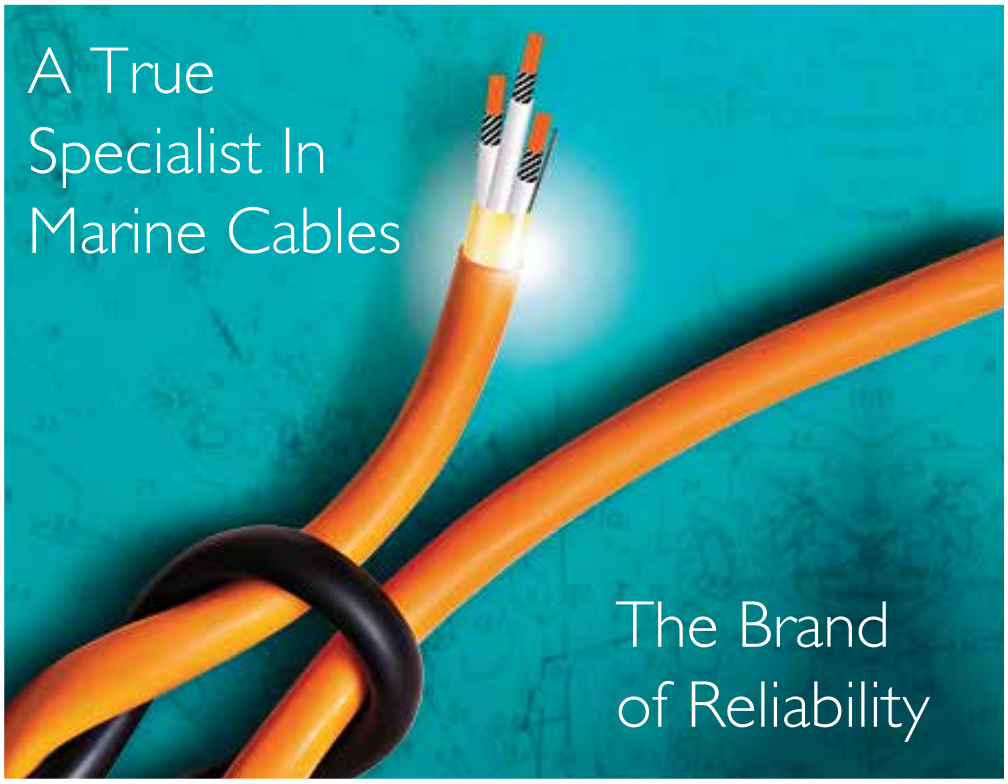
Improving the
fire-safety
of the ships.
Exporting cables
to all corners
of the globe.




# MARINE
## CABLES

HELKAMA
Finland

# LKSM-HF

Armoured power and control cable 0.6 / 1kV


| DESIGN | STANDARDS |
|---|---|
| 1. Conductor<br>- Stranded copper conductor | IEC 60092-353, design |
| 2. Insulation<br>- XLPE plastic | IEC 60228, class 2 ≤ 10mm²<br>class 5 ≥ 16mm² |
| 3. Bedding<br>- Filler tape | IEC 60092-351 |
| 4. Armour<br>- Copper wire braid, coverage > 90% | IEC 60092-350 |
| 5. Sheath<br>- Polyolefin plastic, SHF1<br>- Standard colour black, other colours on request | IEC 60092-359 |

## Application

For fixed installations on open decks in ships and other areas.

## Main characteristics

| | | |
|---|---|---|
| Rated voltage | AC 0.6 / kV (1.2kV)<br>DC 0.9 / 1.5kV (if voltage to earth does not exceed 0.9kV) | |
| Maximum conductor temperature | +90 °C | |
| Flame-retardant | IEC 60332-1-2<br>IEC 60332-3-22 | - test for single insulated wire and cable<br>- test for bunched wires and cables, category A |
| Halogen-free | IEC 60754 series | |
| Smoke emission | IEC 61034 series | |

Minimum recommended installation temperature: -15 °C
Lowest operation temperature: -40 °C

Flame retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

## GENERAL INFORMATION

**XLPE** stands for cross-linked polyethylene compound. It has excellent mechanical and electrical characteristics.
**SHF1** stands for thermoplastic compound. This material is halogen-free, highly flame retardant and has low smoke emission.
**SHF2** stands for oil resistant thermosetting compund. This material is halogen-free, highly flame retardant and low smoke emission.

### Oil resistance

Sheating material is oil resistant according to method IEC 60811-2-1 and requirements from IEC 60092-359/SHF2. The oil resistnace is demonstrated by immersion in IRM902 oil for 24th at 100°C

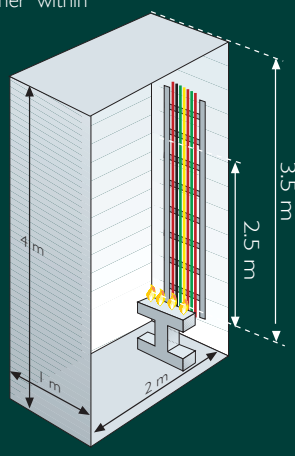
### Flame-retardant

To be flame-retardant, the cables must withstand the test specified in IEC standard 60332-3 or IEC 60332-1. Flame-retardant cables do not propagate fire, and are self-extinguishing.

**IEC 60332-3** is the test for bunched wires and cables and has three categories A, B and C, defined by different limits for flammable material and burning times. Burning time describes how long the burner is directed towards the bunch of cables. The requirement for passing the test is that after the burner has been removed the cables must extinguish themselves. Burning may not occur more than 2.5 m from the burner as shown in the figure.

### Test on bunched cables IEC 60332-3

Burning is allowed up to max. 2.5 meters from the burner within specified time.



# LKSM-FRHF

Fire-resistant armoured power and control cable 0.6 / 1kV


| DESIGN | STANDARDS |
|---|---|
| **1. Conductor**<br>- Stranded copper conductor<br>- Tinned stranded copper conductor on request | IEC 60092-353, design (class 5 on request) |
| **2. Insulation**<br>- Mica tape<br>- XLPE plastic | IEC 60228, class 2 |
| **3. Bedding**<br>- Separator tape | IEC 60092-351 |
| **4. Armour**<br>- Copper wire braid, coverage > 90%<br>- Tinned copper wire braid and galvanized steel wire braid on request | IEC 60092-350 |
| **5. Sheath**<br>- Polyolefin plastic, SHF1<br>- Standard colour orange, other colours on request | IEC 60092-359 |

## Application

For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

## Main characteristics

| | |
|---|---|
| Rated voltage | AC 0.6 / kV (1.2kV)<br>DC 0.9 / 1.5kV (if voltage to earth does not exceed 0.9kV) |
| Maximum conductor temperature | +90 °C |
| Flame-retardant | IEC 60332-1-2 -test for single insulated wire and cable<br>IEC 60332-3-22 -test for bunched wires and cables, category A |
| Fire-resistant | IEC 60331-21 series |
| Halogen-free | IEC 60754 series |
| Smoke emission | IEC 61034 series |

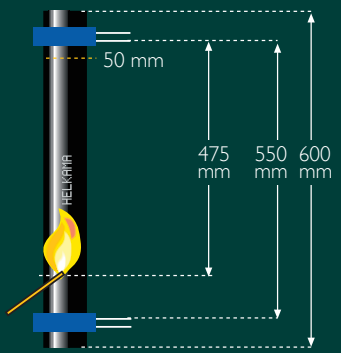
Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

- Flame retardant
- Fire-resistant
- Halogen-free
- Low smoke emission

All Helkama cables comply with the most severe requirements of category A.

| Category | Amount of burning material | Burning time |
|---|---|---|
| A | 7 litres/m | 40 min |
| B | 3.5 litres/m | 40 min |
| C | 1.5 litres/m | 20 min |

**EC 60332-1** is the test for single insu-lated wire and cable. Test procedure and requirements according to the picture below.




Min. 50 mm of the cable, measured from the upper support, must remain unburned after the specified time.

**Halogen-free**
Halogen-free refers to the absence of halogens, such as chlorine and fluorine, and is determined on the basis of halogen content and the acidity of gases of a cable.

**IEC 60754-1** determines the halogen content of the material. To meet the requirements as halogen-free the halogen content of the material may not exceed 0.5 % or 5 mg/g

**IEC 60754-2** determines the degree of acidity of gases evolved during combustion. The limit values are 4,3 for pH and 10 mikroS for conductivity.

# RFE-HF

Armoured instrumentation and communication cable 250V


| DESIGN | STANDARDS |
|---|---|
| 1. Conductor<br>- Stranded copper conductor<br>- tinned stranded copper conductor on request | IEC 60092-376, design |
| 2. Insulation<br>- XLPE plastic | IEC 60228, class 2 |
| 3. Twisted pair<br>- Two insulated cores twisted together to form a pair | IEC 60092-351 |
| 4. Armour<br>- Drain wire copper (in all sizes)<br>- Copper wire braid, coverage > 94%<br>- Tinned copper wire braid and galvanized steel wire braid | IEC 60092-350 |
| 5. Sheath<br>- Polyolefin plastic, SHF1<br>- Standard colour grey, other colours on request | IEC 60092-359 |

## Application

For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

## Main characteristics

| | | |
|---|---|---|
| Rated voltage | 150 / 250V (300V) | |
| Maximum conductor temperature | +90 °C | |
| Flame-retardant | IEC 60332-1-2 | -test for single insulated wire and cable |
| | IEC 60332-3-22 | -test for bunched wires and cables, category A |
| Halogen-free | IEC 60754 series | |
| Smoke emission | IEC 61034 series | |

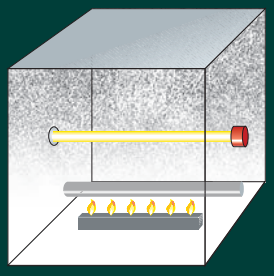
Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

| | |
|---|---|
| Flame retardant | ● |
| Fire-resistant | ○ |
| Halogen-free | ● |
| Low smoke emission | ● |

**Smoke emission**
refers to visibility in a fire. The greater the light trans-mittance, the better the visibility. When tested in accordance with IEC 61034-1 (test method) and IEC 61034-2 (test requirements) the smoke emission of a cable during fire must not exceed the following values.

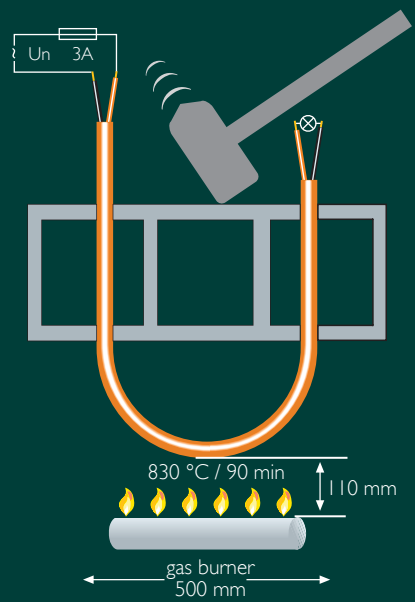
Requirements:
60 % light transmittance

27m³ cube smoke chamber



**Fire-resistant**
IEC 60331-1 test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0.6 / 1.0 kV and with an overall diameter exceeding 20 mm.

IEC 60331-2 test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0.6 / 1.0 kV and with an overall diameter not exceeding 20 mm.




Marine cable factory in
Kaarina, Finland.


# A true specialist in marine cables

Helkama specializes in the development and production of marine cables. Helkama's experience in this field goes back more than thirty years. The products' high technical quality is achieved through continuous development and support from clients.

Helkama has chosen to produce only halogen-free cables. They remarkably improve the fire safety of the ships by not emitting toxic fumes or thick smoke. In addition, no corrosive gases that could damage the ship and its equipment are emitted in case of fire. Using the latest technology, Helkama was able to reduce cable weight and size to a minimum and still maintain the quality. The halogen-free range of cables includes both flame-retardant (IEC 60332-3) and fire resistant (IEC 60331-21) cables. Helkama marine cables are approved by all major classification societies.

As a specialized and independent company focusing on service, Helkama has grown steadily by quickly responding to customers' needs.

# Other Types


**LKM - FRHF** Fire-Resistant Unarmoured Power Cable 0.6 / 1kV


**RFA- HF** Screened Instrumentation and Communication Cable 250V


**LKEM - HF** Switchboard Wire 0.6 / 1kV


**LKAM - FRHF** Fire-Resistant Screened Power and Control Cable 0.6 / 1KV


**RFA - HF(i)** Collectively and Pair Screened Instrumentation and Communication Cable 250V


**LKMM - HF** Unarmoured Power Cable with Extruded Filler 0.6 / 1KV


**LKM - HF** Unarmoured Control and Instrumentation Cable 250V


**RFE - FRHF** Fire-Resistant Armoured Instrumentation and Communication Cable 250V


**LKSM - VFD** Armoured Power and Control Cable with Improved EMC Screening 1.8 / 3KV


**LKSM - HF** Armoured (CY) Control and Instrumentation Cable 250V


**FXMSU** Optical Fibre Indoor / Outdoor Cable

ISO 9001
ISO 14001

CERTIFIED ORGANIZATION

# Advantages

- Improves fire safety of the ships
- Will not generate thick smoke and toxic fumes during fire condition
- Will not produce corrosive gases that could affect electronic parts of the ship
- Flame retardant and self extinguishing
- Fire-resistant is optional
- High temperature rating (-40°C to +90°C)
- Exposure to UV and corrosive environment is possible
- More flexible compared to other brands
- Uses 99.9% pure copper
- Approved by major naval classification societies
- With 3rd party certificates

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