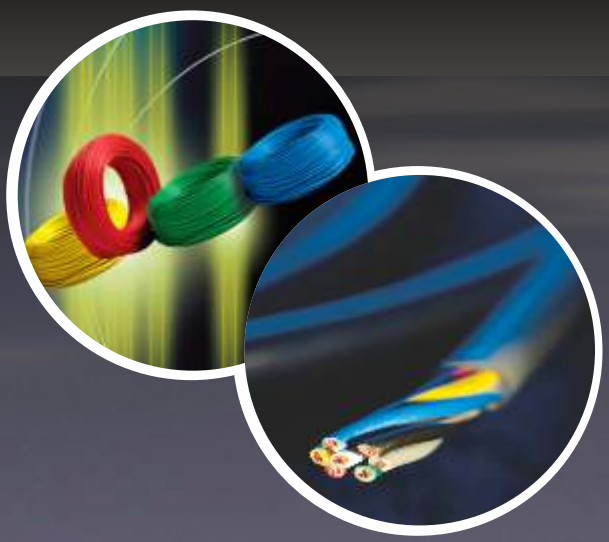
LKB GROUP

NABL

मानकः पथप्रदर्शकः

QMS-ISO 9001
EMS-ISO 14001
OHSMS-ISO 45001



Flexibles

RALLISON
DRIVEN BY DESIRE
An ISO 9001:2015 Certified Co.

INTRODUCTION TO FIRE SURVIVAL WIRES

Each year fires result in thousands of fatalities with many more injuries / burns. The financial cost of the fires is huge. Ordinary wires contribute to fire by propagating flame of the burning cable from one area to another and liberate smoke, toxic gases and corrosive gases.

WHAT IS A FIRE SURVIVAL WIRE?

A wire that will continue to operate in the presence of fire keeping all critical systems running for necessary time & at the same time not propagating flame, very less smoke generation, toxic & corrosive gases.

Wires may increase the hazards involved depending upon the materials used in the wires.

1. Ordinary wires give off smoke hindering escape and fire fighting.
2. Ordinary wires give off acid gases which can cause suffocation to human being within the affected area.
3. Ordinary wires propagate fire.
4. Ordinary wires fail causing breakdown in power.

In places such as subways, railways, road tunnels, ships, hospitals, schools, hotels, malls, theatres, museums and public premises, besides the danger of fire propagation, also fume toxicity and opacity are particularly important as they may cause, serious consequences for human safety, suffocation, intoxication and panic due to reduced visibility.

For fire survival wires the characteristics of prime importance are the Oxygen Index, Smoke Emission, Halogen Acid evolution, Toxicity and Circuit Integrity under fire.

After extensive research RALLISON has successfully developed and introduced new generation Fire Survival House Wires, which ensures service operation during and after fire. These wires will survive fire even when exposed to flame temperature of 950°C for 3 hours, (fire test as per BS 6387: 1914, BS 7846: 2000) and will operate all the circuits for its rated voltage even when the outer protection have been destroyed. Circuit integrity so essential services such as fire extinguishing systems, safety alarms, emergency lighting etc is maintained by these cables. This enables controlled shutdown of the plant and evacuation of personnel to safe areas from crowded places.

The Comparative Properties are explained by the following chart:

Component	Heat Resistant Fire Retardant (HRFR)	Fire Retardant Low Smoke (FR-LSH)	Low Smoke Zero Halogen (LSZH/ZHFR)	Fire Survival (FS)
Oxygen Index (ASTM - D 2863)	29 to32	29 to 32	34 to 36	34 to 36
Flame Retardency (ASTM - D 2863)	Good	Good	Very Good	Very Good
Temp. Required To Catch Fire (With 21% Oxygen) (ASTM - D 2863)	>250°C	>250°C	>300°C	>300°C
Visibility During Burning (%) (ASTM - D 2863)	5 to 10	>40	>95	>95
Halogen Content (%)	30 to 37	<18	<0.5	<0.5
Circuit Integrity At 950°C for 3 Hrs. (BS:6387)	No	No	No	Yes
Toxic Index (NEC 713)	>5	>5	<3	<3
Carbon Mono Oxide (%)	High	High	Low	Low

Table No. 1, Fire Survival (FS)
Multistrand Copper Conductor, Fire Barrier Tape, Zero Halogen Flame Retardent Low Smoke Grade Compound Insulated, 1100 Volts Cable

Cross Sectional Area of conductor (Nominal)	No. & Diameter of Strand (Nominal)	Thickness of Insulation (Nominal)	Diameter (Approx)	Overall Diameter (Maximum)	Conductor Resistance at 20°C (Maximum)	Current Rating
mm²	Nos./mm	mm	mm	mm	Ohm/km	Amps
0.75	24/0.20	0.6	2.7	3.0	26	12
1.0	14/0.30	0.7	3.2	3.5	18.1	16
1.5	22/0.30	0.7	3.5	4.0	12.1	22
2.5	36/0.30	0.8	4.2	4.7	7.41	29
4.0	56/0.30	0.8	4.8	5.3	4.95	37
6.0	84/0.30	0.8	5.3	5.8	3.30	51

1. India's first Fire Survival (FS) wire.
2. Greater Current Carrying Capacity.
3. Higher Short Circuit Capacity.
4. No Overheating / Melting.
5. Resistant to Fire.
6. Circuit Integrity during a fire assuring operation of system .
7. Minimizes the Emission of Toxic Fumes for safeguard of human life.
8. Does not emit Corrosive Gases which lessen likelihood of damage to sensitive equipments.
9. Low Smoke allows humans for rapid evacuation.
10. Less Flame Spread diminishes spread of fire.
11. As per BS: 6387, BS: 7846, BS: 7655 Section 6.1, Rallison Specification.

Table No. 2, Heat Resistant Flame Retardent (HRFR)
Multistrand Copper Conductor, Heat Resistant Flame Retardent PVC Insulated, 1100 Volts Cable

Cross Sectional Area of conductor (Nominal)	No. & Diameter of Strand (Nominal)	Thickness of Insulation (Nominal)	Diameter (Nominal)	Overall Diameter (Maximum)	Conductor Resistance at 20°C (Maximum)	Current Rating
mm²	Nos./mm	mm	mm	mm	Ohm/km	Amps
0.75	24/0.20	0.6	2.5	2.8	26	8
1.0	14/0.30	0.7	2.7	3.2	18.1	16
1.5	22/0.30	0.7	3.1	3.4	12.1	18
2.5	36/0.30	0.8	3.7	4.2	7.41	24
4.0	56/0.30	0.8	4.3	4.8	4.95	32
6.0	84/0.30	0.8	5.0	5.6	3.30	41

1. Conductor as per IS-8130:1984.
2. The number & diameter of conductor strands are for reference only and governed by conductor resistance.
3. Bright anealed electrolytic grade copper conductor, bunched together in high precision machines for uniformity and flexibility.
4. Insulated with double layer HRFR grade PVC for better insulation & electrical Properties.
5. Environment Friendly Lead free PVC Compound.
6. As per IS:694-2010.

Table No. 3, Flame Retardent Low Smoke (FR-LSH)
Multistrand Copper Conductor Flame Retardent Low Smoke PVC Insulated 1100 Volts Cable.

Cross Sectional Area of conductor (Nominal)	No. & Diameter of Strand (Nominal)	Thickness of Insulation (Nominal)	Diameter (Nominal)	Overall Diameter (Maximum)	Conductor Resistance at 20°C (Maximum)	Current Rating
mm²	Nos./mm	mm	mm	mm	Ohm/km	Amps
0.75	24/0.20	0.6	2.5	2.8	26	8
1.0	14/0.30	0.7	2.7	3.2	18.1	16
1.5	22/0.30	0.7	3.1	3.4	12.1	18
2.5	36/0.30	0.8	3.7	4.2	7.41	24
4.0	56/0.30	0.8	4.3	4.8	4.95	32
6.0	84/0.30	0.8	5.0	5.6	3.30	41

1. Conductor as per IS-8130:1984
2. The number & diameter of conductor strands are for reference only and governed by conductor resistance.
3. Bright anealed electrolytic grade copper conductor, bunched together in high precision machines for uniformity and flexibility.
4. Insulation: Specially formulated high temperature grade of Flame Retardent Low Smoke compound to restrict the spread of flames in fire situation. The smoke emitted by the burning cable is less compared to traditional cables. This ensures improved visibility for evacuation of trapped victims and facilitates fire fighting operation.
5. Insulated with environment friendly PVC Compound.
6. As per IS:694-2010.

Table No. 4
ZERO HALOGEN FLAME RETARDENT (ZHFR)/LOW SMOKE ZERO HALOGEN (LSZH)
Multistrand Copper Conductor Zero Halogen Flame Retardent Low Smoke Grade Compound Insulated 1100 Volts Cable.

Cross Sectional Area of conductor (Nominal)	No. & Diameter of Strand (Nominal)	Thickness of Insulation (Nominal)	Diameter (Nominal)	Overall Diameter (Maximum)	Conductor Resistance at 20°C (Maximum)	Current Rating
mm²	Nos./mm	mm	mm	mm	Ohm/km	Amps
0.75	24/0.20	0.6	2.5	2.8	26	12
1.0	14/0.30	0.7	2.7	3.2	18.1	16
1.5	22/0.30	0.7	3.1	3.4	12.1	22
2.5	36/0.30	0.8	3.7	4.2	7.41	29
4.0	56/0.30	0.8	4.3	4.8	4.95	37
6.0	84/0.30	0.8	5.0	5.6	3.30	51

1. Conductor as per IS-8130:1984.
2. The number & diameter of conductor strands are for reference only and governed by conductor resistance.
3. Bright anealed electrolytic grade copper conductor, bunched together in high precision machines for uniformity and flexibility.
4. Insulation: Specially formulated polymeric compound of Zero Halogen Flame Retardent Low Smoke is used. The performance of the cable in a fire situation is exceptionally good. The insulation does not burn readily. The smoke is negligible, transparent, non toxic. The victims trapped in fire do not suffocate and this facilitates fire fighting operations. Unlike PVC, the smoke emitted is non-corrosive. Thus, the electronic printed circuit boards, hard disks and other sensitive electronic equipments are unaffected.
5. Generally conforms to IEC 60332-1 & 3, IEEE 60754-1 & 2, IEC 60754-1 & 2, BS 4066-1 & 3, BS 7211 .

Table No. 5, Heat Resistant Flame Retardent (HRFR) 105°C Cables
Multistrand Copper Conductor Heat Resistant PVC Insulated, 1100 Volts Cable

Cross Sectional Area of conductor (Nominal)	No. & Diameter of Strand (Nominal)	Thickness of Insulation (Nominal)	Diameter (Nominal)	Overall Diameter (Maximum)	Conductor Resistance at 20°C (Maximum)	Current Rating
mm²	Nos./mm	mm	mm	mm	Ohm/km	Amps
0.75	24/0.20	0.6	2.5	2.8	26	12
1.0	14/0.30	0.7	2.7	3.2	18.1	16
1.5	22/0.30	0.7	3.1	3.4	12.1	22
2.5	36/0.30	0.8	3.7	4.2	7.41	29
4.0	56/0.30	0.8	4.3	4.8	4.95	37
6.0	84/0.30	0.8	5.0	5.6	3.30	51

1. Conductor as per IS-8130:1984.
2. The number & diameter of conductor strands are for reference only and governed by conductor resistance.
3. Bright anealed electrolytic grade copper conductor, bunched together in high precision machines for uniformity and flexibility.
4. Insulated: Specially formulated Heat Resistant PVC compound is used to withstand 105°C which enables the cable to withstand overload.
5. As per BS: 6231, IEC 60227, DIN VDE 0281-3.
6. These cable can operate at 105°C on a continuous basis as compared to 70°C in a normal PVC wire thereby providing extra short circuit & overload protection.

Table No. 6
Single Core Flexible Cables (HRFR)
Multistrand Copper Conductor HRFR PVC Insulated, (Unsheathed)1100 Volts Cable.

Cross Sectional Area of conductor (Nominal)	No. & Diameter of Strand (Nominal)	Thickness of Insulation (Nominal)	Diameter (Nominal)	Overall Diameter (Maximum)	Conductor Resistance at 20°C (Maximum)	Current Rating
mm²	Nos./mm	mm	mm	mm	Ohm/km	Amps
0.50	16/0.20	0.6	2.2	2.6	39	5
0.75	24/0.20	0.6	2.5	2.8	26	7
1.0	32/0.20	0.7	2.8	3.0	19.5	14
1.5	30/0.25	0.7	3.1	3.8	13.3	16
2.5	50/0.25	0.8	3.8	4.2	7.98	22
4	56/0.30	0.8	4.4	4.8	4.95	29
6	84/0.30	0.8	5.0	6.4	3.30	37
10	80/0.40	1.0	6.8	8.0	1.91	51
16	126/0.40	1.0	8.0	9.6	1.21	68
25	196/0.40	1.2	10.0	11.5	0.780	86
35	276/0.40	1.2	11.2	13.0	0.554	110
50	396/0.40	1.4	13.5	15.0	0.386	145
70	357/0.50	1.4	15.0	17.0	0.272	215
95	475/0.50	1.6	17.5	19.0	0.206	260
120	608/0.50	1.6	19.5	21.0	0.161	305
150	756/0.50	1.8	22.0	23.5	0.129	355
185	925/0.50	2.0	24.5	26.5	0.106	415
240	1221/0.50	2.2	28.0	30.0	0.0801	500
300	1517/0.50	2.4	30.0	32.0	0.0641	585
400	2013/0.50	2.6	34.5	36.5	0.0486	695

1. Conductor as per IS-8130:1984.
2. The number & diameter of conductor strands are for reference only and governed by conductor resistance.
3. Bright anealed electrolytic grade copper conductor, bunched together in high precision machines for uniformity and flexibility.
4. Insulated with environment friendly lead free PVC Compound.
5. As per IS: 694-2010 (generally).

Table No. 7
Submersible Cables Flexible Three Core
Flat Cables Copper Conductor, PVC Insulated and PVC Sheathed 1100 Volts Grade Cable

Cross Sectional Area of conductor (Nominal)	No. & Diameter of Strand (Nominal)	Thickness of Insulation (Nominal)	Thickness of Sheath (Nominal)	Width (Nominal)	Height (Nominal)	Current Rating
mm²	Nos./mm	mm	mm	mm	mm	Amps
1.0	32/0.20	0.6	0.9	9.6	4.4	12
1.5	30/0.25	0.6	0.9	10.4	4.8	15
2.5	50/0.25	0.7	1.0	13.0	5.8	20
4.0	56/0.30	0.8	1.1	15.2	6.6	26
6.0	84/0.40	0.8	1.1	16.8	7.2	33
10	80/0.40	1.0	1.2	22.7	9.3	45
16	126/0.40	1.0	1.3	26.8	10.8	61
25	196/0.40	1.2	1.5	32.6	13.0	78
35	276/0.40	1.2	1.6	37.0	14.6	99
50	396/0.40	1.4	1.7	44.0	17.0	135

1. Conductor as per IS-8130:1984.
2. The number & diameter of conductor strands are for reference only and governed by conductor resistance.
3. Bright anealed electrolytic grade copper conductor, bunched together in high Precision machines for uniformity and flexibility.
4. Insulated with environment friendly lead free PVC Compound.
5. Generally as per IS: 694-2010.

Table No. 8
Single Core & Multi Core Flexible Round Industrial Cable
Multistrand Copper Conductor, HRFR PVC Insulated and HRFR PVC Sheathed Cable 1100 Cable.

Cross Sectional Area of conductor (Nominal)	No. & Diameter of Strand (Nominal)	Thickness of Insulation (Nominal)	Thickness of Sheath (Nominal)				Overall Diameter (Approx)				Current Rating
mm²	Nos./mm	mm	mm				mm				Amps
			Single Core	Two Core	Three Core	Four Core	Single Core	Two Core	Three Core	Four Core	
0.50	16/0.20	0.6	0.9	0.9	0.9	0.9	4.00	6.20	6.60	7.2	5
0.75	24/0.20	0.6	0.9	0.9	0.9	0.9	4.20	6.60	7.0	7.6	7
1.0	32/0.20	0.6	0.9	0.9	0.9	0.9	4.40	7.00	7.4	8.2	14
1.5	30/0.25	0.6	0.9	0.9	0.9	0.9	4.6	7.40	8.0	8.6	16
2.5	50/0.25	0.7	1.0	1.0	1.0	1.0	5.0	9.0	9.6	10.5	22
4.0	56/0.30	0.8	1.0	1.0	1.1	1.1	6.2	10.4	11.3	12.4	29
6.0	84/0.30	0.8	1.0	1.1	1.1	1.2	6.8	11.9	12.6	14.1	37
10	80/0.40	1.0	1.0	1.2	1.2	1.3	8.8	16.0	17.0	18.8	51
16	126/0.40	1.0	1.0	1.3	1.3	1.4	10.0	18.8	20.0	22.4	68
25	196/0.40	1.2	1.1	1.4	1.5	1.6	12.0	22.6	24.5	27.2	86
35	276/0.40	1.2	1.1	1.5	1.6	1.7	13.5	25.6	27.7	31.0	110
50	396/0.40	1.4	1.2	1.6	1.7	1.8	16.0	30.5	33.0	36.5	145

1. Conductor as per IS-8130:1984.
2. The number & diameter of conductor strands are for reference only and governed by conductor resistance.
3. Bright anealed electrolytic grade copper conductor, bunched together in high precision machines for uniformity and flexibility.
4. Insulated with environment friendly lead free PVC Compound.
5. As per IS: 694-2010.

Table No. 9
Multi core Flexible Round Industrial Cables, Multistrand Copper Conductor, HRFR PVC Insulated and HRFR PVC sheathed 1100 volts grade.

Nominal Cross Sectional Area	sqmm	0.50	0.75	1.00	1.50	2.50	4.00
Conductor, Construction	No./Dia	16/0.20	24/0.20	32/0.20	30/0.25	50/0.25	56/0.30
Conductor Diameter (Approx.)	mm	0.90	1.10	1.30	1.60	2.00	2.60
Nominal Insulation Thickness	mm	0.60	0.60	0.60	0.60	0.70	0.80
Core Diameter (Approx.)	mm	2.20	2.40	2.60	2.80	3.40	4.20

No. Of Cores								
5	Sheath Thickness (Avg)	mm	0.9	0.9	1.0	1.0	1.0	1.1
	Overall Diameter (Approx.)	mm	7.80	8.40	9.10	9.60	11.20	13.60
6	Sheath Thickness (Avg)	mm	0.90	1.00	1.00	1.00	1.10	1.20
	Overall Diameter (Approx.)	mm	8.50	9.20	9.80	10.50	12.80	15.00
7	Sheath Thickness (Avg)	mm	0.90	1.00	1.00	1.00	1.10	1.20
	Overall Diameter (Approx.)	mm	8.50	9.20	9.80	10.50	12.80	15.00
10	Sheath Thickness (Avg)	mm	1.00	1.10	1.10	1.10	1.30	1.40
	Overall Diameter (Approx.)	mm	10.80	12.00	12.60	13.50	16.60	19.80
12	Sheath Thickness (Avg)	mm	1.00	1.10	1.10	1.10	1.30	1.40
	Overall Diameter (Approx.)	mm	11.20	12.40	13.00	14.00	17.30	20.50
14	Sheath Thickness (Avg)	mm	1.00	1.10	1.10	1.20	1.30	1.40
	Overall Diameter (Approx.)	mm	12.00	13.00	13.70	15.00	18.20	21.60
16	Sheath Thickness (Avg)	mm	1.10	1.20	1.20	1.20	1.40	1.50
	Overall Diameter (Approx.)	mm	12.60	13.80	14.60	15.70	19.50	23.00
19	Sheath Thickness (Avg)	mm	1.10	1.20	1.30	1.30	1.40	1.50
	Overall Diameter (Approx.)	mm	13.20	14.50	15.60	16.80	20.50	24.20
24	Sheath Thickness (Avg)	mm	1.20	1.30	1.30	1.40	1.40	1.50
	Overall Diameter (Approx.)	mm	15.60	17.20	18.50	20.00	24.00	28.40

1. Conductor as per IS-8130:1984.
2. The number & diameter of conductor strands are for reference only and governed by conductor resistance.
3. Bright anealed electrolytic grade copper conductor, bunched together in high Precision machines for uniformity and flexibility.
4. Insulated with environment friendly lead free PVC Compound.
5. As per IS: 694-2010.

RALLISON

DRIVEN BY DESIRE

An ISO 9001:2015 Certified Co.

Our Network

East :

Assam | Kolkata | Lucknow | Patna | Cuttak | Ranchi

North :

New Delhi | Haryana | Punjab | J&K | Himachal | UP West

West :

Mumbai | Rajasthan

South :

Bangalore | Chennai | Cochin

WIRES • CABLES • GEYSERS • PVC CONDUIT PIPE
E V CHARGING CABLE • SOLAR CABLE

RALLISON

3 Decades

MAKE IN INDIA

Corporate Office
LKB Engineering Pvt. Ltd.
E-418 to 421, Chopanki Industrial Area
Bhiwadi, Distt Alwar, Rajasthan - 301019

: ho@rallison.com
: www.rallison.com

twitter.com/Rallison LKB
facebook.com/rallisonindia
linkedin.com/in/rallison-lkb-7a4b17165
instagram.com/rallisoncorporate

CUSTOMER CARE : 1800-11-4201 (Toll-Free)