

**POTVRDA O TIPNOM ODOBRENJU**
TYPE APPROVAL CERTIFICATE

Br /No	03-001504/031224
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Potvrđuje se da je ovaj proizvod, u skladu s Pravilima za klasifikaciju brodova, Dio 1. - Opći propisi, Odjeljak 3. - Tipno odobrenje proizvoda, odobren za ugradnju na brodove i postrojenja pod nadzorom Hrvatskog registra brodova.

This is to certify that this product, on the basis of the Rules for the classification of ships, Part 1 - General requirements, Chapter 3 - Type approval of products, is approved for use on board ships and installations under supervision of the Croatian Register of Shipping.

TIP I OPIS PROIZVODA:*TYPE AND DESCRIPTION OF PRODUCT:***BRODSKI ENERGETSKI I KONTROLNI KABEL BEZHALOGENI I TEŠKO GORIVI**
SHIPBOARD POWER AND CONTROL CABLE HALOGEN FREE AND FLAME RETARDANT**LKM-HF/LKSM-HF/LKAM-HF/LKMM-HF/LKMSM-HF/LKSM-EMC 0,6/1 (1,2) kV****LKM-SHF2/LKSM-SHF2/LKAM-SHF2/LKMM-SHF2/LKMSM-SHF2/LKSM-EMC-SHF2 0,6/1 (1,2) kV****PROIZVOĐAČ:***MANUFACTURER:***HELKAMA BICA Oy***Lakimiehenkatu 4**FI-20780 Kaarina***FINLAND****DODATNO MJESTO PROIZVODNJE:***ADDITIONAL PLACES OF PRODUCTION:**HELKAMA Bica Oy, Lasitehtaankatu 12, FI-10960 Hanko, FINLAND***PROIZVOD UDOVOLJAVA SLIJEDEĆIM PRAVILIMA/PROPISIMA:***THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:***HRB PRAVILA ZA KLASIFIKACIJU BRODOVA: DIO 12 - ELEKTRIČNA OPREMA**
CRS RULES FOR THE CLASSIFICATION OF SHIPS: PART 12 - ELECTRICAL EQUIPMENT

Helkama specification: HBKQ 9 spec. 3, 5, 19, 28, 38, 59, 104, 105, 106, 107, 110 and 112

Technical specification:

Design standard: IEC 60092-353 (3rd ed 2011-08),
Single and multicore non-radial field power cable 0,6/1 kV

Other standards:

- testing: IEC 60092-350 Ed.4.0 (2014-08), General constructions and testing requirements
- insulation: IEC 60092-360 (1.0 ed. 2014-04), Insulating materials for shipboard power cables
- sheathing: IEC 60092-360 (1.0 ed. 2014-04),
Sheathing materials for shipboard power and telecommunication cables

DETALJI O PROIZVODU I UVJETIMA CERTIFIKACIJE DANI SU NA POLEĐINI.*FURTHER DETAILS OF THE PRODUCT AND CONDITIONS FOR CERTIFICATION ARE GIVEN OVERLEAF.***ODOBRENJE VRIJEDI DO: 2020-02-10***APPROVAL IS VALID UNTIL:***Mjesto i datum: Split, 2016-04-04***Place and date:***M.P.***(Seal)*

Marinko Popović, dipl.ing.

NAPOMENA: Ova potvrda nije valjana ako se proizvod ili način njegove proizvodnje promijenio u odnosu na tipno ispitani proizvod. Proizvođač treba obavijestiti Hrvatski registar brodova o bilo kojoj izmjeni na proizvodu kako bi ishodio valjanu potvrdu.

NOTE: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Croatian Register of Shipping of any modification or changes to the product in order to obtain a valid certificate.

PODROBNIJI OPIS PROIZVODA:
DETAILED PRODUCT DESCRIPTION:

Multi core power and control cable with stranded plain annealed Cu conductors option tinned conductors, XLPE insulation, halogen free, flame retardant, low smoke, 0.6/1kV

The LKSM-EMC/LKSM-EMC-SHF2 is designed with enhanced Electromagnetic compatibility (EMC) characteristics
 LKM-HF/LKMM-HF/LKM-SHF2/LKMM-SHF2 – 0.6/1 kV (1.2 kV) – (Un-armoured)
 LKSM-HF/LKMSM-HF/LKSM-SHF2/LKMSM-SHF2 – 0.6/1 kV (1.2 kV) – (Armoured, Cu-braid)
 LKAM-HF/LKAM-SHF2-0.6/1 kV (1.2 kV) – (Screened, Al-polyester tape)

<u>Cable Type</u>	<u>No of Cores</u>	<u>Cross Sect area [mm²]</u>
LKM-HF/LKM-SHF2	1	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-HF/LKSM-SHF2	1	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-EMC/LKSM-EMC-SHF2	1	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKM-HF/LKSM-HF	2	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKM-SHF2/LKSM-SHF2	2	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95
LKMM-HF/LKMM-SHF2	2	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKMSM-HF/LKMSM-SHF2	2	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-EMC	2	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-EMC-SHF2	2	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95
LKM-HF/LKM-SHF2	3	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-HF/LKSM-SHF2	3	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKMM-HF/LKMM-SHF2	3	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKMSM-HF/LKMSM-SHF2	3	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-EMC	3	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-EMC-SHF2	3	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240
LKM-HF/LKSM-HF	4	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKM-SHF2/LKSM-SHF2	4	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240
LKMM-HF/LKMM-SHF2	4	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKMSM-HF/LKMSM-SHF2	4	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-EMC	4	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-EMC-SHF2	4	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240
LKM-HF/LKSM-HF	5	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKM-SHF2/LKSM-SHF2	5	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70
LKMM-HF/LKMM-SHF2	5	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKMSM-HF/LKMSM-SHF2	5	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-EMC	5	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
LKSM-EMC-SHF2	5	1.0, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70
LKM-HF/LKSM-HF	7	1.0, 1.5, 2.5, 4, 6, 10, 16, 25
LKM-SHF2/LKSM-SHF2	7	1.0, 1.5, 2.5
LKMM-HF/LKMSM-HF	7	1.5, 2.5, 4, 6, 10, 16, 25
LKMM-SHF2/LKMSM-SHF2	7	1.5, 2.5
LKSM-EMC	7	1.0, 1.5, 2.5, 4, 6, 10, 16, 25
LKSM-EMC-SHF2	7	1.0, 1.5, 2.5
LKM-HF/LKM-SHF2	10, 12, 14, 16,	1.0, 1.5, 2.5
LKSM-HF/LKSM-SHF2	19, 24, 27, 37	1.0, 1.5, 2.5
LKMM-HF/LKMM-SHF2		1.5, 2.5
LKMSM-HF/LKMSM-SHF2		1.5, 2.5
LKSM-EMC/LKSM-EMC-SHF2		1.0, 1.5, 2.5
LKAM-HF/LKAM-SHF2	2, 3, 4, 5, 7, 10, 12, 14, 16, 19, 24, 27, 37	1.0, 1.5, 2.5

PODRUČJE PRIMJENE / POSEBNI GRANIČNI UVJETI:
APPLICATION / LIMITATIONS:

Fiksna ugradnja na pomorskim brodovima, odobalnim objektima i industriji.
Fixed installations in marine, offshore and industrial use.

DOKUMENTACIJA ZA TIPNO ODOBRENJE:
TYPE APPROVAL DOCUMENTATION:

Helkama LKM-HF 0.6/1 kV (1.2 kV) Cable Data Sheet Specification HBKQ 9. Spec 3 incl. App 2 & 3	2015-10-06
Helkama LKSM-HF 0.6/1 kV (1.2 kV) Cable Data Sheet Specification HBKQ 9. Spec 5 incl. App 2 & 3	2015-10-06
Helkama LKMSM-HF 0.6/1 kV (1.2 kV) Cable Data Sheet Specification HBKQ 9. Spec 19 incl. App 2 & 3	2014-12-30
Helkama LKAM-HF 0.6/1 kV (1.2 kV) Cable Data Sheet Specification HBKQ 9 Spec 28 incl. App 2	2015-04-14
Helkama LKMM-HF 0.6/1 kV (1.2 kV) Cable Data Sheet Specification HBKQ 9. Spec 38 incl. App 2 & 3	2014-12-30
Helkama LKSM-EMC 0.6/1 kV, Cable Data Sheet Specification HBKQ 9. Spec 59 incl. App 2	2015-10-06
Helkama LKM-SHF2 0.6/1 kV (1.2 kV) Cable Data Sheet Specification HBKQ 9. Spec 104 incl. App 2 & 3	2016-03-21
Helkama LKSM-SHF2 0.6/1 kV (1.2 kV) Cable Data Sheet Specification HBKQ 9. Spec 105 incl. App 2 & 3	2016-03-21
Helkama LKMM-SHF2 0.6/1 kV (1.2 kV) Cable Data Sheet Specification HBKQ 9. Spec 106 incl. App 2 & 3	2016-03-21
Helkama LKMSM-SHF2 0.6/1 kV (1.2 kV) Cable Data Sheet Specification HBKQ 9. Spec 107 incl. App 2 & 3	2016-03-21
Helkama LKSM-EMC-SHF2 0.6/1 kV, Cable Data Sheet Specification HBKQ 9. Spec 110 incl. App 2	2016-03-21
Helkama LKAM-SHF2 0.6/1 kV (1.2 kV) Cable Data Sheet Specification HBKQ 9 Spec 112 incl. App 2	2016-03-21

Izvještaj o ispitivanju/ test report:

LKM-HF/1 TT 3 x 1_5; LKAM-HF/ATT 3 x 1_5; TT doc_h/S TT3 x 1_5; TT_LKSM-EMC 3 x 6
 LKMM-HF/TT1_5MM.XLS ; LKMSM-HF/TT1_5MSM.XLS
 Helkama Test report for SHF2 sheathed cables dated 19.03.2012.

OZNAČAVANJE PROIZVODA:
MARKING OF PRODUCT:

LOT ##### LKM-HF/LKM-SHF2, LKSM-HF/LKSM-SHF2, LKAM-HF/LKAM-SHF2, LKMM-HF/LKMM-SHF2,
 LKMSM-HF/LKMSM-SHF2 or LKSM-EMC/ LKSM-EMC-SHF2 "number of core" x "size of conductor" mm²
 0,6/1 kV + 90°C IEC 60092-353, 60332-3-22 HELKAMA "month-year" and "length marking".

Note: Cables with conductor of IEC 60228 class 5 shall be marked on the sheath with "cl. 5"

Note: Cables with tinned conductor shall be marked on the sheath with "CuSn"

UVJETI ZA CERTIFIKACIJU:
CONDITIONS FOR CERTIFICATION:

NON

Račlana

12.05.01

Zamjenjuje potvrdu

03-001291/030962