

FIRE RESISTANT CABLE

In all fire disasters, fire smoke, heat and toxic fumes are the main obstacles to safe evacuation of a building or area. A major contribution towards overcoming these hazards is the use of fire resistant and non-halogenated cables. These cables provided the following features :

- Fire resistance
- Long-term circuit integrity in a fire
- Low smoke and toxic gas emissions
- Flame retardant properties
- Zero halogen gases
- Ease and low cost of installation

Fire Resistant cables are used, where required by local fire codes, in the wiring of :

- Fire resistant safety circuits
- Public address and emergency voice communication systems in high-rise buildings
- Control and instrumentation services in industrial, commercial and residential complexes
- High-temperature installation conditions

CONSTRUCTION OF CABLES

UCMB's Fire Resistant cables have been developed to maintain circuit integrity in a fire and to ensure maximum safe evacuation of personnel with no detrimental effects like toxic gases or smoke.

The Fire Resistant cables are constructed in the following typical format :

- Stranded Annealed Copper Conductor
- Glass Mica Tape Fire Resisting Barrier
- XLPE/EPR/SiR/EVA/PE/PVC Primary Insulation
- Low Smoke Halogen Free (LSOH) or Flame Retardant PVC Sheathing

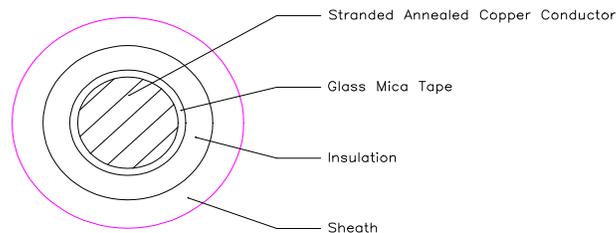


Fig Single-Core Cable

Fire Resistant cables may be single-core or multi-core constructions. The insulation material can be elastomeric materials (XLPE, EPR, SiR, or LSOH) instead of thermoplastic (EVA, PE or PVC) to meet stringent environment requirement. The cables may be armoured or braided, with or without metallic screened depending on our customer's specific application. UCMB provides PE, PVC or Low Smoke Halogen Free (LSOH) materials as outer sheath for marine and offshore application.

INTERNATIONAL STANDARD COMPLIANCE

The Fire Resistant cables manufactured by UCMB complied with either one or combination of the specification as below :

- IEC 60331, BS 6387, SS 299 Fire Resistance Test
- IEC 60332, BS 4066, IEEE 383 Flame Retardant test
- IEC 61034, BS 7622, EN 50268 Smoke Emission Test
- IEC 60754, BS 6425 Halogen Content Test
- ASTM D 2863 Oxygen Index Test

The Fire Resistant cables are categorized by a letter symbol (e.g. A) or series of symbols (e.g. CWZ) according to the requirements for fire resistance characteristics which they meet, the test temperature selected and the duration of the test for resistance to fire alone in according to BS 6387 as below :

Requirement	Symbol
(1) Resistance to fire alone	
650°C for 3 hours	A
750°C for 3 hours	B
950°C for 3 hours	C
950°C for 20 minutes (short duration)	S
(2) Resistance to fire with water	W
(3) Resistance to fire mechanical shock	
650°C	X
750°C	Y
950°C	Z

The following certifications / type test approvals obtained by UCMB :

Sirim QAS Sdn Bhd

- Quality System Registration Certificate
MS ISO 9001 Quality Management Systems
- Product Certification License
- Type Test Approval
Fire Resistant cables to IEC 60331, IEC 60332-3, ASTM D 2863

Jabatan Bomba Dan Penyelamat Malaysia

- Fire Resistant cables to IEC 60331, IEC 60332, BS 6387

Singapore Institute Of Standards & Industrial Research

- Fire Resistant cables to SS 299, IEC 60331, IEC 60332, BS 6387

**LOW SMOKE HALOGEN FREE (OR FLAME RETARDANT PVC) SHEATHED CABLE
(SINGLE CORE)**

Conductor			Nominal thickness of insulation	Nominal thickness of sheath	Approx. overall diameter of cable	Approx. weight of cable	Maximum conductor resistance at 20°C
Cross sectional area	Stranding number / diameter	Nominal diameter					
mm ²	No/mm	mm	mm	mm	mm	Kg / Km	Ohm / Km
1	7 / 0.44	1.32	0.7	0.8	5.1	35	18.1
1.5	7 / 0.53	1.59	0.7	0.8	5.4	42	12.1
2.5	7 / 0.67	2.01	0.7	0.8	5.8	53	7.41
4	7 / 0.85	2.55	0.7	0.9	6.6	74	4.61
6	7 / 1.04	3.12	0.7	0.9	7.1	96	3.08
10	7 / 1.35	4.05	0.7	0.9	8.1	141	1.83
16	7 / 1.70	5.10	0.7	0.9	9.1	203	1.15
25	7 / 2.14	6.42	0.9	1.0	11.0	310	0.727
35	19 / 1.53	7.65	0.9	1.1	12.5	416	0.524
50	19 / 1.78	8.90	1.0	1.4	14.5	564	0.387
70	19 / 2.14	10.70	1.1	1.4	16.5	781	0.268
95	19 / 2.52	12.60	1.1	1.5	18.6	1050	0.193
120	37 / 2.03	14.21	1.2	1.5	20.4	1300	0.153
150	37 / 2.25	15.75	1.4	1.6	22.7	1600	0.124
185	37 / 2.52	17.64	1.6	1.6	25.0	1980	0.0991
240	61 / 2.25	20.25	1.7	1.7	28.1	2590	0.0754
300	61 / 2.52	22.68	1.8	1.8	30.9	3220	0.0601
400	61 / 2.85	25.65	2.0	1.9	34.6	4090	0.0470
500	61 / 3.20	28.80	2.2	2.0	38.3	5110	0.0366
630	91 / 2.98	32.78	2.4	2.2	43.1	6570	0.0283

**LOW SMOKE HALOGEN FREE (OR FLAME RETARDANT PVC) SHEATHED CABLE
(MULTI CORES)**

Conductor				Nominal thickness of insulation	Nominal thickness of sheath	Approx. overall diameter of cable	Approx. weight of cable	Maximum conductor resistance at 20°C
Cross sectional area	Number of cores	Stranding number / diameter	Nominal diameter					
mm ²		No/mm	mm	mm	mm	mm	Kg / Km	Ohm / Km
1	2	7 / 0.44	1.32	0.7	1.6	10.1	104	18.1
1	3	7 / 0.44	1.32	0.7	1.6	10.6	125	18.1
1	4	7 / 0.44	1.32	0.7	1.6	11.5	150	18.1
1.5	2	7 / 0.53	1.59	0.7	1.6	10.7	120	12.1
1.5	3	7 / 0.53	1.59	0.7	1.6	11.3	148	12.1
1.5	4	7 / 0.53	1.59	0.7	1.6	12.2	178	12.1
4	2	7 / 0.85	2.55	0.7	1.6	12.7	188	4.61
4	3	7 / 0.85	2.55	0.7	1.6	13.4	243	4.61
6	2	7 / 1.04	3.12	0.7	1.6	13.7	237	3.08

**LOW SMOKE HALOGEN FREE (OR FLAME RETARDANT PVC) SHEATHED CABLE
(WITH EARTH CONDUCTOR & MULTI CORES)**

Conductor				Nominal thickness of insulation	Nominal thickness of sheath	Approx. overall diameter of cable	Approx. weight of cable	Maximum conductor resistance at 20°C
Cross sectional area	Number of cores	Stranding number / diameter	Nominal diameter					
mm ²		No/mm	mm	mm	mm	mm	Kg / Km	Ohm / Km
1.5	2 + Earth	7 / 0.53	1.59	0.7	1.6	11.3	144	12.1
1.5	3 + Earth	7 / 0.53	1.59	0.7	1.6	12.2	174	12.1
4	2 + Earth	7 / 0.85	2.55	0.7	1.6	13.4	237	4.61
4	3 + Earth	7 / 0.85	2.55	0.7	1.6	14.6	296	4.61
6	2 + Earth	7 / 1.04	3.12	0.7	1.8	14.9	319	3.08
6	3 + Earth	7 / 1.04	3.12	0.7	2.0	16.6	416	3.08
10	3 + Earth	7 / 1.35	4.05	0.7	2.0	19.1	604	1.83
16	3 + Earth	7 / 1.70	5.10	0.7	2.0	21.5	857	1.15
25	3 + Earth	7 / 2.14	6.42	0.9	2.4	26.4	1330	0.727
35	3 + Earth	19 / 1.53	7.65	0.9	2.6	29.9	1770	0.524

XLPE INSULATED, STEEL WIRE ARMoured, FLAME RETARDANT PVC SHEATHED CABLE

Number of cores	Nominal cross sectional area	Nominal thickness of insulation	Approx. diameter under armour	Nominal diameter of steel wire	Nominal thickness of sheath	Approx. overall diameter of cable	Approx. weight of cable
	mm ²	mm	mm	mm	mm	mm	Kg / Km
Two Core	1.5	0.7	10.0	0.9	1.8	15.4	409
	2.5	0.7	10.7	0.9	1.8	16.1	456
	4	0.7	11.7	0.9	1.8	17.1	540
	6	0.7	12.3	0.9	1.8	17.7	583
	10	0.7	14.7	1.25	1.8	20.8	875
	16	0.7	17.0	1.25	1.8	23.1	1067
	25	0.9	19.1	1.6	1.8	25.9	1526
	35	0.9	21.5	1.6	1.8	28.3	1839
	50	1.0	24.2	1.6	1.8	31.0	2230
	70	1.1	27.9	1.6	2.0	35.1	2869
	95	1.1	31.6	2.0	2.1	39.8	3940
	120	1.2	35.3	2.0	2.2	43.7	4700
	150	1.4	39.7	2.0	2.3	48.3	5487
	185	1.6	43.6	2.5	2.5	53.6	7078
240	1.7	49.6	2.5	2.7	60.0	8742	
Three Core	1.5	0.7	10.5	0.9	1.8	15.9	454
	2.5	0.7	11.4	0.9	1.8	16.8	515
	4	0.7	11.8	0.9	1.8	17.2	572
	6	0.7	13.2	0.9	1.8	18.6	673
	10	0.7	15.8	1.25	1.8	21.9	1029
	16	0.7	18.1	1.25	1.8	24.2	1302
	25	0.9	20.6	1.6	1.8	27.4	1849
	35	0.9	22.9	1.6	1.8	29.7	2258
	50	1.0	25.7	1.6	1.8	32.5	2273
	70	1.1	30.2	2.0	2.0	38.2	3962
	95	1.1	33.5	2.0	2.2	41.9	4959
	120	1.2	37.9	2.0	2.3	46.5	5913
	150	1.4	42.6	2.5	2.5	52.6	7545
	185	1.6	47.4	2.5	2.6	57.6	9085
240	1.7	53.3	2.5	2.8	63.9	11379	
Four Core	1.5	0.7	11.8	0.9	1.8	17.2	511
	2.5	0.7	12.3	0.9	1.8	17.7	565
	4	0.7	13.8	0.9	1.8	19.2	678
	6	0.7	15.2	1.25	1.8	21.3	945
	10	0.7	17.7	1.25	1.8	23.8	1223
	16	0.7	19.1	1.6	1.8	25.9	1693
	25	0.9	23.1	1.6	1.8	29.9	2247
	35	0.9	25.8	1.6	1.9	32.8	2820
	50	1.0	28.7	1.6	2.0	35.9	3472
	70	1.1	33.5	2.0	2.2	41.9	4919
	95	1.1	38.7	2.0	2.3	47.3	6132
	120	1.2	43.1	2.5	2.5	53.1	7964
	150	1.4	47.7	2.5	2.6	57.9	9438
	185	1.6	52.8	2.5	2.8	63.4	11388
240	1.7	59.5	2.5	3.0	70.5	14367	