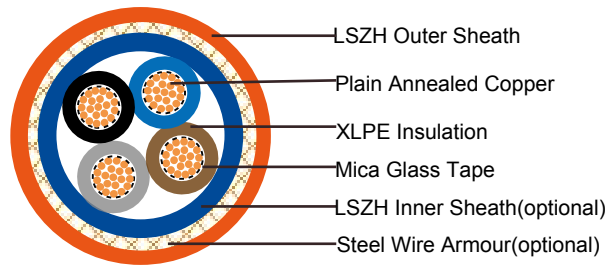
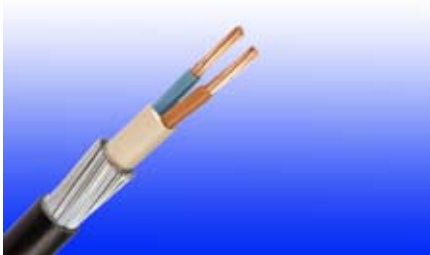


## 600/1000V Mica+XLPE Insulated, LSZH Sheathed Power Cables (2-4 Cores)

FFX400 1mRZ1-R (CU/MGT+XLPE/LSZH 600/1000V Class 2)

FFX400 1mRMZ1-R (CU/MGT+XLPE/LSZH/SWA/LSZH 600/1000V Class 2)



### APPLICATION

This cable is designed for areas where the integrity of the electrical properties circuit is critical in maintaining power supply. Applications can be found in emergency lightings, control and power circuits, power stations, fire alarm systems, underground tunnels, communications systems, sewage treatment plants, lifts, escalators, and high-rise buildings.

### STANDARDS

Basic design to IEC 60502-1/BS 7846

### FIRE PERFORMANCE

Circuit Integrity	IEC 60331-21; BS 6387 CWZ; DIN VDE 0472-814(FE180); CEI 20-36/2-1; SS229-1; NBN C 30-004 (cat. F3); NF C32-070-2.3(CR1); BS 7846-(F2)
System circuit integrity	DIN 4102-12, E30 depending on lay system
Flame Retardance (Single Vertical Wire Test)	EN 60332-1-2; IEC 60332-1-2; BS EN 60332-1-2; VDE 0482-332-1 ; NBN C 30-004 (cat. F1); NF C32-070-2.1(C2); CEI 20-35/1-2; EN 50265-2-1*; DIN VDE 0482-265-2-1*
Reduced Fire Propagation (Vertically-mounted bundled wires & cable test)	EN 60332-3-24 (cat. C); IEC 60332-3-24; BS EN 60332-3-24; VDE 0482-332-3; NBN C 30-004 (cat. F2); NF C32-070-2.2(C1); CEI 20-22/3-4; EN 50266-2-4*; DIN VDE 0482-266-2-4
Halogen Free	IEC 60754-1; EN 50267-2-1; DIN VDE 0482-267-2-1; CEI 20-37/2-1 ; BS 6425-1*
No Corrosive Gas Emission	IEC 60754-2; EN 50267-2-2; DIN VDE 0482-267-2-2; CEI 20-37/2-2 ; BS 6425-2*
Minimum Smoke Emission	IEC 61034-1&2; EN 61034 -1&2; DIN VDE 0482-1034-1&2; CEI 20-37/3-1&2; EN 50268-1&2*; BS 7622-1&2*
No Toxic gases	NES 02-713; NF C 20-454

Note: Asterisk \* denotes superseded standard.



### VOLTAGE RATING

600/1000V

### CABLE CONSTRUCTION

**Conductor:** Plain annealed copper wire, stranded according to IEC(EN) 60228 class 2.

**Insulation:** Mica glass tape covered by extruded cross-linked XLPE compound

**Cabling:** The cores are cabled together in concentric layers with suitable non-hygroscopic fillers.

**Inner Sheath(optional):** Thermoplastic LSZH compound type LTS3 as per BS 7655-6.1

**Armouring(optional):** Galvanized steel wire armour

**Outer Sheath:** Thermoplastic LSZH compound type LTS3 as per BS 7655-6.1 (Thermosetting LSZH compound type SW2-SW4 as per BS 7655-2.6 can be offered.)

### COLOUR CODE

#### Insulation Colour

2 - Core: (Brown & Blue)

3 - Core: (Brown, Black & Grey)

4 - Core: (Brown, Black, Grey & Blue)

#### Sheath Colour

Orange (other colors upon request)

### PHYSICAL AND THERMAL PROPERTIES

**Temperature range during operation (fixed state):** -30°C – +90°C

**Temperature range during installation (mobile state):** -20°C – +50°C

**Minimum bending radius:** 8 x Overall Diameter (unarmoured cable)

10 x Overall Diameter (armoured cable)

### ELECTRICAL PROPERTIES

Dielectric test:	3500 V r.m.s. x 5' (core/core)
Insulation resistance	1000 MΩ x km (at 20°C)
Short circuit temperature	250°C

### CONSTRUCTION PARAMETERS

Conductor			FFX400 1mRZ1-R			FFX400 1mRMZ1-R	
			Unarmoured Cable			Armoured Cable	
Nominal Area	No./Nominal Diameter of Strands	Dia. of Conductor	Nominal Insulation Thickness	Nominal Overall Diameter	Approx. Weight	Nominal Overall Diameter	Approx. Weight
mm <sup>2</sup>	No./mm	mm	mm	mm	kg/km	mm	kg/km
<b>2-CORE</b>							
1.5	7/0.53	1.59	0.7	12.2	150	15.3	390
2.5	7/0.67	2.01	0.7	12.6	180	16.5	450
4	7/0.85	2.55	0.7	14.7	250	17.6	525

6	7/1.04	3.12	0.7	16.2	290	18.8	620
10	7/1.35	4.05	0.7	17.1	450	21	800
16	7/1.70	5.1	0.7	19.2	550	23	1100
25	7/2.14	6.42	0.9	20	680	27	1480
35	19/1.53	7.65	0.9	22	940	30	2000
50	19/1.78	8.9	1	24	1250	33	2450
70	19/2.14	10.7	1.1	27	1700	37	3200
95	19/2.52	12.6	1.1	31	2300	42	4350
120	37/2.03	14.21	1.2	36	3150	48	6500
<b>3-CORE</b>							
1.5	7/0.53	1.59	0.7	12.3	170	16.5	420
2.5	7/0.67	2.01	0.7	13.8	200	17	500
4	7/0.85	2.55	0.7	15.2	300	18.5	600
6	7/1.04	3.12	0.7	16.8	380	19.8	785
10	7/1.35	4.05	0.7	18	550	22.6	1030
16	1/1.70	5.1	0.7	21	760	25	1370
25	7/2.14	6.42	0.9	22	960	29	1900
35	19/1.53	7.65	0.9	24	1300	32	2300
50	19/1.78	8.9	1	28	1700	35	2900
70	19/2.14	10.7	1.1	31	2400	40	4000
95	19/2.52	12.6	1.1	36	3250	45	5400
120	37/2.03	14.21	1.2	38	4000	49	6450
150	37/2.25	15.75	1.4	42	5000	55	8200
185	37/2.52	17.64	1.6	47	6100	60	9800
240	61/2.25	20.25	1.7	52	8000	68	12300
300	61/2.52	22.68	1.8	59	9850	74	14800
400	61/2.85	25.65	2	63	13000	83	17600
<b>4-CORE</b>							
1.5	7/0.53	1.59	0.7	14.3	210	16	475
2.5	7/0.67	2.01	0.7	15.2	270	17.8	570
4	7/0.85	2.55	0.7	17.2	380	19.8	690
6	7/1.04	3.12	0.7	19	440	21	940
10	7/1.35	4.05	0.7	20.6	670	23.3	1200
16	1/1.70	5.1	0.7	23.6	820	26.5	1400
25	7/2.14	6.42	0.9	26	1320	30.5	2400
35	19/1.53	7.65	0.9	29	1730	34	2800
50	19/1.78	8.9	1	32	2300	38	3500



70	19/2.14	10.7	1.1	38	3180	44	5300
95	19/2.52	12.6	1.1	41.9	4370	48.5	6700
120	37/2.03	14.21	1.2	44	5400	54	8500
150	37/2.25	15.75	1.4	50.8	6500	59	10000
185	37/2.52	17.64	1.6	55	8200	64.5	12200
240	61/2.25	20.25	1.7	60.5	10600	74	15400
300	61/2.52	22.68	1.8	68.5	13200	82	19500
400	61/2.85	25.65	2	76	17000	92	25500

### ELECTRICAL PROPERTIES

**Conductor Operating Temperature : 90°C**

**Ambient Temperature : 30°C**

**FFX400 1mRZ1-R**

**Current-Carrying Capacities (Amp)**

Nominal Cross Section 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 (free air)	
	one 3-core cable or one 4-core cable 3-phase a.c.	one 2-core cable single phase a.c. or d.c.	one 3-core cable or one 4-core cable 3-phase a.c.	one 2-core cable single phase a.c. or d.c.	one 3-core cable or one 4-core cable 3-phase a.c.	one 2-core	one 3-core
		cable or one phase a.c. or d.c.	cable or one phase a.c. or d.c.	cable or one phase a.c. or d.c.		cable singlephase	cable or one
						a.c. or d.c.	4-core cable 3-phase a.c.
1	2	3	4	5	6	7	8
mm <sup>2</sup>	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	-	625	536	803	667	865	741

**Voltage Drop (Per Amp Per Meter)**

Nominal Cross Section Area	2-core cable d.c.	2-core cable single-phase a.c			3-core or 4-core cable 3-phase a.c.		
1	2	3			4		
mm <sup>2</sup>	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		
16	2.9	2.9			2.5		
		r	x	z	r	x	z
25	1.85	1.85	0.16	1.9	1.6	0.14	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	0.86	0.135	0.87
70	0.67	0.67	0.15	0.69	0.59	0.13	0.6
95	0.49	0.5	0.15	0.52	0.43	0.13	0.45
120	0.39	0.4	0.145	0.42	0.34	0.13	0.37
150	0.31	0.32	0.145	0.35	0.28	0.125	0.3
185	0.25	0.26	0.145	0.29	0.22	0.125	0.26
240	0.195	0.2	0.14	0.24	0.175	0.125	0.21
300	0.155	0.16	0.14	0.21	0.14	0.12	0.185
400	0.12	0.13	0.14	0.19	0.115	0.12	0.165

**FFX400 1mRMZ1-R  
Current-Carrying Capacities (Amp)**



Nominal Cross Section Area	Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated horizontal cable tray or Reference Method 13 [free air] )		In single-way ducts		Laid direct in ground	
	one 2-core cable single phase a.c. or d.c.	one 3-core or 4-core cable 3-phase a.c.	one 2-core cable single phase a.c. or d.c.	one 3-core or 4-core cable 3-phase a.c.	one 2-core cable single phase a.c. or d.c.	one 3-core or 4-core cable 3-phase a.c.	one 2-core cable single 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 <sup>2</sup>	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

### Voltage Drop (Per Amp Per Meter)

Nominal Cross Section Area	2-core cable d.c.	2 cables, single-phase a.c.	3 or 4 cables, 3-phase a.c.	2 cables, single-phase a.c. In ducts or in ground	3 or 4 cables, 3-phase a.c. In ducts or in ground
	2	3	4	5	6
1	2	3	4	5	6
mm <sup>2</sup>	mV/A/m	mV/A/m	mV/A/m	mV/A/m	mV/A/m
1.5	31	31	27	31	25
2.5	19	19	16	19	15
4	12	12	10	12	9.7

6	7.9	7.9			6.8			7.9	6.5
10	4.7	4.7			4			4.7	3.9
16	2.9	2.9			2.5			2.9	2.6
		r	x	z	r	x	z		
25	1.85	1.35	0.16	1.9	1.6	0.14	1.65	1.9	1.6
35	1.35	1.35	0.155	1.35	1.15	0.135	1.15	1.35	1.2
50	0.98	0.99	0.155	1	0.86	0.135	0.87	1	0.87
70	0.67	0.67	0.15	0.69	0.59	0.13	0.6	0.69	0.61
95	0.49	0.5	0.15	0.52	0.43	0.13	0.45	0.52	0.45
120	0.39	0.4	0.145	0.42	0.34	0.13	0.37	0.42	0.36
150	0.31	0.32	0.145	0.35	0.28	0.125	0.3	0.35	0.3
185	0.25	0.26	0.145	0.29	0.22	0.125	0.26	0.29	0.25
240	0.195	0.2	0.14	0.24	0.175	0.125	0.21	0.24	0.21
300	0.155	0.16	0.14	0.21	0.14	0.12	0.185	0.21	0.19
400	0.12	0.13	0.14	0.19	0.115	0.12	0.165	0.19	0.18

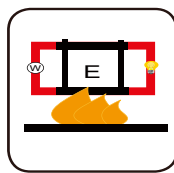
Note : r = conductor resistance at operating temperature  
 x = reactance  
 z = impedance



Rated Voltage



Standard



Circuit Integrity  
 IEC 60331/BS 6387  
 NF C32-070-2.3(CR1)



Reduced Fire Propagation  
 NF C32-070-2.2(C1)  
 IEC60332-3-24/EN50266-2-4



Flame Retardancy  
 NF C32-070-2.1(C2)  
 IEC60332-1-2/EN50265-2-1



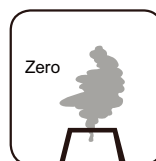
Low Toxicity  
 NES 02-713/NF C 20-454



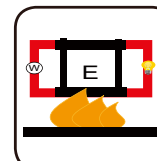
Low Corrosivity  
 IEC60754-2  
 EN50267-2-2/3  
 NF C 32-074



Low Smoke Emission  
 IEC 61034-1&2  
 EN 50268-1&2/NF C32-073



Halogen Free  
 IEC60754-1  
 EN50267-2-1



Functional Integrity  
 DIN 4102-12