EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB00007DF

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV AS under the authority of the Government of Norway.

This is to certify:

That the Fixed fire detection and fire alarm systems components for control stations, service spaces, accommodation spaces, cabin balconies, machinery spaces and unattended machinery spaces: Cables

with type designation(s)
LKSM-FRHF, RFE-FRHF / RFE-FRHF(i), RFE-EMC-FRHF / RFE-EMC-FRHF(i), RFE-FRHF+WSR / +WJR / RFE-FRHF(i)+WSR / +WJR 250V, LKSM-FRSHF2, RFE-FRSHF2 / RFE-FRSHF2(i), RFE-EMC-FRSHF2 / RFE-EMC-FRSHF2(i), RFE-FRSHF2+WSR / +WJR / RFE- FRSHF2(i)+WSR / +WJR 250V

Issued to
Helkama Bica Oy
Hanko, **Finland**

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2020/1170,**
item No. MED/3.51i. SOLAS 74 as amended, Regulation II-2/7 & X/3, 1994 HSC Code 7, 2000 HSC Code 7, FSS Code 9, IGF Code 11 and IMO MSC.1/Circ.1242

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2026-05-17**.

Issued at **Høvik** on **2021-05-18**

DNV local station:
Finland NB

Approval Engineer:
Hanwee Low

Notified Body
No.: **0575**

for **DNV AS**

Sverre Olav Bergli
Head of Notified Body

The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

Type: **LKSM-FRHF, LKSM-FRSHF2**
Construction:

Conductors: Plain (optional tinned) stranded copper class 2 or class 5
Core insulation: Mica + XLPE
Inner covering: Tape
Metal covering: Plain (optional tinned) copper wire braid
Outer sheath: SHF1 or SHF2

No of cable elements:	conductor cross-section mm^2
2, 3, 4, 7, 8, 10, 12, 14, 16, 19, 24, 27, 30, 32, 37 cores	0,75

Type: **RFE-FRHF & RFE-FRHF(i) 250 V and RFE-FRSHF2 & RFE-FRSHF2(i) 250 V**
Construction:

Conductors: Plain (optional tinned) stranded copper class 2 or class 5
Core insulation: Mica tape + XLPE
Individual screen: (i) types: Polyester coated aluminium with tinned copper drain wire
Inner covering: Tape
Metal covering: Plain (optional tinned) copper wire braid
Outer sheath: SHF1 or SHF2

No of cable elements:	conductor cross-section mm^2
1, 2, 3, 4, 7, 8, 10, 12, 14, 16, 19, 24, 27, 30, 32, 37 pairs	0,75 – 1,0 - 1,5 – 2,5
1 Triple	0,75 – 1,0 - 1,5 – 2,5
1 Quad	0,75 – 1,0 - 1,5 – 2,5

Type: **RFE-EMC-FRHF & RFE-EMC-FRHF(i) 250 V, RFE-EMC-FRSHF2 & RFE-EMC-FRSHF2(i) 250 V**
Construction:

Conductors: Plain (optional tinned) stranded copper class 2 or class 5
Core insulation: Mica + XLPE
Individual screen: ((i) variants) Polyester coated aluminium with tinned copper drain wire
Inner covering: Tape
EMC screen: Copper tape, coverage 100%
Metal covering: Plain (optional tinned) copper wire braid
Outer sheath: SHF1 or SHF2

No of cable elements:	conductor cross-section mm^2
1, 2, 3, 4, 7, 8, 10, 12, 14, 16, 19, 24, 27, 30, 32, 37 pairs	0,75 1 1,5 2,5
1, 2, 3, 4, 7, 8, 10, 12, 14, 16, 19, 24, 27, 30, 32, 37 triples	0,75 1 1,5 2,5
1 quad	0,75 1 1,5 2,5

Type:	**RFE-FRHF+WSR/WJR,** **RFE-FRHF(i)+WSR/WJR** **RFE-FRSHF2+WSR/WJR,** **RFE-FRSHF2(i)+WSR/WJR**
Construction:	
Conductors:	Plain (optional tinned) stranded copper class 2 or class 5
Core insulation:	Special grade Mica tapes + XLPE
Individual screen: ((i) variants)	Polyester coated aluminium with tinned copper drain wire
Inner covering:	Tape
Metal covering:	Plain (optional tinned) copper wire braid
Outer sheath:	SHF1 or SHF2

No of cable elements:	conductor cross-section mm^2
1, 2, 3, 4, 7, 8, 10, 12, 14, 16, 19, 24, 27, 30, 32, 37 pairs	0,75 – 1,0 - 1,5 – 2,5
1 Triple	0,75 – 1,0 - 1,5 – 2,5
1 Quad	0,75 – 1,0 - 1,5 – 2,5

Application/Limitation

This type of cable is fire resistant in accordance with IEC Publication 60331.

The requirements of SOLAS Amendments Chapter II-1, Part D, Reg. 45, 5.2 (provision to be taken to limit Fire Propagation along Bunches of Cables or Wires) are fulfilled without any additional measures.

Type Examination documentation

Tests carried out

-EN 60332-1-2:2004+A1:2015 and A11:2016
-IEC 60332-1-2:2004+A1:2015
-IEC 60092-376:2017

Standard	Release	General description	Limitation
DNVGL-CP-0399	2016-03	Class Programme Electric cables	
IEC 60092-376	2017-05	Electrical installations in ships - Part 376: Cables for control and instrumentation circuits 150/250 V (300 V)	
IEC 60331-1/2	2009-05	Fire resistance / Circuit integrity – Test for method for fire with shock at temperature of at least 830ºC for cables rated up to and including 0,6/1 kV	180 min
IEC 60331-21	1999-04	Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to and including 0,6/1,0 kV	Minimum 90 min. flame application + 15 min. cooling period.
IEC 60332-3-22	2009-02	Tests on electric and optical fibre cables under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A	Bunch test Category A
IEC 60754-1	2011-11	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content	Low Halogen: <0,5% Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2013-07 2013-09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%

Marking of product

For identification to this type examination certificate the product is to be marked with:
- Manufacturer's name
- Type designation and fire-technical rating

Examples:

HELKAMA - size - LKSM-FRHF - 250 V - IEC 60331-1/2 - IEC 60332-3-22 – Lot No
HELKAMA - size - LKSM-FRSHF2 - 250 V - IEC 60331-1/2 - IEC 60332-3-22 – Lot No
HELKAMA - size - RFE-FRHF or RFE-FRHF(i) - 250 V - IEC 60331-1/2 - IEC 60332-3-22 or
HELKAMA - size - RFE-FRSHF2 or RFE-FRSHF2(i) - 250 V - IEC 60331-1/2 - IEC 60332-3-22 or
HELKAMA - size - RFE-EMC-FRHF - 250 V - IEC 60331-1/2 - IEC 60332-3-22 – Lot No or
HELKAMA - size - RFE-EMC-FRHF(i) - 250 V - IEC 60331-1/2 - IEC 60332-3-22 – Lot No or
HELKAMA - size - RFE-EMC-FRSHF2 - 250 V - IEC 60331-1/2 - IEC 60332-3-22 – Lot No or
HELKAMA - size - RFE-EMC-FRSHF2(i) - 250 V - IEC 60331-1/2 - IEC 60332-3-22 – Lot No or
HELKAMA - size - RFE-FRHF+WSR/WJR - 250 V - IEC 60331-1/2 - IEC 60332-3-22 – Lot No or
HELKAMA - size - RFE-FRHF(i)+WSR/WJR - 250 V - IEC 60331-1/2 - IEC 60332-3-22 – Lot No or
HELKAMA - size - RFE-FRSHF2+WSR/WJR - 250 V - IEC 60331-1/2 - IEC 60332-3-22 – Lot No or
HELKAMA - size - RFE-FRSHF2(i)+WSR/WJR - 250 V - IEC 60331-1/2 - IEC 60332-3-22 – Lot No

together with

- Mark of Conformity According to Article 10 of the Council Directive (MED)

END OF CERTIFICATE