DNV·GL

Certificate No:
TAE00002EK

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Fiber optical cable

with type designation(s)
Fibre Optic Cable LIFECORD FRHF

Issued to
HELKAMA BICA OY
Hanko, Finland

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Fibre Optical Cable for use in Marine and Offshore installations. Fire resistant.
Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Issued at **Høvik** on **2019-12-11**
This Certificate is valid until **2024-12-07**.
DNV GL local station: **Turku**

Approval Engineer: **Ivar Bull**

for **DNV GL**

Trond Sjåvåg
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.

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Product description

Indoor fiber optic cable with 250 µm optical fibers in slotted core construction.
Fibre Optic Cable LIFECORD

Construction	
Central strength member	FRP element 3,3 mm
Slotted core	Polyolefine diameter 8,0 mm (6 slots with max 36x 250 µm optical fibers) or diameter 9,5mm (8 slots with max 48x 250 µm optical fibers)
Bedding	Swellable and flame retardant tape
Armour	Corrugated steel tape
Outer sheath	SHF1 (optional SHF2)

Specifications for available optical fibers:

Fiber code	Units	1	2	3	4
Standard designation		Single mode	Multi mode	Multi mode	Multi mode
ISO/IEC 11801		OS2	OM1	OM3	OM4
ANSI TIA/EIA		CAAB	AAAA	AAAC	AAAD
IEC 60793-2-10		-	A1b	A1a.2	A1a.3
ITU-T 492		G.652.D	G.651	G.651.1	G651.1
IEC 60793-2-50		B1.3	-	-	-
Operating wavelength	nm	1310/1383/ 1550/1625	850/1300	850/1300	850/1300
Core diameter	µm	9±0,5	62,5±2,5	50±2,5	50±2,5
MFD @1310 nm	µm	9,3±0,5	-	-	-
Cladding	µm	125±1	125±1	125±1	125±1
Coating	µm	245±10	245±10	245±10	245±10
Max attenuation	dB/km	0,40@1310nm 0,30@1550nm	3,0@850nm 1,0@1300nm	2,7@850nm 0,8@1300nm	2,5@850nm 1,0@1300nm

For more details please see datasheet.

Application/Limitation

This type of cable is fire restistant according to IEC 60331-25.

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.

Temperature window :
Min. Installation temperature : -15°C
Operation temperature : -45°C to + 70°C

Type Approval documentation

Job Id: **262.1-029780-1**
Certificate No: **TAE00002EK**

Tests carried out

Standard	Release	General description	Limitation
DNVGL-CP-0402	2016-02	Class programme Optical fibre cables	
IEC 60793-1-1	2017-01	Optical fibres - Part 1-1: Measurement methods and test procedures - General and guidance	
IEC 60793-1-40	2001-07	Optical fibres - Part 1-40: Measurement methods and test procedures - Attenuation	
IEC 60793-2-10	2017-08	Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres	
IEC 60793-2-50	2017-01	Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres	
IEC 60794-1-2	2013-09	Optical fibre cables - Part 1-2: Generic specification - Cross reference table for optical cable test procedures	
IEC 60794-2-20	2013-11	Optical fibre cables - Part 2-20: Indoor cables - Family specification for multi-fibre optical cables	
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.	
60331-25	1999-04	Tests for electric cables under fire conditions - Circuit integrity - Part 25: Procedures and requirements - Optical fibre cables	Flame application time 180 min @750C+15 min monitoring cooling down. Max. Attenuation dur test: SM fibers $\leqslant$ 1,5 dB MM fibers $\leqslant$ 1,5 dB
IEC 60332-1-2	2015-07	Tests on electric and optical fibre cables under fire conditions –	Flame retardant small scale. Distance between the lower edge of the top support and the onset of charring > 50 mm and Charring not to extend downwards > 540 mm from the lower edge of the top support.
IEC 60332-3-22	2018-07	Tests on electric cables under fire conditions - Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category A	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
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%

IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables – Determination of the degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2013-06	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke: >60%

Marking of product

LOT ##### " LifeCord-FRHF SHF2 [1)] " "number of fibers" "type of fiber" –
IEC 60331-25[180min+15min] - IEC 60332-3-22 HELKAMA "month-year" and "length marking".

[1)] if SHF2 sheath

Periodical assessment

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

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine tests (RT) and selected type tests (ref. to applicable class programs) checked (if not available these tests shall be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE