

Low Voltage Cable Range

Edition 4 Brochure



Driven by Powertech 



COMPANY PROFILE

Aberdare Cables, a member of the Powertech Group, is a leading African manufacturer of cables and electrical accessories, with seven manufacturing sites, in three provinces of South Africa, and offshore operations in Lesotho, Mozambique, Portugal and Spain. The company's customer base includes power supply authorities, railway and transport organisations, municipalities, and companies in industries such as petrochemical, mining, wholesaling, manufacturing, general industry, building and construction. The company manufactures and sells a wide range of state-of-the-art products, with customer specific adaptation, design capabilities, and full technical back-up service. Aberdare Cables prides itself on its ability to identify and satisfy customer needs through development of innovative products; unique, cost effective solutions for a wide range of industries. This coupled with extensive project experience make Aberdare the supplier of choice for cable and associated electrical accessories (switches, sockets, circuit breakers and reticulation).

Technology focus

Aberdare Cables pursues on-going technology development programmes, and through active association with its local and overseas affiliates, continues to remain at the forefront of technology. The company has been recognised internationally as a pioneer in cable advancements. Aberdare serves on a number of SABS and International Electro Technical Commission (IEC) cable working groups. As much as ten years ago, in a move towards facilitating the provision of electricity for all countrywide, Aberdare Cables designed products with an emphasis on cost efficiency of electrification. To this end, Aberdare created its Electrodac range, which is aimed specifically at facilitating rural electrification by lowering the cost of electricity delivery. More recently, in accordance with Siemens specifications, Aberdare produced an unarmoured cable, with stringent fire characteristics, that was designed to reduce the propagation of fire by cables. This cable is used at Eskom's open-cycle gas turbine generators at Mossel Bay and Atlantis. To cater for international markets, Aberdare introduced fire survival cable with stringent properties that allow continuous operation and circuit integrity for extended periods during a fire.

Quality focus

Aberdare Cables is a forerunner in the industry with regard to quality. The manufacturing, quality assurance, testing and research resources of Aberdare are of a world-class standard. In fact, the company was one of the first companies in South Africa to be awarded the South African Bureau of Standards (SABS) Quality Assurance Certification, and has been ISO 9001 compliant for many years. Aberdare Cables is UL listed and has Basec QA accreditation.

Transformation focus

Aberdare has embraced the empowerment concept. Today, Izingwe Consortium owns 30% of the company and the company has assisted in the development of a number of black enterprises, such as DRUMCO, the company that makes Aberdare Cable Drums. At Aberdare, education, training and development are seen as a foundation for economic productivity and as crucial tools to build empowered and dedicated employees. In this regard, the company actively promotes and follows a number of education programmes, including adult education, apprentices, trainees, learnerships and formal education assistance.

Aberdare Cables has always been an active supporter and pillar of strength for the communities in which it operates. The company is championing a number of social investment initiatives across our country. The biggest of these investments has been the continuous sponsorship of Sinethemba home for street children in Port Elizabeth.

As a proudly South African company, Aberdare participated actively in the development of the ICT charter and the draft DTI BBBEE codes. Aberdare will continue to adopt a proactive approach to effect the transformation that the codes specify and to lead the cable industry in this regard. We enjoy a BBBEE status of Level 3 (AA).

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Cable Description

High conductivity annealed stranded copper conductors to SANS 1411 Part 1. Insulated with PVC and skin coloured in plain colours to SANS 1411 Part 2. Cable is manufactured to SANS 1507 Part 2. **SLIPDAC®** is the Aberdare Power Cables trade name for a newly developed range of General Purpose wires with superior low friction characteristics.

Installation Information

For the wiring of Industrial Buildings, Housing, Control Panels, where **SLIPDAC®** will be easier to pull through conduit, than standard housewire particularly on long and difficult runs.

Properties

Specification	: SANS 1507-2
Temperature Range	: -10°C to 70°C
Voltage Rating	: 600 / 1000V
Core Identification	: Complete range of colours
Packaging	: 100m shrink-wrapped perforated coils / 500m reels

A specially developed low friction PVC compound which is used in the insulation of House wire for supply to the South African market.

Technical Data

Cable Size (mm ²)	Nominal Stranding No. x diameter	Approx. Overall Diameter (mm)	Current Rating * (A)	Conductor Resistance @ 20°C Maximum (Ω/km)	1 ϕ Volt Drop (mV/A/m)	Approx. Cable Mass per 100m Coil (kg)
600 / 1000 V						
1	7/0,42	3,0	17	18,1	43	1,7
1,5	7/0,53	3,3	21	12,1	29	2,2
2,5	7/0,66**	3,6	27	7,41	18	3,2
4	7/0,86**	4,5	36	4,61	11	5,2
6	7/1,04**	5,0	45	3,08	7,4	7,0
10	7/1,35**	6,0	61	1,83	4,4	11,1
16	7/1,67**	6,9	78	1,15	2,8	16,7

* Note: - Rating based on two touching cables, installed in a duct.
- Assumed ambient air temperature is 30°C.
- Assumed maximum conductor temperature is 70°C.

** Note: - Compacted Conductors

What are the benefits of this product solution compared to standard housewire?

The following benefits are relevant:

- The pulling force required to pull the product through conduit, is significantly reduced, as the cable-to-conduit and cable to cable friction is lower than on the standard product.
- The product is neatly and accurately coiled on automatic coilers, which reduces the risk of entanglement.
- The **SLIPDAC®** coils are sized for placement in a standard **SLIPDAC®** bucket where they may be stored securely after use. Refer PHOTO 3.
- The heat-shrunk plastic used in the packaging, keeps the coil in a sturdy, compact form until such time as it is used, thus there is a reduced risk of entanglement due to poor handling.
- The perforated packaging allows for easy access to the wire end on the inside of the coil, without having to disturb the packaging or the body of the coil during use. Refer PHOTO 1.
- The packaging is perforated on both the top and bottom, thus allowing coils to be stacked for simultaneous extraction of all required colours. A useful tool for this purpose is a bucket, which will hold the stacked coils in place while the wire is being withdrawn. Refer PHOTO 2.

ABERDARE CABLES has established a procedure for testing of the pulling force required to pull a sample of cable through a preformed length of standard 20mm SABS conduit. The initial force required to move the cable was measured and recorded for a number of samples of different sizes in the house wire range of colours, for both standard products as well as for **SLIPDAC®**

See attached photograph of the **SLIPDAC®** rig used during testing. (The conduit was exchanged for an unused piece from the same batch, at regular intervals).

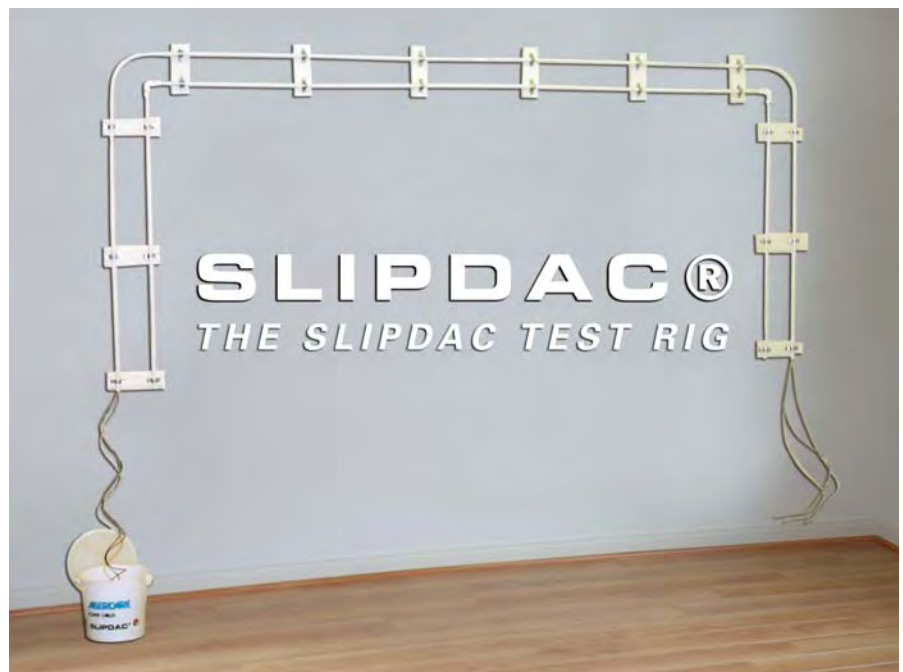


Photo 1:
The **SLIPDAC®** coil - Note the perforation marks in the centre part of the coil.



Photo 3:
The bucket lid is replaced with partially used coils remaining in the bucket for future use.

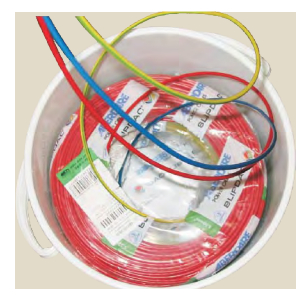


Photo 2:
Extraction of 3 or 4 wires simultaneously from coils held

Single Core PVC 1kV Cable

General Purpose Wire (Housewire)

ABERDARE
CABLES

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Cable Description

High conductivity annealed stranded or solid copper conductors to SANS 1411 Part 1. Insulated with general purpose grade PVC in plain colours to SANS 1411 Part 2.

Installation Information

For the wiring of :

- Industrial Buildings
- Control Panels

Properties

Specification	: SANS 1507-3
Temperature Range	: -10°C to 70°C
Voltage Rating	: 600 / 1000V
Core Identification	: Blue, Black, Yellow/Green, White, Red
Packaging	: 100m shrink-wrapped coils up to 70mm ² : Over 70mm ² on 300m drums

Technical Data

Cable Size	Nominal Stranding No. x diameter	Approx. Overall Diameter	Current Rating *	Conductor Resistance @ 20°C Maximum	1 ϕ Volt Drop	Approx. Cable Mass per 100m Coil
(mm ²)		(mm)	(A)	(Ω /km)	(mV/A/m)	(kg)
25	19/1,38**	8,4	104	0,73	1,7	25,6
35	19/1,62**	9,5	125	0,52	1,3	34,7
50	19/1,88**	11,3	149	0,39	0,93	47,2
70	19/2,28**	12,6	190	0,27	0,65	66,1
95	19/2,50	15,8	238	0,19	0,48	97,6
120	37/2,03	17,5	272	0,15	0,38	120,0
150	37/2,28	19,7	308	0,12	0,32	147,0
185	37/2,50	22,0	350	0,10	0,26	182,2
240	61/2,28	25,0	408	0,08	0,21	235,0
300	61/2,50	27,5	463	0,06	0,18	298,0
400	61/2,80	31,0	531	0,05	0,16	379,0
500	61/3,15	34,5	610	0,04	0,14	483,1
630	91/2,93	38,0	696	0,03	0,13	622,5

- * **Note:**
- Rating calculated for 1kV cable.
 - Rating based on two touching cables installed in a duct.
 - Assumed ambient air temperature is 30°C.
 - Assumed maximum conductor temperature is 70°C.

- ** **Note:**
- Compacted Conductors

Single Core PVC 3,3kV Cable

General Purpose Wire (Housewire)



Cable Description

High conductivity annealed stranded or solid copper conductors to SANS 1411 Part 1. Insulated with general purpose grade PVC in plain colours to SANS 1411 Part 2.

Installation Information

For the wiring of :

- Industrial Buildings
- Control Panels

Properties

Specification	: SANS 1507-3
Temperature Range	: -10°C to 70°C
Voltage Rating	: 1,9/3,3 kV
Core Identification	: Blue, Black, Yellow/Green, White, Red
Packaging	: 100m shrink-wrapped coils up to 70mm ² : Over 70mm ² on 300m drums

Technical Data

Cable Size	Nominal Stranding No. x diameter	Approx. Overall Diameter	Current Rating *	Conductor Resistance @ 20°C Maximum	1 ϕ Volt Drop	Approx. Cable Mass per 100m Coil
(mm ²)		(mm)	(A)	(Ω /km)	(mV/A/m)	(kg)
25	19/1,38**	10,4	104	0,73	1,7	25,6
35	19/1,62**	11,5	125	0,52	1,3	34,7
50	19/1,88**	12,9	149	0,39	0,93	47,2
70	19/2,28**	14,2	190	0,27	0,65	66,1
95	19/2,50	17,0	238	0,19	0,48	97,6
120	37/2,03	18,7	272	0,15	0,38	120,0
150	37/2,28	20,5	308	0,12	0,32	147,0
185	37/2,50	22,4	350	0,10	0,26	182,2
240	61/2,28	25,0	408	0,08	0,21	235,0
300	61/2,50	27,5	463	0,06	0,18	298,0
400	61/2,80	31,0	531	0,05	0,16	379,0
500	61/3,15	34,9	610	0,04	0,14	483,1
630	91/2,93	38,0	696	0,03	0,13	622,5

- * **Note:**
- Rating calculated for 3,3kV cable.
 - Rating based on two touching cables installed in a duct.
 - Assumed ambient air temperature is 30°C.
 - Assumed maximum conductor temperature is 70°C.

- ** **Note:**
- Compacted Conductors

Single Core PVC Cable

General Purpose Wire



D1 = Diameter over conductor D2 = Diameter over the PVC sheath

Cable Description

High conductivity annealed stranded or solid copper conductors to SANS 1411 Part 1. Insulated with general purpose grade PVC in plain colours to SANS 1411 Part 2.

Installation Information

For the wiring of :

- Industrial Buildings
- Control Panels

Properties

Specification	: SANS 1507-3
Temperature Range	: -10°C to 70°C
Voltage Rating	: 600 / 1000V
Core Identification	: Black
Packaging	: 300/500m Drums

Electrical and physical properties of single core PVC Insulated cables with stranded copper conductors, unarmoured, PVC sheathed 600/1000V manufactured to SANS 1507-3.

Technical Data

Rated Area (mm ²)	Nominal Diameters D1 D2		Nominal Mass (kg/km)	Impe- dance (Ω/km)	Cables A.C. or D.C.			Cables in Trefoil Formation			
					Current Rating *		Voltage Drop per Amp per metre (mV)	Current Rating			Voltage Drop per Amp per metre (mV)
					Ground	Air		Ground	Duct	Air	
25	5,95	11,91	366	0,8767	118	133	1,7	127	91	109	1,50
35	7,00	12,96	469	0,6356	156	165	1,3	153	109	136	1,10
50	8,15	15,15	632	0,4745	186	203	0,9	180	130	171	0,80
70	9,79	16,57	880	0,3356	232	251	0,7	221	166	214	0,60
95	11,54	19,04	1160	0,2500	281	313	0,5	265	208	271	0,40
120	12,96	20,24	1413	0,2054	324	362	0,4	301	237	316	0,30
150	14,39	22,07	1734	0,1734	370	414	0,3	338	267	366	0,30
185	16,10	24,80	2145	0,1499	424	482	0,3	381	305	433	0,20
240	18,71	27,81	2725	0,1268	498	578	0,2	442	357	525	0,20
300	21,45	30,75	3375	0,1131	566	660	0,2	499	404	604	0,20
400	24,30	34,10	4395	0,1028	651	704	0,2	565	442	639	0,20
500	26,51	37,13	5299	0,0963	740	821	0,2	634	506	752	0,20
630	33,15	43,62	6965	0,0890	836	960	0,2	718	580	886	0,10

PVC Current Ratings are Based on the following Environmental Parameters

Maximum Sustained Conductor Temperature	Ground Temperature	Ambient Air Temperature	Ground Thermal Resistivity	Depth of Laying to top of Cable
70°C	25°C	30°C	1,2 K.m/W	500mm

- * Note:
- Rating based on two touching cables installed in a duct.
 - Assumed ambient air temperature is 30°C.
 - Assumed maximum conductor temperature is 70°C.

Single Core XLPE PVC Cable

General Purpose Wire (600/1000V)



D1 = Diameter over conductor D2 = Diameter over the PVC sheath

Cable Description

High conductivity annealed stranded or solid copper conductors to SANS 1411 Part 1. Insulated with XLPE plain colours to SANS 1411 Part 4.

Installation Information

For the wiring of :

- Industrial Buildings
- Control Panels

Properties

Specification	: SANS 1507-4
Temperature Range	: -10°C to 90°C
Voltage Rating	: 600/1000V
Core Identification	: Black
Packaging	: 300/500m Drums

Technical Data

Rated Area (mm ²)	Nominal Diameters D1 D2		Nominal Mass (kg/km)	Impe- dance (Ω/km)	Cables A.C. or D.C.			Cables in Trefoil Formation			
					Current Rating *		Voltage Drop per Amp per metre (mV)	Current Rating			Voltage Drop per Amp per metre (mV)
					Ground	Air		Ground	Duct	Air	
25	5,95	11,81	328	0,8767	169	162	2,0	151	103	143	1,7
35	7,00	12,86	426	0,6356	205	202	1,4	181	125	179	1,2
50	8,15	14,38	567	0,4745	245	255	1,0	213	154	229	0,9
70	9,79	16,22	824	0,3356	302	313	0,7	260	192	284	0,6
95	11,54	17,97	1071	0,2500	366	380	0,5	312	233	346	0,5
120	12,96	19,82	1304	0,2054	422	441	0,4	355	268	402	0,4
150	14,39	21,42	1628	0,1734	480	508	0,4	397	305	465	0,3
185	16,10	23,63	1995	0,1499	554	585	0,3	449	345	537	0,3
240	18,71	26,69	2461	0,1268	656	704	0,2	522	406	648	0,2
300	21,45	30,05	3182	0,1131	766	804	0,2	589	459	741	0,2
400	24,30	33,30	4117	0,1028	902	874	0,2	668	511	805	0,2
500	26,51	36,33	5032	0,0963	1040	1013	0,2	750	583	935	0,2
630	33,15	42,79	6641	0,0890	1229	1205	0,2	848	680	1115	0,2

PVC Current Ratings are Based on the following Environmental Parameters

Maximum Sustained Conductor Temperature	Ground Temperature	Ambient Air Temperature	Ground Thermal Resistivity	Depth of Laying to top of Cable
90°C	25°C	30°C	1,2 K.m/W	500mm

- * Note:
- Rating for two touching cables installed in air.
 - Assumed ambient air temperature is 30°C.
 - Assumed maximum conductor temperature is 90°C.



Cable Description

Copper conductors to SANS 1411 Part 1, PVC insulated to SANS 1411 Part 2, laid up with a bare tinned copper earth wire in contact with a longitudinal aluminium/polyethylene laminate, UV stable PVC sheathed to SANS 1411 Part 2.

Installation Information

Complies with SANS 10142 "Code of Practice for wiring of Premises" Section 6:

- Surface wiring
- Under-plastering wiring
- Wiring in hollow walls
- Wiring in roof spaces

Note: The cable shall not be buried direct in concrete or in screed. Joints in the wiring shall be in boxes only.

Properties

- Specification : SANS 1507-2
- Temperature Range : -10°C to 70°C
- Voltage Rating : 300/500V
- Sheath Identification : White & Black
- Core Identification : 2 Core - Red & Black, 3 Core - Red, Yellow, Blue, 4 Core - Red, Yellow, Blue, Black
- Packaging : 100m shrink-wrapped coils
- : Available on 500 & 1000 metre wooden drums on request (depending on size)

Technical Data

Cable Size *		Electrical Properties				Physical Properties					
		Conductor Resistance (dc @ 20°C)		Current Rating **	Volt Drop ***	1 Sec Short Circuit Rating	Approx. Overall Diameter	Approx. Cable Mass			
Phase	Earth	Phase	Earth						(mm ²)	(Ω/km)	(A)
2 Core											
1,5	1	12,1	18,2	17	29	0,14	7,8	10,6			
2,5	1,5	7,41	12,2	23	18	0,24	8,8	14,4			
4	1,5	4,61	12,2	30	11	0,38	10,1	20,8			
6	2,5	3,08	7,56	38	7,3	0,58	11,3	25,7			
3 Core											
1,5	1	12,1	18,2	15	25	0,14	8,0	10,9			
2,5	1,5	7,41	12,2	20	15	0,24	9,3	15,7			
4	1,5	4,61	12,2	27	9,5	0,38	10,8	21,0			
6	2,5	3,08	7,56	34	6,4	0,58	12,0	28,7			
4 Core											
1,5	1	12,1	18,2	15	25	0,14	8,7	13,3			
2,5	1,5	7,41	12,2	20	15	0,24	10,2	19,3			
4	1,5	4,61	12,2	27	9,5	0,38	11,8	26,5			
6	2,5	3,08	7,56	34	6,4	0,58	12,8	33,5			

- Note:**
- * Conductors larger than 2,5mm² are usually stranded.
 - ** Maximum conductor temperature 70° C, and installed as per installation Method 3 of SANS 10142-1.
 - *** 2 Core - Volt drop is phase to Neutral (ie. Single-phase).
3 and 4 Core - Volt drop is phase-to-phase. (ie. Three phase AC).



Cable Description

Copper conductors to SANS 1411 Part 1, PVC insulated to SANS 1411 Part 2, laid up with a bare copper earth-continuity-conductor between them, UV stable PVC sheathed to SANS 1411 Part 2.

Installation Information

Complies with SANS 10142/2001 "Code of Practice for the wiring of Premises" Section 6, Clause 6.3.6:

- Surface wiring
- Under-plaster wiring
- Roof access wiring
- Wiring in hollow walls

Note: The cable shall not be buried direct in concrete or in screed. Joints in the wiring shall be in boxes only.

Properties

Specification	: SANS 1507-2
Temperature Range	: -10°C to 70°C
Voltage Rating	: 300/500V
Sheath Identification	: White & Black
Core Identification	: 2 Core - Red & Black, 3 Core - Red, Yellow, Blue
Packaging	: 100m shrink-wrapped coils

Technical Data

Cable Size *		Electrical Properties				Physical Properties		
		Conductor Resistance (dc @ 20°C)		Current Rating **	Volt Drop ***	1 Sec Short Circuit Rating	Approx. Overall Diameter	Approx. Cable Mass
Phase	Earth	Phase	Earth					
(mm ²)		(Ω/km)		(A)	(mV/A/m)	(kA)	(mm)	(kg/100m)
2 Core								
1,5	1	12,1	18,1	17	29	0,14	8,7 x 4,7	8,7
2,5	1,5	7,4	12,1	23	18	0,24	10,3 x 5,5	12,8
4	1,5	4,61	12,1	30	11	0,38	11,9 x 6,4	17,5
6	2,5	3,08	7,41	38	7,3	0,58	13,4 x 7,0	23,3
10	4	1,83	4,61	52	4,4	0,96	16,5 x 8,3	36,1
3 Core (Trip)								
1	1	18,2	18,2	12	38	0,11	4,4 x 10,4	8,9
1,5	1	12,1	18,2	15	25	0,14	4,8 x 10,5	9,9
2,5	1,5	7,4	12,2	20	15	0,24	5,5 x 12,3	14,1

- Note:**
- * Conductors larger than 2,5mm² are usually stranded.
 - ** Maximum conductor temperature 70° C, and installed as per installation Method 3 of SANS 10142-1.
 - *** 2 Core - Volt drop is phase to Neutral (ie. Single-phase).
3 and 4 Core - Volt drop is phase-to-phase. (ie. Three phase AC).



Cable Description

High conductivity bunched plain flexible copper conductors to SANS 1411 Part 1. Insulated and colour coded with general purpose flexible grade PVC to SANS 1411 Part 2. Cores are twisted together and sheathed with a flexible grade PVC.

Installation Information

For supplying power to all types of electrical, domestic and industrial appliances and equipment such as:

- PowerTools
- Electric Lawnmowers
- Kitchen Appliances
- Extension Leads
- Multi Plug Extensions
- Small Industrial Machinery

Properties

- Specification : SANS 1574
 Temperature Range : -10°C to 70°C
 Voltage Rating : Light Duty (LD) 300/300V and Normal Duty (ND) 300/500V
 Core Identification : **2 Core** - Blue & Brown, **3 Core** - Blue, Brown & Yellow/Green, **4 Core** - Blue, Brown, Black & Yellow/Green, **5 Core** - Blue, Black, Brown, Yellow/Green, Violet, **7 Core** - Blue, Brown, Black, Yellow/Green, Violet, Pink, Orange
 Sheath Colours : White, Black, Grey
 Packaging : 100m shrink-wrapped coils / 500m & 1000m lengths available on request

Technical Data

Cable Size (mm ²)	Number of Cores	Nominal Stranding No. x diameter	Approx. Overall Diameter (mm)	Conductor Resistance @ 20°C Maximum (Ω/km)	Current Rating *		Volt Drop		Approx. Cable Mass per 100m Coil (kg)
					1φ (A)	3φ (A)	1φ (mV/A/m)	3φ (mV/A/m)	
Light Duty 300 / 300V									
0,5	2	15/0,2	5,2	39	3	3	93	80	3,9
	3		5,5		3	3	93	80	4,7
	4		6,0		3	3	93	80	5,5
0,75	5	23/0,2	6,6	26	3	3	93	80	6,7
	3		6,1		6	6	62	54	5,5
Normal Duty 300 / 500V									
0,75	2	23/0,2	6,2	26	6	6	62	54	5,2
	3		7,0		6	6	62	54	6,7
	4		7,2		6	6	62	54	7,8
	5		8,2		6	6	62	54	9,9
	7		8,7		6	6	62	54	12,6
1	2	30/0,2	6,6	19,5	10	10	46	40	6,3
	3		7,0		10	10	46	40	7,6
	4		8,0		10	10	46	40	9,8
	5		8,6		10	10	46	40	11,6
1,5	7	44/0,2	9,3	13,3	10	10	46	40	14,8
	2		7,8		16	16	32	27	8,4
	3		8,3		16	16	32	27	10,8
	4		9,3		16	16	32	27	13,5
	5		10,0		16	16	32	27	16,2
2,5	7	72/0,2	10,9	7,98	16	16	32	27	20,7
	2		9,6		25	20	19	16	13,5
	3		10,3		25	20	19	16	16,8
	4		11,9		25	20	19	16	21,8
	5		12,2		25	20	19	16	24,2
4	7	112/0,2	13,2	4,96	25	20	19	16	31,3
	2		11,0		32	25	12	10	19,0
	3		11,4		32	25	12	10	25,0
	4		13,5		32	25	12	10	32,0
	5	14,1		32	25	12	10	33,9	

* Note: Current Rating based on - Ambient temperature is 30°C Maximum Conductor temperature is 70°C



Cable Description

High conductivity bunched plain flexible copper conductors to SANS 1411 Part 1. 2 Core insulated with general purpose flexible grade PVC to SANS 1411 Part 2.

Installation Information

For the wiring of all types of:

- Intercoms
- Alarm Systems
- Solar Industry
- Audio and Visual Equipment

Properties

- Specification : ABERDARE Specification
 Temperature Range : -10°C to 70°C
 Core Identification : Standard Colours - White, Brown, Grey, Black, Transparent and Red with Black Stripe
 : Other Colours available on request
 Packaging : 100m shrink-wrapped coils / 500m lengths available on request

Technical Data

Cable Size	Nominal Stranding No. x diameter	Approx. Overall Diameter	Current Rating *	Conductor Resistance @ 20°C Maximum	1 ϕ Volt Drop	Approx. Cable Mass per 100m Coil
(mm ²)		(mm)	(A)	(Ω /km)	(mV/A/m)	(kg)
0,2	7/0,2	1,6 x 3,2	1	92	248	0,95
0,4	11/0,2	2,1 x 4,2	2	48,8	98	1,6
0,5	15/0,2	2,5 x 5,0	3	39	93	2,2
0,75	23/0,2	2,7 x 5,4	6	26	62	2,8
1,00	30/0,2	2,9 x 5,8	10	19,5	46	3,6
1,5	44/0,2	3,2 x 6,4	16	13,3	32	4,3
2,5	72/0,2	3,9 x 7,9	25	7,98	19	6,9
4	112/0,2	4,7 x 9,4	32	4,96	12	10,9

* Note: - Assumed ambient air temperature is 30°C.
 - Assumed maximum conductor temperature is 70°C.

Submersible Pump Cable

3 and 4 Core



Cable Description

High conductivity bunch plain flexible copper conductors to SANS 1411 Part 1.. Cores insulated and bedded with Flexible PVC Grade. Final protection is given by a flexible PVC outer sheath.

Installation Information

Power supply of mobile and portable submersible pumps as used in:

- Quarries
- Farms
- Cleaning and Sewerage extraction plants
- De-watering
- Boreholes

Properties

- Specification : SANS 1574
 Temperature Range : -10°C to 70°C
 Insulation & Sheath : Flexible grade waterproof PVC
 Voltage Rating : 600 / 1000V
 Sheath Identification : 3 Core - Blue, 4 Core - Green
 Core Identification : 3 Core - Red, Yellow, Blue, 4 Core - Red, Yellow, Blue, Black
 Packaging : Available on 500 metre wooden drums

Technical Data

Cable Size (mm ²)	Minimum Bending Radius	Approx. Overall Diameter (mm)	Current Rating * (A)	Conductor Resistance @ 20°C Maximum (Ω/km)	Volt Drop		Approx. Cable Mass per 100m Coil (kg)
					1φ 220V (mV/A/m)	3φ 380V (mV/A/m)	
3 Core (Blue)							
1,5 x 3	82	0,15	15	13,3	29	25	10,2
2,5 x 3	94	0,2	20	7,98	17	15	11,7
4 x 3	108	0,3	30	4,96	12	9,5	13,5
6 x 3	121	0,5	35	3,30	7,3	6,4	15,1
10 x 3	141	0,6	50	1,91	4,3	3,8	17,6
16 x 3	161	0,8	65	1,21	2,8	2,4	20,1
4 Core (Green)							
1,5 x 4	89	0,2	15	13,3	29	25	11,2
2,5 x 4	102	0,25	20	7,98	17	15	12,8
4 x 4	116	0,35	30	4,96	12	9,5	14,6
6 x 4	132	0,5	35	3,30	7,3	6,4	16,5
10 x 4	153	0,7	50	1,91	4,3	3,8	19,2
16 x 4	176	1	65	1,21	2,8	2,4	22,0

* Note: - Assumed ambient air temperature is 30°C.
 - Assumed maximum conductor temperature is 70°C.



Cable Description

Single core flexible copper conductors to SANS 1411 Part 1, EPM (Ethylene-propylene monomer) insulated, CM (Chlorinated Polyethylene) or CR (Polychloroprene) sheathed, heavy duty welding cables.

Installation Information

Heavy duty welding for:

- Indoor and outdoor electric welding equipment.

Properties

Specification	: SANS 1576
Voltage Rating	: 100V ac or dc to earth for welding applications
Core Identification	: EPM/CM - Outer CM sheath is coloured
	: EPM/CR - EPM insulation is coloured and CR sheath is black
Packaging	: 100m shrink-wrapped coils

Technical Data

Physical Properties

Colour Code	Conductor				Dimensions		Approx. Cable Mass (kg/m)
	Conductor Size (mm ²)	Maximum Diameter of Wires (mm)	Approx. Diameter (mm)	Maximum Resistance of Untinned Conductor at 20°C (Ω/km)	Nominal Thickness of Insulation (mm)	Approx. Overall Diameter (mm)	
Green	16	0,31	5,2	1,210	2,0	9,2	0,25
Blue	25	0,31	7,1	0,780	2,0	11,1	0,35
Grey	35	0,31	8,5	0,554	2,0	12,5	0,45
Red	50	0,31	10,4	0,386	2,2	14,8	0,60
Brown	70	0,31	11,6	0,272	2,4	16,4	0,75
Yellow	95	0,31	14,1	0,206	2,6	19,3	1,10
Black	120	0,51	15,6	0,161	2,8	21,2	1,40

Electrical Properties

Conductor Size (mm ²)	Class of Welding					D.C. Voltage Drop (mV/A/m)
	Automatic		Manual		Very Intermittent	
	Semi-automatic					
	Maximum Current Rating (A) for Duty Cycles of:					
	100%	85%	60%	30%	20%	
16	131	134	142	172	199	1,6
25	177	182	197	246	289	1,0
35	220	229	252	322	380	0,8
50	280	293	327	426	507	0,6
70	346	364	411	546	654	0,5
95	422	446	508	681	819	0,4
120	493	523	599	809	976	0,3

- * Note:
- Assumed ambient air temperature is 30°C.
 - Assumed maximum conductor temperature is 85°C.
 - Assumed duty cycle period 5 minutes.
 - Derating of maximum current for other ambient temperatures - use rating factor X as given below:

Ambient temperature, °C	: 25	30	35	40	45
Rating factor, X	: 1,04	1,00	0,95	0,91	0,85



Cable Description

Single core flexible copper conductors to SANS 1411 Part 1, insulated with general purpose flexible grade PVC and sheathed with a flexible grade waterproof PVC/Nitrile.

Installation Information

A flexible power cable where flexibility is needed in equipment such as:

- LV Transformer Connections
- Motor Control Centres
- General Wiring Applications
- Distribution Boards

Properties

- Specification : SANS 1574 Part 3
- Temperature Range : -10°C to 70°C
- Voltage Rating : 600 / 1000V
- Core Identification : Red, Black, Blue, Yellow (Other colours on request)
- Packaging : Shrink-wrapped coils from 16mm² to 70mm² or 500m drums
- : The product is sequentially marked at one metre intervals

Technical Data

Conductor Size (mm²)	Approx. Conductor Diameter (mm)	Approx. Cable Diameter (mm)	Impedance at 70°C (Ω/km)	Approximate Volt Drop		Continuous Current Rating *		Approx. Cable Mass (kg/100m)
				(mV/A/m)		(A)		
				1φ	3φ	1φ	3φ	
16	5,2	10,8	1,460	2,8	2,4	76	64	23,00
25	7,1	13,5	0,933	1,7	1,5	104	88	31,50
35	8,5	15,3	0,663	1,3	1,1	125	106	42,50
50	10,4	18,4	0,462	0,9	0,8	148	126	57,50
70	11,6	21,2	0,326	0,7	0,6	187	159	76,00
95	14,1	24,1	0,247	0,5	0,4	232	198	101,00
120	15,6	25,6	0,193	0,4	0,4	265	226	129,00
150	17,30	27,7	0,16	0,3	0,3	299	255	159,00
185	20,00	30,8	0,14	0,3	0,3	343	292	189,00

- * Note:
- Current ratings are based on cable installed in a cubicle, and may vary depending on other applications.
 - Assumed ambient air temperature is 30°C.
 - Maximum conductor temperature is 70°C.
 - Derating of maximum current for other ambient temperatures - use rating factor X as given below:

Ambient temperature, °C	:	25	30	35	40	45
Rating factor, X	:	1,04	1,00	0,95	0,91	0,85
Fault rating	:	115A/mm² (1 Second)				

Nitrile Trailing Cable

Flexible PVC - 4 Core



Cable Description

High conductivity bunch plain flexible copper conductors to SANS 1411 Part 1. Cores insulated and bedded with Flexible PVC. Flexible Grade PVC / Nitrile outer sheath.

Installation Information

- Power supply of mobile and stationary industrial machinery
- Applications that require medium duty abrasion and where oil and water resistance is required.

Properties

Good chemical resistance. Flame retardant, self extinguishing. Oil and water resistant.

Specification	: SANS 1574
Temperature Range	: -10°C to 70°C
Voltage Rating	: 600 / 1000V
Sheath Identification	: PVC / Nitrile - Orange
Core Identification	: Red, Yellow, Blue, Black
Packaging	: Available on 500 metre wooden drums

Technical Data

Cable Size	Approx. Overall Diameter	Current Rating *	Conductor Resistance @ 20°C Maximum	1 ϕ Volt Drop	Approx. Cable Mass
(mm ²)	(mm)	(A)	(Ω /km)	(mV/A/m)	(kg/m)
1,5 x 4	11	15	13,3	25	0,2
2,5 x 4	13	20	7,98	15	0,3
4 x 4	15	30	4,96	9,5	0,4
6 x 4	17	35	3,30	6,4	0,5
10 x 4	20	50	1,91	3,8	0,7
16 x 4	23	65	1,21	2,4	1
25 x 4	26,2	95	0,78	0,87	1,4

* Note: - Assumed ambient air temperature is 30°C.
- Assumed maximum conductor temperature is 70°C.



Cable Description

High conductivity bunched plain flexible copper conductors to SANS 1411 Part 1. 2 Core insulated with general purpose flexible grade PVC to SANS 1411 Part 2.

Installation Information

For the wiring of:

- Audio (Loud Speaker Leads) Equipment
- Solar Power Industry

Properties

- Specification : ABERDARE Specification
- Temperature Range : -10°C to 70°C
- Core Identification : Transparent with Blue Stripe
- Packaging : 100m shrink-wrapped coils or 100m reels

Technical Data

Cable Size	Nominal Stranding No. x diameter	Approx. Overall Diameter	Current Rating *	Conductor Resistance @ 20°C Maximum	1 ϕ Volt Drop	Approx. Cable Mass per 100m Coil
(mm ²)		(mm)	(A)	(Ω /km)	(mV/A/m)	(kg)
1,00	30/0,2	2,9 x 5,8	10	19,5	46	3,6
1,6	51/0,2	4,1 x 8,2	16	11	33	6,3
3,0	90/0,2	5,5 x 11	29	6,5	16	10,2

* Note: - Assumed ambient air temperature is 30°C.
- Assumed maximum conductor temperature is 70°C.



Cable Description

High conductivity solid copper conductor to SANS 1411 Part 1. Insulated with D5 High temperature PVC 105°C to SANS 1411 Part 2.

Installation Information

For the wiring of:

- Capacitor Tails
- Ballasts for Fluorescent Lights

Properties

- Specification : SANS 1507-2
- Temperature Range : -10°C to 105°C
- Voltage Rating : 300/500V
- Core Identification : White, Yellow, Black, Brown, Red, Orange, Tan, Light Blue and White with a choice of either Yellow, Orange, Red, Black, Blue or Brown Stripes
- Packaging : 7000m lengths down coiled into cardboard barrels

Technical Data

Cable Size	Nominal Stranding No. x diameter	Approx. Overall Diameter	Current Rating *	Conductor Resistance @ 20°C Maximum	1 ϕ Volt Drop	Approx. Cable Mass per 100m Coil
(mm ²)		(mm)	(A)	(Ω /km)	(mV/A/m)	(kg)
0,5	1 x 0,8	2,6	15	36	96,1	1,1

* Note:

- Rating based on two touching cables installed in a duct.
- Assumed ambient air temperature is 30°C.
- Assumed maximum conductor temperature is 105°C.

■ Illumination Cable

Flexible Wiring (also called Maconite)



Cable Description

High conductivity stranded plain copper conductors. Insulated and sheathed with general purpose flexible grade PVC in a flat parallel configuration.

Installation Information

- For festoon lighting at festivals, parties, outdoor functions
- Other applications where quick fit lamp holders are used or required

Properties

The correct size profile and soft sheath allows for a watertight seal between the standard lamp holder and the cable.

Specification	: SANS 1507 AFAA
Temperature Range	: -10°C to 70°C
Voltage Rating	: 300/500V
Sheath Colour	: Black or Red
Core Identification	: Black and Red
Packaging	: 100m shrink-wrapped coils
	: 1000m drums available on request

Technical Data

Cable Size	Number of Cores	Approx. Overall Diameter	Current Rating *	Conductor Resistance @ 20°C	1φ Volt Drop	Approx. Cable Mass per 100m Coil
(mm ²)		(mm)	(A)	(W/km)	(mV/A/m)	(kg)
2,5	2	7,98	25	15	10,2 x 5,6	12

* **Note:**

- Assumed ambient air temperature is 30°C.
- Assumed maximum conductor temperature is 70°C.



Cable Description

High conductivity bunched plain flexible copper conductors to SANS 1411 Part 1. Insulated with general purpose flexible grade PVC in all colours to SANS 1411 Part 2.

Installation Information

For the wiring of all types of:

- Control panels
- Light fittings
- Communication panels
- Appliances

Properties

- Specification : SANS 1574-3
- Temperature Range : -10°C to 70°C
- Voltage Rating : 300 / 500V and 600 / 1000V
- Core Identification : Blue, Black, Brown, Yellow/Green, Orange, Pink, Violet, Grey, White, Red
- Packaging : 100m shrink-wrapped coils
- : 500m lengths available on request
- : 2500m, 4000m and 7000m lengths down coiled into cardboard barrels available on request. (depending on size)

Technical Data

Cable Size	Nominal Stranding No. x diameter	Approx. Overall Diameter	Current Rating *	Conductor Resistance @ 20°C Maximum	1φ Volt Drop	Approx. Cable Mass per 100m Coil
(mm ²)		(mm)	(A)	(W/km)	(mV/A/m)	(kg)
600 / 1000V						
0,5	15/0,2	2,6	11	39	93,3	1,1
0,75	23/0,2	2,8	14	26	62,2	1,3
1	30/0,2	3,0	16	19,5	46,7	1,6
1,5	44/0,2	3,3	20	13,3	31,8	2,2
2,5	72/0,2	3,7	26	7,98	19,1	3,1
4	112/0,2	4,8	35	4,95	11,8	4,9
6	175/0,2	5,3	43	3,30	7,9	7,3
10	294/0,2	9,1	58	1,91	4,6	11,1
16	462/0,2	10,0	75	1,21	2,9	16,7
25	721/0,21	12,7	100	0,780	1,9	27,1
35	1026/0,21	14,5	122	0,55	1,3	35,8

* Note:

- Assumed ambient air temperature is 30°C.
- Assumed maximum conductor temperature is 70°C.
- Rating for 2 wires only



Cable Description

Single core flexible copper conductors to SANS 1411 Part 1, insulated with general purpose flexible grade PVC and sheathed with a flexible grade waterproof PVC/Nitrile

Installation Information

A flexible power cable where flexibility is needed in equipment such as:

- LV transformer connections
- Motor control centres
- General wiring applications
- Distribution boards

Properties

- Specification : SANS 1574 Part 3
- Temperature Range : -10°C to 70°C
- Voltage Rating : 600 / 1000V
- Core Identification : Red, Black, Blue, Yellow (Other colours on request)
- Packaging : Shrink-wrapped coils from 16mm² to 70mm² or 500m drums
- : The product is sequentially marked at one metre intervals.

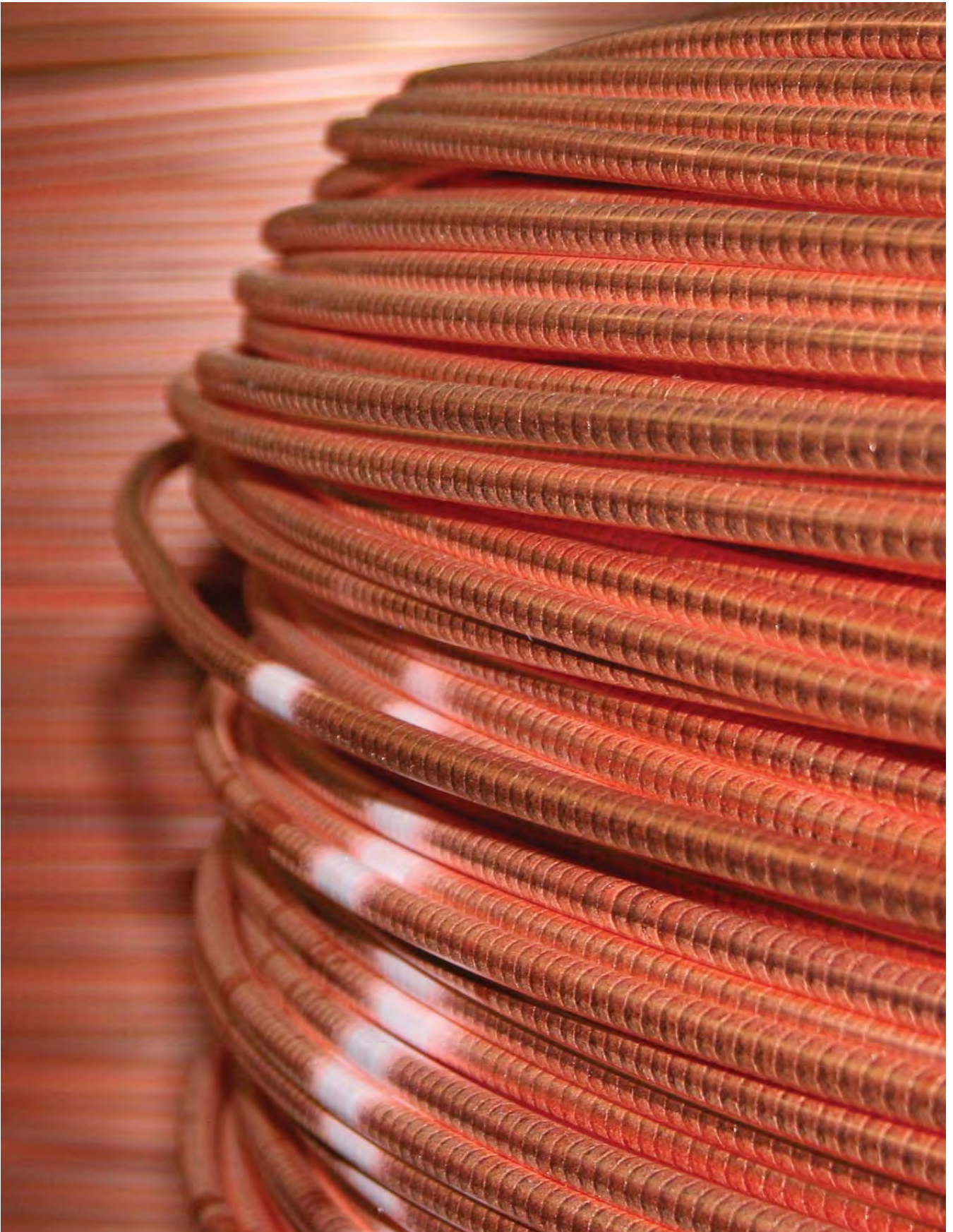
Technical Data

Conductor Size (mm ²)	Approx. Conductor Diameter (mm)	Approx. Cable Diameter (mm)	Impedance at 70°C (W/km)	Approx. Volt Drop (mV/A/m)		Continuous Current Rating * (A)		Approx. Cable Mass (kg/100m)
				1f	3f	1f	3f	
				16	5,2	10,8	1,460	
25	7,1	13,5	0,933	1,7	1,5	104	88	31,50
35	8,5	15,3	0,663	1,3	1,1	125	106	42,50
50	10,4	18,4	0,462	0,9	0,8	148	126	57,50
70	11,6	21,2	0,326	0,7	0,6	187	159	76,00
95	14,1	24,1	0,247	0,5	0,4	232	198	101,00
120	15,6	25,6	0,193	0,4	0,4	265	226	129,00
150	17,30	27,7	0,16	0,3	0,3	299	255	159,00
185	20,00	30,8	0,14	0,3	0,3	343	292	189,00

- * Note:**
- Current ratings are based on cable installed in a cubicle, and may vary depending on other applications.
 - Assumed ambient air temperature is 30°C.
 - Maximum conductor temperature is 70°C.
 - Derating of maximum current for other ambient temperatures - use rating factor X as given below:

- Ambient temperature, °C : 25 30 35 40 45
- Rating factor, X : 1,04 1,00 0,95 0,91 0,85
- Fault rating : 115A/mm² (1 Second)

Bare Copper





Cable Description

High conductivity plain soft stranded copper conductors to SANS 1411.

Installation Information

For the wiring of earthing circuits where general house wiring is used.

- 1,5mm²- Amp's @ 30°C = 20
- 2,5mm²- Amp's @ 30°C = 27
- 4,00mm²- Amp's @ 30°C = 37
- 6,00mm²- Amp's @ 30°C = 70

Properties

- Specification : SANS 1411-1
- Temperature Range : -10°C to 70°C
- Sheath Identification : Copper
- Packaging : 1,5mm²- 6mm², 5kg & 25kg coils
- : 10mm²- 16mm², 25kg & 500kg wooden drums
- : 25mm²- 240mm² & 500kg wooden drums

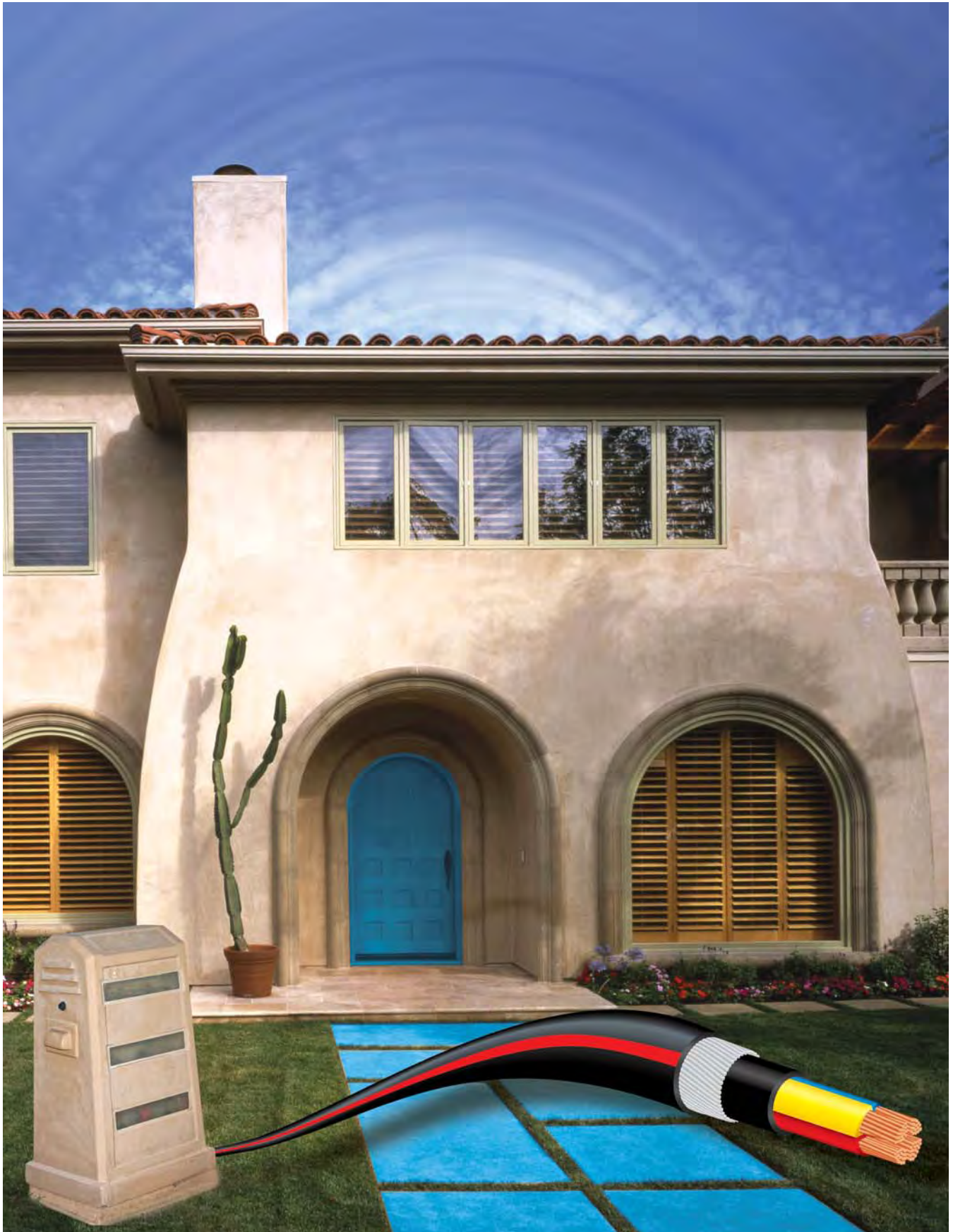
Technical Data

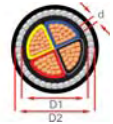
Conductor Size	Nominal Stranding	Approximate Meters
(mm ²)	(No. x Diameter)	(mm.kg)
1,5	7/0,53	72,22
2,5	7/0,66	46,62
4	7/0,85	27,46
6	7/1,04	18,75
10	7/1,35	11,13
16	7/1,67	7,27
25	19/1,38*	4,54
35	19/1,62*	3,34
50	19/1,88*	2,46
70	19/2,28*	1,56
95	19/2,50	1,13
120	37/2,03	0,91
150	37/2,28	0,739
185	37/2,50	0,599
240	37/2,98	0,450

* Note : Compacted conductors

Example : Customer requires : 180m of 70mm² Copper Earth, Wire. 1kg of 70mm² Copper is therefore = 1,58m.
So 180m divided by 1,58 = 113,92kg say 114kg

Low Voltage Armoured Cables





D1 = Diameter over bedding sheath d = Diameter of armour wire D2 = Diameter over outer sheath

Electrical and physical properties of 3 and 4 core PVC insulated PVC bedded *SWA PVC sheathed 600/1000 V cables with aluminium or copper conductors and manufactured to SANS 1507-3.

* Where the armouring of cable is used as the earth continuity path, it may be necessary to replace some of the steel wires with tinned copper wires (ECC) or to use a supplementary earth continuity conductor.

Technical Data

Copper Conductors

Cable Size (mm ²)	Electrical Properties						Physical Properties							
	Current Rating			Impedance (Ω/km)	Volt Drop (mV/A/m)	1 Sec Short Circuit Rating (kA)	Nominal Diameters						Approx. Mass	
	Ground (A)	Ducts (A)	Air (A)				D1		d		D2		3c (kg/km)	4c (kg/km)
				3c (mm)	4c (mm)	3c (mm)	4c (mm)	3c (mm)	4c (mm)					
1,5	24	20	19	14,48	25,080	0,17	8,51	9,33	1,25	1,25	14,13	14,95	448	501
2,5	32	26	26	8,87	15,363	0,28	9,61	10,56	1,25	1,25	15,23	16,18	522	597
4	42	34	35	5,52	9,561	0,46	11,40	12,57	1,25	1,25	17,02	18,39	667	762
6	53	43	45	3,69	6,391	0,69	12,58	13,90	1,25	1,25	18,4	19,72	790	910
10	70	58	62	2,19	3,793	1,15	14,59	16,14	1,25	1,25	20,41	21,96	996	1169
16	91	75	83	1,38	2,390	1,84	16,55	19,18	1,25	1,25	22,37	25,92	1295	1768
25	119	96	110	0,8749	1,515	2,87	19,46	21,34	1,60	1,60	26,46	28,34	1838	2196
35	143	116	135	0,6335	1,097	4,02	20,89	23,97	1,60	1,60	27,89	31,17	2215	2732
50	169	138	163	0,4718	0,817	5,75	24,26	28,14	1,60	1,60	31,46	36,54	2871	3893
70	210	171	207	0,3325	0,576	8,05	27,07	31,29	2,00	2,00	35,47	40,09	3617	4837
95	251	205	251	0,2460	0,427	10,92	31,19	35,82	2,00	2,00	39,99	44,62	4901	6115
120	285	234	290	0,2012	0,348	13,80	33,38	38,10	2,00	2,00	42,18	47,40	5720	7269
150	320	263	332	0,1698	0,294	17,25	36,68	42,05	2,00	2,00	45,98	52,65	6908	9250
185	361	298	378	0,1445	0,250	21,27	40,82	46,75	2,50	2,50	51,12	57,45	8690	11039
240	416	344	445	0,1220	0,211	27,60	46,43	53,06	2,50	2,50	57,13	64,16	10767	13726
300	465	385	510	0,1090	0,189	34,50	51,10	58,53	2,50	2,50	62,20	70,13	12950	16544

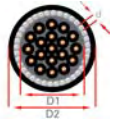
Aluminium Conductors

Cable Size (mm ²)	Electrical Properties						Physical Properties							
	Current Rating			Impedance (Ω/km)	Volt Drop (mV/A/m)	1 Sec Short Circuit Rating (kA)	Nominal Diameters						Approx. Mass	
	Ground (A)	Ducts (A)	Air (A)				D1		d		D2		3c (kg/km)	4c (kg/km)
				3c (mm)	4c (mm)	3c (mm)	4c (mm)	3c (mm)	4c (mm)					
25	90	73	80	1,4446	2,502	1,80	17,76	20,65	1,60	1,60	24,76	27,65	1301	1554
35	108	87	99	1,0465	1,813	2,52	19,33	21,93	1,60	1,60	26,33	29,13	1477	1757
50	129	104	119	0,7749	1,342	3,61	21,87	25,05	1,60	1,60	29,07	32,25	1782	2150
70	158	130	151	0,5388	0,9333	5,05	24,76	29,27	1,60	1,60	31,96	37,67	2132	2930
95	192	157	186	0,3934	0,681	6,86	28,68	33,73	2,00	2,00	37,08	42,53	2908	3647
120	219	179	216	0,3148	0,545	8,66	31,09	35,44	2,00	2,00	39,89	44,24	3328	4023
150	245	201	250	0,2607	0,452	10,83	33,99	39,39	2,00	2,50	42,79	49,69	3837	5276
185	278	229	287	0,2133	0,369	13,35	37,80	44,51	2,00	2,50	47,10	54,81	4557	6231
240	324	268	342	0,1708	0,296	17,32	42,60	50,04	2,50	2,50	52,90	61,14	5977	7550

Under short circuit conditions a maximum conductor temperature of 160°C is allowed for a maximum of 1 second

PVC Current Ratings are Based on the following Environmental Parameters

Maximum Sustained Conductor Temperature	Ground Temperature	Ambient Air Temperature (Free Air Shaded)	Ground Thermal Resistivity	Depth of Laying to top of Cable or Duct
70°C	25°C	30°C	1,2 K.m/W	500mm



D1 = Diameter over bedding sheath d = Diameter of armour wire D2 = Diameter over outer sheath

Electrical and physical properties of Multicore PVC Insulated PVC Bedded *SWA PVC sheathed 600/1000 V cables with stranded copper conductors manufactured to SANS 1507-3.

* Where the armouring of cable is used as the earth continuity path, it may be necessary to replace some of the steel wires with tinned copper wires (ECC) or to use a supplementary earth continuity conductor.

Technical Data

1.5mm² Multicore Cables

No of Cores	Electrical Properties					Physical Properties			
	Current Rating			Impedance	Capacitance	Nominal Diameters			Mass
	Ground	Ducts	Air			(mm)			
(A)	(A)	(A)	(Ω/km)	(nF/lm)	D1	d	D2	(kg/km)	
2	29	23	22	14,4782	422	8,1	1,25	13,8	422
3	24	20	19	14,4782	422	8,6	1,25	14,3	456
4	24	20	19	14,4782	422	9,5	1,25	15,1	510
5	21	17	17	14,4782	422	10,3	1,25	15,8	577
6	20	16	16	14,4782	422	11,4	1,25	17,0	613
7	18	15	15	14,4782	422	11,4	1,25	17,0	629
8	17	14	14	14,4782	422	12,6	1,25	18,2	710
10	16	13	13	14,4782	413	14,8	1,25	20,7	837
12	15	12	12	14,4782	413	15,3	1,25	21,2	901
14	14	11	12	14,4782	413	16,2	1,60	22,0	980
19	12	10	11	14,4782	379	19,2	1,60	25,9	1404
24	11	9	10	14,4782	379	22,4	1,60	29,3	1687
27	11	8	10	14,4782	379	22,9	1,60	29,8	1783
30	10	8	9	14,4782	379	23,7	1,60	30,7	1867
37	9	7	9	14,4782	379	25,9	1,60	32,8	2153

2.5mm² Multicore Cables

No of Cores	Electrical Properties					Physical Properties			
	Current Rating			Impedance	Capacitance	Nominal Diameters			Mass
	Ground	Ducts	Air			(mm)			
(A)	(A)	(A)	(Ω/km)	(nF/lm)	D1	d	D2	(kg/km)	
2	37	31	31	8,8668	487	9,0	1,25	14,7	475
3	32	26	26	8,8668	487	9,6	1,25	15,2	524
4	32	26	26	8,8668	487	10,6	1,25	16,2	606
5	27	22	22	8,8668	487	11,5	1,25	17	690
6	25	20	21	8,8668	487	12,7	1,25	18,5	737
7	24	19	20	8,8668	487	12,7	1,25	18,5	756
8	22	18	19	8,8668	487	13,0	1,25	18,9	806
10	21	17	18	8,8668	477	16,6	1,60	22,5	1000
12	19	15	17	8,8668	434	18,1	1,60	24,8	1306
14	18	14	16	8,8668	434	19,0	1,60	25,7	1421
19	16	13	14	8,8668	434	21,4	1,60	28,1	1695
24	14	12	13	8,8668	434	25,1	1,60	32,0	2053
27	14	11	13	8,8668	434	25,7	1,60	32,6	2181
30	13	10	12	8,8668	434	26,6	2,00	34,8	2594
37	12	10	11	8,8668	410	29,4	2,00	37,6	3011

PVC Current Ratings are Based on the following Environmental Parameters

Maximum Sustained Conductor Temperature	Ground Temperature	Ambient Air Temperature (Free Air Shaded)	Ground Thermal Resistivity	Depth of Laying to top of Cable or Duct
70°C	25°C	30°C	1,2 K.m/W	500mm

Technical Data

4mm² Multicore Cables

No of Cores	Electrical Properties					Physical Properties			
	Current Rating			Impedance	Capacitance	Nominal Diameters			Mass
	Ground	Ducts	Air			(mm)			
(A)	(A)	(A)	(Ω/km)	(nF/lm)	D1	d	D2	(kg/km)	
2	50	41	41	5,5171	487	10,2	1,25	16,3	597
3	42	34	35	5,5171	487	10,9	1,25	17,0	669
4	42	34	35	5,5171	487	12,3	1,25	18,4	764
5	35	28	29	5,5171	487	13,6	1,25	19,7	884
6	33	27	28	5,5171	487	14,9	1,25	21,0	961
7	31	25	26	5,5171	487	14,9	1,25	21,0	986
8	29	24	25	5,5171	487	18,1	1,25	24,2	1079
10	27	22	24	5,5171	477	20,2	1,60	27,0	1251
12	25	20	22	5,5171	434	20,4	1,60	28,2	1211
14	23	19	21	5,5171	434	22,8	1,60	29,6	1885
19	21	16	19	5,5171	434	24,9	2,00	32,5	2282

6mm² Multicore Cables

No of Cores	Electrical Properties					Physical Properties			
	Current Rating			Impedance	Capacitance	Nominal Diameters			Mass
	Ground	Ducts	Air			(mm)			
(A)	(A)	(A)	(Ω/km)	(nF/lm)	D1	d	D2	(kg/km)	
2	62	51	53	3,6868	556	11,8	1,25	17,4	684
3	53	43	45	3,6868	556	12,6	1,25	18,4	791
4	53	43	45	3,6868	556	13,9	1,25	19,7	911

Sustained Current Rating Factors for Non-Standard Conditions for both PVDAC and Multicore LV PVC Cables

Maximum Conductor Temperature (°C)	Ground Temperature (°C)				Maximum Conductor Temperature (°C)	Air Temperature (°C)			
	25	30	35	40		30	35	40	45
70	1,00	0,94	0,88	0,82	70	1,00	0,94	0,87	0,79

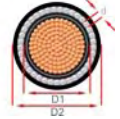
Depth of Laying (mm)	Direct in Ground
500	1,00
800	0,96
1000	0,94
1250	0,92
1500	0,90

Current Rating Factors for Grouping of Multicore Cables Installed Horizontally in Air

No of Cables in group	Direct in ground				
	Axial Spacing (mm)				
	Touching	150	300	450	600
2	0,81	0,87	0,91	0,93	0,94
3	0,70	0,78	0,84	0,87	0,90
4	0,63	0,74	0,81	0,86	0,89
5	0,59	0,70	0,78	0,83	0,87
6	0,55	0,67	0,76	0,82	0,86

No of Cables	2	3	5	6	9
Condition	Derating Factor				
Cables touching	0,86	0,81	0,75	0,74	0,72
Clearance D* between cables	0,91	0,89	0,87	0,87	0,85

* Note: - D is overall diameter of one cable



D1 = Diameter over insulation d = Diameter of armour wire D2 = Diameter over outer sheath

Electrical and physical properties of single core stranded copper conductors, PVC Insulated, PVC bedded, AWA PVC sheathed 600/1000V cables manufactured to SANS 1507-3.

Technical Data

Rated Area (mm ²)	Approximate Diameters			Approx. Mass (kg/km)	Impedance (Ω/km)	Cables in Trefoil Formation			
	D1	d	D2			Current Rating			Voltage Drop per Amp per metre (mV)
						Ground (A)	Ducts (A)	Air (A)	
25	8,35	1,25	15,45	563	0,879	125	112	121	1,52
35	9,40	1,25	16,50	700	0,639	156	140	147	1,11
50	10,95	1,25	18,05	846	0,479	183	165	177	0,83
70	12,59	1,25	19,89	1128	0,339	223	200	221	0,59
95	14,74	1,25	22,04	1504	0,257	266	238	273	0,45
120	16,16	1,60	25,16	1784	0,213	301	269	314	0,37
150	17,99	1,60	26,99	2102	0,182	336	299	357	0,32
185	20,10	1,60	29,30	2547	0,157	370	329	401	0,27
240	23,11	1,60	32,31	3114	0,134	410	363	481	0,23
300	26,25	2,0	37,05	4124	0,123	476	420	546	0,21
400	29,50	2,0	41,50	5133	0,113	529	465	622	0,19
500	32,51	2,0	44,51	6203	0,106	581	509	695	0,18
630	38,75	2,5	51,75	8218	0,099	623	541	779	0,17

PVC Current Ratings are Based on the following Environmental Parameters

Maximum Sustained Conductor Temperature	Ground Temperature	Ambient Air Temperature	Ground Thermal Resistivity	Depth of Laying to top of Cable
70°C	25°C	30°C	1,2 K.m/W	500mm





D1 = Diameter over bedding sheath d = Diameter of armour wire D2 = Diameter over outer sheath

Cable Description

Electrical and physical properties of 3 core PVC insulated PVC bedded SWA PVC sheathed 1,9 / 3,3 kV cables with copper conductors and manufactured to SANS 1507-3.

Application Information

The cost effectiveness of transferring power over long distances through intermediate step-up step-down systems is desirable for the electrification of industrial and residential installations, including game lodges.

Armadac® consists of 3 circular stranded plain soft copper conductors, PVC insulated, PVC bedded, Steel Wire Armoured, PVC sheathed, 1,9/3,3 kV manufactured to SANS 1507-3. Applications where this cable can typically be used include, amongst others, residential installations, game lodges and general long distance electricity transfer applications at intermediate voltage.

Advantages of using an intermediate voltage cable over the conventional 400V 3-phase system offered by the increased voltage of 3,3 kV include the fact that volt drop will be considerably lower and small conductor sizes (10mm², 16mm² or 25mm²) will suffice for most applications. The Armadac® cable is steel wire armoured and provides a robust mechanical protection to the cable, hence it is suitable to be installed underground. Furthermore, Armadac® offers additional protection against attack by rodents and other animals as provided by the steel wire armouring. The steel wire armouring can also be utilized as an earth continuity path, therefore eliminating the need for an external earth conductor. Armadac® makes use of circular cores which limits electrical stress in the insulation and also incorporates a flame retardant PVC Sheath, which limits the spread of fire.

Properties

- Specification : SANS 1507-3
- Temperature Range : -10°C to 70°C
- Voltage Rating : 1900/3300V
- Core Identification : Red, Yellow, Blue
- Packaging : Available on 500 metre wooden drums

Technical Data

Electrical & Physical Properties

Cable Size	Electrical Properties						Physical Properties			
	Current Rating *			Impedance (Z)	Volt Drop	1 Sec Short Circuit Rating	Nominal Diameters			Approx. Mass
	Ground	Ducts	Air				D1	d	D2	
(mm ²)	(A)	(A)	(A)	(Ω/km)	(mV/A/m)	(kA)	(mm)	(mm)	(mm)	(kg/km)
10	68	58	60	2.34	2,2	1,4	20,7	1,6	227,3	1543
16	91	76	81	1.47	1,4	2,2	22,8	1,6	29,6	1859
25	113	95	103	0.93	0,9	3,4	24,9	1,6	31,7	2221

- Recommended depth of lay 500mm. Soil thermal resistivity 1,2 km/W
- Soil temperature at 25°C
- * In ground at 500mm depth

Airdac SNE Cable

House Service Connecting Cable with or without Pilot Cores



Cable Description

Circular stranded hard drawn copper phase conductor, XLPE insulated with concentrically arranged identified neutral and bare earth conductors. Polyethylene sheathed 600/1000V service connection cable. Nylon ripcord laid under sheath. Manufactured to SANS 1507-6.

- Small overall diameter - concentric construction (SNE - Seperate Neutral Earth).
- Lower mass - due to smaller diameter - no steel wire armour.
- Increased safety - reliable earthing.
- Improved reliability - UV stable sheath and core insulation and water blocked.
- Tamper and vandal proof - unauthorised access to phase conductor inhibited by concentric layer.
- Easy strip with nylon ripcord.

Technical Data

Electrical Properties

Cable Size (mm ²)	10	16
Phase Conductor Resistance (Ohm/km) DC @ 20 °C	1,90	1,20
Earth Size (mm ²)	7,5	10
Neutral Size (mm ²)	10	16
Phase Core Impedance (Z) (Ohm/km)	2,34	1,47
Current Rating* (A)	50	70
Pilot Cores (No. x OD) Solid (mm)	2 x 1,13	2 x 1,13

* Note: - In air, with 30 °C ambient with maximum conductor temperature 90 °C

Mechanical Properties

Cable Size (mm ²)	10	16
Phase Conductor (No. x OD)(mm)	7 x 1,35	7 x 1,67
Nominal Insulation Thickness (mm)	1,0	1,0
Neutral Conductor (No. x OD)(mm)	7 x 1,33	7 x 1,76
Earth Conductor (No. x OD)(mm)	3 x 1,78	3 x 2,20
Nominal Sheath Thickness (mm)	1,6	1,6
Approximate Cable OD (mm)	12,8	14,5
Approximate Cable Mass (kg/km)	320	485

Installation Data

Span (m)		10	20	30	40	50	Based on	
							UTS**	MWT***
SAG* (mm)	10 mm ²	45	180	400	710	1110	3600	900
SAG* (mm)	16 mm ²	40	170	380	670	1050	5760	1440

- Note:**
- * Assuming worst conditions, i.e. - 5,5 °C with simultaneous wind speed of 31 m/s and measured at midspan.
 - ** UTS = Minimum ultimate tensile strength.
 - *** MWT = Minimum working tension.



Cable Description

Circular stranded hard-drawn copper phase conductor, XLPE insulated with concentrically arranged bare earth conductors. Polyethylene sheathed 600/1000 V house service connection cable. Nylon ripcord laid under sheath. Manufactured to SANS 1507-6.

- Small overall diameter - concentric construction
- Lower mass - due to smaller diameter - no steel wire armour
- Increased safety - reliable earthing
- Improved reliability - UV stable sheath and core insulation
- Tamper and vandal proof - unauthorised access to phase conductor inhibited by concentric layer
- Easy strip with nylon ripcord

Technical Data

Electrical Properties

Cable Size (mm ²)	4	10
Phase Conductor Resistance (Ohm/km) DC @ 20 °C	4,80	1,90
Phase Core Impedance (Z) (Ohm/km)	5,88	2,34
Current Rating (A)*	30	50
Symmetrical Short Circuit Rating for 1s in kA	0,572	1,431

* Note: - In air, with 30 °C ambient with maximum conductor temperature 90 °C

Mechanical Properties

Cable Size (mm ²)	4	10
Phase Conductor {No. x OD} (mm)	7 x 0,92	7 x 1,45
Nominal Insulation Thickness (mm)	1,0	1,0
Earth Size (mm ²)	4	10
Earth Conductor {No. x OD} (mm)	8 x 0,85	18 x 0,85
Nominal Sheath Thickness (mm)	1,4	1,4
Approximate Cable OD (mm)	9,0	11,0
Approximate Cable Mass (kg/km)	121	249

Installation Data

Span (m)		10	20	30	40	50	Based on	
							UTS**	MWT***
SAG* (mm)	4 mm ²	40	165	370	650	1020	1480	370
SAG* (mm)	10 mm ²	35	140	310	550	870	3600	900

Note: * Assuming worst conditions, i.e. temperature -5,5°C with simultaneous wind speed of 31m/s and measured at midspan.
 ** UTS = Minimum ultimate tensile strength. Safety factor of 2,5.
 *** MWT = Minimum working tension.

Aerial Bundle Conductor (ABC) Cable



SELF SUPPORTING



SUPPORTING CORE

Cable Description

Self-supporting system consists of four cores of hard-drawn stranded and compacted aluminium conductors of equal cross-section and insulated with carbon-loaded XLPE to ensure UV protection. All cores strained equally. Supporting-core system consists of three phase cores of hard-drawn stranded compacted aluminium conductors insulated with carbon-loaded XLPE laid up around an aluminium-alloy supporting core insulated with carbon loaded XLPE to ensure UV protection. Additional sub-conductors optional in both self-supporting and supporting-core systems.

Installation Information

- Economical
- Flexible
- Safe
- Vandal proof
- Durable
- Aesthetically pleasing
- Adaptable

Properties

Specification	: SANS 1418 Part 1 and 2
Temperature Range	: -10°C to 80°C
Voltage Rating	: 600/1000V
Core Identification	: Phase 1,2 and 3 indented, • Non strain-bearing neutral, 2 longitudinal ribs on opposite surfaces 0,5mm x 1,00mm • Strain-bearing (supporting) neutral, 1 longitudinal rib on one surface 0,5mm x 1,00mm
Packaging	: Available on 500 metre wooden drums

Technical Data

Electrical Properties

Cable Size	Current Rating (Note 1)	Short Circuit Rating (Note 2)	Conductor Resistance @ 20°C	Conductor Resistance (ac) @ 80°C	Self Supporting System		Supporting Core System		
					Induction Reactance @ 50Hz	Impedance (z) @ 50Hz at 80°C	Supporting Core Size	Induction Reactance @ 50Hz	Impedance (z) @ 50Hz at 80°C
mm ²	(A)	kA	(Ω/km)	(Ω/km)	(Ω/km)	(Ω/km)	mm ²	(Ω/km)	(Ω/km)
25	105	2,3	1,200	1,490	0,096	1,493	54,6	0,101	1,493
35	144	3,2	0,868	1,078	0,096	1,082	54,6	0,097	1,082
50	183	4,6	0,641	0,796	0,090	0,801	54,6	0,089	0,801
70	228	6,4	0,443	0,550	0,089	0,557	54,6	0,086	0,557
95	277	8,5	0,320	0,397	0,086	0,406	54,6	0,081	0,405
120	322	11,0	0,253	0,314	0,084	0,325	70	0,079	0,324
150	350	13,8	0,206	0,256	0,082	0,269	95	0,079	0,268

- NOTES:** 1. Continuous current ratings are given for ambient temperature of 35 °C, and maximum conductor temperature of 80°C. For other ambient temperatures use adjoining rating factors
2. Short circuit ratings of 1 second duration, for a final conductor temperature of 130 °C.

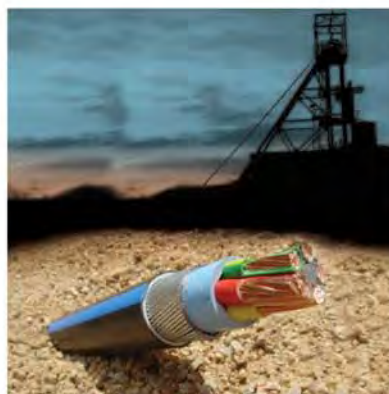
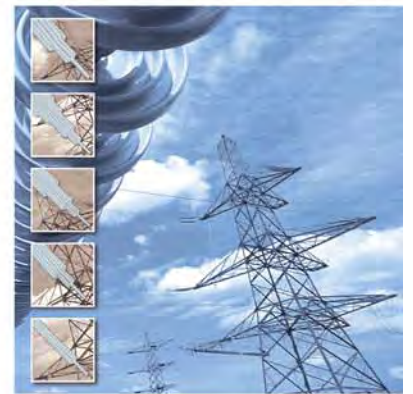
Temp °C	25	30	35	40	45
Factor	1.11	1.05	1.00	0.94	0.88

Mechanical Properties

Cable Size	Conductor Diameter		Core Diameter		Self Supporting System			Supporting Core System			
	Min	Max	Min	Max	Approx. Assembly Diameter	Approx. Assembly Mass	Maximum Design Load	Supporting Core Size	Approx. Assembly Diameter	Approx. Assembly Mass	Maximum Design Load
Phase Cores	mm		mm		mm	kg/km	kN	mm ²	mm	kg/km	kN
mm ²											
25	5,6	6,5	8,4	9,6	25	400	5	54,6	26	507	6
35	6,6	7,5	9,8	11,1	27	540	7	54,6	28	612	6
50	7,7	8,6	10,9	12,3	29	697	9	54,6	32	730	6
70	9,3	10,2	12,9	14,3	33	982	14	54,6	34	944	6
95	11,0	12,0	14,6	16,2	37	1302	19	54,6	38	1183	6
120	12,5	13,5	16,1	17,5	41	1470	24	70,0	40	1600	8
150	13,9	15,0	17,5	19,2	45	2011	30	95,0	44	1870	13

Above Plus 25mm² Auxiliary Core

25	N/A	N/A	N/A	N/A	25	505	N/A	N/A	32	612	N/A
35					32	645			34	717	
50					34	802			36	835	
70					38	1087			38	1049	
95					42	1407			42	1288	
120					44	1575			50	1705	
150					48	2116			56	1975	



The Aberdare Group's product range and services are wide but specialised. Tried and tested and carrying South African Bureau of Standards (SABS) marks and complying with International Standards, we stand by our products.

Paper Insulated Cables up to 42 kV

- Screened or belted
- Fully impregnated, general purpose, heavy duty or drained
- Copper or Aluminium conductors up to 400mm² (3 core) and 1000mm² (single core)

XLPE Insulated Cables up to 66 kV

- Individually screened
- Copper or aluminium conductors up to 300mm² (3 core) and 500mm² (single core)

Elastomeric Insulated Cables

- Flexible Cable (Types HO5 RN-F;HO7 RN-F)
- Welding Cable
- Mining Trailing Cable (Up to 33kV)

Overhead Aluminium Conductors

- AAC (All Aluminium Conductors)
- AAAC (All Aluminium Alloy Conductors)
- ACSR (Aluminium Conductor Steel Reinforced)
- PHDC (Plain Hard Drawn Copper)

General Wire Insulated & Bare Copper Wire

- Slipdac Single Core Cable
- Surfix Cable
- Flat Twin and Earth Cable
- Cabtyre Cable
- Submersible Pump Cable
- Audio cord (Ripcord)

- General Welding cable
- Monster Cable
- HRQ Insulated Cable
- Panel Flex Cable
- Illumination Cable
- PVC Nitrile Panel Cable
- Nitrile Trailing Cable
- Bare Copper
- Single Core PVC 1kV Cable
- Single Core XLPE PVC 3.3kV Cable

Low Voltage Armoured Cables

- Bells and Mains Cable
- Multicore Cable
- Single Core Cable

Electrodac Cables

- Aerial Bundle Conductor (ABC) (LV & MV)
- Airdac SNE Cable
- Airdac CNE Cable

Intermediate Voltage Cables

- Armadac Cable

Specialised Cables

- SafeEarth Cable
- Insulated Airfield Lighting Cable

Theft Prevention Technology

- CableGuard™



Correction Factors for Direct Solar Radiation

Colour Code	Correction Factor	
	Solar Radiation	
	1000 W/m ² (Coastal)	1250 W/m ² (Highveld)
1,5 - 10	0,70	0,62
16 - 35	0,68	0,57
50 - 95	0,65	0,53
120 - 185	0,62	0,49
240 - 400	0,59	0,44

Short Circuit Ratings for PVC Insulated Cables

$$I_{sc} = \frac{K \times A}{\sqrt{t}} \text{ Amps}$$

where I_{sc} = Short circuit rating in amps
 K = A constant combining temperature limits and properties of conductor materials
 A = Area of conductor
 t = Duration of short circuit in seconds

Values of conductor / temperature constant K

Insulation Material	Conductor Material	Operating Temp °C	Short Circuit Temp °C	K Factor
PVC	Copper	70	160	115
PVC	Aluminium	70	160	76

Bending Radii

PVC Insulated Cables 1000V	
Multi and Single Core 16 - 50 mm ²	8 x d
70 mm ² and greater	10 x d

FLAMOSAFE RANGE OF FIRE PERFORMANCE OF ELECTRIC CABLES

FR (Flame Retardant) Red and Orange Stripe cables are designed to reduce the spread of fire along a cable tray or duct. However, when these cables burn, they give off large quantities of toxic gases and smoke. (**FYRGARD®**)



LHFR (Low Halogen) Blue Stripe cables has specially formulated PVC that reduces the emission of hydrochloric acid during burning of the cables. (**LOHAL®**)



NHLSFR (Non Halogen) White Stripe cables are designed to reduce flame propagation and smoke in those instances where a fire may develop. By replacing the standard PVC with XLPE insulation and EVA bedding and outer sheath, no HCl gases will be liberated during the burning of the cables. (**LOTOX®**)



NOTICE TO THE USER OF ELECTRIC CABLE PRODUCTS MANUFACTURED BY ABERDARE CABLES:

- **“WARNING: Electrical equipment (including cable) and installations which form part of a facility, whether fixed, mobile or moveable are by nature inherently dangerous when energized with electrical power as contact with un-insulated or damaged components of such a facility may result in injury, loss of life and damage to property. Only qualified persons should attend to the installation of such electrical equipment, the maintenance thereof, and the repair of any faulty facilities which have an electrical component.”**
 - Selection and Installation of the product must be carried out as per the applicable compulsory specifications by appropriately qualified persons and certified by a competent person so authorized by law prior to being put into service. All fixed electrical Low Voltage installations must have a valid Certificate of Compliance (COC)
 - Low voltage electrical installations up to 600/1000V must conform to the compulsory specification SANS 10142-1 “The Wiring of Premises Part 1: Low voltage installations”
 - SA Legislation determines that the User or Lessor is responsible for the safety of the electrical installation.
 - All Medium Voltage installations above 1 kV must conform to the specification SANS 10198 “The Selection, Handling and installation of electric power cables of rating not exceeding 33 kV”, and where applicable SABS 10142-2 “The wiring of premises Part 2: Medium voltage installations above 1 kV a.c. and not exceeding 22kV a.c. and up to and including 3 000 kW installed capacity”
 - The following **Compulsory Safety Standards** are applicable to Electric Cables manufactured, imported and used in South Africa and no product may be used which does not comply to the applicable standard:
 - (VC 8075) SANS 1507: Electric Cables with solid dielectric insulation for fixed installations (300/500V to 1900/3300V)
 - (VC 8077) SANS 1339: Electric Cables Cross linked Polyethylene (XLPE) insulated cables for rated voltages 3,8/6,6 kV to 19/33 kV
 - (VC 8077) SANS 97: Electric Cables Impregnated paper insulated metal sheathed cables for rated voltages 3,3/3,3 kV to 19/33 kV
 - (VC8006) SANS 1574: Electric Flexible Cables with solid dielectric insulation.
 - All cables manufactured to a compulsory safety standard must be clearly marked with the applicable SANS standard number as well as the Manufacturer's name.
 - Aberdare Cables manufactures all Electric Cables made to Compulsory standards under the SABS Mark scheme. Products manufactured under the SABS mark scheme carries the wording “**SABS**” to show that the manufacturer is a licensed Mark Holder. The SABS Mark gives the user the assurance that the South African Bureau of Standards monitors the quality of the products which carries this mark and verifies the quality system used by Aberdare Cables to manufacture these products, on an ongoing basis.
 - Compulsory specifications (VC's) may be downloaded for free from the SABS website www.sabs.co.za.
 - The user of electric cable products has the right to take up any issue of concern with the **National Regulator of Compulsory Specifications** at +27(0)12 428 5000
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GROUP OPERATIONS CENTRE

181A Barbara Road
Elandsfontein
PO Box 1679, Edenvale 1610
Tel +27 (0) 11 396 8000
Fax +27 (0) 11 396 8010
E-mail: info@aberdare.co.za

DISTRIBUTION & LOGISTICS

4 Gross Street, Off Tunney Road
Elandsfontein
PO Box 2566, Edenvale 1610
Tel +27 (0)11 396 8000
Fax +27 (0)11 396 8015
E-mail: info@aberdare.co.za

DIVISION

Alcon Marepha (Pty) Ltd
10 Kite Street, Birch Acres
Kempton Park
PO Box 13837, Norkem Park, 1631
Tel +27 (0)11 393 4037
Fax +27 (0)11 393 4410

Swanib Cables (Pty) Ltd
5 Nasmith Street
Windhoek
PO Box 5023, Windhoek, Ausspannplatz
Tel +264 6122 6218/9
Fax +264 6122 8307

MANUFACTURING - SA**Crabtree Electrical Accessories**

Cnr Davidson & Wadeville Roads
Wadeville
PO Box 14040, Wadeville, 1422
Tel +27 (0)11 874 7600
Fax +27 (0)11 827 5320

CBI-electric Aberdare ATC Telecom Cables

Marthinus Ras Street, Industrial Sites
Brits, North West Province
PO Box 663, Brits 0250
Tel +27 (0)12 381 1400
Fax +27 (0)12 250 3412

Gauteng

1 Long Street, Belgravia
Johannesburg
PO Box 5093, Johannesburg 2000
Tel +27 (0)11 406 1000
Fax +27 (0)11 406 1298

Pietermaritzburg

Gladys Manzi Road, M'Kondeni,
Pietermaritzburg
PO Box 188, Pietermaritzburg 3200
Tel +27 (0)33 845 3200
Fax +27 (0)33 346 0039

Port Elizabeth

Standford Road, Neave Township
Port Elizabeth
PO Box 494, Port Elizabeth 6000
Tel +27 (0)41 405 6000
Fax +27 (0)41 451 1471

MANUFACTURING - INTERNATIONAL**Maputo (Mozambique)**

Aberdare Intelec
Av. de Angola, No 1818
Maputo - Mozambique
Tel +25 821 466496/7
Fax +25 821 466396

Porto (Portugal)

Alcobré Condutores Eléctricos S.A.
Av. D. Manuel 1 Zona Industrial de Ovar
Apartado 30 3884-909 OVAR CODEX
Tel +351 256 579440
Fax +351 256 579445

Zaragoza (Spain)

Cables de Comunicaciones
Poligono de Malpica C/D 83
50016 Zaragoza, Spain
Tel +34 976 72 9900
Fax +34 976 72 9968

CUSTOMER SERVICE CENTRES - SA**Bloemfontein**

1 Alpha Street, Cnr Kraal Street
Old Industrial, Bloemfontein
PO Box 1883, Bloemfontein 9300
Tel +27 (0)51 448 9226
Fax +27 (0)51 447 9078

Cape Town

Unit No 6A, Phumelela Park
Montague Drive, Montague Gardens
PO Box 36654, Chempet 7442
Tel +27 (0)21 555 2919
Fax +27 (0)21 555 2950/2

Durban

23 Gillitts Road
Pinetown
PO Box 131, Pinetown 3600
Tel +27 (0)31 702 2861
Fax +27 (0)31 702 2959

Exports

181A Barbara Road
Elandsfontein
PO Box 2566, Edenvale 1610
Tel +27 (0)11 396 8000
Fax +27 (0)11 396 8014

Gauteng

181A Barbara Road, Elandsfontein
PO Box 2566, Edenvale 1610
Tel. +27 (0)11 396 8000
Fax Internal Sales +27 (0)11 396 8011
Fax Sales & Admin +27 (0)11 396 8012
Fax Tenders +27 (0)11 396 8013

Middelburg

13 Wicht Street
Middelburg
PO Box 2433, Middelburg 1050
Tel +27 (0)13 246 2511
Fax +27 (0)13 246 2144

Nelspruit

11 Wilken Street, Rocky Drift
Nelspruit
PO Box 3856, White River 1240
Tel +27 (0)13 758 1049
Fax +27 (0)13 758 1037

Port Elizabeth

253 Grahamstown Road, Deal Party
Port Elizabeth
PO Box 3963, Northend 6056
Tel +27 (0)41 486 1536
Fax +27 (0)41 486 1010

Welkom

30 11th Street, Voorspoed East
Welkom
PO Box 2327, Welkom 9460
Tel +27 (0)57 355 3395/6
Fax +27 (0)57 355 3717

www.aberdare.co.za

Technical / Product Application queries email: helpdesk@aberdare.co.za call: +27 (0)11 396 8107



Electrical Accessories

**POSSIBLE SPECIFICATION CHANGES:**

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