

SWA Cable – BS6724 Steel Wire Armoured LSZH

Eland Product Group **A9L**



Application

SWA Cable – power and auxiliary control cables for use in power networks, underground, outdoor and indoor applications and for use in cable ducting. For installation where fire, smoke emission and toxic fumes create a potential threat to life and equipment.

Standards

BS6724, IEC 60754-1

Technical Data

Conductor

Class 2 plain stranded copper conductor to BS EN 60228:2005 (previously BS6360)

Insulation

XLPE (Cross-Linked Polyethylene)

Bedding

LSZH (Low Smoke Zero Halogen)

Armouring

Single Core: AWA (Aluminium Wire Armour)
Multi-Core: SWA (Steel Wire Armour)

Sheath

LSZH (Low Smoke Zero Halogen)

Sheath Colour

Black

Voltage Rating

600/1000V

Temperature Rating

0°C to +90°C

Minimum Bending Radius

1.5mm² - 16mm²: 6 x overall diameter
25mm² and above: 8 x overall diameter

Core Identification

1 Core: Brown
2 Cores: Brown, Blue
3 Cores: Brown, Black, Grey
4 Cores: Blue, Brown, Black, Grey
5 Cores: Green/Yellow, Blue, Brown, Black, Grey
Alternative core identification: White cores with Black numbers

Dimensions

BS6724 XLPE/LSZH/AWA/LSZH (Copper)

Eland Part Number	No. of Cores x Nominal Cross Sectional Area # x mm ²	Nominal Thickness of Insulation mm	Nominal Diameter mm		Nominal Weight kg/Km
			Under Armour	Overall	
AWA Cable - BS6724 Aluminium Wire Armoured LSZH - 1 Core					
A9AWA150LSZH	1 x 50	1.0	12.7	17.5	800
A9AWA170LSZH	1 x 70	1.1	14.7	20.2	960
A9AWA195LSZH	1 x 95	1.1	16.6	22.3	1240
A9AWA1120LSZH	1 x 120	1.2	18.5	24.2	1510
A9AWA1150LSZH	1 x 150	1.4	20.8	27.4	1900
A9AWA1185LSZH	1 x 185	1.6	23.2	30.0	2320
A9AWA1240LSZH	1 x 240	1.7	26.0	32.8	2930
A9AWA1300LSZH	1 x 300	1.8	28.6	35.6	3580
A9AWA1400LSZH	1 x 400	2.0	32.4	40.4	4600
A9AWA1500LSZH	1 x 500	2.2	36.0	44.2	5770
A9AWA1630LSZH	1 x 630	2.4	40.0	48.8	7250
A9AWA1800LSZH	1 x 800	2.6	45.6	55.4	9381
A9AWA11000LSZH	1 x 1000	2.8	50.6	60.6	11540

BS6724 XLPE/LSZH/SWA/LSZH (Copper)

Eland Part Number	No. of Cores x Nominal Cross Sectional Area # x mm ²	Nominal Thickness of Insulation mm	Nominal Diameter mm		Nominal Weight kg/Km
			Under Armour	Overall	

SWA Cable - BS6724 Steel Wire Armoured LSZH - 2 Cores

A9SWA2015LSZH	2 x 1.5	0.6	7.3	12.1	302
A9SWA2025LSZH	2 x 2.5	0.7	8.5	13.6	346
A9SWA2040LSZH	2 x 4.0	0.7	9.4	14.7	410
A9SWA2060LSZH	2 x 6.0	0.7	10.5	15.9	499
A9SWA210LSZH	2 x 10.0	0.7	12.3	18.0	648
A9SWA216LSZH	2 x 16.0	0.7	14.3	20.4	978
A9SWA225LSZH	2 x 25.0	0.9	14.7	20.4	1290
A9SWA235LSZH	2 x 35.0	0.9	16.8	23.3	1500
A9SWA250LSZH	2 x 50.0	1.0	19.0	25.8	1890
A9SWA270LSZH	2 x 70.0	1.1	22.0	29.0	2450
A9SWA295LSZH	2 x 95.0	1.1	25.1	33.1	3300
A9SWA2150LSZH	2 x 150.0	1.4	30.9	39.3	4750

SWA Cable - BS6724 Steel Wire Armoured LSZH - 3 Cores

A9SWA3015LSZH	3 x 1.5	0.6	7.8	12.6	330
A9SWA3025LSZH	3 x 2.5	0.7	9.2	14.1	390
A9SWA3040LSZH	3 x 4.0	0.7	10.0	15.3	464
A9SWA3060LSZH	3 x 6.0	0.7	11.2	16.6	568
A9SWA310LSZH	3 x 10.0	0.7	13.1	19.5	866
A9SWA316LSZH	3 x 16.0	0.7	15.3	21.6	1152
A9SWA325LSZH	3 x 25.0	0.9	18.9	25.5	1800
A9SWA335LSZH	3 x 35.0	0.9	21.3	28.0	2230
A9SWA350LSZH	3 x 50.0	1.0	21.7	28.5	2490
A9SWA370LSZH	3 x 70.0	1.1	25.2	32.2	3290
A9SWA395LSZH	3 x 95.0	1.1	28.8	37.0	4440

SWA Cable - BS6724 Steel Wire Armoured LSZH - 4 Cores

A9SWA4015LSZH	4 x 1.5	0.6	8.5	13.5	365
A9SWA4025LSZH	4 x 2.5	0.7	9.9	15.0	438
A9SWA4040LSZH	4 x 4.0	0.7	11.0	16.4	532
A9SWA4060LSZH	4 x 6.0	0.7	12.3	18.7	764
A9SWA410LSZH	4 x 10.0	0.7	14.5	21.1	1013
A9SWA416LSZH	4 x 16.0	0.7	17.0	22.9	1360
A9SWA425LSZH	4 x 25.0	0.9	21.0	27.6	2160
A9SWA435LSZH	4 x 35.0	0.9	23.6	30.4	2690
A9SWA450LSZH	4 x 50.0	1.0	25.0	32.0	3130
A9SWA470LSZH	4 x 70.0	1.1	29.5	37.7	4500
A9SWA495LSZH	4 x 95.0	1.1	33.3	41.7	5600
A9SWA4120LSZH	4 x 120.0	1.2	37.5	47.1	7400
A9SWA4150LSZH	4 x 150.0	1.4	41.6	51.4	8780

SWA Cable - BS6724 Steel Wire Armoured LSZH - 4 Cores

A9SWA4185LSZH	4 x 185.0	1.6	46.4	56.6	10630
A9SWA4240LSZH	4 x 240.0	1.7	52.6	63.0	13390

SWA Cable - BS6724 Steel Wire Armoured LSZH - 5 Cores

A9SWA5015LSZH	5 x 1.5	0.6	9.7	14.3	410
A9SWA5025LSZH	5 x 2.5	0.7	11.7	16.3	470
A9SWA5040LSZH	5 x 4.0	0.7	13.0	17.8	710
A9SWA5060LSZH	5 x 6.0	0.7	14.5	20.0	876
A9SWA510LSZH	5 x 10.0	0.7	17.2	22.9	1165
A9SWA516LSZH	5 x 16.0	0.7	20.0	26.6	1742

Eland Part Number	No. of Cores x Nominal Cross Sectional Area # x mm ²	Nominal Thickness of Insulation mm	Nominal Diameter mm		Nominal Weight kg/Km
			Under Armour	Overall	
A9SWA525LSZH	5 x 25.0	0.9	24.7	31.5	2323
A9SWA535LSZH	5 x 35.0	0.9	27.8	34.8	2932
A9SWA550LSZH	5 x 50.0	1.0	32.4	40.4	4192
SWA Cable - BS6724 Steel Wire Armoured LSZH - 7 Cores					
A9SWA7015LSZH	7 x 1.5	0.6	10.2	15.2	470
A9SWA7025LSZH	7 x 2.5	0.7	12.3	17.1	600
SWA Cable - BS6724 Steel Wire Armoured LSZH - 12 Cores					
A9SWA1215LSZH	12 x 1.5	0.6	13.7	19.4	780
A9SWA1225LSZH	12 x 2.5	0.7	16.3	22.4	1000
SWA Cable - BS6724 Steel Wire Armoured LSZH - 19 Cores					
A9SWA1915LSZH	19 x 1.5	0.6	16.2	22.2	1000
A9SWA1925LSZH	19 x 2.5	0.7	19.9	26.6	1540
SWA Cable - BS6724 Steel Wire Armoured LSZH - 27 Cores					
A9SWA2715LSZH	27 x 1.5	0.6	20.0	26.7	1500
A9SWA2725LSZH	27 x 2.5	0.7	24.0	30.7	1950
SWA Cable - BS6724 Steel Wire Armoured LSZH - 37 Cores					
A9SWA3715LSZH	37 x 1.5	0.6	22.3	29.0	1800
A9SWA3725LSZH	37 x 2.5	0.7	26.9	33.8	2350

Conductors

Class 2 stranded conductors for Single Core and Multi-Core cables

1	2	3	4	5	6	7	8
Nominal Cross Sectional Area mm ²	Minimum Number of Wires in the Conductor						Maximum Resistance of Conductor at 20°C Annealed Copper Conductor Plain Wires ohms/Km
	Circular		Circular Compacted		Shaped		
	Cu	Al	Cu	Al	Cu	Al	
1.50	7	-	6	-	-	-	12.1000
2.50	7	-	6	-	-	-	7.4100
4.00	7	-	6	-	-	-	4.6100
6.00	7	-	6	-	-	-	3.0800
10.00	7	7	6	6	-	-	1.8300
16.00	7	7	6	6	-	-	1.1500
25.00	7	7	6	6	6	6	0.7270
35.00	7	7	6	6	6	6	0.5240
50.00	19	19	6	6	6	6	0.3870
70.00	19	19	12	12	12	12	0.2680
95.00	19	19	15	15	15	15	0.1930
120.00	37	37	18	15	18	15	0.1530
150.00	37	37	18	15	18	15	0.1240
185.00	37	37	30	30	30	30	0.0991
240.00	37	37	34	30	34	30	0.0754
300.00	61	61	34	30	34	30	0.0601
400.00	61	61	53	53	53	53	0.0470

Table in accordance with BS EN 60228:2005 (previously BS6360)

Electrical Characteristics XLPE/LSZH/AWA/LSZH

Current Carrying Capacity (amperes)

Conductor Cross Sectional Area mm ²	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 AC or DC Flat Amps	3 or 4 Cables Three Phase AC Flat Amps	2 Cables Single Phase AC or DC Flat Amps	3 Cables Three Phase AC Flat Amps	3 Cables Three Phase AC Trefoil Amps	2 Cables DC Amps		2 Cables Single Phase AC Amps		3 or 4 Cables Three Phase AC Amps	
						Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
1	2	3	4	5	6	7	8	9	10	11	12
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

Ambient temperature: 30°C

Conductor operating temperature: 90°C

1. Where a conductor operates at a temperature exceeding 70°C it must be ascertained that the equipment connected to the conductor is suitable for the conductor operating temperature (see Regulation 512.1.2).

2. Where cables in this table are connected to equipment or accessories designed to operate at a temperature not exceeding 70°C, the current ratings given in the equivalent table for 70°C thermoplastic insulated cables (Table 4D3A) must be used (see Regulation 523.1).

The above table is in accordance with Table 4E3A of the 17th Edition of IEE Wiring Regulations.

Voltage Drop (per ampere per metre)

Conductor Cross Sectional Area mm ²	2 Cables DC	Reference Method C & F (clipped direct, on tray or in free air)														
		2 Cables Single Phase AC mV/A/m						3 or 4 Cables Three Phase AC mV/A/m								
		Touching			Spaced*			Trefoil and Touching			Flat and Touching			Flat and Spaced*		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		r	x	z	r	x	z	r	x	z	r	x	z	r	x	z
50	0.980	0.990	0.210	1.000	0.980	0.29	1.00	0.860	0.180	0.870	0.840	0.250	0.88	0.840	0.330	0.90
70	0.670	0.680	0.200	0.710	0.690	0.29	0.75	0.590	0.170	0.620	0.600	0.250	0.65	0.620	0.320	0.70
95	0.490	0.510	0.195	0.550	0.530	0.28	0.60	0.440	0.170	0.470	0.460	0.240	0.52	0.490	0.310	0.58
120	0.390	0.410	0.190	0.450	0.430	0.27	0.51	0.350	0.165	0.390	0.380	0.240	0.44	0.410	0.300	0.51
150	0.310	0.330	0.185	0.380	0.360	0.27	0.45	0.290	0.160	0.330	0.310	0.230	0.39	0.340	0.290	0.45
185	0.250	0.270	0.185	0.330	0.300	0.26	0.40	0.230	0.160	0.280	0.260	0.230	0.34	0.290	0.290	0.41
240	0.195	0.210	0.180	0.280	0.240	0.26	0.35	0.180	0.155	0.240	0.210	0.220	0.30	0.240	0.280	0.37
300	0.155	0.170	0.175	0.250	0.195	0.25	0.32	0.145	0.150	0.210	0.170	0.220	0.28	0.200	0.270	0.34
400	0.115	0.145	0.170	0.220	0.180	0.24	0.30	0.125	0.150	0.195	0.160	0.210	0.27	0.200	0.270	0.33
500	0.093	0.125	0.170	0.210	0.165	0.24	0.29	0.105	0.145	0.180	0.145	0.200	0.25	0.190	0.240	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	0.230	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

Conductor operating temperature: 90°C

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

The above table is in accordance with Table 4E3B of the 17th Edition of IEE Wiring Regulations.

For cables having conductors of 16mm² or less cross-sectional area their inductances can be ignored and (mV/A/m)_r values only are tabulated. For cables having conductors greater than 16mm², cross-sectional area the impedance values are given as (mV/A/m)_z, together with the resistive component (mV/A/m)_r and the reactive component (mV/A/m)_x.

The above paragraph is extracted from Appendix 4 of the 17th Edition of IEE Wiring Regulations

Electrical Characteristics XLPE/PVC/SWA/LSZH**Current Carrying Capacity (amperes)**

Conductor Cross Sectional Area mm ²	Reference Method C (clipped direct) Amps		Reference Method E (in free air or on a perforated cable tray, horizontal or vertical) Amps		Reference Method D (direct in ground or in ducting in ground, in or around buildings) Amps	
	1 Two Core Cable Single Phase AC or DC	1 Three or 1 Four Core Cable Three Phase AC	1 Two Core Cable Single Phase AC or DC	1 Three or 1 Four Core Cable Three Phase AC	1 Two Core Cable Single Phase AC or DC	1 Three or 1 Four Core Cable Three Phase AC
1	2	3	4	5	6	7
1.5	27	23	29	25	25	21
2.5	36	31	39	33	33	28
4.0	49	42	52	44	43	36
6.0	62	53	66	56	53	44
10.0	85	73	90	78	71	58
16.0	110	94	115	99	91	75
25.0	146	124	152	131	116	96
35.0	180	154	188	162	139	115
50.0	219	187	228	197	164	135
70.0	279	238	291	251	203	167
95.0	338	289	354	304	239	197
120.0	392	335	410	353	271	223
150.0	451	386	472	406	306	251
185.0	515	441	539	463	343	281
240.0	607	520	636	546	395	324
300.0	698	599	732	628	446	365
400.0	787	673	847	728	-	-

Air ambient temperature: 30°C

Ground ambient temperature: 20°C

Conductor operating temperature: 90°C

1. Where a conductor operates at a temperature exceeding 70°C it must be ascertained that the equipment connected to the conductor is suitable for the conductor operating temperature (see Regulation 512.1.2).

2. Where cables in this table are connected to equipment or accessories designed to operate at a temperature not exceeding 70°C, the current ratings given in the equivalent table for 70°C thermoplastic insulated cables (Table 4D4A) must be used (see Regulation 523.1).

The above table is in accordance with Table 4E4A of the 17th Edition of IEE Wiring Regulations.

Voltage Drop (per ampere per metre)

Conductor Cross Sectional Area mm ²	Two Core Cable DC	Two Core Cable Single Phase AC mV/A/m			Three or Four Core Cable Three Phase AC mV/A/m		
1	2	3			4		
1.5	31.000	31.0			27.0		
2.5	19.000	19.0			16.0		
4.0	12.000	12.0			10.0		
6.0	7.900	7.9			6.8		
10.0	4.700	4.7			4.0		
16.0	2.900	2.9			2.5		
		r	x	z	r	x	z
25.0	1.850	1.85	0.160	1.900	1.600	0.140	1.650
35.0	1.350	1.35	0.155	1.350	1.150	0.135	1.150
50.0	0.980	0.99	0.155	1.000	0.860	0.135	0.870
70.0	0.670	0.67	0.150	0.069	0.590	0.130	0.600
95.0	0.490	0.50	0.150	0.052	0.430	0.130	0.450
120.0	0.390	0.40	0.145	0.420	0.340	0.130	0.370
150.0	0.310	0.32	0.145	0.350	0.280	0.125	0.300
185.0	0.250	0.26	0.145	0.290	0.220	0.125	0.260
240.0	0.195	0.20	0.140	0.240	0.175	0.125	0.210
300.0	0.155	0.16	0.140	0.210	0.140	0.120	0.185
400.0	0.120	0.13	0.140	0.190	0.115	0.120	0.165

Conductor operating temperature: 90°C

The above table is in accordance with Table 4E4B of the 17th Edition of IEE Wiring Regulations.

For cables having conductors of 16mm² or less cross-sectional area their inductances can be ignored and (mV/A/m)_r values only are tabulated. For cables having conductors greater than 16mm², cross-sectional area the impedance values are given as (mV/A/m)_z, together with the resistive component (mV/A/m)_r and the reactive component (mV/A/m)_x.

The above paragraph is extracted from Appendix 4 of the 17th Edition of IEE Wiring Regulations