4	15.8	4.61	446	XK-07085-RP39
6	7/1.04	0.8	0.8	1.25	1.5	18.0	3.08	721	XK-07104-RP39
10	7/1.35	1.0	0.8	1.25	1.6	21.2	1.83	987	XK-07135-RP39
16	7/1.70	1.0	0.8	1.25	1.6	23.1	1.15	1259	XK-07170-RP39
25	7/2.14	1.2	1.0	1.6	1.7	28.2	0.727	2160	XK-07214-RP39
35	7/2.52	1.2	1.0	1.6	1.8	30.8	0.524	2630	XK-07252-RP39
5 Core Armoured Cables									
1.5	7/0.53	0.6	0.8	0.9	1.4	14.3	12.1	394	XK-07053-RP59
2.5	7/0.67	0.7	0.8	0.9	1.5	16.3	7.41	504	XK-07067-RP59
4	7/0.85	0.8	0.8	1.25	1.5	19.0	4.61	752	XK-07085-RP59
6	7/1.04	0.8	0.8	1.25	1.6	20.9	3.08	918	XK-07104-RP59
10	7/1.35	1.0	1.0	1.6	1.7	25.8	1.83	1465	XK-07135-RP59
16	7/1.70	1.0	1.0	1.6	1.7	28.4	1.15	1885	XK-07170-RP59
25	7/2.14	1.2	1.0	1.6	1.9	33.5	0.727	2622	XK-07214-RP59
35	7/2.52	1.2	1.0	1.6	1.9	36.6	0.524	3259	XK-07252-RP59

SINGLE CORE UNARMoured - THERMOSETTING (XLPE) INSULATED CABLES

- Type : Cu/ XLPE/ PVC
- Standard : BS 7889: 2012
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 90°C rated XLPE compound
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
mm ²	x/mm	mm	mm	mm	Ω/km	kg/km	
50	19/1.78	1.0	1.4	14.2	0.387	549	XK-19178-JBXX
70	19/2.14	1.1	1.4	16.2	0.268	767	XK-19214-JBXX
95	19/2.52	1.1	1.5	18.3	0.193	1038	XK-19252-JBXX
120	37/2.03	1.2	1.5	20.2	0.153	1287	XK-37203-JBXX
150	37/2.25	1.4	1.6	22.4	0.124	1579	XK-37225-JBXX
185	37/2.52	1.6	1.6	24.7	0.0991	1961	XK-37252-JBXX
240	61/2.25	1.7	1.7	27.7	0.0754	2542	XK-61225-JBXX
300	61/2.52	1.8	1.8	30.6	0.0601	3163	XK-61262-JBXX
400	61/2.85	2.0	1.9	34.2	0.0470	4020	XK-61285-JBXX
500	61/3.20	2.2	2.0	38.0	0.0366	5038	XK-61320-JBXX
630	127/2.52	2.4	2.2	42.9	0.0283	6489	XK-12725-JBXX
800	127/2.85	2.6	2.3	47.8	0.0221	8147	XK-12728-JBXX
1000	127/3.20	2.8	2.4	53.0	0.0176	10095	XK-12732-JBXX

FOUR-CORE UNARMoured - THERMOSETTING (XLPE) INSULATED CABLES

- Type : Cu/ XLPE/ PVC
- Standard : BS 5467: 2016/ BS 7889 : 2012
- Nominal voltage : 600/1000V
- Conductor : Class 2 copper
- Insulation : 90°C rated XLPE compound
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
mm ²	x/mm	mm	mm	mm	Ω/km	kg/km	
Circular Stranded Conductor - Class 2 Copper							
1.5	7/0.53	0.7	1.8	10.8	12.1	126	XK-07053-SX49
2.5	7/0.67	0.7	1.8	12.2	7.41	182	XK-07067-SX49
4	7/0.85	0.7	1.8	13.4	4.61	251	XK-07085-SX49
6	7/1.04	0.7	1.8	14.8	3.08	345	XK-07104-SX49
10	7/1.35	0.7	1.8	17.1	1.83	520	XK-07135-SX49
16	7/1.70	0.7	1.8	19.6	1.15	775	XK-07170-SX49
25	7/2.14	0.9	1.8	23.8	0.727	1193	XK-07214-SX49
35	7/2.52	0.9	1.8	26.8	0.524	1606	XK-07252-SX49
Shaped Stranded Conductor - Class 2 Copper							
25	7/2.14	0.9	1.8	21.0	0.727	1133	XK-07214-SX49
35	7/2.52	0.9	1.8	23.0	0.524	1549	XK-07252-SX49
50	19/1.78	1.0	1.8	26.7	0.387	2048	XK-19178-SX49
70	19/2.14	1.1	2.0	31.1	0.268	2939	XK-19214-SX49
95	19/2.52	1.1	2.1	35.1	0.193	3982	XK-19252-SX49
120	37/2.03	1.2	2.3	38.9	0.153	5097	XK-37203-SX49
150	37/2.25	1.4	2.4	43.3	0.124	6047	XK-37225-SX49
185	37/2.52	1.6	2.6	48.1	0.0991	7663	XK-37252-SX49
240	61/2.25	1.7	2.7	53.9	0.0754	9826	XK-61225-SX49
300	61/2.52	1.8	2.9	59.6	0.0601	12402	XK-61252-SX49
400	61/2.85	2.0	3.2	68.3	0.0470	15389	XK-61285-SX49

MULTI CORE UNARMoured - THERMOSETTING (XLPE) INSULATED CABLES (2 CORE/3 CORE/5 CORE)

- Type : Cu/ XLPE/ PVC
- Standard : BS 7889 : 2012
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 90°C rated XLPE compound
- Sheathing : PVC compound



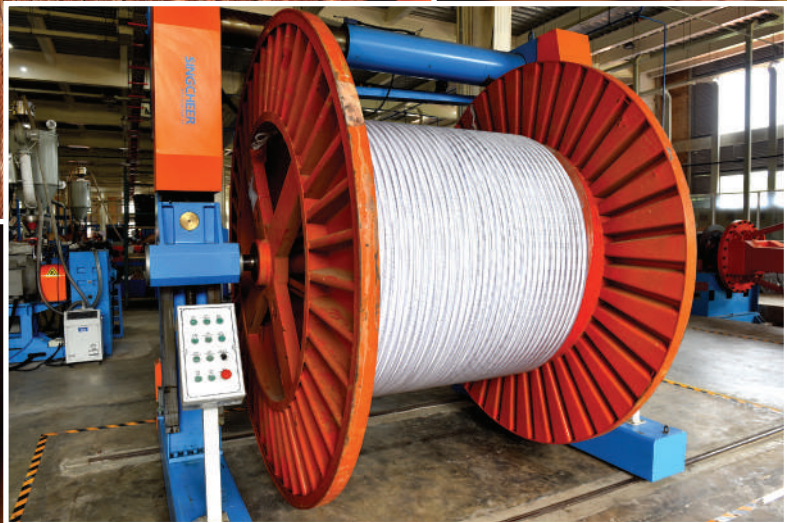
Conductor		Nominal Insulation Thickness	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
mm ²	x/mm	mm	mm	mm	Ω/km	kg/km	
2 Core Unarmoured Cables							
1.5	7/0.53	0.7	1.8	9.7	12.1	82	XK-07053-RX29
2.5	7/0.67	0.7	1.8	10.7	7.41	115	XK-07067-RX29
4	7/0.85	0.7	1.8	11.8	4.61	152	XK-07085-RX29
6	7/1.04	0.7	1.8	12.9	3.08	199	XK-07104-RX29
10	7/1.35	0.7	1.8	14.8	1.83	298	XK-07135-RX29
16	7/1.70	0.7	1.8	16.9	1.15	427	XK-07170-RX29
25	7/2.14	0.9	1.8	20.3	0.727	649	XK-07214-RX29
35	7/2.52	0.9	1.8	22.8	0.524	866	XK-07252-RX29
3 Core Unarmoured Cables							
1.5	7/0.53	0.7	1.8	10.1	12.1	103	XK-07053-RX39
2.5	7/0.67	0.7	1.8	11.3	7.41	147	XK-07067-RX39
4	7/0.85	0.7	1.8	12.4	4.61	200	XK-07085-RX39
6	7/1.04	0.7	1.8	13.7	3.08	267	XK-07104-RX39
10	7/1.35	0.7	1.8	15.7	1.83	407	XK-07135-RX39
16	7/1.70	0.7	1.8	17.9	1.15	602	XK-07170-RX39
25	7/2.14	0.9	1.8	21.7	0.727	922	XK-07214-RX39
35	7/2.52	0.9	1.8	24.3	0.524	1237	XK-07252-RX39
5 Core Unarmoured Cables							
1.5	7/0.53	0.7	1.8	11.6	12.1	154	XK-07053-RX59
2.5	7/0.67	0.7	1.8	13.1	7.41	217	XK-07067-RX59
4	7/0.85	0.7	1.8	14.5	4.61	309	XK-07085-RX59
6	7/1.04	0.7	1.8	16.1	3.08	417	XK-07104-RX59
10	7/1.35	0.7	1.8	18.6	1.83	643	XK-07135-RX59
16	7/1.70	0.7	1.8	21.5	1.15	958	XK-07170-RX59
25	7/2.14	0.9	1.8	26.1	0.727	1478	XK-07214-RX59
35	7/2.52	0.9	1.8	29.4	0.524	1990	XK-07252-RX59

SINGLE CORE UNARMoured - THERMOPLASTIC (PVC) INSULATED CABLES

- Type : Cu/ PVC/ PVC
- Standard : BS 6346: 1997
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 70°C rated PVC compound
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
mm ²	x/mm	mm	mm	mm	Ω/km	kg/km	
50	19/1.78	1.4	1.5	14.7	0.387	605	XK-19178-BXXX
70	19/2.14	1.4	1.6	16.7	0.268	834	XK-19217-BXXX
95	19/2.52	1.6	1.6	19.0	0.193	1126	XK-19252-BXXX
120	37/2.03	1.6	1.7	20.8	0.153	1384	XK-37203-BXXX
150	37/2.25	1.8	1.7	22.8	0.124	1683	XK-37225-BXXX
185	37/2.52	2.0	1.8	25.2	0.0991	2096	XK-37252-BXXX
240	61/2.25	2.2	1.9	28.5	0.0754	2711	XK-61225-BXXX
300	61/2.52	2.4	1.9	31.3	0.0601	3356	XK-61252-BXXX
400	61/2.85	2.6	2.1	35.1	0.0470	4265	XK-61285-BXXX
500	61/3.20	2.8	2.1	38.6	0.0366	5306	XK-61322-BXXX
630	127/2.52	2.8	2.2	42.8	0.0283	6747	XK-12725-BXXX
800	127/2.85	2.8	2.4	47.3	0.0221	8430	XK-12728-BXXX
1000	127/3.20	3.0	2.5	52.1	0.0176	10431	XK-12732-BXXX



FOUR-CORE UNARMoured - THERMOPLASTIC (PVC) INSULATED CABLES

- Type : Cu/ PVC/ PVC
- Standard : BS 6346: 1997
- Nominal voltage : 600/1000V
- Conductor : Class 2 copper
- Insulation : 70°C rated PVC compound
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
mm ²	x/mm	mm	mm	mm	Ω/km	kg/km	
Circular Stranded Conductor - Class 2 Copper							
1.5	7/0.53	0.6	1.4	9.9	12.1	140	XK-07053-SP49
2.5	7/0.67	0.7	1.4	11.4	7.41	196	XK-07067-SP49
4	7/0.85	0.8	1.5	13.3	4.61	286	XK-07085-SP49
6	7/1.04	0.8	1.5	14.7	3.08	378	XK-07104-SP49
10	7/1.35	1.0	1.6	18.1	1.83	599	XK-07135-SP49
16	7/1.70	1.0	1.7	20.9	1.15	869	XK-07170-SP49
25	7/2.14	1.2	1.8	25.2	0.727	1321	XK-07214-SP49
35	7/2.52	1.2	1.9	28.4	0.524	1754	XK-07252-SP49
Shaped Stranded Conductor - Class 2 Copper							
25	7/2.14	1.2	1.8	21.6	0.727	1257	XK-07214-SP49
35	7/2.52	1.2	1.9	24.1	0.524	1681	XK-07252-SP49
50	19/1.78	1.4	2.0	28.2	0.387	2233	XK-19178-SP49
70	19/2.14	1.4	2.1	32.0	0.268	3121	XK-19214-SP49
95	19/2.52	1.6	2.2	36.6	0.193	4259	XK-19252-SP49
120	37/2.03	1.6	2.4	40.4	0.153	5402	XK-37203-SP49
150	37/2.25	1.8	2.5	44.7	0.124	6406	XK-37225-SP49
185	37/2.52	2.0	2.6	49.3	0.0991	8071	XK-37252-SP49
240	61/2.25	2.2	2.8	55.6	0.0754	10381	XK-61225-SP49
300	61/2.52	2.4	3.0	61.7	0.0601	13099	XK-61252-SP49
400	61/2.85	2.6	3.3	70.3	0.0470	16204	XK-61285-SP49

MULTI CORE UNARMoured - THERMOPLASTIC (PVC) INSULATED CABLES (2 CORE/3 CORE/5 CORE)

- Type : Cu/ PVC/ PVC
- Standard : BS 6346 : 1997
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 70°C rated PVC compound
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
mm ²	x/mm	mm	mm	mm	Ω/km	kg/km	
2 Core Unarmoured Cables							
1.5	7/0.53	0.6	1.4	8.7	12.1	91	XK-07053-SP29
2.5	7/0.67	0.7	1.4	9.9	7.41	122	XK-07067-SP29
4	7/0.85	0.8	1.4	11.4	4.61	167	XK-07085-SP29
6	7/1.04	0.8	1.5	12.7	3.08	222	XK-07104-SP29
10	7/1.35	1.0	1.6	15.6	1.83	343	XK-07135-SP29
16	7/1.70	1.0	1.6	17.7	1.15	479	XK-07170-SP29
25	7/2.14	1.2	1.7	21.3	0.727	718	XK-07214-SP29
35	7/2.52	1.2	1.8	24.0	0.524	945	XK-07252-SP29
3 Core Unarmoured Cables							
1.5	7/0.53	0.6	1.4	9.1	12.1	114	XK-07053-SP39
2.5	7/0.67	0.7	1.4	10.5	7.41	158	XK-07067-SP39
4	7/0.85	0.8	1.4	12.1	4.61	222	XK-07085-SP39
6	7/1.04	0.8	1.5	13.5	3.08	299	XK-07104-SP39
10	7/1.35	1.0	1.6	16.6	1.83	469	XK-07135-SP39
16	7/1.70	1.0	1.6	18.8	1.15	667	XK-07170-SP39
25	7/2.14	1.2	1.7	22.8	0.727	1010	XK-07214-SP39
35	7/2.52	1.2	1.8	25.6	0.524	1340	XK-07252-SP39
5 Core Unarmoured Cables							
1.5	7/0.53	0.6	1.4	10.6	12.1	166	XK-07053-SP59
2.5	7/0.67	0.7	1.5	12.5	7.41	240	XK-07067-SP59
4	7/0.85	0.8	1.5	14.5	4.61	344	XK-07085-SP59
6	7/1.04	0.8	1.6	16.2	3.08	466	XK-07104-SP59
10	7/1.35	1.0	1.7	20.0	1.83	740	XK-07135-SP59
16	7/1.70	1.0	1.7	22.9	1.15	1063	XK-07170-SP59
25	7/2.14	1.2	1.9	27.9	0.727	1635	XK-07214-SP59
35	7/2.52	1.2	1.9	31.2	0.524	2157	XK-07252-SP59

CONTROL CABLES ARMoured – THERMOSETTING (XLPE) INSULATED

- Type : Cu/ XLPE/ SWA/ PVC
- Standard : BS 5467: 2016
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 90°C rated XLPE compound
- Armour : Steel Wire Armour
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Bedding Thickness	Nominal Steel Armour wire Diameter	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires								
N x mm ²	x/mm	mm	mm	mm	mm	mm	Ω/km	kg/km	
7x1.5	7/0.53	0.6	0.8	0.9	1.4	15.2	12.1	441	XK-07053-XXXX
12x1.5	7/0.53	0.6	0.8	1.25	1.5	19.4	12.1	736	XK-07053-XXXX
19x1.5	7/0.53	0.6	0.8	1.25	1.6	22.2	12.1	954	XK-07053-XXXX
27x1.5	7/0.53	0.6	1.0	1.6	1.7	26.7	12.1	1404	XK-07053-XXXX
37x1.5	7/0.53	0.6	1.0	1.6	1.7	29.0	12.1	1688	XK-07053-XXXX
7x2.5	7/0.67	0.7	0.8	0.9	1.4	17.1	7.41	564	XK-07067-XXXX
12x2.5	7/0.67	0.7	0.8	1.25	1.6	22.4	7.41	958	XK-07067-XXXX
19x2.5	7/0.67	0.7	1.0	1.6	1.7	26.6	7.41	1449	XK-07067-XXXX
27x2.5	7/0.67	0.7	1.0	1.6	1.8	30.7	7.41	1859	XK-07067-XXXX
37x2.5	7/0.67	0.7	1.0	1.6	1.8	33.8	7.41	2.270	XK-07067-XXXX
7x4	7/0.85	0.7	0.8	1.25	1.5	19.7	4.61	830	XK-07085-XXXX
12x4	7/0.85	0.7	1.0	1.6	1.6	25.7	4.61	1392	XK-07085-XXXX
19x4	7/0.85	0.7	1.0	1.6	1.7	29.3	4.61	1851	XK-07085-XXXX
27x4	7/0.85	0.7	1.0	1.6	1.9	34.4	4.61	2426	XK-07085-XXXX
37x4	7/0.85	0.7	1.2	2.0	2.0	39.2	4.61	3329	XK-07085-XXXX

CONTROL CABLES ARMoured - THERMOPLASTIC (PVC) INSULATED

- Type : Cu/PVC/ SWA/ PVC
- Standard : BS 6346: 1997
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 70°C rated PVC compound
- Armour : Steel Wire Armour
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Bedding Thickness	Nominal Steel Armour wire Diameter	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires								
N x mm ²	x/mm	mm	mm	mm	mm	mm	Ω/km	kg/km	
7x1.5	7/0.53	0.6	0.8	0.9	1.4	15.2	12.1	458	XK-07053-U079
12x1.5	7/0.53	0.6	0.8	1.25	1.5	19.4	12.1	765	XK-07053-U129
19x1.5	7/0.53	0.6	0.8	1.25	1.6	22.2	12.1	1000	XK-07053-U199
27x1.5	7/0.53	0.6	1.0	1.6	1.7	26.7	12.1	1470	XK-07053-U279
37x1.5	7/0.53	0.6	1.0	1.6	1.8	29.2	12.1	1791	XK-07053-U379
48x1.5	7/0.53	0.6	1.0	1.6	1.9	32.9	12.1	2173	XK-07053-U489
7x2.5	7/0.67	0.7	0.8	1.25	1.5	18.0	7.41	694	XK-07067-U079
12x2.5	7/0.67	0.7	0.8	1.25	1.6	22.4	7.41	1000	XK-07067-U129
19x2.5	7/0.67	0.7	1.0	1.6	1.7	26.6	7.41	1516	XK-07067-U199
27x2.5	7/0.67	0.7	1.0	1.6	1.8	30.7	7.41	1955	XK-07067-U279
37x2.5	7/0.67	0.7	1.0	1.6	1.9	34.0	7.41	2416	XK-07067-U379
48x2.5	7/0.67	0.7	1.2	2.0	2.1	39.5	7.41	3281	XK-07067-U489
7x4	7/0.85	0.8	0.8	1.25	1.6	20.5	4.61	904	XK-07085-U079
12x4	7/0.85	0.8	1.0	1.6	1.7	26.8	4.61	1514	XK-07085-U129
19x4	7/0.85	0.8	1.0	1.6	1.8	30.5	4.61	2026	XK-07085-U199
27x4	7/0.85	0.8	1.2	2.0	2.0	37.1	4.61	2950	XK-07085-U279
37x4	7/0.85	0.8	1.2	2.0	2.1	40.8	4.61	3653	XK-07085-U379
48x4	7/0.85	0.8	1.2	2.0	2.2	46.0	4.61	4476	XK-07085-U489

CONTROL CABLES UNARMoured - THERMOSETTING (XLPE) INSULATED

- Type : Cu/ XLPE/ PVC
- Standard : BS 5467: 2016
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 90°C rated XLPE compound
- Sheathing : PVC compound



Conductor		Nominal Insulation Thickness	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approx. Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
N x mm ²	x/mm	mm	mm	mm	Ω/km	kg/km	
7x1.5	7/0.53	0.6	1.4	11.5	12.1	196	XK-07053-XXXX
12x1.5	7/0.53	0.6	1.5	14.9	12.1	316	XK-07053-XXXX
19x1.5	7/0.53	0.6	1.6	17.5	12.1	470	XK-07053-XXXX
27x1.5	7/0.53	0.6	1.7	20.9	12.1	650	XK-07053-XXXX
37x1.5	7/0.53	0.6	1.7	23.3	12.1	852	XK-07053-XXXX
7x2.5	7/0.67	0.7	1.4	13.3	7.41	281	XK-07067-XXXX
12x2.5	7/0.67	0.7	1.6	17.7	7.41	467	XK-07067-XXXX
19x2.5	7/0.67	0.7	1.7	20.8	7.41	699	XK-07067-XXXX
27x2.5	7/0.67	0.7	1.8	24.9	7.41	972	XK-.07067-XXXX
37x2.5	7/0.67	0.7	1.8	27.8	7.41	1283	XK-07067-XXXX
7x4	7/0.85	0.7	1.5	15.2	4.61	405	XK-07085-XXXX
12x4	7/0.85	0.7	1.6	19.9	4.61	666	XK-07085-XXXX
19x4	7/0.85	0.7	1.7	23.5	4.61	1008	XK-07085-XXXX
27x4	7/0.85	0.7	1.9	28.4	4.61	1422	XK-07085-XXXX
37x4	7/0.85	0.7	2.0	32.0	4.61	1905	XK-07085-XXXX

CONTROL CABLES UNARMoured - THERMOPLASTIC (PVC) INSULATED

- Type : Cu/ PVC / PVC
- Standard : BS 6346: 1997
- Nominal voltage : 600/1000V
- Conductor : Circular stranded conductor - Class 2 copper
- Insulation : 70°C rated PVC compound
- Sheathing : PVC compound

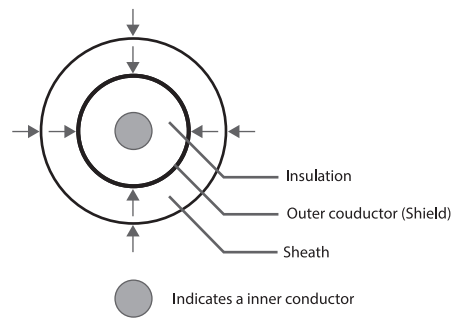


Conductor		Nominal Insulation Thickness	Nominal Sheathing Thickness	Approximate Overall Diameter	Max D.C. Resistance at 20°C	Approximate Weight	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires						
N x mm ²	x/mm	mm	mm	mm	Ω/km	kg/km	
7x1.5	7/0.53	0.6	1.4	11.5	12.1	213	XK-07053-K079
12x1.5	7/0.53	0.6	1.5	14.9	12.1	346	XK-07053-K129
19x1.5	7/0.53	0.6	1.6	17.5	12.1	516	XK-07053-K199
27x1.5	7/0.53	0.6	1.7	20.9	12.1	716	XK-07053-K279
37x1.5	7/0.53	0.6	1.8	23.4	12.1	954	XK-07053-K379
48x1.5	7/0.53	0.6	1.9	26.8	12.1	1222	XK-07053-K489
7x2.5	7/0.67	0.7	1.5	13.5	7.41	312	XK-07067-K079
12x2.5	7/0.67	0.7	1.6	17.7	7.41	510	XK-07067-K129
19x2.5	7/0.67	0.7	1.7	20.8	7.41	767	XK-07067-K199
27x2.5	7/0.67	0.7	1.8	24.9	7.41	1068	XK-07067-K279
37x2.5	7/0.67	0.7	1.9	28.0	7.41	1427	XK-07067-K379
48x2.5	7/0.67	0.7	2.1	32.3	7.41	1847	XK-07067-K489
7x4	7/0.85	0.8	1.6	16.0	4.61	460	XK-07085-K079
12x4	7/0.85	0.8	1.7	21.0	4.61	757	XK-07085-K129
19x4	7/0.85	0.8	1.8	24.7	4.61	1147	XK-07085-K199
27x4	7/0.85	0.8	2.0	29.8	4.61	1616	XK-07085-K279
37x4	7/0.85	0.8	2.1	33.6	4.61	2165	XK-07085-K379
48x4	7/0.85	0.8	2.2	38.5	4.61	2781	XK-07085-K489

ANTENNA CABLES

Polyethylene (or foamed polyethylene) insulated coaxial cable for radio frequency and television receiver

- Type : Cu/PE/SCR/PVC
- Standard : SLS 1513: 2015
- Conductor : Solid copper conductor
- Insulation : Polyethylene
- Screen : Copper Braid
- Sheathing : 70° C rated PVC compound



Category			3C-2V	5C-2V
Item code			XK-03C2V-HBKX	XK-05C2V-HBKX
Inner conductor	Number/diameter of component wire	mm	1/0.5	1/0.8
	Outside diameter	mm	0.5	0.8
Insulation (Natural colour)	Standard thickness	mm	1.30	2.05
	Standard outside diameter	mm	3.1	4.9
Outer conductor	Standard component wire diameter	mm	0.14	0.14
	Number or wire ends per spindle		5	7
	Total number of spindles		24	24
	Pitch (max)	mm	26	42
	Standard outside diameter	mm	3.8	5.6
Sheath (Black colour)	Standard thickness	mm	0.8	0.9
	Standard outside diameter	mm	5.4	7.4
	Finished outside diameter	mm	5.4±0.5	7.4±0.5
Informative reference	Characteristic impedance	Ω	75	75
	Capacitance (1kHz)	nF/N	67±3	67±3
	Standard attenuation @ 10MHz	dB/100m	42	27
	Approximate mass	kg/100m	4.2	7.4
	Maximum Conductor resistance (20°C)	Ω/100m	9.1	3.6

The meanings of symbols are as follows,

- First numeral : numeral expressing approximate inner diameter of outer conductor in mm.
- Second letter C : cable with characteristic impedance of 75Ω.
- Third numeral 2 : cable with solid polyethylene.
- Fourth letter V : cable with single outer conductor (shield) applied with vinyl sheath.

SCREENED CABLE

- Type : Cu/ PVC/ SCR/ PVC
- Standard : EN 50525 - 2 - 51 : 2011
- Nominal voltage : 300/500V
- Conductor : Annealed - Class 5 Copper
- Insulation : 70°C PVC compound
- Screen : Copper Braid
- Sheathing : PVC Compound



Conductor		Nominal Insulation Thickness	Nominal Bedding Thickness	Nominal Sheathing Thickness	Max. Overall Diameter	Max. d.c. Resistance at 20°C	Approx. Weight	Colour Code	Item Code
Nominal Cross Sectional Area	No. of Dia. of Wires								
mm ²	x/mm	mm	mm	mm	mm	Ω/km	kg/km		
2 X 0.5	16/0.20	0.6	0.7	0.9	9.6	39.0	104	Blue & Brown	XK-16202-GBK9
2 X 0.75	24/0.20	0.6	0.7	0.9	10.0	26.0	138		XK-24202-GBK9
2 X 1	32/0.20	0.6	0.7	0.9	10.3	19.5	140		XK-32202-GBK9
2 X 1.5	30/0.25	0.7	0.7	1.0	11.6	13.3	200		XK-30252-GBK9
2 X 2.5	50/0.25	0.8	0.7	1.1	13.3	7.98	261		XK-50252-GBK9
3 X 0.5	16/0.20	0.6	0.7	0.9	10.0	39.0	116	Blue, Brown, Green, & Yellow	XK-16203-GBK9
3 X 0.75	24/0.20	0.6	0.7	0.9	10.4	26.0	147		XK-32203-GBK9
3 X 1	32/0.20	0.6	0.7	1.0	11.0	19.5	173		XK-30253-GBK9
3 X 1.5	30/0.25	0.7	0.7	1.0	12.1	13.3	225		XK-50253-GBK9
3 X 2.5	50/0.25	0.8	0.7	1.1	14.0	7.98	307		XK-50253-GBK9
4 X 0.5	16/0.20	0.6	0.7	0.9	10.7	39.0	154	Brown, Black, Grey, Green & Yellow	XK-16204-GBK9
4 X 0.75	24/0.20	0.6	0.7	1.0	11.3	26.0	179		XK-24204-GBK9
4 X 1	32/0.20	0.6	0.7	1.0	11.7	19.5	203		XK-32204-GBK9
4 X 1.5	30/0.25	0.7	0.7	1.1	13.2	13.3	270		XK-30254-GBK9
4 X 2.5	50/0.25	0.8	0.8	1.2	15.5	7.98	374		XK-50254-GBK9

SWITCH GEAR CABLES

- Type : Cu/ PVC
- Standard : BS 6231 : 2006
- Nominal voltage : 600/1000V
- Conductor : Annealed - Class 5 Copper
- Insulation : 70°C PVC compound



Nominal Cross Sectional Area of Conductor	Nominal Insulation Thickness	Overall Diameter		Max. D.C. Resistance at 20°C	Item Code
		Lower Limit	Upper Limit		
mm ²	mm	mm	mm	Ω/km	
1.0	0.8	2.7	3.3	19.5	XK-03220-HBK4
1.5	0.8	3.0	3.6	13.3	XK-03025-HBK4
2.5	0.8	3.4	4.1	7.98	XK-05025-HBK4
4	0.8	3.9	4.8	4.95	XK-05630-HBK4
6	0.8	4.4	5.3	3.30	XK-08430-HBK4
10	1.0	5.7	7.2	1.91	XK-12630-HBK4
16	1.0	6.7	9.0	1.21	XK-19630-HBK4
25	1.2	8.4	11.5	0.780	XK-32230-HBK4
35	1.2	9.7	12.5	0.554	XK-45630-HBK4
50	1.4	11.5	15.4	0.386	XK-66530-HBK4
70	1.4	13.2	17.5	0.272	XK-93130-HBK4
95	1.6	15.1	19.2	0.206	XK-12583-HBK4
120	1.6	16.7	21.2	0.161	XK-15543-HBK4

INDOOR TELEPHONE CABLES

Application : Use for connecting subscribers in to the exchange cable network.

- Type : Cu/PE/PVC
- Standard : BS 3573
- Conductor : Solid Circular Annealed Copper
- Insulation : Polyethylene
- Sheathing : PVC Compound



Indoor Application			
Number of Pairs	Conductor Diameter	Nominal Overall Diameter	Approximate Mass
	mm	mm	kg/100m
1	0.50	5.3	1.9
2	0.50	6.1	3.0
5	0.50	8.0	5.1
10	0.50	9.2	9.0
20	0.50	11.6	16.5
50	0.50	21.0	42.0

Conductor Resistance at 20°C = 91Ω/km

Minimum Insulation Resistance = 1500MΩ at 20°C after electrification for one minute at 500VDC

Colour Chart

Pair Number Wire	Pair 1		Pair 2		Pair 3		Pair 4		Pair 5		Last Pair	
	A	B	A	B	A	B	A	B	A	B	A	B
1 - Pair Centre	Orange	White										
2 - Pair Centre	Orange	White	Green	Black								
3 - Pair Centre	Orange	White	Red	Grey	Green	Black						
4 - Pair Centre	Orange	White	Red	Grey	Blue	Brown	Green	Black				
Additional Layers	Orange	White	Red	Grey	Blue	Brown	Red	Grey	Blue	Brown	Green	Black
5 - Pair Centre	Orange	White	Red	Grey	Blue	Brown	Red	Grey	-	-	Green	Black

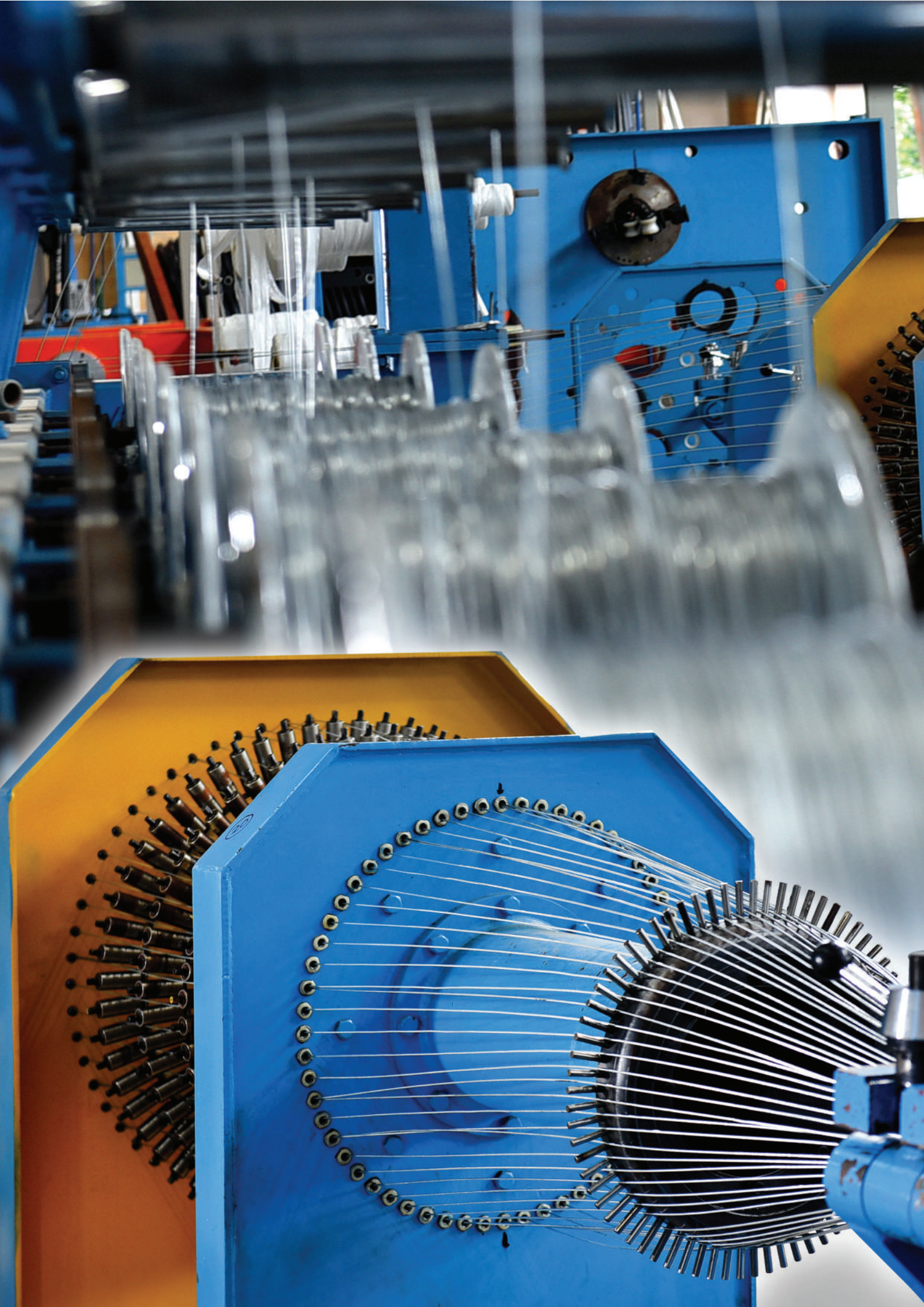


TABLE 4D1A

Single-core 70 °C thermoplastic (pvc) insulated cables,
non-armoured, with or without sheath
(COPPER CONDUCTORS)

CURRENT - CARRYING CAPACITY (amperes)

- Ambient Temperature : 30 °C
- Conductor Operating Temperature : 70 °C

Conductor Cross-Sectional Area	Reference Method A (enclosed in conduit in thermally insulating wall etc.)		Reference Method B (enclosed in conduit on a wall or in trunking etc.)		Reference Method C (clipped direct)		Reference Method F (in free air or on a perforated cable tray horizontal or vertical)					
	2 cables, single-phase a.c or d.c	3 or 4 cables, three-phase a.c.	2 cables, single-phase a.c or d.c	3 or 4 cables, three-phase a.c.	2 cables, single-phase a.c. or d.c. flat and touching	3 or 4 cables, three-phase a.c. flat and touching or trefoil	Touching			Spaced by one diameter		
							2 cables, single-phase a.c. or d.c. flat	3 cables, three-phase a.c. flat	3 cables, three-phase a.c. trefoil	2 cables, single-phase a.c. or d.c. or 3 cables three-phase a.c. flat	Horizontal	Vertical
1	2	3	4	5	6	7	8	9	10	11	12	
(mm ²)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
1	11	10.5	13.5	12	15.5	14	-	-	-	-	-	-
1.5	14.5	13.5	17.5	15.5	20	18	-	-	-	-	-	-
2.5	20	18	24	21	27	25	-	-	-	-	-	-
4	26	24	32	28	37	33	-	-	-	-	-	-
6	34	31	41	36	47	43	-	-	-	-	-	-
10	46	42	57	50	65	59	-	-	-	-	-	-
16	61	56	76	68	87	79	-	-	-	-	-	-
25	80	73	101	89	114	104	131	114	110	146	130	
35	99	89	125	110	141	129	162	143	137	181	162	
50	119	108	151	134	182	167	196	174	167	219	197	
70	151	136	192	171	234	214	251	225	216	281	254	
95	182	164	232	207	284	261	304	275	264	341	311	
120	210	188	269	239	330	303	352	321	308	396	362	
150	240	216	300	262	381	349	406	372	356	456	419	
185	273	245	341	296	436	400	463	427	409	521	480	
240	321	286	400	346	515	472	546	507	485	615	569	
300	367	328	458	394	594	545	629	587	561	709	659	
400	-	-	546	467	694	634	754	689	656	852	795	
500	-	-	626	533	792	723	868	789	749	982	920	
630	-	-	720	611	904	826	1005	905	855	1138	1070	
800	-	-	-	-	1030	943	1086	1020	971	1265	1188	
1000	-	-	-	-	1154	1058	1216	1149	1079	1420	1337	

TABLE 4D1B

Conductor Operating Temperature : 70 °C

VOLTAGE DROP (per ampere per metre)

Conductor Cross-Sectional Area	2 Cables, single-phase a.c.										3 or 4 Cables, three-phase a.c.										
	Reference Methods A & B (enclosed in conduit or trunking)		Reference Methods C & F (clipped direct, on tray or in free air)				Reference Methods A & B (enclosed in conduit or trunking)				Reference Method C & F (clipped direct, on tray or in free air)										
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
(mm ²)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)
1	44	44	44	44	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
1.5	29	29	29	29	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
2.5	18	18	18	18	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
4	11	11	11	11	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
6	7.3	7.3	7.3	7.3	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
10	4.4	4.4	4.4	4.4	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
16	2.8	2.8	2.8	2.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
25	1.75	1.80	1.75	1.75	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
35	1.25	1.30	1.25	1.25	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
50	0.93	0.95	0.93	0.93	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
70	0.63	0.65	0.63	0.63	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
95	0.46	0.49	0.47	0.47	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
120	0.36	0.39	0.37	0.37	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
150	0.29	0.31	0.30	0.30	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
185	0.23	0.25	0.24	0.24	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
240	0.180	0.195	0.185	0.185	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
300	0.145	0.160	0.150	0.150	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
400	0.105	0.130	0.120	0.120	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
500	0.086	0.110	0.098	0.098	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
630	0.068	0.094	0.081	0.081	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
800	0.053	-	0.068	0.068	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1000	0.042	-	0.059	0.059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: *Spacings larger than one cable diameter will result in a larger voltage drop

TABLE 4D2A

Multicore 70 °C thermoplastic insulated and thermoplastic sheathed cables, non-armoured (COPPER CONDUCTORS)

CURRENT - CARRYING CAPACITY (amperes)

- Ambient Temperature : 30 °C
- Conductor Operating Temperature : 70 °C

Conductor Cross-Sectional Area	Reference Method A (enclosed in conduit in thermally insulating wall etc.)		Reference Method B (enclosed in Conduit on a wall or in trunking etc.)		Reference Method C (clipped direct)		Reference Method E (in free air or on a perforated cable tray etc, horizontal or vertical)	
	1 two - core cable*, single-phase a.c. or d.c.	1 three-core cable* or 1 four-core cable, three-phase a.c.	1 two core cable*, single-phase a.c. or d.c.	1 three-core cable* or 1 four-core cable, three-phase a.c.	1 two - core cable*, single-phase a.c. or d.c.	1 three-core cable* or 1 four-core cable, three-phase a.c.	1 two core cable*, single-phase a.c. or d.c.	1 three-core cable* or 1 four-core cable, three-phase a.c.
1	2	3	4	5	6	7	8	9
(mm ²)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
1	11	10	13	11.5	15	13.5	17	14.5
1.5	14	13	16.5	15	19.5	17.5	22	18.5
2.5	18.5	17.5	23	20	27	24	30	25
4	25	23	30	27	36	32	40	34
6	32	29	38	34	46	41	51	43
10	43	39	52	46	63	57	70	60
16	57	52	69	62	85	76	94	80
25	75	68	90	80	112	96	119	101
35	92	83	111	99	138	119	148	126
50	110	99	133	118	168	144	180	153
70	139	125	168	149	213	184	232	196
95	167	150	201	179	258	223	282	238
120	192	172	232	206	299	259	328	276
150	219	196	258	225	344	299	379	319
185	248	223	294	255	392	341	434	364
240	291	261	344	297	461	403	514	430
300	334	298	394	339	530	464	593	497
400	-	-	470	402	634	557	715	597

* With or without a protective conductor

TABLE 4D2B

VOLTAGE DROP (per ampere per metre)

• Conductor Operating Temperature : 70 °C

Conductor Cross-Sectional Area	Two-core cable, d.c.	Two-core cable, single phase a.c.			Three or four-core cable, three phase a.c		
1	2	3			4		
(mm ²)	(mV/A/m)	(mV/A/m)			(mV/A/m)		
1	44	44			38		
1.5	29	29			25		
2.5	18	18			15		
4	11	11			9.5		
6	7.3	7.3			6.4		
10	4.4	4.4			3.8		
16	2.8	2.8			2.4		
		r	x	z	r	x	z
25	1.75	1.75	0.170	1.75	1.50	0.145	1.50
35	1.25	1.25	0.165	1.25	1.10	0.145	1.10
50	0.93	0.93	0.165	0.94	0.80	0.140	0.81
70	0.63	0.63	0.160	0.65	0.55	0.140	0.57
95	0.46	0.47	0.155	0.50	0.41	0.135	0.43
120	0.36	0.38	0.155	0.41	0.33	0.135	0.35
150	0.29	0.30	0.155	0.34	0.26	0.130	0.29
185	0.23	0.25	0.150	0.29	0.21	0.130	0.25
240	0.180	0.190	0.150	0.24	0.165	0.130	0.21
300	0.145	0.155	0.145	0.21	0.135	0.130	0.185
400	0.105	0.115	0.145	0.185	0.100	0.125	0.160

TABLE 4D3A

Single-core armoured 70 °C

thermoplastic insulated cables (non-magnetic armour)

(COPPER CONDUCTORS)

CURRENT - CARRYING CAPACITY (amperes)

- Ambient Temperature : 30 °C
- Conductor Operating Temperature : 70 °C

Conductor Cross-Sectional Area	Reference Method C (clipped direct)		Reference Method F (in free air or on a perforated cable tray, horizontal or vertical)								
	Touching		Touching			Spaced by one cable diameter					
	2 cables, single-phase a.c. or d.c. flat	3 or 4 cables, three-phase a.c. flat	2 cables, single-phase a.c. or d.c. flat	3 cables, three-phase a.c. flat	3 cables, three-phase a.c. trefoil	2 cables, d.c.		2 cables, single - phase a.c.		3 or 4 cables, three-phase a.c.	
						Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
1	2	3	4	5	6	7	8	9	10	11	12
(mm ²)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
50	193	179	205	189	181	229	216	229	217	230	212
70	245	225	259	238	231	294	279	287	272	286	263
95	296	269	313	285	280	357	340	349	332	338	313
120	342	309	360	327	324	415	396	401	383	385	357
150	393	352	413	373	373	479	458	449	429	436	405
185	447	399	469	422	425	548	525	511	489	490	456
240	525	465	550	492	501	648	622	593	568	566	528
300	594	515	624	547	567	748	719	668	640	616	578
400	687	575	723	618	657	885	851	737	707	674	632
500	763	622	805	673	731	1035	997	810	777	721	676
630	843	669	891	728	809	1218	1174	893	856	771	723
800	919	710	976	777	886	1441	1390	943	905	824	772
1000	975	737	1041	808	945	1685	1627	1008	967	872	816

TABLE 4D3B

VOLTAGE DROP (per ampere per metre)

- Conductor Operating Temperature : 70 °C

Conductor Cross-Sectional Area	2 cables d.c	Reference Methods C & F (clipped direct, on tray or free air)														
		2 cables, single-phase a.c.						3 or 4 cables, three-phase a.c.								
		Touching			Spaced*			Trefoil and Touching			Flat and Touching			Flat and Spaced*		
1	2	3			4			5			6			7		
(mm ²)	(mV/A/m)	(mV/A/m)			(mV/A/m)			(mV/A/m)			(mV/A/m)			(mV/A/m)		
		r	x	z	r	x	z	r	x	z	r	x	z	r	x	z
50	0.93	0.93	0.22	0.95	0.92	0.30	0.97	0.80	0.190	0.82	0.79	0.26	0.84	0.79	0.34	0.86
70	0.63	0.64	0.21	0.68	0.66	0.29	0.72	0.56	0.180	0.58	0.57	0.25	0.62	0.59	0.32	0.68
95	0.46	0.48	0.20	0.52	0.51	0.28	0.58	0.42	0.175	0.45	0.44	0.25	0.50	0.47	0.31	0.57
120	0.36	0.39	0.195	0.43	0.42	0.28	0.50	0.33	0.170	0.37	0.36	0.24	0.43	0.40	0.30	0.50
150	0.29	0.31	0.190	0.37	0.34	0.27	0.44	0.27	0.165	0.32	0.30	0.24	0.38	0.34	0.30	0.45
185	0.23	0.26	0.190	0.32	0.29	0.27	0.39	0.22	0.160	0.27	0.25	0.23	0.34	0.29	0.29	0.41
240	0.180	0.20	0.180	0.27	0.23	0.26	0.35	0.175	0.160	0.23	0.20	0.23	0.30	0.24	0.28	0.37
300	0.145	0.160	0.180	0.24	0.190	0.26	0.32	0.140	0.155	0.21	0.165	0.22	0.28	0.20	0.28	0.34
400	0.105	0.140	0.175	0.22	0.180	0.24	0.30	0.120	0.130	0.195	0.160	0.21	0.26	0.21	0.25	0.32
500	0.086	0.120	0.170	0.21	0.165	0.23	0.29	0.105	0.145	0.180	0.145	0.20	0.25	0.190	0.24	0.30
630	0.068	0.105	0.165	0.195	0.150	0.22	0.27	0.091	0.145	0.170	0.135	0.195	0.23	0.175	0.22	0.28
800	0.053	0.095	0.160	0.185	0.145	0.21	0.25	0.082	0.140	0.160	0.125	0.180	0.22	0.170	0.195	0.26
1000	0.042	0.091	0.155	0.180	0.140	0.190	0.24	0.079	0.135	0.155	0.125	0.165	0.21	0.165	0.170	0.24

NOTE:* Spacings larger than one cable diameter will result in a larger voltage drop.

TABLE 4D4A

Multicore Armoured 70 °C thermoplastic insulated cables (COPPER CONDUCTORS)

CURRENT - CARRYING CAPACITY (amperes)

- Ambient Temperature : 30 °C
- Ground Ambient Temperature : 20 °C
- Conductor Operating Temperature : 70 °C

Conductor Cross-Sectional Area	Reference Method C (clipped direct)		Reference Method E (in free air or on a perforated cable tray etc. horizontal or vertical)		Reference Method D (direct in ground or in ducting in ground, in or around buildings)	
	1 two-core cable, single-phase a.c. or d.c.	1 three - or four-core cable, three phase a.c.	1 two-core cable, single-phase a.c. or d.c.	1 three- or four- core cable, three phase a.c.	1 two-core cable, single-phase a.c. or d.c.	three - or four-core cable, three phase a.c.
1	2	3	4	5	6	7
(mm ²)	(A)	(A)	(A)	(A)	(A)	(A)
1.5	21	18	22	19	22	18
2.5	28	25	31	26	29	24
4	38	33	41	35	37	30
6	49	42	53	45	46	38
10	67	58	72	62	60	50
16	89	77	97	83	78	64
25	118	102	128	110	99	82
35	145	125	157	135	119	98
50	175	151	190	163	140	116
70	222	192	241	207	173	143
95	269	231	291	251	204	169
120	310	267	336	290	231	192
150	356	306	386	332	261	217
185	405	348	439	378	292	243
240	476	409	516	445	336	280
300	547	469	592	510	379	316
400	621	540	683	590	-	-

TABLE 4D4B

VOLTAGE DROP (per ampere per metre)

- Conductor Operating Temperature : 70 °C

Conductor Cross-Sectional Area	Two-core cable, d.c.	Two-core cable, single - phase a.c.			Three or four-core cable, three phase a.c		
		1	2	3	4		
(mm ²)	(mV/A/m)	(mV/A/m)			(mV/A/m)		
1.5	29	29			25		
2.5	18	18			15		
4	11	11			9.5		
6	7.3	7.3			6.4		
10	4.4	4.4			3.8		
16	2.8	2.8			2.4		
		r	x	z	r	x	z
25	1.75	1.75	0.170	1.75	1.50	0.145	1.50
35	1.25	1.25	0.165	1.25	1.10	0.145	1.10
50	0.93	0.93	0.165	0.94	0.80	0.140	0.81
70	0.63	0.63	0.160	0.65	0.55	0.140	0.57
95	0.46	0.47	0.155	0.50	0.41	0.135	0.43
120	0.36	0.38	0.155	0.41	0.33	0.135	0.35
150	0.29	0.30	0.155	0.34	0.26	0.130	0.29
185	0.23	0.25	0.150	0.29	0.21	0.130	0.25
240	0.180	0.190	0.150	0.24	0.165	0.130	0.21
300	0.145	0.155	0.145	0.21	0.135	0.130	0.185
400	0.105	0.115	0.145	0.185	0.100	0.125	0.160

TABLE 4D5 70 °C Thermoplastic insulated and sheathed flat cable with protective conductor (COPPER CONDUCTORS)

CURRENT - CARRYING CAPACITY (amperes) and VOLTAGE DROP (per ampere per metre)

- Ambient Temperature : 30 °C
- Conductor Operating Temperature : 70 °C

Conductor Cross-Sectional Area	Method 100# (above a plasterboard ceiling covered by thermal insulation <u>not exceeding 100mm</u> in thickness)	Method 101# (above a plasterboard ceiling covered by thermal insulation <u>exceeding 100mm</u> in thickness)	Method 102# (In a stud wall with thermal insulation with cable <u>touching</u> the inner wall surface)	Method 103# (In a stud wall with thermal insulation with cable <u>not touching</u> the inner wall surface)	Reference Method C* (clipped direct)	Reference Method A* (enclosed in conduit in an insulated wall)	Voltage drop (per ampere per metre)
1	2	3	4	5	6	7	8
(mm ²)	(A)	(A)	(A)	(A)	(A)	(A)	(mV/A/m)
1	13	10.5	13	8	16	11.5	44
1.5	16	13	16	10	20	14.5	29
2.5	21	17	21	13.5	27	20	18
4	27	22	27	17.5	37	26	11
6	34	27	35	23.5	47	32	7.3
10	45	36	47	32	64	44	4.4
16	57	46	63	42.5	85	57	2.8

A* For full installation method refer to Table 4A2 Installation Method 2 but for flat twin and earth cable.

C* For full installation method refer to Table 4A2 Installation Method 20 but for flat twin and earth cable.

100# For full installation method refer to Table 4A2 Installation Method 100

101# For full installation method refer to Table 4A2 Installation Method 101

102# For full installation method refer to Table 4A2 Installation Method 102

103# For full installation method refer to Table 4A2 Installation Method 103

Wherever practicable, a cable is to be fixed in a position such that it will not be covered with thermal insulation.

Regulation 523.9, BS 5803-5: Appendix C: Avoidance of overheating of electric cables,

Building Regulations Approved document B and Thermal insulation : avoiding risks, BR 262, BRE, 2001 refer.

TABLE 4E1A

Single -core 90 °C thermosetting insulated cables ,non-armoured, with or without sheath
(COPPER CONDUCTORS)

CURRENT - CARRYING CAPACITY (amperes)

- Ambient Temperature : 30 °C
- Conductor Operating Temperature : 90 °C

Conductor Cross-Sectional Area	Reference Method A (enclosed in conduit in thermally insulating wall etc.)		Reference Method B (enclosed in conduit on a wall or in trunking etc.)		Reference Method C (clipped direct)		Reference Method F (in free air or on a perforated cable tray etc horizontal or vertical etc) Touching			Reference Method G (in free air) Spaced by one cable diameter		
	2 cables, single - phase a.c or d.c	3 or 4 cables, three-phase a.c.	2 cables, single - phase a.c or d.c	3 or 4 cables, three-phase a.c.	2 cables, single-phase a.c. or d.c. flat and touching	3 or 4 cables, three-phase a.c. flat and touching or trefoil	2 cables, single-phase a.c. or d.c. flat	3 cables, three-phase a.c. flat	3 cables, three-phase a.c. trefoil	2 cables, single-phase a.c. or d.c. or 3 cables three-phase a.c. flat		
	1	2	3	4	5	6	7	8	9	10	11	12
(mm ²)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
1	14	13	17	15	19	17.5	-	-	-	-	-	-
1.5	19	17	23	20	25	23	-	-	-	-	-	-
2.5	26	23	31	28	34	31	-	-	-	-	-	-
4	35	31	42	37	46	41	-	-	-	-	-	-
6	45	40	54	48	59	54	-	-	-	-	-	-
10	61	54	75	66	81	74	-	-	-	-	-	-
16	81	73	100	88	109	99	-	-	-	-	-	-
25	106	95	133	117	143	130	161	141	135	182	161	
35	131	117	164	144	176	161	200	176	169	226	201	
50	158	141	198	175	228	209	242	216	207	275	246	
70	200	179	253	222	293	268	310	279	268	353	318	
95	241	216	306	269	355	326	377	342	328	430	389	
120	278	249	354	312	413	379	437	400	383	500	454	
150	318	285	393	342	476	436	504	464	444	577	527	
185	362	324	449	384	545	500	575	533	510	661	605	
240	424	380	528	450	644	590	679	634	607	781	719	
300	486	435	603	514	743	681	783	736	703	902	833	
400	-	-	683	584	868	793	940	868	823	1085	1008	
500	-	-	783	666	990	904	1083	998	946	1253	1169	
630	-	-	900	764	1130	1033	1254	1151	1088	1454	1362	
800	-	-	-	-	1288	1179	1358	1275	1214	1581	1485	
1000	-	-	-	-	1443	1323	1520	1436	1349	1775	1671	

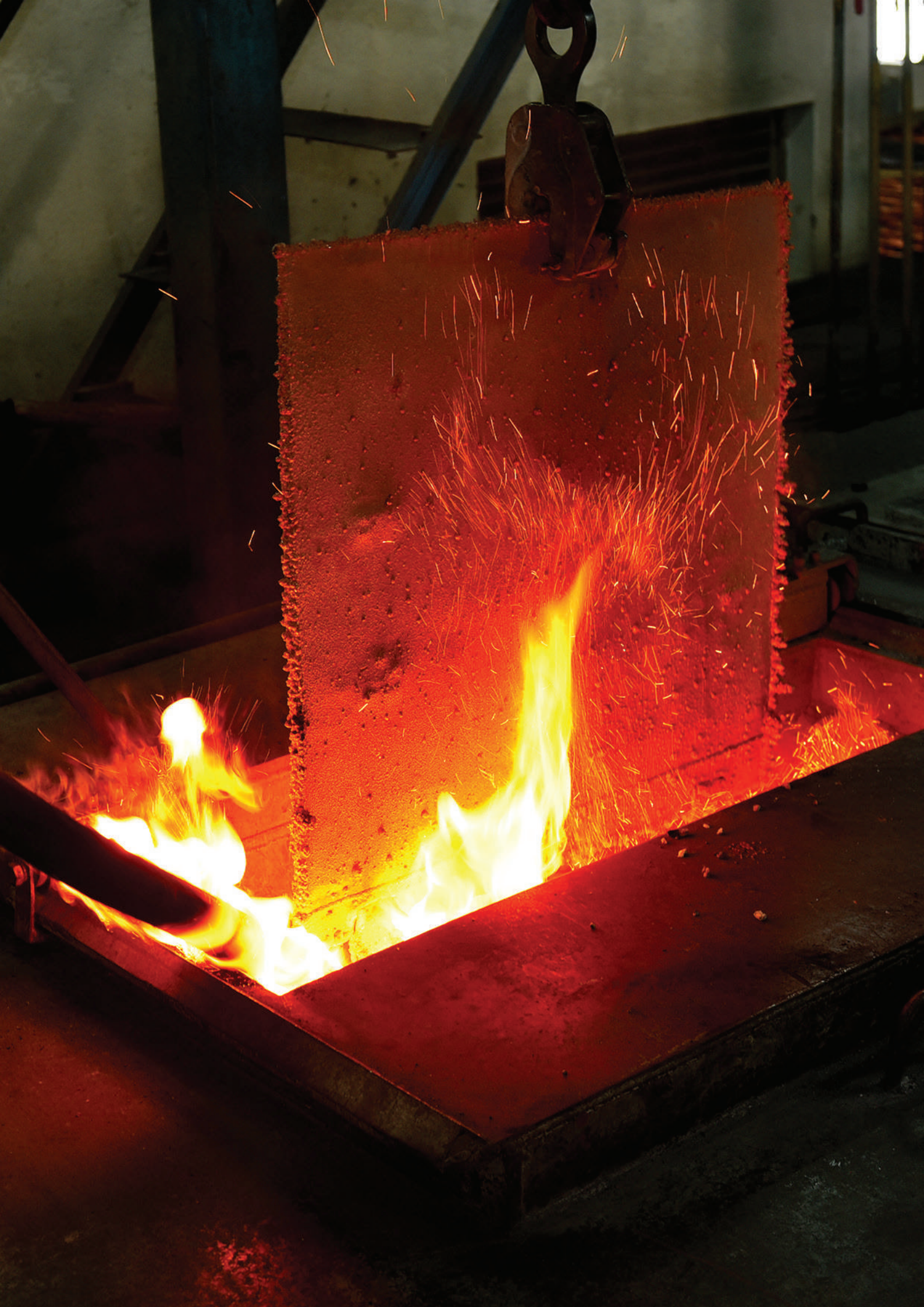


TABLE 4E1B

Conductor Operating Temperature : 90 °C

VOLTAGE DROP (per ampere per metre)

Conductor Cross-Sectional Area	2 Cables, single-phase a.c.											3 or 4 Cables, three-phase a.c.										
	Reference Methods A & B (enclosed in conduit or trunking)			References Methods C,F & G (clipped direct, on tray or in free air)				Reference Methods A & B (enclosed in conduit or trunking)				Reference Methods C, F & G (clipped direct, on tray or in free air)										
	2 cables d.c	3	4	Cables touching	Cables spaced*	5	6	7	8	9	7	8	9	7	8	9						
1	2	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)	(mV/A/m)						
1	46	46	46	46	46	40	40	40	40	40	40	40	40	40	40	40						
1.5	31	31	31	31	31	27	27	27	27	27	27	27	27	27	27	27						
2.5	19	19	19	19	19	16	16	16	16	16	16	16	16	16	16	16						
4	12	12	12	12	12	10	10	10	10	10	10	10	10	10	10	10						
6	7.9	7.9	7.9	7.9	7.9	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8						
10	4.7	4.7	4.7	4.7	4.7	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0						
16	2.9	2.9	2.9	2.9	2.9	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5						
25	1.85	0.31	1.90	1.85	0.28	1.85	1.60	0.27	1.65	1.60	0.165	1.60	1.60	0.190	1.60	0.27	1.65					
35	1.35	0.29	1.35	1.35	0.27	1.35	1.15	0.25	1.15	1.15	0.155	1.15	1.15	0.180	1.15	0.26	1.20					
50	0.99	1.00	1.05	0.99	0.27	1.00	0.87	0.25	0.90	0.86	0.155	0.87	0.86	0.180	0.87	0.26	0.89					
70	0.68	0.70	0.75	0.68	0.26	0.73	0.60	0.24	0.65	0.59	0.150	0.61	0.59	0.175	0.62	0.25	0.65					
95	0.49	0.51	0.58	0.49	0.26	0.56	0.44	0.23	0.50	0.43	0.145	0.45	0.43	0.170	0.46	0.25	0.49					
120	0.39	0.41	0.26	0.43	0.25	0.47	0.35	0.23	0.42	0.34	0.140	0.37	0.34	0.165	0.38	0.24	0.42					
150	0.32	0.33	0.26	0.36	0.25	0.41	0.29	0.23	0.37	0.28	0.140	0.31	0.28	0.165	0.32	0.24	0.37					
185	0.25	0.27	0.26	0.30	0.25	0.36	0.23	0.23	0.32	0.22	0.140	0.26	0.22	0.165	0.28	0.24	0.33					
240	0.190	0.21	0.26	0.25	0.25	0.31	0.185	0.22	0.29	0.170	0.140	0.22	0.170	0.165	0.24	0.24	0.29					
300	0.155	0.175	0.25	0.22	0.25	0.29	0.150	0.22	0.27	0.140	0.140	0.195	0.135	0.160	0.21	0.135	0.27					
400	0.120	0.140	0.25	0.20	0.24	0.27	0.125	0.22	0.25	0.110	0.135	0.175	0.110	0.160	0.195	0.110	0.24					
500	0.093	0.120	0.25	0.185	0.24	0.26	0.100	0.22	0.24	0.090	0.135	0.160	0.088	0.160	0.180	0.085	0.25					
630	0.072	0.100	0.25	0.175	0.24	0.25	0.088	0.21	0.23	0.074	0.135	0.150	0.071	0.160	0.170	0.068	0.24					
800	0.056	-	-	0.170	0.24	0.25	-	-	-	0.062	0.130	0.145	0.059	0.155	0.165	0.055	0.23					
1000	0.045	-	-	0.165	0.24	0.24	-	-	-	0.055	0.130	0.140	0.050	0.155	0.165	0.047	0.23					

Note: *Spacings larger than one cable diameter will result in a larger voltage drop

TABLE 4E2A

Multicore 90 °C thermosetting insulated and thermoplastic sheathed cables, non-armoured (COPPER CONDUCTORS)

CURRENT - CARRYING CAPACITY (amperes)

- Ambient Temperature : 30 °C
- Conductor Operating Temperature : 90 °C

Conductor Cross-Sectional Area	Reference Method A (enclosed in conduit in thermally insulating wall etc.)		Reference Method B (enclosed in conduit on a wall or in trunking etc.)		Reference Method C (clipped direct)		Reference Method E (free air or on a perforated cable tray etc, horizontal or vertical)	
	1 two - core cable*, single-phase a.c. or d.c.	1 three-or four-core cable*, three-phase a.c.	1 two core cable*, single-phase a.c. or d.c.	1 three-or four-core cable*, three-phase a.c.	1 two-core cable*, single-phase a.c. or d.c.	1 three-or four-core cable*, three-phase a.c.	1 two core cable*, single-phase a.c. or d.c.	1 three-or four-core cable*, three-phase a.c.
1	2	3	4	5	6	7	8	9
(mm ²)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
1	14.5	13	17	15	19	17	21	18
1.5	18.5	16.5	22	19.5	24	22	26	23
2.5	25	22	30	26	33	30	36	32
4	33	30	40	35	45	40	49	42
6	42	38	51	44	58	52	63	54
10	57	51	69	60	80	71	86	75
16	76	68	91	80	107	96	115	100
25	99	89	119	105	138	119	149	127
35	121	109	146	128	171	147	185	158
50	145	130	175	154	209	179	225	192
70	183	164	221	194	269	229	289	246
95	220	197	265	233	328	278	352	298
120	253	227	305	268	382	322	410	346
150	290	259	334	300	441	371	473	399
185	329	295	384	340	506	424	542	456
240	386	346	459	398	599	500	641	538
300	442	396	532	455	693	576	741	621
400	-	-	625	536	803	667	865	741

* With or without a protective conductor

TABLE 4E2B

VOLTAGE DROP (per ampere per metre)

- Conductor Operating Temperature : 90 °C

Conductor Cross-Sectional Area	Two-core cable, d.c.	Two-core cable, single phase a.c.			Three or four-core cable, three phase a.c		
1	2	3			4		
(mm ²)	(mV/A/m)	(mV/A/m)			(mV/A/m)		
1	46	46			40		
1.5	31	31			27		
2.5	19	19			16		
4	12	12			10		
6	7.9	7.9			6.8		
10	4.7	4.7			4.0		
16	2.9	2.9			2.5		
		r	x	z	r	x	z
25	1.85	1.85	0.160	1.90	1.60	0.140	1.65
35	1.35	1.35	0.155	1.35	1.15	0.135	1.15
50	0.98	0.99	0.155	1.00	0.86	0.135	0.87
70	0.67	0.67	0.150	0.69	0.59	0.130	0.60
95	0.49	0.50	0.150	0.52	0.43	0.130	0.45
120	0.39	0.40	0.145	0.42	0.34	0.130	0.37
150	0.31	0.32	0.145	0.35	0.28	0.125	0.30
185	0.25	0.26	0.145	0.29	0.22	0.125	0.26
240	0.195	0.200	0.140	0.24	0.175	0.125	0.21
300	0.155	0.160	0.140	0.21	0.140	0.120	0.185
400	0.120	0.130	0.140	0.190	0.115	0.120	0.165

TABLE 4E3A

Single-core armoured 90 °C thermosetting insulated cables (non-magnetic armour) (COPPER CONDUCTORS)

CURRENT - CARRYING CAPACITY (amperes)

- Ambient Temperature : 30 °C
- Conductor Operating Temperature : 90 °C

Conductor Cross-Sectional Area	Reference method C (clipped direct)		Reference Method F (in free air or on a perforated cable tray, horizontal or vertical)								
	Touching		Touching			Spaced by one cable diameter					
	2 cables, single-phase a.c. or d.c. flat	3 or 4 cables, three-phase a.c. flat	2 cables, single-phase a.c. or d.c. flat	3 cables, three-phase a.c. flat	3 cables, three-phase a.c. trefoil	2 cables, d.c.		2 cables, single - phase a.c.		3 or 4 cables, three-phase a.c.	
						Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
1	2	3	4	5	6	7	8	9	10	11	12
(mm ²)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
50	237	220	253	232	222	284	270	282	266	288	266
70	303	277	322	293	285	356	349	357	337	358	331
95	367	333	389	352	346	446	426	436	412	425	393
120	425	383	449	405	402	519	497	504	477	485	449
150	488	437	516	462	463	600	575	566	539	549	510
185	557	496	587	524	529	688	660	643	614	618	574
240	656	579	689	612	625	815	782	749	714	715	666
300	755	662	792	700	720	943	906	842	805	810	755
400	853	717	899	767	815	1137	1094	929	889	848	797
500	962	791	1016	851	918	1314	1266	1032	989	923	871
630	1082	861	1146	935	1027	1528	1474	1139	1092	992	940
800	1170	904	1246	987	1119	1809	1744	1204	1155	1042	978
1000	1261	961	1345	1055	1214	2100	2026	1289	1238	1110	1041

TABLE 4E3B

VOLTAGE DROP (per ampere per metre)

• Conductor Operating Temperature : 90 °C

Conductor Cross-Sectional Area	2 cables d.c	Reference Methods C & F (clipped direct, on tray or in free air)														
		2 cables, single-phase a.c.						3 or 4 cables, three-phase a.c.								
		Touching			Spaced*			Trefoil and Touching			Flat and Touching			Flat and Spaced*		
1	2	3			4			5			6			7		
(mm ²)	(mV/A/m)	(mV/A/m)			(mV/A/m)			(mV/A/m)			(mV/A/m)			(mV/A/m)		
		r	x	z	r	x	z	r	x	z	r	x	z	r	x	z
50	0.98	0.99	0.21	1.00	0.98	0.29	1.00	0.86	0.180	0.87	0.84	0.25	0.88	0.84	0.33	0.90
70	0.67	0.68	0.200	0.71	0.69	0.29	0.75	0.59	0.170	0.62	0.60	0.25	0.65	0.62	0.32	0.70
95	0.49	0.51	0.195	0.55	0.53	0.28	0.60	0.44	0.170	0.47	0.46	0.24	0.52	0.49	0.31	0.58
120	0.39	0.41	0.190	0.45	0.43	0.27	0.51	0.35	0.165	0.39	0.38	0.24	0.44	0.41	0.30	0.51
150	0.31	0.33	0.185	0.38	0.36	0.27	0.45	0.29	0.160	0.33	0.31	0.23	0.39	0.34	0.29	0.45
185	0.25	0.27	0.185	0.33	0.30	0.26	0.40	0.23	0.160	0.28	0.26	0.23	0.34	0.29	0.29	0.41
240	0.195	0.21	0.180	0.28	0.24	0.26	0.35	0.180	0.155	0.24	0.21	0.22	0.30	0.24	0.28	0.37
300	0.155	0.170	0.175	0.25	0.195	0.25	0.32	0.145	0.150	0.21	0.170	0.22	0.28	0.20	0.27	0.34
400	0.115	0.145	0.170	0.22	0.180	0.24	0.30	0.125	0.150	0.195	0.160	0.21	0.27	0.20	0.27	0.33
500	0.093	0.125	0.170	0.21	0.165	0.24	0.29	0.105	0.145	0.180	0.145	0.20	0.25	0.190	0.24	0.31
630	0.073	0.105	0.165	0.195	0.150	0.23	0.27	0.092	0.145	0.170	0.135	0.195	0.24	0.175	0.23	0.29
800	0.056	0.090	0.160	0.190	0.145	0.23	0.27	0.086	0.140	0.165	0.130	0.180	0.23	0.175	0.195	0.26
1000	0.045	0.092	0.155	0.180	0.140	0.21	0.25	0.080	0.135	0.155	0.125	0.170	0.21	0.165	0.180	0.24

NOTE : * Spacings larger than one cable diameter will result in a larger voltage drop.

TABLE 4E4A

Multicore armoured 90 °C thermosetting insulated cables (COPPER CONDUCTORS)

CURRENT - CARRYING CAPACITY (amperes)

- Ambient Temperature : 30 °C
- Ground Ambient Temperature : 20 °C
- Conductor Operating Temperature : 90 °C

Conductor Cross-Sectional Area	Reference Method C (clipped direct)		Reference Method E (in free air or on a perforated cable tray etc. horizontal or vertical)		Reference Method D (direct in ground or in ducting in ground, in or around buildings)	
	1 two-core cable, single-phase a.c. or d.c.	1 three - or 1 four-core cable, three phase a.c.	1 two-core cable, single-phase a.c. or d.c.	1 three- or 1 four- core cable, three phase a.c.	1 two-core cable, single-phase a.c. or d.c.	1 three - or 1 four-core cable, three phase a.c.
1	2	3	4	5	6	7
(mm ²)	(A)	(A)	(A)	(A)	(A)	(A)
1.5	27	23	29	25	25	21
2.5	36	31	39	33	33	28
4	49	42	52	44	43	36
6	62	53	66	56	53	44
10	85	73	90	78	71	58
16	110	94	115	99	91	75
25	146	124	152	131	116	96
35	180	154	188	162	139	115
50	219	187	228	197	164	135
70	279	238	291	251	203	167
95	338	289	354	304	239	197
120	392	335	410	353	271	223
150	451	386	472	406	306	251
185	515	441	539	463	343	281
240	607	520	636	546	395	324
300	698	599	732	628	446	365
400	787	673	847	728	-	-

TABLE 4E4B

VOLTAGE DROP (per ampere per metre)

- Conductor Operating Temperature : 90 °C

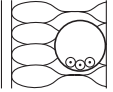
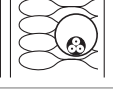
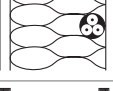


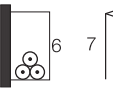
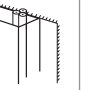
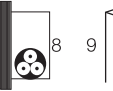
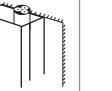
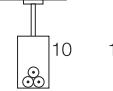
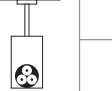

Conductor Cross-Sectional Area	Two-core cable, d.c.	Two-core cable, single - phase a.c.			Three or four-core cable, three phase a.c		
		1	2	3	4		
(mm ²)	(mV/A/m)	(mV/A/m)			(mV/A/m)		
1.5	31	31			27		
2.5	19	19			16		
4	12	12			10		
6	7.9	7.9			6.8		
10	4.7	4.7			4.0		
16	2.9	2.9			2.5		
		r	x	z	r	x	z
25	1.85	1.85	0.160	1.90	1.60	0.140	1.65
35	1.35	1.35	0.155	1.35	1.15	0.135	1.15
50	0.98	0.99	0.155	1.00	0.86	0.135	0.87
70	0.67	0.67	0.150	0.69	0.59	0.130	0.60
95	0.49	0.50	0.150	0.52	0.43	0.130	0.45
120	0.39	0.40	0.145	0.42	0.34	0.130	0.37
150	0.31	0.32	0.145	0.35	0.28	0.125	0.30
185	0.25	0.26	0.145	0.29	0.22	0.125	0.26
240	0.195	0.20	0.140	0.24	0.175	0.125	0.21
300	0.155	0.16	0.140	0.21	0.140	0.120	0.185
400	0.120	0.13	0.140	0.190	0.115	0.120	0.165

TABLE 4A2

Schedule of Installation Methods of cables (including Reference Methods) for determining current-carrying capacity

NOTE 1 : The illustrations are not intended to depict actual product or installation practices but are indicative of the method described.

NOTE 2 : The installation and reference methods stated are in line with IEC. However, not all methods have a corresponding rating for all cable types.

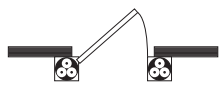
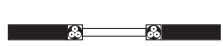
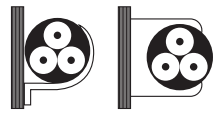


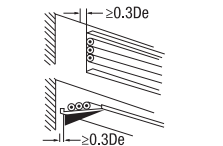
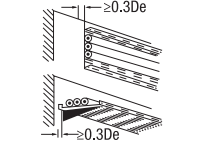
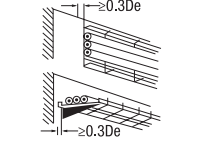
Installation Method			Reference Method to be used to determine current-carrying capacity
Number	Examples	Description	
1	 Room	Non-sheathed cables in conduit in a thermally insulated wall with an inner skin having a thermal conductance of not less than 10 W/m ² K ^c	A
2	 Room	Multicore cable in conduit in a thermally insulated wall with an inner skin having a thermal conductance of not less than 10 W/m ² K ^c	A
3	 Room	Multicore cable direct in a thermally insulated wall with an inner skin having a thermal conductance of not less than 10 W/m ² K ^c	A
4		Non-sheathed cables in conduit on a wooden or masonry wall or spaced less than 0.3 x conduit diameter from it ^c	B
5		Multicore cable in conduit on a wooden or masonry wall or spaced less than 0.3 x conduit diameter from it ^c	B
6	 6	Non-sheathed cables In cable trunking on a wooden or masonry wall 6 - run horizontally ^b	B
7	 7	7 - run vertically ^{b,c}	
8	 8	Multicore cable In cable trunking on a wooden or masonry wall 8 - run horizontally ^b	B
9	 9	9 - run vertically ^{b,c}	
10	 10	Non-sheathed cables in suspended cable trunking ^b	B
11	 11	Multicore cable in suspended cable trunking ^b	B
12		Non-sheathed cables run in mouldings ^{c,e}	A

^b Values given for Installation Method B in Appendix 4 are for a single circuit. Where there is more than one circuit in the trunking the group rating factor given in Table 4C1 is applicable, irrespective of the presence of an internal barrier or partition.

^c Care is needed where the cable runs vertically and ventilation is restricted. The ambient temperature at the top of the vertical section can be much higher.

^e The thermal resistivity of the enclosure is assumed to be poor because of the material of construction and possible air spaces. Where the construction is thermally equivalent to installation Methods 6 or 7, Reference Method B may be used.

TABLE 4A2 (continued)

Installation Method			Reference Method to be used to determine current-carrying capacity
Number	Examples	Description	
13 14		Deleted by BS 7671: 2008 Amendment No 1	
15		Non-sheathed cables In conduit or single-core or multicore cable in architrave ^{c,f}	A
16		Non-sheathed cables In conduit or single-core or multicore cable in window frames ^{c,f}	A
20		Single-core or multicore cables: - fixed on (clipped direct), or spaced less than 0.3 x cable diameter from a wooden or masonry wall ^c	C
21		Single-core or multicore cables: - fixed directly under a wooden or masonry ceiling	C (Higher than standard ambient temperatures may occur with this installation method)
22		Single-core or multicore cables: - spaced from a ceiling	E,F,or G* (Higher than standard ambient temperature may occur with this installation method)
23		Not used.	
30		Single -core or multicore cables: - on unperforated tray run horizontally or vertically ^{c,h}	C with item 2 of Table 4CI
31		Single -core or multicore cables: - on perforated tray run horizontally or vertically ^{c,h}	E or F
32		Single - core or multicore cables: - on brackets or on a wire mesh tray run horizontally or vertically ^{c,h}	E or F

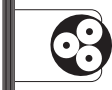
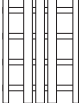


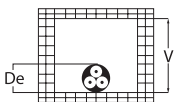
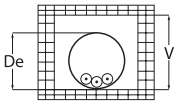
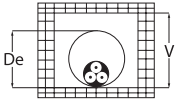
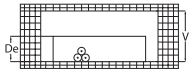
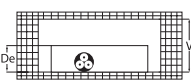
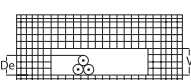
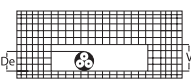
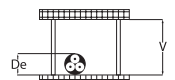
c Care is needed where the cable runs vertically and ventilation is restricted. The ambient temperature at the top of the vertical section can be much higher.

f The thermal resistivity of the enclosure is assumed to be poor because of the material of construction and possible air spaces. Where the construction is thermally equivalent to installation Methods 6 ,7,8 or 9. Reference Method B may be used.

h D_e = the external diameter of a multicore cable:
- 2.2 x the cable diameter when three single-core cables are bound in trefoil, or
- 3x the cable diameter when three single-core cables are laid in flat formation.

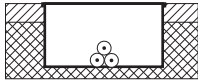

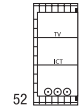
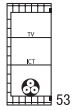
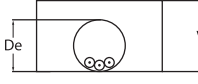
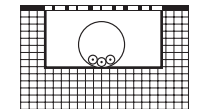
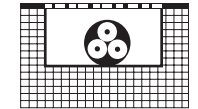
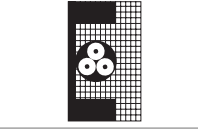

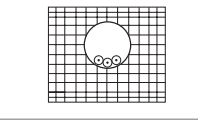
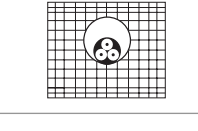
* Still under consideration in IEC.

TABLE 4A2 (continued)

Installation Method			Reference Method to be used to determine current-carrying capacity
Number	Examples	Description	
33		Single-core or multicore cables: - spaced more than 0.3 times the cable diameter from a wall	E,F or G ⁹
34		Single-core or multicore cables: - on a ladder ^c	E or F
35		Single-core or multicore cable suspended from or incorporating a support wire or harness	E or F
36		Bare or non-sheathed cables on insulators	G
40		Single-core or multicore cable In a building void ^{c,h,i}	Where $1.5 D_e \leq V < 20 D_e$ use B
41		Non-sheathed cables In conduit In a building void In masonry having a thermal resistivity not greater than 2 K.m/W ^{c,i,j}	Where $1.5 D_e \leq V$ use B
42		Single -core or multicore cable In conduit In a building void In masonry having a thermal resistivity not greater than 2K.m/W ^{c,i}	Where $1.5 D_e \leq V$ use B
43		Non-sheathed cables in cable ducting In a building void In masonry having a thermal resistivity not greater than 2 K.m/W ^{c,i,j}	Where $1.5 D_e \leq V$ use B
44		Single-core or multicore cable In cable ducting In a building void In masonry having a thermal resistivity not greater than 2 K.m/W ^{c,i,j}	Where $1.5 D_e \leq V$ use B
45		Non-sheathed cables In cable ducting In masonry having a thermal resistivity not greater than 2 K.m/W ^{c,h,i}	Where $1.5 D_e \leq V < 50 D_e$ use B
46		Single-core or multicore cable in cable ducting In masonry having a thermal resistivity not greater than 2 K.m/W ^{c,h,i}	Where $1.5 D_e \leq V < 50 D_e$ use B
47		Single-core or multicore cable: - in a ceiling void - in a suspended floor ^{h,i}	Where $1.5 D_e \leq V < 50 D_e$ use B

- c Care is needed where the cable runs vertically and ventilation is restricted. The ambient temperature at the top of the vertical section can be much higher.
- g The factors in Table 4C1 may also be used.
- h D_e = the external diameter of a multicore cable:
 - 2.2 x the cable diameter when three single-core cables are bound in trefoil, or
 - 3 x the cable diameter when three single-core cables are laid in flat formation.
- i V =the smaller dimension or diameter of a masonry duct or void, or the vertical depth of a rectangular duct, floor or ceiling void or channel.
- j D_e = external diameter of conduit or vertical depth of cable ducting.

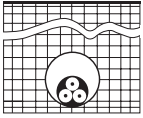
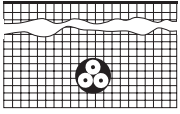
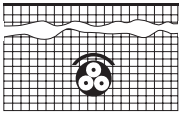
TABLE 4A2 (continued)

Installation Method		Reference Method to be used to determine current-carrying capacity	
Number	Examples		
50		Non-sheathed cables In flush cable trunking in the floor	B
51		Multicore cable In flush cable trunking in the floor	B
52		Non-sheathed cables In flush trunking ^c	B
53		Multicore cable In flush trunking ^c	B
54		Non-sheathed cables or single-core cables in conduit in an unventilated cable channel run horizontally or vertically ^{c,i,k,m}	Where $1.5 D_e \leq V$ use B
55		Non-sheathed cables In conduit in an open or ventilated cable channel in the floor ^{i,m}	B
56		Sheathed single-core or multicore cable in an open or ventilated cable channel run horizontally or vertically ^m	B
57		Single-core or multicore cable direct in masonry having a thermal resistivity not greater than 2 K.m/W - without added mechanical protection ^{n,o}	C
58		Single-core or multicore cable direct in masonry having a thermal resistivity not greater than 2 K.m/W -with added mechanical protection ^{n,o} (e.g. Capping)	C
59		Non-sheathed cables or single-core cables In conduit In masonry having a thermal resistivity not greater than 2 K.m/W ^o	B
60		Multicore cables In conduit In masonry having a thermal resistivity not greater than 2 K.m/W ^o	B

- c Care is needed where the cable runs vertically and ventilation is restricted. The ambient temperature at the top of the vertical section can be much higher.
- k D_e = external diameter of conduit
- i V = the smaller dimension or diameter of a masonry duct or void, or the vertical depth of a rectangular duct, floor or ceiling void or channel.


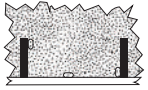


The depth of the channel is more important than the width.
- l For multicore cable installed as Method 55, use current-carrying capacity for Reference Method B.
- m It is recommended that these installation Methods are used only in areas where access is restricted to authorized persons so that the reduction in current-carrying capacity and the fire hazard due to the accumulation of debris can be prevented.
- n For cables having conductors not greater than 16mm^2 , the current-carrying capacity may be higher.
- o Thermal resistivity of masonry is not greater than 2 K.m/W . The term masonry is taken to include brickwork, concrete, plaster and the like (excludes thermally insulating materials.)

TABLE 4A2 (continued)

Installation Method			Reference Method to be used to determine current-carrying capacity
Number	Examples	Description	
70		Multicore armoured cable in conduit or in cable ducting in the ground	D For multicore armoured cable only
71		Deleted by BS 7671: 2008 Amendment No1	
72		Sheathed, armoured or multicore cables direct in the ground: - without added mechanical protection (see note)	D
73		Sheathed, armoured or multicore cables direct in the ground: - with added mechanical protection (e.g. Cable covers) (see note)	D

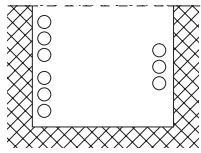
NOTE : The inclusion of directly buried cables is satisfactory where the soil thermal resistivity is of the order of 2.5 K.m/W . For lower soil resistivities, the current-carrying capacity for directly buried cables is appreciably higher than for cables in ducts.

TABLE 4A2 (continued-Installation methods specifically for flat twin and earth cables in thermal insulation)

Installation Method			Reference Method to be used to determine current-carrying capacity
Number	Examples	Description	
100		Installation methods for flat twin and earth cable clipped direct to a wooden joist, or touching the plasterboard ceiling surface, above a plasterboard ceiling with thermal <u>insulation not exceeding</u> 100mm in thickness having a minimum U value of 0.1W/m ² K	Table 4D5
101		Installation methods for flat twin and earth cable clipped direct to a wooden joist, or touching the plasterboard ceiling surface, above a plasterboard ceiling with thermal <u>insulation exceeding</u> 100mm in thickness having a minimum U value of 0.1W/m ² K	Table 4D5
102		Installation methods for flat twin and earth cable in a stud wall with thermal insulation with a minimum U value of 0.1W/m ² K with the <u> cable touching</u> the inner wall surface, or touching the plasterboard ceiling surface, and the inner skin having a minimum U value of 10 W/m ² K	Table 4D5
103		Installation methods for flat twin and earth cable in a stud wall with thermal insulation with a minimum U value of 0.1 W/m ² K with the <u> cable not touching</u> the inner wall surface	Table 4D5

Wherever practicable, a cable is to be fixed in a position such that it will not be covered with thermal insulation.
 Regulation 523.9, BS 5803-5: Appendix C: Avoidance of overheating of electric cables
 Building Regulations Approved document B and Thermal insulation : avoiding risks, BR 262 , BRE 2001 refer.

TABLE 4A2 (continued-Installation methods for cables enclosed in infloor concrete troughs)

Installation Method			Reference Method to be used to determine current-carrying capacity
Number	Examples	Description	
117		<p>Cables supported on the wall of an open or ventilated infloor concret trough with spacing as follows:</p> <ul style="list-style-type: none"> - Sheathed single-core cables in free air (any supporting metalwork under the cables occupying less than 10% of plan area). - Two or three cables vertically one above the other, minimum distance between cable surfaces equal to the overall cable diameters, distance from the wall not less than 1/2 the cable diameter. - Two or three cables horizontally with spacing as above 	E or F

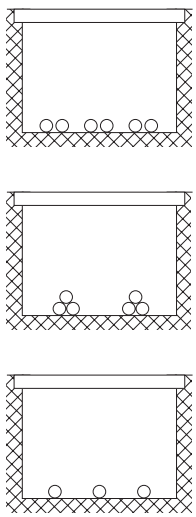
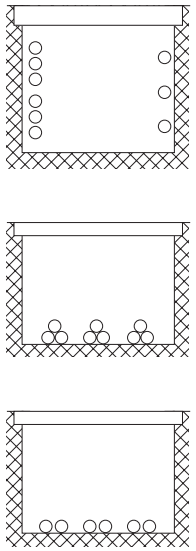
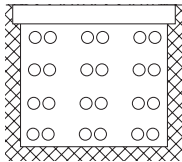
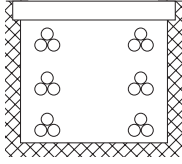
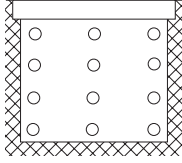
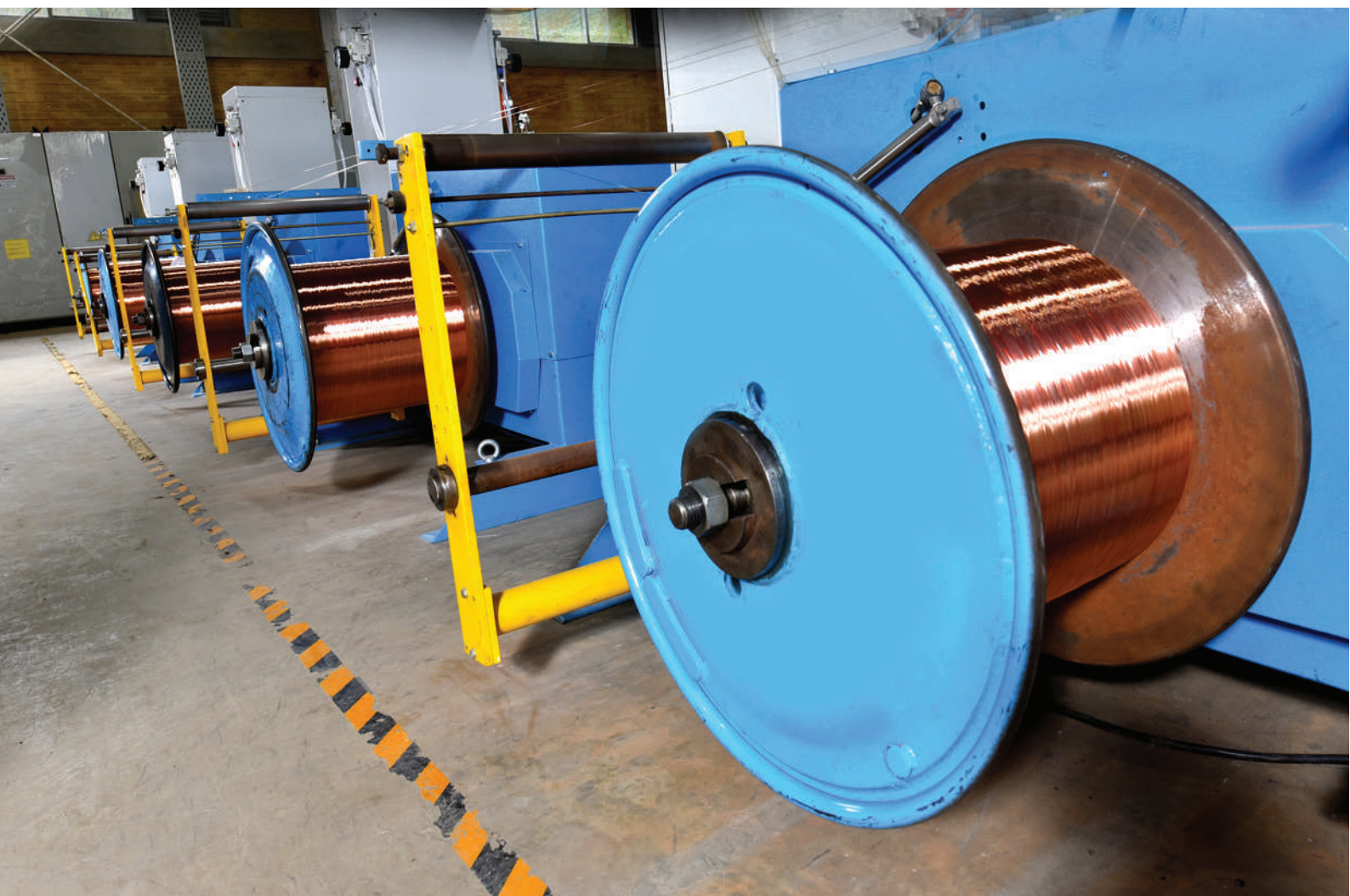
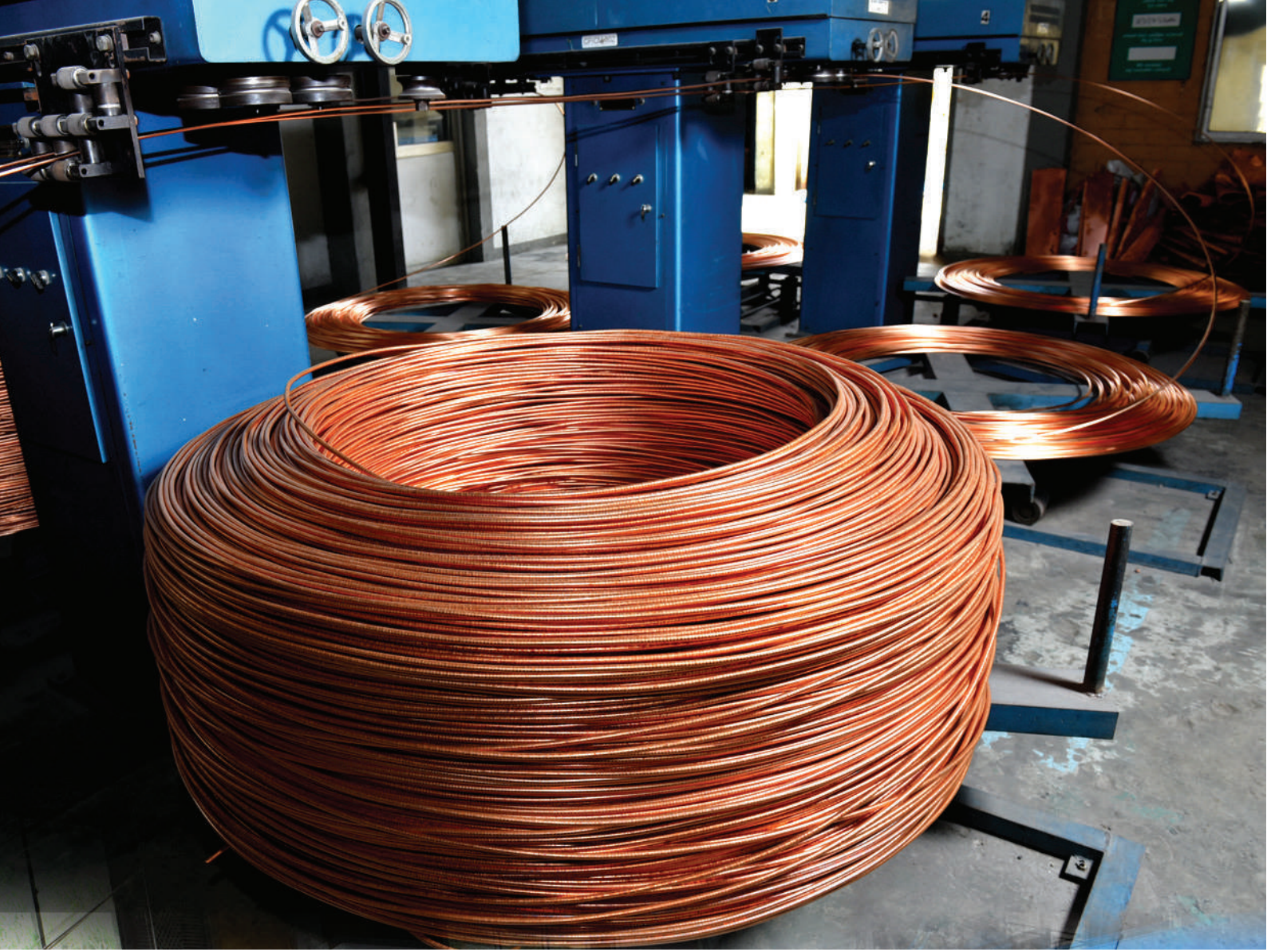
Installation Method			Reference Method to be used to determine current-carrying capacity
Number	Examples	Description	
118		<p>Cables in enclosed trench 450mm wide by 300mm deep (minimum dimensions) including 100mm cover</p> <ul style="list-style-type: none"> - Two to six single-core cables with surfaces separated by a minimum of one cable diameter - One or two groups of three single-core cables in trefoil formation - One to four 2-core cables or one to three cables of 3 or 4 cores with all cables separated by a minimum of 50mm 	E or F Using rating factors in Table 4C6
119		<p>Cables enclosed in an in-floor concrete trough 450mm wide by 600mm deep (minimum dimensions) including 100mm cover.</p> <p>Six to twelve single-core cables arranged in flat groups of two or three on the vertical trench wall with cables separated by one cable diameter and a minimum of 50mm between groups</p> <p>Or</p> <p>Two to four groups of three single-core cables in trefoil formation with a minimum of 50mm between trefoil formations</p> <p>Or</p> <p>Four to eight 2-core cables or three to six cables of 3 or 4 cores with cables separated by a minimum of 75mm.</p> <p>All cables spaced at least 25mm from trench wall.</p>	E or F Using rating factors in Table 4C6

TABLE 4A2 (continued-Installation methods for cables enclosed in infloor concrete troughs)

		Installation Method		Reference Method to be used to determine current-carrying capacity
Number	Examples	Description		
120		Cables enclosed in an infloor concrete trough 600mm wide by 760mm deep (minimum dimensions) including 100mm cover.		E or F Using rating factors in Table 4C6
		Twelve to twenty four single-core cables arranged in either Flat formation of two or three cables in a group with cables separated by one cable diameter and each cable group separated by a minimum of 50mm either horizontally or vertically		
		or Single-core cables in trefoil formation with each group or trefoil formation separated by a minimum of 50mm either horizontally or vertically		
		or Eight to sixteen 2-core cables or six to twelve cables of 3 or 4 cores with cables separated by a minimum of 75mm either horizontally or vertically.		
		All cables spaced at least 25mm from trench wall.		



Technical Data for Cable Installation

Voltage Drop in Consumers' Installations

The voltage drop between the origin of an Installation and any load point should not be greater than the values in the table below expressed with respect to the value of the nominal voltage of the installation.

The calculated voltage drop should include any effects due to the harmonic currents.

Voltage drop

	Lighting	Other uses
1.Low voltage installations supplied directly from a public low voltage distribution system	3%	5%
2.Low voltage installation supplied from private LV supply(*)	6%	8%

(*) The voltage drop within each final circuit should not exceed the values given in (1). Where the wiring systems of the installation are longer than 100m, the voltage drops indicated above may be increased by 0.005% per metre of the wiring system beyond 100m, without this increase being greater than 0.5%.

The voltage drop is determined from the demand of the current-using equipment, applying diversity factors where applicable, or from the value of the design current of the circuit.

NOTE 1: A greater voltage drop may be acceptable for a motor circuit during starting and for other equipment with a high inrush current, provided that in both cases it is ensured that the voltage variations remain within the limits specified in the relevant equipment standard.

NOTE 2: The following temporary conditions are excluded:

- voltage transients
- voltage variations due to abnormal operation.

TABLE 4B1

Rating factors (C_a) for ambient air temperatures other than 30 °C

Ambient temperature ^a °C	Insulation				
	60 °C Thermosetting	70 °C Thermoplastic	90 °C Thermosetting	Mineral ^a	
				Thermoplastic covered or bare and exposed to touch 70 °C	Bare and not exposed to touch 105 °C
25	1.04	1.03	1.02	1.07	1.04
30	1.00	1.00	1.00	1.00	1.00
35	0.91	0.94	0.96	0.93	0.96
40	0.82	0.87	0.91	0.85	0.92
45	0.71	0.79	0.87	0.78	0.88
50	0.58	0.71	0.82	0.67	0.84
55	0.41	0.61	0.76	0.57	0.80
60	-	0.50	0.71	0.45	0.75
65	-	-	0.65	-	0.70
70	-	-	0.58	-	0.65
75	-	-	0.50	-	0.60
80	-	-	0.41	-	0.54
85	-	-	-	-	0.47
90	-	-	-	-	0.40
95	-	-	-	-	0.32

a - For higher ambient temperatures, consult manufacturer.

TABLE 4B2

Rating factors (C_a) for ambient ground temperatures other than 20 °C

Ground temperature °C	Insulation	
	70°C Thermoplastic	90°C Thermosetting
10	1.10	1.07
15	1.05	1.04
20	1.00	1.00
25	0.95	0.96
30	0.89	0.93
35	0.84	0.89
40	0.77	0.85
45	0.71	0.80
50	0.63	0.76
55	0.55	0.71
60	0.45	0.65
65	-	0.60
70	-	0.53
75	-	0.46
80	-	0.38

TABLE 4B3

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

Thermal resistivity, K.m/W	0.5	0.8	1	1.2	1.5	2	2.5	3
Rating factor for cables in buried ducts	1.28	1.20	1.18	1.13	1.1	1.05	1	0.96
Rating factor for direct buried cables	1.88	1.62	1.5	1.40	1.28	1.12	1	0.90

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

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

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

TABLE 4B4

Rating factors (C_d) for depths of laying other than 0.7m for direct buried cables and cables in buried ducts

Depth of laying, m	Buried direct	In buried ducts
0.5	1.03	1.02
0.7	1.00	1.00
1	0.97	0.98
1.25	0.95	0.96
1.5	0.94	0.95
1.75	0.93	0.94
2	0.92	0.93
2.5	0.90	0.92
3	0.89	0.91

TABLE 4B5

Rating factors for cables having more than 4 loaded cores

Number of loaded cores	5	6	7	10	12	14	19
Rating factor	0.72	0.67	0.63	0.56	0.53	0.51	0.45
Number of loaded cores	24	27	30	37	44	46	48
Rating factor	0.42	0.40	0.39	0.36	0.34	0.33	0.33

NOTE 1 : The current-carrying capacity for a cable in the size range 1.5 to 4mm² , having more than 4 loaded cores, is obtained by multiplying the current-carrying capacity of a 2-core, having the same insulation type, by the factor selected from this table. The current-carrying capacity for the 2-core cable is that for the installation condition to be used for the multicore cable.

NOTE 2 : If, due to known operating conditions, a core is expected to carry not more than 30% of its current-carrying capacity in the multicore cable it may be ignored for the purpose of determining the number of cores in the cable.

NOTE 3: If, due to known operating conditions, a core is expected to carry not more than 30% of its rating, after applying the rating factor for the total number of current-carrying cores, it may be ignored for the purpose of obtaining the rating factor for the number of loaded cores.

For example, the current-carrying capacity of a cable having N loaded cores would normally be obtained by multiplying the current-carrying capacity of a 2-core, having the same insulation type, by the factor selected from this table for N cores. That is

$$I_{ZC} = I_{t2c} \times C_{gN}$$

Where:

I_{ZC} is the current-carrying capacity of the multicore cable after applying the rating factor for the total number of current-carrying cores

I_{t2c} is the tabulated current-carrying capacity of a 2-core cable, having the same insulation type as the multi-core cable

C_{gN} is the rating factor from Table 4B5 for the total number of current-carrying cores,

However, if M cores in the cable carry loads which are not greater than $0.3 \times I_{t2c} \times C_{gN}$ the current-carrying capacity can be obtained by using the rating factor corresponding to (N-M) cores.

The “not greater than $0.3 \times I_{t2c} \times C_{gN}$ ” calculation should be applied before the adjacent multicore cable grouping factor, if applicable, from Table 4C1. The 30% rule should not be further applied to any adjacent cable grouping factor calculations. I_{ZC} should be greater than or equal to I_n or I_b as appropriate, divided by the relevant rating factor (S) C, that is $I_{ZC} \geq I_n$ or I_b / C

TABLE 4C1

Rating factors for one circuit or one multicore cable or for a group of circuits, or a group of multicore cables, to be used with current-carrying capacities of Tables 4D1A to 4J4A

Item	Arrangement (cables touching)	Number of circuits or multicore cables												To be used with current-carrying capacities, Reference Method
		1	2	3	4	5	6	7	8	9	12	16	20	
1	Bunched in air, on a surface, embedded or enclosed	1.00	0.80	0.70	0.65	0.60	0.57	0.54	0.52	0.50	0.45	0.41	0.38	A to F
2	Single layer on wall or floor	1.00	0.85	0.79	0.75	0.73	0.72	0.72	0.71	0.70	0.70	0.70	0.70	C
3	Single layer multicore on a perforated horizontal or vertical cable tray system	1.00	0.88	0.82	0.77	0.75	0.73	0.73	0.72	0.72	0.72	0.72	0.72	E
4	Single layer multicore on cable ladder system or cleats etc.	1.00	0.87	0.82	0.80	0.80	0.79	0.79	0.78	0.78	0.78	0.78	0.78	E

NOTE 1 : These factors are applicable to uniform groups of cables, equally loaded.

NOTE 2 : Where horizontal clearances between adjacent cables exceed twice their overall diameter, no rating factor need be applied.

NOTE 3 : The same factors are applied to :

- Groups of two or three single-core cables;
- Multicore cables.

NOTE 4 : If a group consist of both two-and three-core cables, the total number of cables is taken as the number of circuits, and the corresponding factor is applied to the tables for two loaded conductors for the two-core cables, and to the Tables for three loaded conductors for the three-core cables.

NOTE 5 : If a group consists of n single-core cables it may either be considered as n/2 circuits to two loaded conductors or n/3 circuits of three loaded conductors.

NOTE 6 : The rating factors given have been averaged over the range of conductors sizes and types of installation included in Tables 4D1A to 4J4A and the overall accuracy of tabulated values is within 5%.

NOTE 7 : For some installations and for other methods not provided for in the above table, it may be appropriate to use factors calculated for specific cases, see for example Tables 4C4 an 4C5.

NOTE 8 : Where cables having differing conductor, operating temperature are grouped together, the current rating is to be based upon the lowest operating temperature of any cable in the group.

NOTE 9 : If, due to known operating conditions, a cable is expected to carry not more than 30% of its grouped rating, it may be ignored for the purpose of obtaining the rating factor for the rest of the group.

For example, a group or N loaded cables would normally require a group rating factor of C_g applied to the tabulated I_t .

However, if M cables in the group carry loads which are not greater than $0.3 C_g I_t$ amperes the other cables can be sized by using the group rating factor corresponding to (N-M) cables.

TABLE 4C6

Rating factors for cables enclosed in infloor concrete troughs (Installation Methods 118 to 120 of Table 4A2)

The rating factors tabulated below relate to the disposition of cables illustrated in items 118 to 120 of Table 4A2 and are applicable to the current carrying capacities for reference Methods E and F as given in the relevant tables of this appendix.

Conductor Cross- Sectional Area	Rating factor									
	Installation method 118				Installation method 119			Installation method 120		
	2 single- core cables, or 1 three or four-core cables	3 single- core cables, or 2 two-core cables	4 single- core cables, or 2 three or four-core cables	6 single- core cables, 4 two-core cables, or 3 three-or four-core cables	6 single- core cables, 4 two-core cables, or 3 three-or four-core cables	8 single- core cables, or 4 three or four-core cables	12 single- core cables, 8 two-core cables, or 6 three-or four-core cables	12 single- core cables, 8 two-core cables, or 6 three-or four-core cables	18 single- core cables, 12 two-core cables, or 9 three-or four-core cables	24 single- core cables 16 two-core cables, or 12 three-or four-core cables
1	2	3	4	5	6	7	8	9	10	11
(mm ²)										
4	0.93	0.90	0.87	0.82	0.86	0.83	0.76	0.81	0.74	0.69
6	0.92	0.89	0.86	0.81	0.86	0.82	0.75	0.80	0.73	0.68
10	0.91	0.88	0.85	0.80	0.85	0.80	0.74	0.78	0.72	0.66
16	0.91	0.87	0.84	0.78	0.83	0.78	0.71	0.76	0.70	0.64
25	0.90	0.86	0.82	0.76	0.81	0.76	0.69	0.74	0.67	0.62
35	0.89	0.85	0.81	0.75	0.80	0.74	0.68	0.72	0.66	0.60
50	0.88	0.84	0.79	0.74	0.78	0.73	0.66	0.71	0.64	0.59
70	0.87	0.82	0.78	0.72	0.77	0.72	0.64	0.70	0.62	0.57
95	0.86	0.81	0.76	0.70	0.75	0.70	0.63	0.68	0.60	0.55
120	0.85	0.80	0.75	0.69	0.73	0.68	0.61	0.66	0.58	0.53
150	0.84	0.78	0.74	0.67	0.72	0.67	0.59	0.64	0.57	0.51
185	0.83	0.77	0.73	0.65	0.70	0.65	0.58	0.63	0.55	0.49
240	0.82	0.76	0.71	0.63	0.69	0.63	0.56	0.61	0.53	0.48
300	0.81	0.74	0.69	0.62	0.68	0.62	0.54	0.59	0.52	0.46
400	0.80	0.73	0.67	0.59	0.66	0.60	0.52	0.57	0.50	0.44
500	0.78	0.72	0.66	0.58	0.64	0.58	0.51	0.56	0.48	0.43
630	0.77	0.71	0.65	0.56	0.63	0.57	0.49	0.54	0.47	0.41

NOTES:

1. The factors in Tables 4C6 are applicable to groups of cables all of one size. The value of current derived from application of the appropriate factors is the maximum current to be carried by any of the cables in the group.
2. If, due to known operating conditions, a cable is expected to carry not more than 30% of its grouped rating, it may be ignored for the purpose of obtaining the rating factor for the rest of the group.
3. Where cables having different conductor operating temperatures are grouped together the current rating should be based on the lowest operating temperature of any cable in the group.
4. When the number of cables used differs from those stated in the table, the rating factor for the next higher stated number of cables should be used.

Selection of Protective Conductor

543.1.3 The cross-sectional area, where calculated, shall be not less than the value determines by the following formula or shall be obtained by reference to Bs 7454.

Cross Sectional Areas

$$S = \frac{\sqrt{I^2 t}}{k}$$

NOTE : This equation is an adiabatic equation and is applicable for disconnection time not exceeding 5s.

Where:

- S - is the nominal cross-sectional area of the conductor in mm²
- I - is the value in amperes (rms for a.c.) of fault current for a fault of negligible impedance, which can flow through the associated protective device, due account being taken of the current limiting effect of the circuit impedances and the limiting capability (I^2t) of that protective device.
- t - is the operating time of the protective device in seconds corresponding to the fault current I amperes
- k - is a factor taking account of the resistivity, temperature coefficient and heat capacity of the conductor material, and the appropriate initial and final temperatures.

Values of k for protective conductors in various use or service are as given in Tables 54.2 to 54.6 The values are based on the initial and final temperatures indicated in each table.

Where the application of the formula produces a non-standard size, a conductor having the nearest larger standard cross-sectional area shall be used.

TABLE 54.2

Values of k for insulated protective conductor not incorporated in a cable and not bunched with cables, or for separate bare protective conductor in contact with cable covering but not bunched with cables where the assumed initial temperature is 30°C

Material of conductor	Insulation of protective conductor or cable covering		
	70 °C thermoplastic	90 °C thermoplastic	90 °C thermosetting
Copper	143/133*	143/133*	176
Aluminium	95/88*	95/88*	116
Steel	52	52	64
Assumed initial temperature	30 °C	30 °C	30 °C
Final temperature	160 °C/140 °C*	160 °C/140 °C*	250 °C

*Above 300mm²

TABLE 54.3

Values of k for protective conductor incorporated in a cable or bunched with cables, where the assumed initial temperature is 70°C or greater

Material of conductor	Insulation material		
	70 °C thermoplastic	90 °C thermoplastic	90 °C thermosetting
Copper	115/103*	100/86*	143
Aluminium	76/68*	66/57*	94
Assumed initial temperature	70 °C	90 °C	90 °C
Final temperature	160 °C/140 °C*	160 °C/140 °C*	250 °C

*Above 300mm²

TABLE 54.4

Values of k for protective conductor as the sheath or armour of a cable as the protective conductor

Material of conductor	Insulation material		
	70 °C thermoplastic	90 °C thermoplastic	90 °C thermosetting
Aluminium	93	85	85
Steel	51	46	46
Lead	26	23	23
Assumed initial temperature	60 °C	80 °C	80 °C
Final temperature	200 °C	200 °C	200 °C

TABLE 54.5

Values of k for steel conduit, ducting and trunking as the protective conductor

Material of protective conductor	Insulation material		
	70 °C thermoplastic	90 °C thermoplastic	90 °C thermosetting
Steel conduit, ducting and trunking	47	44	58
Assumed initial temperature	50 °C	60 °C	60 °C
Final temperature	160 °C	160 °C	250 °C

TABLE 54.6

Values of k for bare conductor where there is no risk of damage to any neighbouring material by the temperatures indicated

NOTE: The temperatures indicated are valid only where they do not impair the quality of the connections.

Material of conductor		Conditions		
		Visible and in restricted areas	Normal conditions	Fire risk
Copper		228	159	138
Aluminium		125	105	91
Steel		82	58	50
Assumed initial temperature		30 °C	30 °C	30 °C
Final temperature	Copper conductor	500 °C	200 °C	150 °C
	Aluminium conductor	300 °C	200 °C	150 °C
	Steel conductor	500 °C	200 °C	150 °C

Where it is desired not to calculate the minimum cross-sectional area of a protective conductor in accordance with Regulation at 543.1.3, the cross-sectional area may be determined in accordance with Table 54.7

Where the application of Table 54.7 produces a non-standard size, a conductor having the nearest larger standard cross-sectional area shall be used.

TABLE 54.7

Minimum cross-sectional area of protective conductor in relation to the cross-sectional area of associated line conductor

Cross-sectional area of line conductor S (mm ²)	Minimum cross-sectional area of the corresponding protective conductor	
	If the protective conductor is of the same material as the line conductor	If the protective conductor is not of the same material as the line conductor
(mm ²)	(mm ²)	(mm ²)
S ≤ 16	S	$\frac{k_1}{k_2} \times S$
16 < S ≤ 35	16	$\frac{k_1}{k_2} \times 16$
S > 35	$\frac{S}{2}$	$\frac{k_1}{k_2} \times \frac{S}{2}$

Where:

k_1 is the value of k for the line conductor, selected from Table 43.1 in chapter 43 according to the materials of both conductor and insulation.

k_2 is the value of k for the protective conductor, selected from Tables 54.2 to 6, as applicable.

TABLE 43.1

Values of k for common materials, for calculation of effects of fault current for disconnection times to 5 seconds

	Insulation Material					
	Thermoplastic				Thermosetting	
	90 °C		70 °C		90 °C	60 °C
Conductor cross sectional area (mm ²)	≤300	>300	≤300	>300	-	-
Initial temperature	90 °C		70 °C		90 °C	60 °C
Final temperature	160 °C	140 °C	160 °C	140 °C	250 °C	200 °C
Copper conductor	K=100	K=86	K=115	K=103	K=143	K=141
Aluminium conductor	K=66	K=57	K=76	K=68	K=94	K=93

Cable Core Colours

Cables according to SLS 733/BS 6004	
Cable Type	Core Colours
Single Core	Brown or Blue
Two Core	Brown, Blue
Three Core	Brown, Black, Grey
Cables according to SLS 1186, BS 5467, BS 7889 or BS 6346	
Cable Type	Core Colours
Single Core	Brown Or Blue
Two Core	Brown, Blue
Three Core	Brown, Black, Grey
Four Core	Brown, Black, Grey, Blue
Five Core	Brown, Black, Grey, Blue, Green & Yellow
Flexible Cable according to SLS 1504-2-11, BS EN 50525-2-11	
Cable Type	Core Colours
Two Core	Brown, Blue
Three Core	Brown, Blue, Green & Yellow
Four Core	Brown, Black, Grey, Green & Yellow
Five Core	Brown, Black, Grey, Blue, Green & Yellow

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