

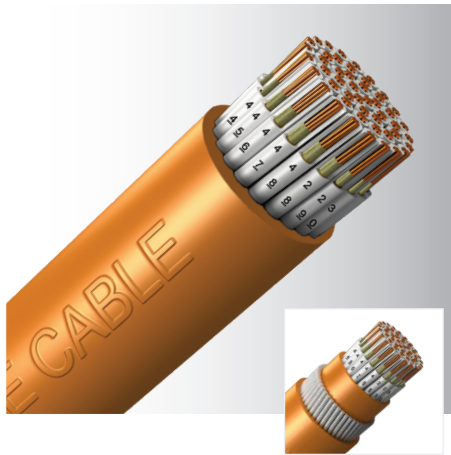
LSZH Fire Resistant Cables

0.6/1kV Multi-Core

Mica Tape, XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed Cable

Description: CU/MT/XLPE/LSZH-AT-UV or CU/MT/XLPE/LSZH/SWA/LSZH-AT-UV

Model Code: MXL-AT-UV or MXLSL-AT-UV



Application : This cable is designed for areas where the integrity of the electrical circuit is critical in maintaining power supply. Applications include emergency lightings, control and power circuits, power stations, fire alarm systems, sewage treatment plants, and high-rise buildings.

Voltage rating : 0.6/1kV

Construction : Plain annealed copper (IEC 60228 Class 2), mica tape barrier, XLPE compound insulated, unarmoured or galvanized steel wires armoured, anti-termite and UV resistant LSZH compound sheathed cable

Insulation colour : White (With black numbering)

Sheath colour : Orange

Specification : IEC 60502-1, SS 299, BS 6387, IEC 60331, IEC 60332-1-2, IEC 60332-3, IEC 60754, IEC 61034-2

Operating temperature : 90°C

Conductor			Insulation	Unarmoured Cable			Armoured Cable		
No. of Core	Nominal Area	No./Diam. of Strand	Thickness	Part No.	Approx. Overall Diam.	Approx. Weight	Part No.	Approx. Overall Diam.	Approx. Weight
	(mm ²)	(mm)	(mm)		(mm)	(kg/km)		(mm)	(kg/km)
5	1.5	7/0.53	0.7	07054010	15.3	285	07054161	19.3	585
7				07074010	16.7	345	07074161	20.6	685
10				07104010	20.5	457	07104161	25.7	1075
12				07124010	21.2	512	07124161	26.5	1133
19				07194010	24.7	715	07194161	29.7	1593
27				07274010	29.3	1000	07274161	35.0	2060
37				07374010	32.6	1305	07374161	38.3	2450
48				07484010	37.3	1640	07484161	43.3	2980
5	2.5	7/0.67	0.7	08054010	16.3	335	08054161	20.8	680
7				08074010	17.8	425	08074161	23.0	924
10				08104010	22.3	580	08104161	27.6	1378
12				08124010	23.0	650	08124161	28.2	1472
19				08194010	26.8	935	08194161	32.8	1890
27				08274010	31.8	1310	08274161	37.8	2460
37				08374010	35.5	1705	08374161	41.6	3000
48				08484010	40.9	2180	08484161	48.5	4090
5	4	7/0.85	0.7	09054010	18.0	450	09054161	23.3	990
7				09074010	19.6	570	09074161	24.8	1145
10				09104010	24.6	785	09104161	30.4	1665
12				09124010	25.4	900	09124161	31.2	1810
19				09194010	29.5	1305	09194161	35.5	2375
27				09274010	35.2	1790	09274161	41.4	3070
37				09374010	39.6	2370	09374161	47.3	4210
48				09484010	45.8	3060	09484161	53.1	5125

Current rating and voltage drop

For Unarmoured Cable, please refer to Table 14 & 15 (Page 60)

For Armoured Cable, please refer to Table 16 & 17 (Page 61)

For Rating Factors, please refer to Table 28 (Page 67)

Current Rating and Voltage Drop

XLPE (or LSZH) Insulated Cables
Multi-Core, Unarmoured



tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

Multi-Core Cables with XLPE (or LSZH) Insulation, PVC (or LSZH) Outersheath 300/500V or 0.6/1kV

Table 14 : Current-Carrying Capacities (Amp)
[CU/XLPE/PVC, CU/XLPE/LSZH or CU/MT/XLPE/LSZH Cables]

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

IEC 60502-1

Conductor Cross-sectional Area	Reference Method 4 (enclosed in an conduit insulated wall etc)	Reference Method 3 (enclosed in conduit on a wall or ceiling, or in trunking)		Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated cable tray), or Reference Method 13 (in free air)	
	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.
1	2	3	4	5	6	7	8
mm ²	A	A	A	A	A	A	A
1.5	16.5	22	19.5	24	22	26	23
2.5	22	30	26	33	30	36	32
4	30	40	35	45	40	49	42
6	38	51	44	58	52	63	54
10	51	69	60	80	71	86	75
16	68	91	80	107	96	115	100
25	89	119	105	138	119	149	127
35	109	146	128	171	147	185	158
50	130	175	154	209	179	225	192
70	164	221	194	269	229	289	246
95	197	265	233	328	278	352	298
120	227	305	268	382	322	410	346
150	259	334	300	441	371	473	399
185	295	384	340	506	424	542	456
240	346	459	398	599	500	641	538
300	396	532	455	693	576	741	621
400	472	625	536	803	667	865	741

Note : For rating factors of ambient temperature other than 30°C, please refer to Table 25 (Page 66)

Table 15 : Voltage Drop (Per Amp Per Meter)
[CU/XLPE/PVC, CU/XLPE/LSZH or CU/MT/XLPE/LSZH Cables]

Conductor Operating Temperature : 90°C

IEC 60502-1

Conductor Cross-sectional Area	2-core cable, d.c.	2-core cable, 1-phase a.c.			3-core or 4-core cables, 3-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	0.140	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

Note : r = resistive component; x = reactive component; z = impedance value

Current Rating and Voltage Drop

XLPE (or LSZH) Insulated Cables
Multi-Core, Armoured



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Multi-Core Cables with XLPE (or LSZH) Insulation, Armoured, PVC or LSZH Outersheath 0.6/1kV

Table 16 : Current-Carrying Capacities (Amp)

[CU/XLPE/PVC/SWA/PVC, CU/XLPE/LSZH/SWA/LSZH, CU/MT/XLPE/LSZH/SWA/LSZH Cables]

Conductor Operating Temperature : 90°C

Ambient Temperature : 30°C

Ground Temperature : 15°C

Depth of Laying : 0.5m

Soil Thermal Resistivity : 1.2 k•m/W

BS 6724

IEC 60502-1

Conductor Cross-sectional Area	Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated horizontal cable tray) or Reference Method 13 (in free air)		In single-way ducts		Laid direct in ground	
	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.
1	2	3	4	5	6	7	8	9
mm ²	A	A	A	A	A	A	A	A
1.5	27	23	29	25	-	23	-	28
2.5	36	31	39	33	-	30	-	36
4	49	42	52	44	-	40	-	48
6	62	53	66	56	-	50	-	60
10	85	73	90	78	-	65	-	80
16	110	94	115	99	115	94	140	115
25	146	124	152	131	145	125	180	150
35	180	154	188	162	175	150	215	180
50	219	187	228	197	210	175	255	215
70	279	238	291	251	260	215	315	265
95	338	289	354	304	310	260	380	315
120	392	335	410	353	355	300	430	360
150	451	386	472	406	400	335	480	405
185	515	441	539	463	455	380	540	460
240	607	520	636	546	520	440	630	530
300	698	599	732	628	590	495	700	590
400	787	673	847	728	660	560	790	670

Note : For rating factors of ambient temperature other than 30°C, please refer to Table 25 (Page 66)
For rating factors of ground temperature other than 15°C, please refer to Table 26 (Page 66)

Table 17 : Voltage Drop (Per Amp Per Meter)

[CU/XLPE/PVC/SWA/PVC, CU/XLPE/LSZH/SWA/LSZH, CU/MT/XLPE/LSZH/SWA/LSZH Cables]

Conductor Operating Temperature : 90°C

BS 6724

IEC 60502-1

Conductor Cross-sectional Area	2-core cable, d.c.	2-core cables, 1-phase a.c.			3-core or 4-core cables, 3-phase a.c.			2-core cables, 1-phase a.c.	3-core or 4-core cables, 3-phase a.c.
								In ducts or in ground	In ducts or in ground
1	2	3			4			5	6
mm ²	mV/A/m	mV/A/m			mV/A/m			mV/A/m	mV/A/m
1.5	31.0	31.0			27.0			31.0	25.0
2.5	19.0	19.0			16.0			19.0	15.0
4	12.0	12.0			10.0			12.0	9.7
6	7.9	7.9			6.8			7.9	6.5
10	4.7	4.7			4.0			4.7	3.9
16	2.9	2.9			2.5			2.9	2.6
		r	x	z	r	x	z		
25	1.850	1.850	0.160	1.900	1.600	0.140	1.650	1.900	1.600
35	1.350	1.350	0.155	1.350	1.150	0.135	1.150	1.350	1.200
50	0.980	0.990	0.155	1.000	0.860	0.135	0.870	1.000	0.870
70	0.670	0.670	0.150	0.690	0.590	0.130	0.600	0.690	0.610
95	0.490	0.500	0.150	0.520	0.430	0.130	0.450	0.520	0.450
120	0.390	0.400	0.145	0.420	0.340	0.130	0.370	0.420	0.360
150	0.310	0.320	0.145	0.350	0.280	0.125	0.300	0.350	0.300
185	0.250	0.260	0.145	0.290	0.220	0.125	0.260	0.290	0.250
240	0.195	0.200	0.140	0.240	0.175	0.125	0.210	0.240	0.210
300	0.155	0.160	0.140	0.210	0.140	0.120	0.185	0.210	0.190
400	0.120	0.130	0.140	0.190	0.115	0.120	0.165	0.190	0.180

Note : r = resistive component; x = reactive component; z = impedance value

Table 25 : Correction Factor for Ambient Air Temperature Other Than 30°C to be Applied to the Current-Carrying Capacities for Cables in Free Air

Ambient Temperature (°C)	Insulation				
	PVC (70°C)	XLPE (90°C)	HT-PVC (90°C)	Rubber (85°C)	Rubber (60°C)
10	1.22	1.15	-	-	-
15	1.17	1.12	-	-	-
20	1.12	1.08	-	-	-
25	1.06	1.04	1.03	1.02	-
30	1.00	1.00	1.00	1.00	1.00
35	0.94	0.96	0.97	0.95	0.91
40	0.87	0.91	0.94	0.90	0.82
45	0.79	0.87	0.91	0.85	0.71
50	0.71	0.82	0.87	0.80	0.58
55	0.61	0.76	0.84	0.74	0.41
60	0.50	0.71	0.80	0.67	-
65	0.35	0.65	0.76	0.60	-
70	-	0.58	0.71	0.52	-
75	-	0.50	0.61	0.43	-
80	-	0.41	0.50	0.30	-
85	-	0.29	0.35	-	-

Table 26 : Correction Factor for Ambient Ground Temperature Other Than 15°C to be Applied to the Current-Carrying Capacities for Cables in Ducts or in Ground

Ground Temperature (°C)	Insulation	
	PVC (70°C)	XLPE (90°C)
10	1.04	1.03
15	1.00	1.00
20	0.95	0.97
25	0.90	0.93
30	0.85	0.89
35	0.80	0.86
40	0.74	0.82
45	0.67	0.77
50	0.60	0.73
55	-	0.68
60	-	0.63
65	-	0.58

Table 27 : Correction Factors for Ambient Temperature & Group Installation

Correction for groups of more than one circuit of single-core cables, or more than one multi-core cable

Reference Methods of Installation		Correction Factor (Cg)													
		Number of Circuits or Multi-Core Cables													
		2	3	4	5	6	7	8	9	10	12	14	16	18	20
Enclosed (Method 3 or 4) or bunched and clipped to a non-metallic surface (Method 1)		0.80	0.70	0.65	0.60	0.57	0.54	0.52	0.50	0.48	0.45	0.43	0.41	0.39	0.38
Single layer clipped to a non-metallic surface (Method 1)	Touching	0.85	0.79	0.75	0.73	0.72	0.72	0.71	0.70	-	-	-	-	-	-
	Spaced*	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Single layer multi-core on a perforated metal cable tray (Method 11)	Touching	0.86	0.81	0.77	0.75	0.74	0.73	0.73	0.72	0.71	0.70	-	-	-	-
	Spaced*	0.91	0.89	0.88	0.87	0.87	-	-	-	-	-	-	-	-	-
Single layer single-core on a perforated metal cable tray, touching (Method 11)	Horizontal	0.90	0.85	-	-	-	-	-	-	-	-	-	-	-	-
	Vertical	0.85	-	-	-	-	-	-	-	-	-	-	-	-	-
Single layer multi-core touching on ladder supports		0.86	0.82	0.80	0.79	0.78	0.78	0.78	0.77	-	-	-	-	-	-

* Space means a clearance between adjacent surfaces of at least one cable Diam. (D_e). Where the horizontal clearance between adjacent cables exceeds 2 D_e, no correction factor need be applied

Note : 1 The factors in the table are applicable to a group of cables all of the same sizes. The value of the current derived from application of the appropriate factors is the maximum continuous 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.

For example, a group of N loaded cables would normally require a group reduction factor of C_g applied to the tabulated I_t. However, if M cables in the group carry loads which are not greater than 0.3C_g I_t amperes, the other cables can be sized by using the group rating factor corresponding to (N-M) cables.

Table 28 : Correction Factor for Cables with More Than 4 Loaded Cores

No. of Loaded Cores	5	6	7	10	12	14	19
Correction Factor	0.72	0.67	0.63	0.56	0.53	0.51	0.45
No. of Loaded Cores	24	27	30	37	44	46	48
Correction Factor	0.42	0.40	0.39	0.36	0.34	0.33	0.33

- Note:
- 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 installation type, by the factor selected from this table. The current-carrying for the 2-core cable is that for the installation condition to be used for the multi-core cable.
 - If due to known operating conditions, a core is expected to carry not more than 30% of its current-carrying capacity in the multi-core cable, it may be ignored for the purpose of obtaining the correction factor for the number of loaded cores.
 - If due to known operating conditions, a core is expected to carry not more than 30% of its rating, after applying the correction factor for the total number of current-carrying cores, it may be ignored for the purpose of obtaining the correction 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 $I_{21c} = I_{12c} \times C_{gN}$ where:

I_{21c} is the current-carrying capacity for the multi-core cable after applying the correction factor for the total number of current-carrying cores.

I_{12c} 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 correction factor from Table 28 for the total number of current-carrying cores.

However, if M cores in the cable carry loads which are not greater than $0.3 \times I_{12c} \times C_{gN}$, the current-carrying capacity can be obtained by using the correction factor corresponding to (N-M) cores.

The 'not greater than $0.3 \times I_{12c} \times C_{gN}$ ' calculation should be applied before the adjacent multi-core cable grouping factor, if applicable, from Table 27 from BS 7671. The 30% rule should not be further applied to any adjacent cable grouping factor calculations.

I_{21c} should be greater than or equal to I_n or I_b as appropriate, divided by the relevant correction factor(s) C, that is $I_{21c} \geq I_n$ or I_b / C