

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Low Voltage Cable**

with type designation(s)

BFOU-HCF(c) 250V S16 / 1100°C / 30 minutes, BFOU-HCF(i) 250V S15 / 1100°C / 30 minutes

Issued to

**Draka Norsk Kabel - part of the Prysmian Group
DRAMMEN, Norway**

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards**Application :****Control. Instrumentation. Communication.****HydroCarbon Fire resistant. Flame retardant in bunch Cat. A. Halogen free. Low smoke.**

Type	Voltage class (V)	Temp. class (°C)
BFOU-HCF(c) 250V S16 / 1100°C / 30 minutes	150/250	90
BFOU-HCF(i) 250V S15 / 1100°C / 30 minutes	150/250	90

This Certificate is valid until **2019-06-22**.Issued at **Høvik** on **2015-06-23**for **DNV GL**DNV GL local station: **Oslo Maritime and CAP**Approval Engineer: **Ivar Bull**

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: **262.1-019891-1**
Certificate No: **TAE000002E**

Product description

Types: BFOU-HCF(c) 250V S16 / 1100°C / 30 minutes
BFOU-HCF(i) 250V S15 / 1100°C / 30 minutes

Construction:

Conductors: Tinned, stranded copper and Mica-tape helically applied directly over the copper conductor
Core insulation: EPR
Screen: Individual or collective screen made of copper backed polyester tape with tinned copper drain wire.
Inner covering: Extruded flame retardant halogen free compound
Metal covering: Tinned, Copper wire braid (O) or Galvanized steel wire braid (C)
Outer sheath: SHF2 mud resistant according to IEC 60092-360 Annex D. NEK TS 606.

HCF protection: Extruded heatblock compound

Tape: Lapped glassfibre tape

Overall sheath: Flame retardant, halogen-free thermoplastic compound, SHF1

No of Elements:	Cross sectional area [mm ²]
2, 4, 8, 12, 16, 19, 24 pairs	0,75 1,5 2,5 mm ²
1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16 triples	0,75 1,5 2,5 mm ²
1 Quad	0,75

Application/Limitation

This type of cable is fire resistant in accordance with IEC Publication 60331.

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

Tests carried out

Standard	Issued	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 60092-376	2003-05	<i>Cables for control and instrumentation circuits 150/250 V (300 V)</i>	
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 60331-21	1999-04	<i>Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to 0,6/1,0 kV</i>	90 min. test @750 °C + 15 minutes cooling down
IEC 60331-1/2	2009-05	Fire resistance / Circuit integrity – Test for method for fire <i>with shock</i> at temperature of at least 830°C for cables rated up to and including 0,6/1kV	90 minutes @830 °C + 15 minutes cooling down
IEC 60332-1-2	2004-07	Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable	

Job Id: **262.1-019891-1**
Certificate No: **TAE000002E**

Standard	Issued	General description	Limitation
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 – Determination of the amount of halogen acid gas	Low Halogen: <0,5% Halogen
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
IEC 61034-1/2	2005-04	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke
NEK TS606 Ed. 4	2009-05	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	HCF test Section 4.5 30 minutes
IEC 61892-4	2008-01	Mobile and fixed offshore units - Electrical installations - Part 4: Cables	HCF test Annex C 30 minutes

Marking of product

"meter" "år" DRAKA NORSE KABEL BFOU-HCF(c) 250V S16 4 PAIR 1,5mm²

HCF 1100/30 FLEX - FLAME IEC 60331-21 IEC 60332-3-22

or

Eg. "meter" "år" DRAKA NORSE KABEL BFOU-HCF(i) 250V S15 4 PAIR 1,5 mm²

HCF 1100/30 FLEX - FLAME IEC 60331-21 IEC 60332-3-22

Periodical assessment

The scope of the retention/renewal survey 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 survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if 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
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Survey to be performed at least every second year.

END OF CERTIFICATE