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Voltimum Webinar

Cable Fire Safety – Making the Right Choice

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Cable Fire Safety – Making the Right Choice

Agenda

+ Europacable
+ Scope of webinar – typical relevant applications
+ Cable and material types – PVC and LSHF materials
+ Historic fires and their impact on regulations
+ Effects of smoke – visibility, toxicity, escape, firefighting
+ Fire propagation – PVC and LSHF cables – CPR classifications
+ Economic benefits of using LSHF cables
+ Environmental Impact of LFH vs PVC Cables
+ Durability of LSHF vs PVC Cables
+ Local regulations for the use of LSHF Cables
+ Summary and Conclusion

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Introducing Europacable

The voice of Europe's leading wire and cable manufacturers

Member Companies & Partners

National Associations

Associated Industry Partners

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Introducing Europacable
What we do

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Scope of Typical Applications

- **Public buildings**
  - Schools, hospitals, shopping centres, hotels, cinemas, theatres
- **Residential buildings**
  - Apartment blocks, care homes, student accommodation
  - *Not specifically covered: single occupancy houses and other similar dwellings*
- **Transport infrastructure**
  - Railway stations, metro stations, airports, tunnels
- **High-risk installations**
  - Data centres, industrial control rooms, power plants

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Scope of Cable Applications

- **Higher densities of cables**
  - Multiple cables, exposed to fire
- **Power distribution**
  - Supplies to buildings, distribution within buildings
- **Final circuit wiring**
  - Cables supplying sockets, equipment, lighting
- **Communications cables**
  - Metallic and optical fibre network cables, control cables

Material Types

- **PVC – Polyvinyl Chloride**
  - Sheathing / jacket
  - Insulation
  - Whole cable: compliant with single flame test EN 60332-1-2
- **LSHF – Low Smoke Halogen Free**
  - Sheathing / jacket and insulation
  - May be called LSH, LSF, OHLS, OHLS, LSZH, and other terms
  - Compliant with acidic gases tests on insulation and sheathing materials
  - Whole cable: compliant with smoke emission test EN 61034-2
  - Whole cable: compliant with single flame test EN 60332-1-2

Historic Fires and Regulatory Changes

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+ **King's Cross Station Fire (1987, UK)**

  31 fatalities

  Fire started by a lit match on a wooden escalator

  Highlighted need for safer materials in public spaces

+ **Mont Blanc Tunnel Fire (1999, France/Italy)**

  39 deaths

  Led to stricter regulations for tunnels and underground stations

  Emphasized use of LSHF cables

+ **Grenfell Tower Fire (2017, UK)**

  72 deaths

  Exposed shortcomings in construction practices and fire safety standards

+ **Dusseldorf Airport Fire (1996, Germany)**

  17 fatalities

  Fire started by hot work spreading to insulation

  PVC and other cables became involved

+ **Notre-Dame Cathedral Fire (2019, France)**

  No fatalities

  Historic building loss

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Smoke Emission

+ LSHF Cables
  - Emit lower levels of smoke
  - Maintain visibility during a fire
  - Reduce risk of smoke inhalation
  - Important for evacuation scenarios
+ PVC Cables
  - Produce significant amount of dense smoke
  - Reduced visibility during a fire
  - Could hinder evacuation efforts
  - Could hinder firefighting efforts

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Effects of Smoke

- **Visibility**
  - Ability of occupants to see easily
- **Toxicity**
  - Components of smoke have detrimental effects on occupants
- **Ability to Escape**
  - Combination of visibility and toxicity can reduce ability to escape
- **Ease of rescue / firefighting**
  - Fire brigades may be hindered and delayed

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Visibility

+ Challenges for Occupants / Visitors
  - Difficult to identify exits / signs
  - Unfamiliar buildings
  - Smoke may enter escape routes
+ Challenges for Emergency Responders
  - Navigation of the building becomes difficult

Advantages of LSHF Cables for Visibility

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+ Reduced Smoke Production
  - LSHF cables produce significantly less smoke compared to PVC cables
  - Smoke is light grey and less dense
+ Improved Light Transmittance
  - Better visibility in affected areas
  - Helps occupants locate exits quickly
+ Enhanced Safety During Evacuation
  - Reduces panic and promotes orderly evacuations
  - Critical for safe and timely evacuation
+ Support for Emergency Responders
  - Improved visibility aids firefighters
+ Significant Impact on Fire Safety

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Effects of Smoke Toxicity

- Components of smoke - gases
  - Carbon monoxide, carbon dioxide, nitrogen oxides, hydrogen chloride, hydrogen cyanide, formaldehyde, VOCs, etc.
- Immediate Coughing and Eye Watering
  - Breathing smoke may cause a number of immediate respiratory effects
  - Slows down escape, disorientation, debilitation
- Medium term effects
  - Poisoning effects of carbon monoxide and similar components
- Medical treatment needed
  - Almost all affected by smoke will need prompt medical treatment

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Effects of Corrosivity

- Acidic gases are not just bad for health
- Corrosive effect on electronics and related equipment
  - Acidic gases (HCl etc.) dissolve readily in moisture or water
  - Acidic moisture can attack sensitive electronic parts and joints
  - Devices and equipment may no longer function
  - Devices and equipment may have shorter lifespans
  - Cleaning of devices and equipment is difficult
- Interruption to normal operations
  - Services such as data centres may be taken offline for long periods

Fire Propagation

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- **PVC cables**
  - Generally perform well for basic fire spread
- **LSHF cables**
  - Generally perform better than PVC cables for fire spread
- **CPR Classification**
  - CPR provides designers with additional information and choice
- **Fire engineering**
  - Fire brigades may be hindered and delayed

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Benefits of LSHF Flame Retardant Cables

+ Reduced fire propagation
+ Reduced smoke production
+ Lower toxicity

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Economic Impact of LSHF Cables

- Reduced impact on health and safety
  - Reduced fatalities and injuries
- Reduced damage and business interruption
  - Acidic gases can have detrimental effects on equipment
  - Minimise recovery time after a fire
- Offers better risk rating
  - As part of a risk management programme
  - Better risk profile can attract lower insurance premiums
- Long term investment
  - Recurrent savings over the life of the facility
  - Prepared for any increasing regulatory requirements

Long-Term Cost Savings

- Initial Cost Comparison
  - LFH cables have a higher initial cost than PVC cables
- Long-Term Savings
  - Reduced risk of fire-related damage
  - Lower insurance premiums
- Risk Management
  - LFH cables classified under CPR classification Cca
  - Enhanced safety in fire situations
- Financial Planning
  - Businesses benefit from prioritizing long-term financial planning
  - Significant cost savings over time

Environmental and Corporate Responsibility

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- Importance of Corporate Responsibility
  - Increasing significance in today's business landscape
  - Commitment to sustainability
- Reputation Enhancement
  - Attracts environmentally conscious customers
  - Potential financial incentives
- Benefits of Choosing LSHF Cables
  - Demonstrates environmental stewardship
  - Ensures well-being of employees and customers
- LSHF Cables vs PVC Cables
  - LSHF cables do not contain or release harmful materials such as phthalates and dioxin

Environmental Concerns with PVC Cables

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+ Durability and Cost-effectiveness
  - PVC cables are known for their durability
  - They are flexible and cost-effective
+ Environmental Concerns
  - PVC contains halogens like chlorine
  - Burning PVC releases toxic gases such as dioxins and hydrogen chloride
  - Dioxins are highly toxic and can cause cancer and reproductive issues
+ Non-biodegradable Nature
  - PVC persists in the environment for a long time
  - Disposal in landfills can leach harmful chemicals into soil and groundwater
+ Production Hazards
  - Production involves hazardous chemicals

Environmental Benefits of LSHF Cables

- Environmental Impact
  - LSHF cables do not contain halogens
  - No toxic gases released when burned
- Safety Benefits
  - Safer for human health and the environment
  - Less smoke production during fire
  - No corrosive gases emitted
- Protection of Equipment
  - Reduces risk of damage to electronic equipment and infrastructure
- Lifecycle Impact
  - Do not contribute to formation of dioxins and other toxic substances
- Recycling and Reuse

Durability and Use

- Local fire regulations
  - Fire requirements are set locally around European countries
  - Countries may reference particular CPR classifications – others may not
  - Requirements are likely to be application specific
  - Some regulations may set mandatory requirements
- Installation standards
  - Installation standards (e.g., wiring codes) may recommend / specify
  - Application-specific standards and guidance, e.g., hospitals, schools
  - Recommendations / specifications may refer to CPR classifications

Durability of PVC Cables

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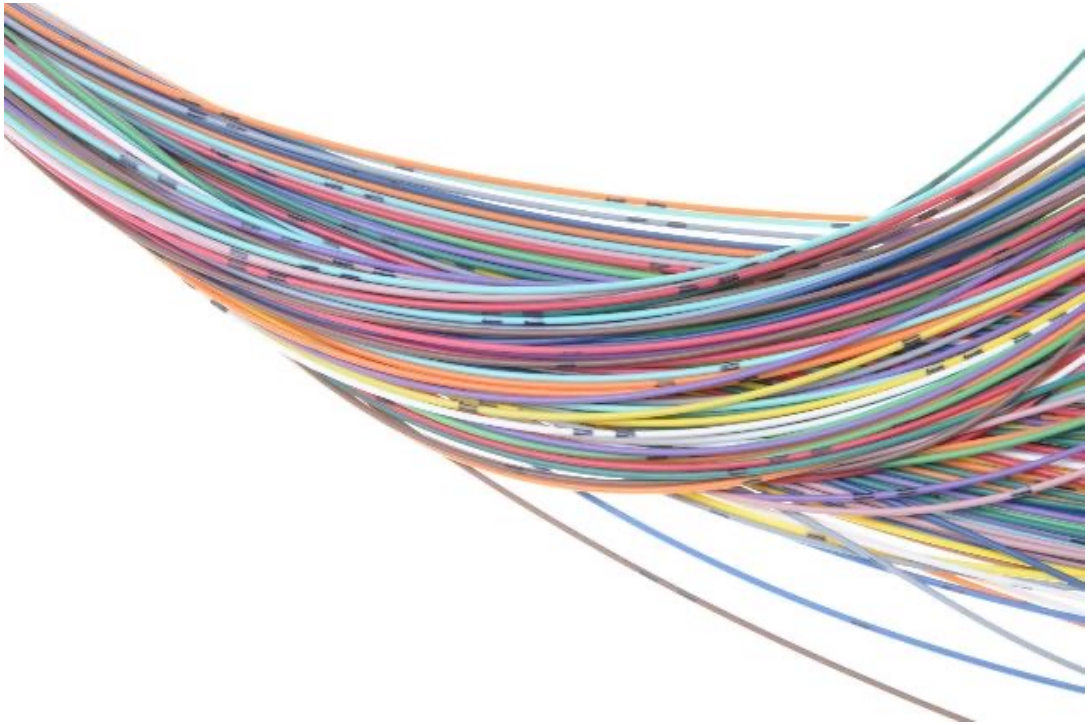
- Resistant to moisture, chemicals, and UV radiation
- Suitable for both indoor and many outdoor applications
- Reliable in general use
- Flexibility and mechanical stress resistance
- Commonly used in industrial settings
- Suitable for buried applications



Durability of LSHF Cables

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+ Highly durable but less flexible than PVC cables
+ Designed with safety in mind
+ Made from materials without halogens
+ Produce less smoke and corrosive gases when exposed to fire
+ Well-suited to indoor uses
+ May not perform as well in extremely harsh environments
+ Better reaction to fire and resistant to chemicals and mechanical stress

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Local Regulations and LSHF Cables

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- Installation standards
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CPR Classifications and LSHF Cables

- Classes B2ca and Cca – subclasses s1a, a1
  - Higher classes steer specifiers towards LSHF cables
  - Higher sub-classes for smoke and acid indicate LSHF cables
  - PVC cables unlikely to be available with these classes
- Classes Dca and Eca
  - PVC cables should achieve these classes
  - Higher performing LSHF cables would also perform to these levels

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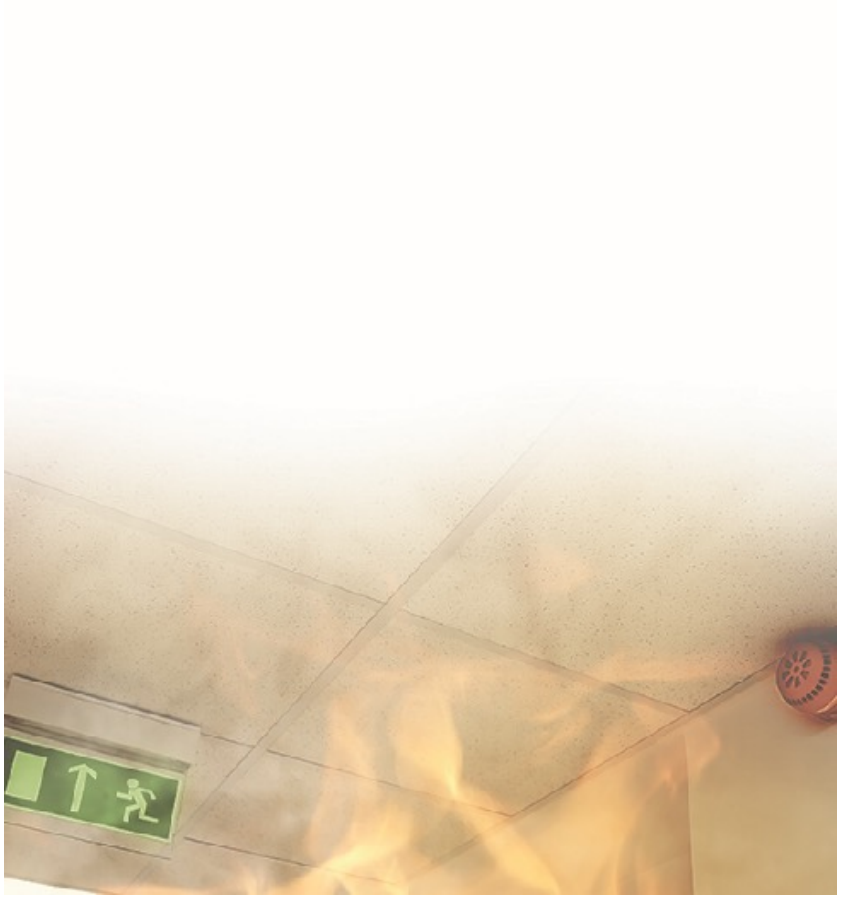

Specific Applications Suited for LSHF Cables

+ Public Buildings
  - Schools, hospitals, airports, and shopping centres
  - Ensures minimal smoke and corrosive gas emissions during a fire
  - Facilitates safer evacuations
+ Residential Buildings
  - Recommended in multi-storey residential buildings
  - Enhances fire safety
  - Protects residents from smoke inhalation and corrosive gases
+ Transport Infrastructure
  - May be mandated in tunnels, underground stations, and other transport facilities
  - Ensures safety in confined spaces
+ High-Risk Areas

Conclusions

+ Enhanced Safety Compliance
  LSHF cables meet higher safety standards
  Compliance with regulations can avoid fines and penalties
+ Reduced Damage and Maintenance Costs
  LSHF cables are more durable and require less frequent repairs
  Lower long-term maintenance expenses
+ Better Insurance Risk
  Enhanced safety features reduce risk
  Insurance companies offer lower premiums for safer installations
+ Long-term Savings and Benefits
  Initial investment is higher but offset by long-term savings
+ Increased Adoption

Further Information

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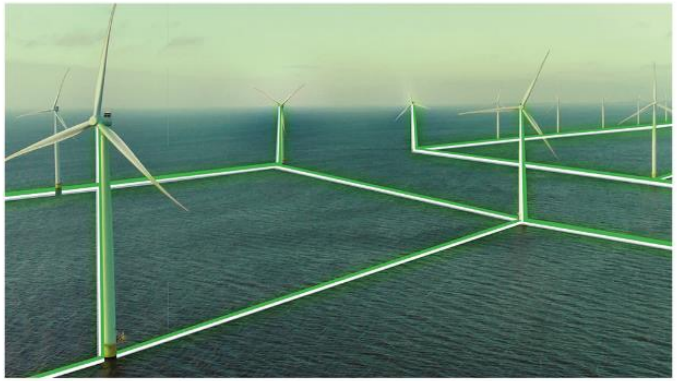

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