

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Electric Power Cable**with type designation(s)
LKEM-HF 0,6/1 kV Switchboard wire

Issued to

Helkama Bica (Shanghai) Co. Ltd.
Shanghai 020, Chinais found to comply with
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards**Application :****General power and lighting. Control.**
Halogen free. Low smoke.**Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Voltage class (kV) 0,6/1**
Temp. class (°C) 90This Certificate is valid until **2019-07-15**.Issued at **Høvik** on **2016-03-08**DNV GL local station: **Shanghai**Approval Engineer: **Ivar Bull**for **DNV GL**.....
Marit Laumann
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Job Id: **262.1-001606-4**
Certificate No: **TAE000006A**
Revision No: **1**

Product description

Type: LKEM-HF 0,6/1 kV Switchboard wire

Construction:

Conductor: Plain, stranded, annealed copper

Core insulation: HF90

No of cores:	Cross sectional area [mm ²]
1	1 - 300

Application/Limitation

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 Approval documentation

Data sheet: Specification HBKQ 9.SPEC.33 dated 2010-08-03.
Main drawing, appendix1 for HBKQ 9.SPEC.33 dated 2010-08-03.
Technical specification, appendix2 for HBKQ 9.SPEC.33 dated 2011-01-12..

Test reports: Helkama test document LKEM-HF/TT1_0 dated 1999-11-01.
Ozone resistance test, FIMKO dated 1999-12-27.
CT07-0310-1 dated 2007-04-09

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-360	2014-04	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	
IEC 60092-353	2011-08	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	0,6/1 kV
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

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Standard	Release	General description	Limitation
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 $\geq 60\%$

Marking of product

HELKAMA 3 – LKEM-HF – Size – 0,6/1 kV – IEC 60332 Cat. A – Lot no.

Periodical assessment

The scope of the Periodical assessment is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the Periodical assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routine Tests (RT) checked
- (if RT- and PST-test reports are not available, tests according to PST and RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensure traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment shall be performed at least every second year.

END OF CERTIFICATE