INSUCON

FIRE SURVIVAL CABLE

INSUCON *CABLES AND CONDUCTORS PRIVATE LIMITED*

INTRODUCTION

Founded in 1995 in the vibrant capital of Rajasthan, Jaipur, **INSUCON** Cables and Conductors Private Limited has established itself as a trusted leader in the manufacturing of LT XLPE Power and Control Cables. With three decades of industry experience, **INSUCON** has consistently prioritized customer satisfaction and product quality, setting the foundation for its long-standing success.

From the outset, **INSUCON's** commitment to excellence has been unwavering. The company is ISO 9001:2015, ISO 14001:2015 and ISO 45001:2015 certified, reflecting its adherence to international standards in quality management, environmental responsibility, and occupational health and safety. Furthermore, **INSUCON** boasts an in-house NABL testing laboratory, ensuring that every product meets stringent quality checks and performance standards.

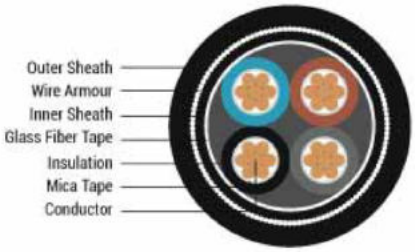
INSUCON's dedication to improving its infrastructure and technological capabilities allows it to meet the evolving demands of its customers. By adopting cutting-edge manufacturing techniques and utilizing high-quality raw materials, **INSUCON** delivers reliable and durable cables that meet both national and international standards.

At the heart of **INSUCON's** operations is a team of dedicated and highly experienced professionals. Their expertise and commitment to quality assurance play a crucial role in the company's ability to deliver products that exceed customer expectations. This skilled workforce is the backbone of **INSUCON**, enabling the company to tackle challenges head-on and innovate in a competitive market.

INSUCON's range of LT XLPE Power and Control Cables, LT PVC Power and Control Cable, Instrumentation Cable, Flexible Cable, Aerial Bunched Cable, Fire Survival Cable etc. is designed to meet diverse applications across various sectors, including power distribution, infrastructure, and industrial applications. These cables are engineered for optimal performance, offering excellent electrical insulation properties, resistance to environmental factors, and enhanced safety features. This makes **INSUCON** a preferred choice for customers seeking reliability and efficiency in their electrical solutions.

As **INSUCON** Cables and Conductors Private Limited continues to grow, the company remains steadfast in its mission: to deliver quality products while ensuring customer satisfaction. With a solid foundation built on trust, innovation, and expertise, **INSUCON** is poised to lead the cable manufacturing industry well into the future. Whether you are an individual consumer or a large corporation, **INSUCON** is committed to providing you with the best in power and control cables, tailored to your specific needs.

FIRE SURVIVAL CABLE



Application

These cables offer the advantages of an armoured 600/1000V rated, low smoke zero halogen (LSZH) cable with circuit integrity. They are intended for use in installations where vital circuits are required to continue operation in the event of the outbreak of fire. It is particularly suited for use in public buildings and constructions (such as hospitals, threatres, shopping developments, tunnels, mass transit railways, oil and petrochemical plants, power stations and computer installations) where the danger to life, equipment and structures may be greatly increased in the event of a power failure due to fire.

Standard

BS 7846

Technical Data

Voltage Rating : 600 / 1000V

Operating Temperature : - 40^0 C to + 90^0 C

(The cable should not be flexed when either the ambient of cable temperature is below 0^0 C)

Minimum Bending Radious : 12 x overall diameter of cable

Construction

- Annealed plain stranded copper conductor as per IEC 60228, Class - 2
- Mica Glass flame barrier tape.
- Extruded XLPE insulation.
- Insulated Cores assembled together.
- Extruded LSZH Inner Sheath (FRLSH Inner Sheath available on demand)
- Galvanised Steel Armoured.
- Extruded LSZH Outer Sheath, Colour : Black. (FRLSH Outer Sheath available on demand) (other colour as per customer's requirements)

Compliance

Fire Resistant	BS 7846-F2 / BS 6387 CWZ /
Flame Propagation	EN 60332-1-2
Fire Retardant	EN 60332-3-24 (Cat.C)
Halogen free material	EN 60754-1
Smoke Density	EN 61034-2 / ASTM - D- 2843

Advantages of Fire Survival Cables

Fire survival cables, also known as fire-resistant or fire-performance cables, are designed to continue functioning in the presence of fire for a specified period, providing essential safety in emergency situations. Here are the key advantages of fire survival cables:

1. Continuous Functionality During Fire

- **Operational Integrity**: Fire survival cables are built to maintain electrical integrity and continue transmitting power or signals during fire exposure, typically for 30, 60, or 120 minutes, depending on the design and fire resistance rating. This is critical for powering essential systems such as alarms, emergency lighting, and communication devices in an emergency.

2. Ensures Safety in Critical Systems

- **Supports Emergency Systems**: These cables are essential for life-saving equipment such as fire alarms, emergency lighting, public address systems, fire suppression systems, and ventilation systems, ensuring they remain functional during evacuation or firefighting efforts.
- **Safe Evacuation**: By keeping lighting, alarms, and communication systems operational, fire survival cables help guide building occupants and emergency personnel to safety during a fire, reducing panic and confusion.

3. Fire Resistance

- **High Temperature Endurance**: These cables are constructed with fire-resistant materials like Mica tape, which can endure extreme heat for a prolonged period. This ensures that the cable does not fail even when exposed to flames, preserving its core functionality.

4. Low Smoke and Toxicity

- **Low Smoke Emission**: Fire survival cables are typically made with **low smoke zero halogen (LSZH)** materials. In the event of a fire, these cables emit minimal smoke, ensuring better visibility for evacuation and reducing the risk of suffocation from toxic fumes.
- **No Toxic Halogen Gases**: LSZH cables release little to no halogens (such as chlorine or fluorine) during combustion, which reduces the risk of harmful acidic gases that can damage equipment or cause harm to humans.

5. Durability and Longevity

- **Resistant to Harsh Conditions**: Fire survival cables are often designed to withstand not only high temperatures but also moisture, chemicals, mechanical stress, and abrasions, making them suitable for harsh environments where longevity is essential.
- **Long Service Life**: These cables are robust, ensuring they perform reliably over time, reducing the need for frequent replacements, even in demanding environments.

6. Compliance with Safety Standards

- **Adheres to Fire Safety Regulations**: Fire survival cables comply with strict international safety and performance standards, such as BS 7629-1, BS 7846, and IEC 60331. These standards ensure that the cables meet stringent fire resistance and safety criteria.
- **Approved for Critical Installations**: Many fire safety codes mandate the use of fire survival cables in specific locations, such as hospitals, airports, tunnels, high-rise buildings, and industrial facilities, where continuous power and communication are crucial during an emergency.

CABLE TECHNICAL DATA

	Nominal Cross Sectional Area (Sq. mm)	Insulation Thickness (mm)	Nominal Armour Wire Diameter (mm)	Approx. Diameter Under Armour (mm)	Approx. Overall Diameter (mm)	Approx Cable Weight (kg/km)	Max. DC Conductor Resistance at 20°C (Ω/km)	Max. DC Conductor Resistance at 90°C (Ω/km)	Reactance at 50Hz (Ω/km)	AC Impedance at 90°C (Ω/km)	Max. Arm Resistance at 20°C (Ω/km)
2 CORE	1.5*	0.6	0.9	8.5	13.0	415	12.1	15.428	0.104	15.428	10.7
	2.5*	0.7	0.9	10	14.5	495	7.41	9.448	0.101	9.448	8.8
	4*	0.7	0.9	11	15.5	575	4.61	5.878	0.099	5.878	7.9
	6*	1	0.9	12.5	17.0	658	3.08	3.927	0.094	3.925	7.0
	10*	1	0.9	14.0	19.0	828	1.83	2.333	0.093	2.335	6.0
	16	1	1.25	16.0	21.5	1005	1.15	1.466	0.088	1.469	3.8
	25	1	1.25	15.5	21.2	1105	0.727	0.927	0.082	0.93	3.7
	35	1	1.6	17.5	24.0	1555	0.524	0.668	0.077	0.673	2.5
	50	1	1.6	20.0	26.5	1855	0.387	0.494	0.076	0.5	2.3
	70	1.1	1.6	23.0	30.0	2455	0.268	0.342	0.075	0.349	2.0
	95	1.1	2.0	26.0	34.0	3345	0.193	0.247	0.074	0.258	1.4
	120	1.2	2.0	29.0	37.0	3898	0.153	0.196	0.072	0.209	1.3
	150	1.4	2.0	32.0	40.0	4645	0.124	0.16	0.073	0.176	1.2
	185	1.6	2.5	36.0	45.5	5945	0.0991	0.128	0.073	0.148	0.82
	240	1.7	2.5	40.0	50.0	7345	0.0754	0.099	0.072	0.122	0.73
	300	1.8	2.5	44.0	54.5	8695	0.0601	0.08	0.072	0.107	0.67
	400	2	2.5	49.5	60.0	10745	0.047	0.064	0.071	0.096	0.59
3 CORE	1.5*	0.6	0.9	9.0	13.5	423	12.1	15.428	0.104	15.428	10.2
	2.5*	0.7	0.9	10.5	15.0	544	741	9.448	0.101	9.448	8.2
	4*	0.7	0.9	11.5	16.5	644	4.61	5.878	0.099	5.878	7.5
	6*	0.7	0.9	13.0	17.5	738	3.08	3.927	0.094	3.925	6.6
	10*	0.7	1.25	15.0	20.5	1085	1.83	2.333	0.093	2.335	4.0
	16	0.7	1.25	17.0	22.5	1313	1.15	1.466	0.088	1.469	3.6
	25	0.9	1.6	20.0	26.5	1803	0.727	0.927	0.082	0.93	2.5
	35	0.9	1.6	22.0	29.0	2202	0.524	0.668	0.077	0.673	2.3
	50	1	1.6	22.5	29.5	2453	0.387	0.494	0.076	0.5	2.0
	70	1.1	1.6	26.0	33.0	3202	0.268	0.342	0.075	0.349	1.8
	95	1.1	2.0	30.0	38.0	4455	0.193	0.247	0.074	0.258	1.3
	120	1.2	2.0	33.0	41.5	5305	0.153	0.196	0.072	0.209	1.2
	150	1.4	2.5	37.0	46.5	6705	0.124	0.16	0.073	0.176	0.78
	185	1.6	2.5	41.0	51.0	8052	0.0991	0.128	0.073	0.148	0.71
	240	1.7	2.5	46.0	56.0	9953	0.0754	0.099	0.072	0.122	0.63
	300	1.8	2.5	51.0	61.0	12053	0.0601	0.08	0.072	0.107	0.58
	400	2.0	2.5	57.0	67.5	14803	0.047	0.064	0.071	0.096	0.52
4 CORE	1.5*	0.6	0.9	10	14.8	522	12.1	15.428	0.104	15.428	9.5
	2.5*	0.7	0.9	11.5	16.0	618	7.41	9.448	0.101	9.448	7.7
	4*	0.7	0.9	13	17.8	725	4.61	5.878	0.099	5.878	6.8
	6*	0.7	1.25	14.5	20.0	985	3.08	3.927	0.094	3.925	4.3
	10*	0.7	1.25	16.5	22.0	1255	1.83	2.333	0.093	2.335	3.7
	16	0.7	1.25	19	24.5	1635	1.15	1.466	0.088	1.469	3.2
	25	0.9	1.6	22	28.5	2145	0.727	0.927	0.082	0.930	2.3
	35	0.9	1.6	24.5	31.5	2645	0.524	0.668	0.077	0.673	2
	50	1.0	1.6	26	33.2	3103	0.387	0.494	0.076	0.500	1.8
	70	1.1	2.0	30.5	39.2	4405	0.268	0.342	0.075	0.349	1.2
	95	1.1	2.0	34.5	43.2	5653	0.193	0.247	0.074	0.258	1.1
	120	1.2	2.5	38.5	48.6	7252	0.153	0.196	0.072	0.209	0.76
	150	1.4	2.5	42.5	53.0	8553	0.124	0.16	0.073	0.176	0.68
	185	1.6	2.5	47.5	58.0	10304	0.0991	0.128	0.073	0.148	0.61
	240	1.7	2.5	53.5	64.5	12895	0.0754	0.099	0.072	0.122	0.54
	300	1.8	2.5	59.0	70.3	15545	0.0601	0.08	0.072	0.107	0.49
	400	2.0	3.15	66.5	79.8	20245	0.047	0.064	0.071	0.096	0.35

Storage of Fire Survival Cables

Fire survival cables, also known as fire-resistant or fire-resistant cables, are essential in ensuring that critical electrical systems remain operational in the event of a fire. These cables are designed to withstand high temperatures and maintain electrical continuity even under fire conditions. Proper storage and handling of these cables are crucial for their effectiveness and longevity. Here's how to store them properly:

1. Keep in Original Packaging

- Store the cables in their original, unopened packaging until they are ready to be installed. The packaging helps protect the cables from physical damage, moisture, and contaminants.

2. Store in a Dry, Cool Environment

- **Temperature**: Fire survival cables should be stored in a cool, dry environment. Excessive heat or cold can degrade the materials over time. The ideal temperature range is typically between 10°C to 25°C (50°F to 77°F).
- **Humidity**: The storage area should be low in humidity to avoid moisture absorption, which can damage the insulation and compromise the fire-resistance properties.

3. Avoid Direct Sunlight

- Prolonged exposure to direct sunlight can damage the outer insulation and may degrade the fire-resistant properties of the cable. Store cables in a shaded area or in a space where sunlight does not directly hit them.

4. Keep Away from Chemicals

- Store fire survival cables away from aggressive chemicals or solvents, as they may cause the insulation material to break down. This is particularly important for cables with rubber or plastic insulation.

5. Avoid Physical Damage

- Fire-resistant cables should be stored in a manner that prevents them from being crushed or subjected to excessive mechanical stress. Avoid stacking heavy objects on top of cable reels or coils to prevent deformation or damage to the cables.

6. Use Cable Drums or Coils

- If the cables are stored on reels, drums, or coils, make sure the reels are placed on a flat surface to avoid uneven winding or tangling. When coiled, the cable should not be bent at sharp angles, as this can damage the insulation or the internal conductors.

7. Label and Track Expiry Dates (If Applicable)

- Some fire-resistant cables may have an expiry date or a recommended shelf life, which ensures that the cable's fire-resistant properties are intact. Check the manufacturer's guidelines regarding shelf life and store cables in a way that ensures older stock is used first.

8. Fire Safety

- Even though these cables are designed to withstand fire, they should still be stored in a fire-safe area, away from any sources of heat or fire hazards. It is also a good idea to store them in a fireproof cabinet or area for added safety.

By following these storage recommendations, you can ensure that fire survival cables remain in optimal condition and perform as intended when needed most.

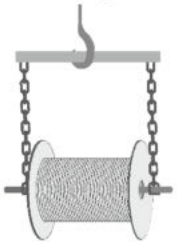
INSUCON

RECOMMENDATIONS FOR STORAGE AND INSTALLATION OF CABLES

HANDLING AND STORAGE

Handling at site: While unloading the cable drums certain precautions are to be taken for ensuring the safety of the cable.

WRONG



CORRECT

When using a lift or crane use a spreader bar longer than the overall drum width, just above the drum flanges. Without a spreader bar this will lead to bending of drum flanges crushing and damaging the cable.

WRONG

CORRECT

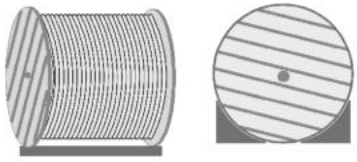
When unloading from the truck, an inclined ramp should be used to lower the drum. Do not drop the drum directly from the truck as it may lead to the damage of the drum and subsequently the cable.

WRONG

CORRECT

While using forklift for handling or shifting the drum, the drum should be perpendicular to the forks, rather than parallel. Do not allow the forks to be in contact with the cable.

WRONG



CORRECT

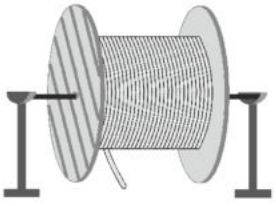
STORAGE

Cable drums should be stored on plain ground without any hard stones projecting above the surface and dry place away from direct sunlight and rain . All cable drums should be stored with the battens intact, with sufficient space in between the drums. Ensure stoppers for every drum to avoid the drum movement after storage. Cable drums should not be stored one above the other.

INSTALLATION AND LAYING

While laying of cables special care has to be taken. The cable end should be pulled with pulling eye only after mounting the drum on the jacks. Do not keep the drum on its flange while pulling the cable. This will result in bird caging (twists and deformation of cable) and armour swelling.

WRONG



CORRECT

WRONG

CORRECT

Minimum Bending Radius:		
Cable Type	Single Core	Multi Core
HT Cable	20xD	15xD
LT Cable	15xD	12xD

TESTING AT SITE

After the cable is installed before commissioning, it should be tested for DC High voltage. The recommended voltage and duration will be as per IS:1255. Megger, continuity and cross continuity to be checked on each core before and after laying.

INSUCON

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