



Lloyd's
Register

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
Lakimiehenkatu 4
FI- 20780 Kaarina
Finland

DESCRIPTION

Multi core power and control cable for fixed marine installations Flame retardant, fire resistant, low smoke, halogen free, XLPE insulated, 0.6/1kV (1.2kV). LKSM-EMC-FRHF is designed with enhanced Electromagnetic compatibility (EMC) characteristics.

TYPES

(1)
LKM-FRHF Unarmoured
LKM-FRSHF2
LKSM-FRHF Cu- or CuSn-wire braid Armoured
LKSM-FRSHF2
LKSM-EMC-FRHF Cu-tape Screened and Cu- or CuSn-wire braid
LKSM-EMC-FRSHF2 Armoured
LKAM-FRHF Al/ pest-tape Screened
LKAM-FRSHF2

(2) (3)
LKM-FRHF + WSR 0.6/1(1.2) kV / LKM-FRHF + WJR 0.6/1(1.2) kV
LKSM-FRHF + WSR 0.6/1(1.2) kV / LKSM-FRHF + WJR 0.6/1(1.2) kV

Certificate No.

13/20031 (E2)

Issue Date

28 February 2018

Expiry Date

11 January 2023

Sheet

1 of 5



Jochen Körner
Hamburg Technical Support Office
Lloyd's Register EMEA

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71 Fenchurch Street, London EC3M 4BS

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APPLICATION

Fixed wiring on ships, offshore and industrial installations

SPECIFIED STANDARDS

Construction:	IEC 60092-353: 2016 and IEC60092-350: 2014
Conductor:	IEC 60228: 2004 Annealed stranded copper wire plain or tinned to class2 or class5
Insulation:	IEC 60092-360:2014 /XLPE
Collective screen:	Copper foil (-EMC-) Plastic coated aluminium tape (LKAM-)
Armour:	Copper wire braid plain or tinned
Sheathing:	IEC 60092-360:2014/ SHF1 or SHF2
Helkama Bica Oy specification:	HBKQ-9 spec
LKM-FRHF	23
LKM-FRSHF2	108
LKSM-FRHF	24
LKSM-FRSHF2	109
LKSM-EMC-FRHF	84
LKSM-EMC-FRSHF2	116
LKAM-FRHF	60
LKAM-FRSHF2	113
LKM-FRHF+ WSR/ + WSJ	197
KSM-FRHF+ WSR/ + WSJ	198

ADDITIONAL TESTS

Flame retardancy	IEC 60332-1-2: 2015 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

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Sheet

2 of 5



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Transfer impedance IEC 61196-1: 2005
 (3) Water Spray IEC 60331-2: 2009+EN 50200 Annex E: 2015
 (180min + 15min Water Spray)
 (3) Water Jet BS 8491: 2008 (180min + 5x5s Water Jet)

RATINGS

Rated Voltage $U_0/U (U_m)$: 0.6/1 (1.2) kV
 Maximum conductor temperature: 90°C
 Minimum installation temperature: -15°C

RANGE

Number of conductors Conductor cross section

1, 2, 3, 4, 5	LKM-FRHF LKSM-FRHF LKSM-EMC-FRHF LKM-FRSHF2 LKSM-FRSHF2 LKSM-EMC-FRSHF2 LKM-FRHF+WSR/ +WSJ LKSM-FRHF+WSR/+WSJ	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
7x	LKM-FRHF LKSM-FRHF LKSM-EMC-FRHF LKM-FRSHF2 LKSM-FRSHF2 LKSM-EMC-FRSHF2 LKM_FRHF+ WSR/ +WSJ LKSM-FRHF+ WSR/ + WSJ	1.0, 1.5, 2.5, 4, 6, 10, 16, 25
10, 12, 14, 16, 19, 24,	LKM-FRHF LKSM-FRHF	1.0, 1.5, 2.5

Certificate No. 13/20031 (E2)
 Issue Date 28 February 2018
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 Sheet 3 of 5

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27, 30, 37x	LKSM-EMC-FRHF LKM-FRSHF2 LKSM-FRSHF2 LKSM-EMC-FRSHF2 LKM-FRHF+ WSR/ + WSJ LKSM-FRHF+ WSR/ + WSJ	
1, 2, 3, 4, 5, 7, 10, 12, 14, 16, 19, 24, 27, 30, 37x	LKAM-FRHF LKAM-FRSHF2	1.0, 1.5, 2.5

OTHER CONDITIONS

Installation conditions as per the relevant LR Rules and Regulations and SOLAS are to be observed.

PLACES OF PRODUCTION

⁽¹⁾ and ⁽²⁾
Helkama Bica Oy
Lakimiehenkatu 4
FI- 20780 Kaarina
Finland

⁽¹⁾ and ⁽²⁾
Helkama Bica Oy
Lasitehtaankatu 12
FI- 10960 Hanko
Finland

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

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Sheet 4 of 5



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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 36600-18 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

Certificate No. 13/20031 (E2)
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Expiry Date 11 January 2023
Sheet 5 of 5

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Design Appraisal Document

Lloyd's Register EMEA
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E-mail: hamburg-technical-support@lr.org

Date
28 February 2018

Please quote this reference number on all future communications
HPC1662160/36600-18/JK/LK

**THE LLOYD'S REGISTER'S TYPE APPROVAL SYSTEM, 2017
ISSUED TO: HELKAMA BICA OY
FOR: MULTICORE POWER AND CONTROL CABLE
TYPE APPROVAL CERTIFICATE NO. 13/20031 (E2)**

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.

ADDITIONAL APPROVAL DOCUMENTATION

HTS/ETS 34663-17 unnumbered	Design Appraisal Document C/N 1662160 Application checklist – Appendix to Form 2502TA	19.01.2017 04.12.2017
HBKQ Spec. 23/108	Cable Data Sheet, 10 pages	25.10.2017
HBKQ Spec. 24/109	Cable Data Sheet, 12 pages	17.08.2017
HBKQ Spec. 84/116	Cable Data Sheet, 9 pages	17.08.2017
HBKQ Spec. 60/113	Cable Data Sheet, 5 pages	25.09.2017
HBKQ Spec. 197	Cable Data Sheet, 13 pages	25.09.2017
HBKQ Spec. 198	Cable Data Sheet, 14 pages	25.09.2017

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LR031.1.2013.12

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

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Date
28 February 2018

Please quote this reference number on all future communications
HPC1662160/36600-18/JK/LK

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

Description of Product				Cert. No.
Producer / Licence No.	Type	Details of Approval	Application	
Helkama Bica Oy, Finland Lakimiehentkatu 4 FI- 20780 Kaarina Finland		Multi core power and control cable for fixed marine installations. Flame retardant, fire resistant, low smoke, halogen free. XLPE insulated, 0.6/1kV (1.2kV). The LKSM-EMC-FRHF is designed with enhanced Electromagnetic compatibility (EMC) characteristics	Marine, Offshore and Industrial applications Other conditions: Installation conditions as per the relevant LR Rules and Regulations and SOLAS are to be observed.	Expires: 11 January 2023 Comply with: IEC 60092-353: 2016 IEC 60092-350: 2014 IEC 60228: 2004 IEC 60092-360:2014 IEC 60092-360:2014 Additional tests: IEC 60332-1-2:2015 IEC 60332-3-22: 2009 IEC 60331-1: 2009 IEC 60331-2: 2009 IEC 60754-1: 2011 IEC 60754-2: 2011 IEC 60684-2: 2011 IEC 61034-1: 2005 IEC 61034-2: 2005 IEC 61196-1: 2005
	LKM-FRHF	Unarmoured		
	LKM-FRSHF2			
	LKM-FRHF + WSR			
	LKM-FRHF + WJR			
	LKSM-FRHF	Cu- or CuSn-wire braid Armoured		
	LKSM-FRSHF2			
	LKSM-FRHF + WSR			
	LKSM-FRHF + WJR			
	LKSM-EMC-FRHF	Cu-tape Screened and Cu- or CuSn-wire braid Armoured		
LKSM-EMC-FRSHF2				
LKAM-FRHF	Al/pest-tape Screened			
LKAM-FRSHF2				

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		
LKM-FRHF LKSM-FRHF LKSM-EMC-FRHF LKM-FRSHF2 LKSM-FRSHF2 LKSM-EMC-FRSHF2	Rated voltage: $U_0/U (U_m) = 0,6/1 (1,2)$ kV Max. conductor temperature: 90°C Minimum installation temperature: -15°C Number of conductors: Conductor cross section: 1,2,3,4,5 1,0,1,5,2,5,4,6,10,16,25,35,50, 70,95,120,150,185,240,300				
LKM-FRHF LKSM-FRHF LKSM-EMC-FRHF LKM-FRSHF2 LKSM-FRSHF2 LKSM-EMC-FRSHF2	7 1,0,1,5,2,5,4,6,10,16,25				
LKM-FRHF LKSM-FRHF LKSM-EMC-FRHF LKM-FRSHF2 LKSM-FRSHF2 LKSM-EMC-FRSHF2	10, 12, 14, 16, 19, 24, 27, 30, 37				
LKAM-FRHF LKAM-FRSHF2	1, 2, 3, 4, 5, 7, 10, 12, 14, 16, 19, 24, 27, 30, 37				
LKM-FRHF + WSR 0,6/1(1,2) kV / LKM-FRHF + WJR 0,6/1(1,2) kV	As LKM-FRHF				
LKSM-FRHF + WSR 0,6/1(1,2) kV / LKSM-FRHF + WJR 0,6/1(1,2) kV	As LKSM-FRHF				

Additional tests for :
LKM-FRHF + WSR / +WJR
0,6/1(1,2) kV
LKSM-FRHF + WSR / +WJR
0,6/1(1,2) kV:
IEC 60331-2: 2009 + EN 50200 Annex E:
2015 (180min + 15min Water Spray)
IEC 60331-2:2009 + BS 8491: 2008
(180min + 5x5s Water Jet)

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