



Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

This certificate is issued to:

| | | |
|------------------------|--|---|
| PRODUCER | Helkama Bica Oy, Finland Lakimiehenkatu 4 FI- 20780 Kaarina Finland | |
| DESCRIPTION | Multi core instrument cables with stranded plain annealed Cu conductors (option tinned Cu) with XLPE insulation Flame retardant, fire resistant, halogen free and low smoke | |
| TYPES | LKM-FRHF 250V LKM-FRSHF2 250V LKSM-FRHF 250V LKSM-FRSHF2 250V LKAM-FRHF 250V LKAM-FRSHF2 250V | Unarmoured Cu- or CuSn-wire braid Armoured Al/pest-tape Collectively screened |
| APPLICATION | Fixed control and instrumentation cable installations in marine, offshore and industrial use. | |
| STANDARDS | Construction: | IEC 60092-376: 2017 and IEC 60092-350: 2008 |
| | Conductor: | IEC 60228: 2004 Annealed stranded copper wire plain or tinned to class 2 |
| | Insulation: | IEC 60092-360: 2014 |
| | Armour: | Copper wire braid plain or tinned (LKSM-) |
| | Sheathing: | IEC 60092-360: 2014 |
| Certificate No. | 13/20037 (E1) | |
| Issue Date | 26 October 2017 | |
| Expiry Date | 04 Dezember 2021 | |
| Sheet | 1 of 3 | |


 Jochen Körner
 Hamburg Technical Support Office
 Lloyd's Register
 Lloyd's Register EMEA
LR031.1.2013.12

Jochen Körner
 Hamburg Technical Support Office
 Lloyd's Register EMEA

Lloyd's Register EMEA
71 Fenchurch Street, London EC3M 4BS

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ADDITIONAL TESTS

| | |
|---------------------|---|
| Flame retardancy | IEC 60332-1-2: 2004 IEC 60332-3-22: 2009 |
| Fire resistant | IEC 60331-1: 2009 IEC 60331-2: 2009 |
| Acid gas emission | IEC 60754-1: 2011 |
| pH and conductivity | IEC 60754-2: 2011 |
| Fluorine content | IEC 60684-2: 2011 |
| Smoke emission | IEC 61034-1: 2013 IEC 61034-2: 2013 |

| | |
|------------------------|--------------|
| Helkama specification: | HBKQ-9 spec. |
| LKM-FRHF 250V | 63 |
| LKM-FRSHF2 250V | 124 |
| LKSM-FRHF 250V | 64 |
| LKSM-FRSHF2 250V | 126 |
| LKAM-FRHF 250V | 67 |
| LKAM-FRSHF2 250V | 130 |

RATINGS

Rated Voltage $U_0/U (U_m)$: 150/250V (300V)
 Maximum conductor temperature: 90°C
 Minimum installation temperature: - 15 °C

| | |
|--|-------------------------|
| Range: | |
| Number of conductors: | Conductor cross section |
| 2, 3, 4, 5, 7, 10, 12, 14, 16, 19, 20, 24, 27, 32, 37, 61 | 0.75 |

| | |
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PLACES OF PRODUCTION Helkama Bica Oy, Finland Helkama Bica Oy
Lakimiehenkatu 4 Lasitehtaankatu 12
FI- 20780 Kaarina FI- 10960 Hanko
Finland Finland

Helkama Bica (Shanghai) CO., LTD
Plot 1-2, Minhang Export Processing Zone
No. 3111 Huan Cheng West Road
Fengxian District, Shanghai 201401, China

The Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.

If the specified standards are amended during the validity of this certificate, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply.

The Design Appraisal Document No. HTS/ETS 36041-17 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

Certificate No. 13/20037 (E1)
Issue Date 26 October 2017
Expiry Date 04 Dezember 2021
Sheet 3 of 3

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Design Appraisal Document

Lloyd's Register EMEA
Hamburg Technical Support Office
Am Sandtorkai 41
20457 Hamburg
Telephone +49 (0)40 328107-0 Fax +49 (0)40 328107-480
E-mail: hamburg-technical-support@lr.org

Date
26 October 2017

Please quote this reference number on all future communications
HPC1762033/36041-17/JK/KW

THE LLOYD'S REGISTER'S TYPE APPROVAL SYSTEM, 2017
ISSUED TO: HELKAMA BICA OY, KAARINA, FINLAND
FOR: MULTICORE INSTRUMENTATION CABLE, LKM-..., LKSM-..., LKAM-...
TYPE APPROVAL CERTIFICATE NO. 13/20037 (E1)

The undernoted documents have been reviewed for compliance with the requirements of the Lloyd's Register's Type Approval System Procedure TA14 and this Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

| | | |
|------------------|---|------------|
| Unnumbered | Application checklist | 27.02.2017 |
| HTS/ETS 28622-13 | Marine Design Appraisal Document HPC 13210193 | 04.12.2017 |
| HBKQ-9, SPEC 63 | Cable Data Sheet LKM-FRHF , | 26.09.2017 |
| HBKQ-9, SPEC 124 | Cable Data Sheet LKM-FRSHF , | 26.09.2017 |
| HBKQ-9, SPEC 64 | Cable Data Sheet LKSM-FRHF , | 26.09.2017 |
| HBKQ-9, SPEC 126 | Cable Data Sheet LKSM-FRSHF , | 26.09.2017 |
| HBKQ-9, SPEC 67 | Cable Data Sheet LKAM-FRHF , | 26.09.2017 |
| HBKQ-9, SPEC 130 | Cable Data Sheet LKAM-FRSHF , | 26.09.2017 |

TEST REPORTS

| | | |
|----------|----------------------------------|------------|
| 6F007714 | FTIR Analysis on Cables, 6 pages | 26.04.2016 |
|----------|----------------------------------|------------|



Jochen Körner
Senior Specialist
Electrotechnical Systems
Hamburg Technical Support Office
Lloyd's Register EMEA
T +49 (0)40 328107-443
E jochen.koerner@lr.org

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

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Lloyd's Register EMEA
Hamburg Technical Support Office
Am Sandtorkai 41
20457 Hamburg
Telephone +49 (0)40 328107-0 Fax +49 (0)40 328107-480
E-mail: hamburg-technical-support@lr.org

Date
26 October 2017

Please quote this reference number on all future communications
HPC1762033/36041-17/JK/KW

Supplementary Type Approval Terms and Conditions

Type Approval certifies that a representative sample of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein. It does not mean or imply approval for any other use, nor approval of any product(s) designed or manufactured otherwise than in strict conformity with the said representative sample.

Type Approval is based on the understanding that the manufacturer's recommendations and instructions and any relevant requirements of the Rules and Regulations are complied with.

Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.

Lloyd's Register EMEA reserves the right to cancel or withdraw this Type Approval Certificate in accordance with the LR Type Approval System Procedure.

FINAL ACCEPTANCE OF ACTUAL ITEM(S) DEPEND(S) ON SATISFACTORY SURVEY AND TESTING

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Part 1

Subject: Electrical Equipment (Not Environmentally Tested)

Product: Cables Power

| Producer/Licence No. | Description of Product | | | | Cert. No. |
|--|--|--|--|--|---------------|
| | Type | Details of Approval | Application | Remarks | |
| Helkama Bica Oy, Finland Lakimiehenkatu 4 FI- 20780 Kaarina Finland | LKM-FRHF 250V LKM-FRSHF2 250V | Multi core instrument cables with stranded plain annealed Cu conductors (option tinned Cu) with XLPE insulation. Fire properties: flame retardant, fire resistant, halogen free and low smoke Unarmoured | Fixed wiring on ships, offshore and industrial installations | Expires: 4 December 2021 Comply with: IEC 60092-350: 2008 IEC 60092-376:2017 IEC 60092-360, 2014 IEC 60228: 2004 Additional tests: IEC 60332-1-2:2004 IEC 60332-3-22: 2009 IEC 60331-1: 2009 IEC 60754-1: 2011 IEC 60754-2: 2011 IEC 60684-2: 2011 IEC 61034-1: 2013 IEC 61034-2: 2013 | 13/20037 (E1) |
| | LKSM-FRHF 250V LKSM-FRSHF2 250V | Cu- or CuSn-wire braid Armoured (Collectively screened) | | | |
| | LKAM-FRHF 250V LKAM-FRSHF2 250V | Al/pest-tape Collectively screened Rated voltage: $U_o/U (U_m) = 150/250V (300V)$ Max. conductor temperature: 90°C Minimum installation temperature: -15°C | | | |
| LKM-FRHF 250V LKM-FRSHF2 250V LKSM-FRHF 250V LKSM-FRSHF2 250V LKAM-FRHF 250V LKAM-FRSHF2 250V | Number of cores: Conductor cross section: 2,3,4,5,7,10,12,14,16,19,24,27,30,32, 0.75 37,61 | | | | |

Jochen Körner
Hamburg Technical Support Office




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