

# TYPE APPROVAL CERTIFICATE

## This is to certify:

### That the Low Voltage Cable

with type designation(s)  
**BFOU (c) S4/S8 250 V, BFOU (i+c) S3/S7 250 V**

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 :

**Instrumentation and communication.**

**Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Type	Rated voltage (V)	Temp. class (°C)
<b>BFOU (c) S4/S8 250 V</b>	<b>250</b>	<b>90</b>
<b>BFOU (i+c) S3/S7 250 V</b>	<b>250</b>	<b>90</b>

Issued at **Høvik** on **2018-01-02**

This Certificate is valid until **2022-06-30**.  
DNV GL local station: **Dubai**

Approval Engineer: **Marta Alonso Pontes**



for **DNV GL**

Digitally Signed By: **Andreas Kristoffersen**  
Location: **DNV GL Høvik, Norway**

**Andreas Kristoffersen**  
**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 (c) S4/S8 250 V, BFOU (i+c) S3/S7 250 V

Construction:

Conductors: Tinned stranded copper class 2  
 Core Insulation: Mica tape + EPR  
 Screen: Copper backed polyester tape with tinned copper drain wire.  
 Inner covering: SHF1  
 Metal covering: Tinned copper wire braid (O)  
 Outer sheath: SHF2 or SHF2 Mud

Number of pairs	Conductor cross section [mm <sup>2</sup> ]
1, 2, 4, 7, 8, 12, 16, 19, 24, 32	0.75, 1.0, 1.5, 2.5

## Application/Limitation

This cable is fire resistant according to IEC 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 sheets: [Nuhas Oman LCC Technical data sheet ship board cables \(type BFOU\) dated 2012-10-20](#)  
 Test reports: [Dated 13/05/2013](#)

## Tests carried out

Standard	Release	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 60092-360	2014-04	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	
IEC 60092-376	2017-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
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 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 and with an overall diameter under 20 mm	Minimum 90 min + 15 min cooling down time
IEC 60331-1	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 and with an overall diameter exceeding 20 mm	Minimum 120 min+15 min cooling down time. Tested for cables with overall diameter exceeding 20 mm.

Job Id: **262.1-013581-2**  
Certificate No: **TAE00002AW**

<b>Standard</b>	<b>Release</b>	<b>General description</b>	<b>Limitation</b>
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	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
IEC 61034-1/2	2005-04	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke
NEK 606 Ed. 4	2009-05	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. <u>Oil based mud:</u> Carbo Sea 70°C 56d or EDC 95/11 70°C 56d

### Marking of product

Nuhas Oman LLC - BFOU (c) S4/S8 or BFOU (i+c) S3/S7 - size - 250 V – IEC 60331-21 or 60331-1-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