

**TYPE APPROVAL CERTIFICATE**

**This is to certify:**

**That the Electric Power Cable**

with type designation(s)  
**AFUMEX FIRS NAU-XTCUA 0,6/1 kV,**  
**AFUMEX FIRS NAU-XTA 0,6/1 kV,**  
**AFUMEX FIRS NAU-XOTCUA 0,6/1 kV**

Issued to  
**PRYSMIAN CABLES SPAIN, S.A.**  
**Vilanova i la Geltrú, Barcelona, Spain**

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

**Application :**

**General power and lighting. Control.**  
**Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**

| Type                                   | Rated voltage (kV) | Temp. class (°C) |
|--|--------------------|------------------|
| <b>AFUMEX FIRS NAU-XTCUA 0,6/1 kV</b>  | <b>0,6/1</b>       | <b>90</b>        |
| <b>AFUMEX FIRS NAU-XTA 0,6/1 kV</b>    | <b>0,6/1</b>       | <b>90</b>        |
| <b>AFUMEX FIRS NAU-XOTCUA 0,6/1 kV</b> | <b>0,6/1</b>       | <b>90</b>        |

Issued at **Høvik** on **2020-12-18**

for **DNV GL**

This Certificate is valid until **2023-06-30**.  
 DNV GL local station: **Area NB/CMC Iberia**

Approval Engineer: **Ivar Bull**

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**Marta Alonso Pontes**  
**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Job Id: **262.1-015325-15**  
 Certificate No: **TAE000019N**  
 Revision No: **3**

## Product description

Type: AFUMEX FIRS NAU-XTCUA 0,6/1 kV 0,6/1  
 AFUMEX FIRS NAU-XTA 0,6/1 kV 0,6/1  
 AFUMEX FIRS NAU-XOTCUA 0,6/1 kV 0,6/1

### Construction:

Conductors: Plain or tinned, stranded copper. Class 2 or class 5  
 Core insulation: Mica-tape + HF XLPE  
 Inner covering: Tape or Halogen free compound  
 Metallic screen: Overall metallic screen. Helically copper tape overlapped (XOTCUA)  
 Armour: Plain or tinned copper wire braid (TCU) or Galv. steel wire braid (T)  
 Outer sheath: SHF1

AFUMEX FIRS NAU-XTCUA & AFUMEX FIRS NAU-XTA 0,6/1 kV:

| Number of cores                           | Conductor cross section [mm <sup>2</sup> ]                             |
|---|--|
| 1   | 1, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300 |
| 2, 4                                      | 1, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120                     |
| 3   | 1, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185           |
| 5   | 1, 1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70                              |
| 7, 10, 12, 14, 16, 19, 20, 24, 27, 30, 37 | 1.5, 2.5   |

AFUMEX FIRS NAU-XOTCUA & AFUMEX FIRS NAU-XTCUA 0,6/1 kV

| Number of cores | Conductor cross section [mm <sup>2</sup> ] |
|-----------------|--|
| 3G              | 2.5, 4, 6, 10                              |

## 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 sheets: AFUMEX FIRS NAU XTCUA 0,6/1kV (power) rev.10  
 AFUMEX FIRS NAU XTCUA 0,6/1kV (control) rev.8  
 AFUMEX FIRS NAU XOTCUA 0,6/1kV Rev.7

Test reports: di\_25388 dated 13/09/2016

## Tests carried out

| Standard      | Issued  | 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. |            |

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| <b>Standard</b> | <b>Issued</b> | <b>General description</b>  | <b>Limitation</b>   |
|-----------------|---------------|---|---|
| IEC 60092-353   | 2011-08       | Single and multicore non-radial field power cables with extruded solid insulation for rated Voltages of 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  | 120 min+ 15 min cooling down time   |
| 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 120 min + 15 min cooling down time                                  |
| 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   | 120 min   |
| 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 – 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:<br>pH > 4,3<br>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   |

### Marking of product

PRYSMIAN SAP – AFUMEX FIRS NAU XTCUA or XTA or NAU-XOTCUA - size - 0,6/1 kV – 60092-353 – IEC 60331-1/2 – IEC 60332-3-22 - Lot No. or

SAP = Santa Perpetua Plant.

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### **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