

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Electric Power Cable**

with type designation(s)

BFOU P5 0,6/1kV, BFOU P5/P12 0,6/1 kV

Issued to

**Nuhas Oman LLC
Sultanate of Oman, Oman**

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****General power and lighting. Fire resistant.****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**

Type	Rated voltage (kV)	Temp. class (°C)
BFOU P5 0,6/1kV	0,6/1	90
BFOU P5/P12 0,6/1 kV	0,6/1	90

Issued at **Høvik** on **2019-09-10**for **DNV GL**This Certificate is valid until **2023-12-31**.DNV GL local station: **New Building Dubai**Approval Engineer: **Ivar Bull****Trond Sjøvåg
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.



Product description

Type: BFOU P5 0,6/1kV or BFOU P5/P12 0,6/1 kV

Construction:

Conductors: Tinned stranded copper class 2 or class 5
 Core insulation: Mica tape + EPR or HFEP
 Bedding: Halogen free compound
 Metal covering: Tinned copper wire braid
 Outer sheath: SHF2 or SHF Mud

No of cores:	Cross sectional area [mm ²]
1	16 - 630
2	1,5 - 120
3, 4	1,5 - 300
5	1,5 - 120
7, 12, 19, 27, 37	1,5 - 2,5

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

Data sheet: Doc no.: NO/TEC/TP/BFOU/DNV/1kV Rev.:01 Date: 28/07/2014
 Test reports: dated 25/6-2014

Tests carried out

	Release	General description	Limitation
DNVGL-CP-0399	2016-03	Class Programme Electric cables	
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
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 60092-353	2016-09	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	
IEC 60331-1/2	2009-05	Fire resistance / Circuit integrity - Test for method for fire with shock at temperature of at least 830°C for cables rated up to and including 0,6/1 kV	90 min
IEC 60331-21	1999-04	Tests for electric cables under fire conditions - Circuit integrity - Part 21: Procedures and requirements - Cables of rated voltage up to and including 0,6/1,0 kV	Minimum 90 min. test + 15 minutes cooling time.

Job Id: **262.1-032020-1**
Certificate No: **TAE00003N7**

	Release	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 - Part 1: Determination of the halogen acid gas content	Low Halogen: <0,5% Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2013-07 2013-09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance $\geq 60\%$
NEK TS606 Ed5	2016	Cables for offshore installations - halogen-free low smoke flame-retardant / fire-resistant (HFFR-LS). Technical specification.	Mud resistance test: Required Max variations \pm : IRM902 & 903 100°C 7d. TS & E@B, weight & vol.: $\pm 30\%$ Calc. Bromide 70°C 56d. TS & E@B: $\pm 25\%$, weight: $\pm 15\%$, vol.: $\pm 20\%$ Oil based mud: EDC 95/11 70°C 56d TS & E@B $\pm 30\%$, weight & vol.: $\pm 25\%$

Marking of product

Nuhas Oman LLC – BFOU P5 or P5/P12– size – 0,6/1 kV – IEC 60331 - IEC 60332-3-22 – Lot No

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