

PYROTEC[®]

Engineered for Safety



**Flame Retardant
Mineral Insulated Cable**

Buildings Fire Safety

Buildings today are not only designed to be eye catching state-of-the-art architectures, they must be safe and enduring at the same time. It must be able to withstand various unforeseen circumstances prevalent in our aggressive environment today. Whilst steel and concrete structures form the physical backbone of buildings, electrical cables act as the main arteries, feeding life by distributing power and activation signals during normal operation or emergency mode. This convenience of modern lifestyle comes without compromising on fire safety. In the event of a fire, a poor quality cable is akin to failing arteries that becomes the main culprit of heat and flame propagation within a building, leading to major catastrophic damage to building structures and even loss of human lives. Inferior materials in such cables can emit excessive smoke, acidic gases and toxic fumes in an event of fire, incapacitating human life.

As such, architects and engineers have the utmost responsibility to ensure every possible safety feature is in place in the event of building fires. Ensuring and protecting occupants' safety is an ultimatum. Hence, selection of the right choice of cables has become even more critical to ensure 100% prevention and safety measures in the event of an untoward situation.

Selecting the Right Cable

The selection of cable insulation and sheath materials determines the performance characteristic in the event of emergencies.

Performance Characteristic \ Insulation Type	Conventional PVC	Conventional XLPE	PYROTEC® FRT-MI 90
Operating Temperature	70°C	90°C	90°C
Flame Retardant	Moderate	Low	High
Low Smoke Density	No	No	Yes
Zero Halogen	No	No	Yes
Low Toxic Emission	No	No	Yes
Self Extinguish	Moderate	Low	High
Limiting Oxygen Index	23%	19%	33%

Applications

PYROTEC® FRT-MI cable is designed to minimize flame propagation, reduce emission of hazardous gases for human safety while eliminating smoke emission to improve visibility index within all type of building environment as below:



PYROTEC® Engineered for Safety

PYROTEC®, the high-performance Flame Retardant Mineral Insulated Cable FRT-MI is the result of joint venture between EITA Power System Sdn Bhd and Universal Cable (M) Bhd, combining the best fit of marketing distribution with the best reputation in cable production. **PYROTEC®** is developed based on our knowledge of 'Fire Technology', incorporating new developments in material engineering and our consistent innovation whilst achieving the highest cable standards in all three main aspects of flame retardant cable namely in fire performance, prevention and safety requirements. We pride ourselves in our unceasing innovation in product design and in delivering service excellence to meet the ever changing market needs.

PYROTEC® FRT-MI is developed to meet the rising pressures faced by consultants in selecting the best cost effective yet high performance cable for their designs. The FRT-MI, mineral-filled insulation compound is engineered to optimize safety requirements. The compound is non-flammable, halogen-free, low smoke and toxic emission and is highly self-extinguishing; offering significant cost, weight and space savings while still providing a superior level of fire safety with enhanced cable life span.

Cable Characteristics



Flame Retardant
IEC 60332-3
(22,23,24)



Low Smoke Density
IEC 61034-2



Zero Halogen
IEC 60754-1 & 2
BS EN 50525-1



Operating
Temperature 90°C



Termite & Rodents
Resistant (Optional)

Current Ratings

Correction Factors for Ambient Air Temperature

Ambient Temperature °C	25	30	35	40	45	50	55	60
Correction Factors	1.04	1.00	0.96	0.91	0.87	0.82	0.76	0.71

Correction Factors for Groupings

Number of circuits		2	3	4	5	6	7	8	9
Single layer direct clipped on a non-metallic surface	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
Single layer Multi-core on a perforated metal cable tray vertical or horizontal	Touching	0.86	0.81	0.77	0.75	0.74	0.73	0.73	0.72
	Spaced*	0.91	0.89	0.88	0.87	0.87			
Single layer Single-core on a perforated metal cable tray touching	Horizontal	0.90	0.85						
	Vertical	0.85							

* Space by a clearance between adjacent surfaces of at least one cable diameter. No correction factor is needed, where horizontal clearance between adjacent cables exceeds 2 cable diameters.

The above are applicable to groups of cables all of one size. If a cable is expected to carry <30% of its grouped ratings, it may be ignored for the purpose of obtaining the correct factor for the rest of the groups.

Single Insulated (Non-Sheathed)

Cable Construction

Temperature Rating	90 °C
Voltage, U ₀ /U	600 / 1000 V.
Conductor	Plain Annealed Copper Wire: IEC 60228 (Class 2)
Insulation	Flame Retardant Mineral Insulated LSOH Compound; BLACK, RED, GREEN, ORANGE

Cable Characteristic / Performance

- Flame Retardant in compliance to IEC 60332-3 (Cat. 22, 23, 24)
- Zero Halogen Content in compliance to IEC 60754-1, IEC 60754-2 and BS EN 50525-1
- Low Smoke Density in compliance to IEC 61034-2
- Limiting Oxygen Index (LOI) shall be greater than 30% in accordance with ASTM D2863
- Voltage Test 3.5 kV / 5 min.
- Minimum Bending Radius 6 ~ 8 times of overall diameter (OD)



Conductor			Nominal insulation thickness	Approx. diameter of cable	Approx. cable weight	Current Rating in Air		Current Rating in Enclosed		Voltage drop			
Size	No. of strands	Nominal diameter				1 phase	3 phase	1 phase	3 phase	1 phase	3 phase	1 phase	3 phase
						2 cables	Trefoil	2 cables	Trefoil	Trefoil			
mm ²	No.	mm	mm	mm	Kg / Km	Amps		Amps		mV / A/m			
1.5	7	1.6	0.7	3.0	20	28	22	24	20	30.9	26.7		
2.5	7	2.0	0.8	3.6	30	37	30	32	27	18.9	16.4		
4	7	2.6	0.8	4.2	50	50	41	43	35	11.8	10.2		
6	7	3.1	0.8	4.7	70	64	52	55	46	7.86	6.80		
10	7	4.1	1.0	6.1	110	88	73	77	65	4.67	4.05		
16	7	4.8	1.0	6.8	170	116	97	101	88	2.94	2.55		
25	7	6.0	1.2	8.4	270	156	132	137	114	1.86	1.61		
35	7	7.2	1.2	9.6	360	192	164	170	142	1.35	1.17		
50	19	8.4	1.4	11.2	490	234	202	193	173	1.00	0.870		
70	19	10.1	1.4	12.9	690	297	257	243	220	0.703	0.609		
95	19	11.8	1.6	15.0	960	367	322	299	267	0.519	0.449		
120	19	13.4	1.6	16.6	1,190	428	376	348	308	0.422	0.365		
150	19	14.8	1.8	18.4	1,490	490	433	386	338	0.354	0.307		
185	37	16.6	2.0	20.6	1,830	566	504	442	372	0.299	0.259		
240	37	19.0	2.2	23.4	2,400	674	604	523	443	0.248	0.215		
300	37	21.3	2.4	26.1	3,010	776	699	598	506	0.219	0.190		
400	61	24.1	2.6	29.3	3,820	900	815	708	600	0.196	0.170		
500	61	27.1	2.8	32.7	4,800	1036	942	819	693	0.180	0.156		
630	61	30.8	2.8	36.4	6,100	1215	1110	967	820	0.167	0.144		

Double Insulated (Sheathed)

Cable Construction

Temperature Rating	90 °C
Voltage, U ₀ /U	600 / 1000 V.
Conductor	Plain Annealed Copper Wire: IEC 60228 (Class 2)
Insulation	Flame Retardant Mineral Insulated LSOH Compound; BLACK
Sheath	Flame Retardant Mineral Insulated LSOH Compound; ORANGE

Cable Characteristic / Performance

Flame Retardant in compliance to IEC 60332-3 (Cat. 22, 23, 24)	
Zero Halogen Content in compliance to IEC 60754-1, IEC 60754-2 and BS EN 50525-1	
Low Smoke Density in compliance to IEC 61034-2	
Limiting Oxygen Index (LOI) shall be greater than 30% in accordance with ASTM D2863	
Voltage Test	3.5 kV / 5 min
Minimum Bending Radius	6 ~ 8 times of overall diameter (OD)



Conductor			Nominal insulation thickness	Nominal sheath thickness	Approx. diameter of cable	Approx. cable weight	Current Rating in Air		Voltage drop	
Size	No. of strands	Nominal diameter					1 phase	3 phase	1 phase	
							2 cables	Trefoil	mV / A/m	
mm ²	No.	mm	mm	mm	mm	Kg / Km	Amps			
1.5	7	1.6	0.8	1.4	6.0	55	31	26	30.9	26.7
2.5	7	2.0	0.8	1.4	6.4	65	40	35	18.9	16.4
4	7	2.6	1.0	1.4	7.4	95	54	46	11.8	10.2
6	7	3.1	1.0	1.4	7.9	120	68	58	7.86	6.81
10	7	4.1	1.0	1.4	8.9	160	92	80	4.67	4.05
16	7	4.8	1.0	1.4	9.6	230	121	105	2.94	2.55
25	7	6.0	1.2	1.4	11.2	340	161	141	1.86	1.61
35	7	7.2	1.2	1.4	12.4	440	197	173	1.35	1.17
50	19	8.4	1.4	1.4	14.0	580	238	211	1.00	0.870
70	19	10.1	1.4	1.4	15.7	790	300	267	0.703	0.609
95	19	11.8	1.6	1.5	18.0	1,080	370	331	0.518	0.449
120	19	13.4	1.6	1.5	19.6	1,330	430	385	0.421	0.365
150	19	14.8	1.8	1.6	21.6	1,650	491	443	0.354	0.306
185	37	16.6	2.0	1.7	24.0	2,020	566	513	0.298	0.258
240	37	19.0	2.2	1.8	27.0	2,620	672	612	0.247	0.214
300	37	21.3	2.4	1.9	29.9	3,270	772	707	0.218	0.189
400	61	24.1	2.6	2.0	33.3	4,120	895	822	0.195	0.169
500	61	27.1	2.8	2.1	36.9	5,150	1029	949	0.179	0.155
630	61	30.8	2.8	2.2	40.8	6,520	1207	1117	0.165	0.143

Double Insulated (Sheathed)

Cable Construction

Temperature Rating	90 °C
Voltage, U ₀ /U	600 / 1000 V.
Conductor	Plain Annealed Copper Wire: IEC 60228 (Class 2)
Insulation	Flame Retardant Mineral Insulated LSOH Compound; Red, Black (2 core) Red, Yellow, Blue (3 core) Red, Yellow, Blue, Black (4 core)
Sheath	Flame Retardant Mineral Insulated LSOH Compound; ORANGE

Cable Characteristic / Performance

- Flame Retardant in compliance to IEC 60332-3 (Cat. 22, 23, 24)
- Zero Halogen Content in compliance to IEC 60754-1, IEC 60754-2 and BS EN 50525-1
- Low Smoke Density in compliance to IEC 61034-2
- Limiting Oxygen Index (LOI) shall be greater than 30% in accordance with ASTM D2863
- Voltage Test 3.5 kV / 5 min
- Minimum Bending Radius 6 ~ 8 times of overall diameter (OD)



Size	Conductor		Nominal insulation thickness	Nominal sheath thickness	Approx. diameter of cable	Approx. cable weight	Current Rating In Air	Voltage drop
	No. of strands	Nominal diameter					Free Air	Refer to NOTE #1
mm ²	No.	mm	mm	mm	mm	Kg / Km	Amps	mV / A/m
2C x 1.5	7	1.6	0.8	1.8	10.1	130	30	30.9
2C x 2.5	7	2.0	0.8	1.8	10.9	160	40	18.9
2C x 4	7	2.6	1.0	1.8	12.8	220	54	11.8
2C x 6	7	3.1	1.0	1.8	13.9	280	68	7.86
2C x 10	7	4.1	1.0	1.8	15.8	390	93	4.67
2C x 16	7	4.8	1.0	1.8	17.7	530	123	2.94
3C x 1.5	7	1.6	0.8	1.8	10.6	160	26	26.7
3C x 2.5	7	2.0	0.8	1.8	11.5	200	34	16.4
3C x 4	7	2.6	1.0	1.8	13.5	280	46	10.2
3C x 6	7	3.1	1.0	1.8	14.7	360	58	6.81
3C x 10	7	4.1	1.0	1.8	16.7	510	80	4.05
3C x 16	7	4.8	1.0	1.8	18.7	710	105	2.55
3C x 25	7	6.0	1.2	1.8	22.3	1,060	141	1.61
3C x 35	7	7.2	1.2	1.8	24.8	1,390	174	1.17
3C x 50	19	8.4	1.4	1.8	28.2	1,830	212	0.870
3C x 70	19	10.1	1.4	1.9	32.0	2,510	268	0.608
3C x 95	19	11.8	1.6	2.1	37.1	3,430	331	0.448
3C x 120	19	13.4	1.6	2.2	40.6	4,240	386	0.364
3C x 150	19	14.8	1.8	2.3	44.8	5,250	443	0.305
4C x 1.5	7	1.6	0.8	1.8	11.4	190	26	26.7
4C x 2.5	7	2.0	0.8	1.8	12.4	240	34	16.4
4C x 4	7	2.6	1.0	1.8	14.7	350	46	10.2
4C x 6	7	3.1	1.0	1.8	16.1	450	58	6.81
4C x 10	7	4.1	1.0	1.8	18.3	650	80	4.05
4C x 16	7	4.8	1.0	1.8	20.5	910	105	2.55
4C x 25	7	6.0	1.2	1.8	24.5	1,360	141	1.61
4C x 35	7	7.2	1.2	1.8	27.3	1,790	174	1.17
4C x 50	19	8.4	1.4	1.9	31.3	2,380	212	0.870
4C x 70	19	10.1	1.4	2.0	35.5	3,280	268	0.608
4C x 95	19	11.8	1.6	2.2	41.2	4,490	331	0.448
4C x 120	19	13.4	1.6	2.3	45.1	5,550	386	0.364
4C x 150	19	14.8	1.8	2.5	49.9	6,900	443	0.305

NOTE # 1: 2C - 1 Phase System, 3C or 4C - 3 Phase System

Double Insulated (Sheathed)

Cable Construction

Temperature Rating	90 °C
Voltage, U ₀ /U	300 /500 V.
Conductor	Plain Annealed Copper Wire: IEC 60228 (Class 2)
Insulation	Flame Retardant Mineral Insulated LSOH Compound; Black, White (Insulated Core with numbering)
Drain Wire	Tinned Annealed Copper Wire
Overall Screen	Laminated Aluminium Foil
Sheath	Flame Retardant Mineral Insulated LSOH Compound; RED

Cable Characteristic / Performance

- Flame Retardant in compliance to IEC 60332-3 [Cat. 22, 23, 24]
- Zero Halogen Content in compliance to IEC 60754-1, IEC 60754-2 and BS EN 50525-1
- Low Smoke Density in compliance to IEC 61034-2
- Limiting Oxygen Index (LOI) shall be greater than 30% in accordance with ASTM D2863
- Voltage Test 2 kV / 1 min
- Minimum Bending Radius 6 ~ 8 times of overall diameter (OD)



Size	Conductor		Nominal insulation thickness	Nominal sheath thickness	Approx. diameter of cable	Approx. cable weight
	No. of strands	Nominal diameter				
No x mm ²	No.	mm	mm	mm	mm	Kg / Km
1 Pr x 1.0	7	1.3	0.6	0.9	7.8	70
2 Pr x 1.0	7	1.3	0.6	1.1	9.2	110
3 Pr x 1.0	7	1.3	0.6	1.2	12.0	170
4 Pr x 1.0	7	1.3	0.6	1.2	13.1	210
5 Pr x 1.0	7	1.3	0.6	1.2	14.3	250
7 Pr x 1.0	7	1.3	0.6	1.2	15.6	320
10 Pr x 1.0	7	1.3	0.6	1.4	20.2	460
1 Pr x 1.5	7	1.6	0.7	0.9	8.8	90
2 Pr x 1.5	7	1.6	0.7	1.2	10.6	160
3 Pr x 1.5	7	1.6	0.7	1.2	13.9	230
4 Pr x 1.5	7	1.6	0.7	1.2	15.2	280
5 Pr x 1.5	7	1.6	0.7	1.3	16.8	350
7 Pr x 1.5	7	1.6	0.7	1.3	18.3	450
10 Pr x 1.5	7	1.6	0.7	1.5	23.8	650
1 Pr x 2.5	7	2.0	0.8	1.0	10.2	120
2 Pr x 2.5	7	2.0	0.8	1.3	12.3	220
3 Pr x 2.5	7	2.0	0.8	1.3	16.3	320
4 Pr x 2.5	7	2.0	0.8	1.3	17.9	400
5 Pr x 2.5	7	2.0	0.8	1.4	19.9	500
7 Pr x 2.5	7	2.0	0.8	1.4	21.7	650
10 Pr x 2.5	7	2.0	0.8	1.7	28.4	950

Marketed by:

EITA Power System Sdn. Bhd.
(A member of EITA Resources Berhad)

Lot 4, Block A, Jalan SS13/7,
Subang Jaya Industrial Estate,
47500 Subang Jaya,
Selangor, Malaysia

Tel : +603-5637 8363

Fax : +603-5636 0538

Manufactured by:

Universal Cable (M) Berhad

No. 33, Jalan Tiran,
Kangkar Tebrau,
81100 Johor Bahru,
Johor, Malaysia

Tel : +607-355 3333

Fax : +607-355 5298