

# TYPE APPROVAL CERTIFICATE

## This is to certify:

That the High Voltage Cable

with type designation(s)

**AFUMEX NAU DHATCUA CL5 6/10kV,  
AFUMEX NAU DHATCUA CL5 8,7/15 kV**

Issued to

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

is found to comply with

**DNV rules for classification – Ships, offshore units, and high speed and light craft**

## Application :

High voltage cable.

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

| Type                             | Rated voltage (kV) | Temp. class (°C) |
|----------------------------------|--------------------|------------------|
| AFUMEX NAU DHATCUA CL5 6/10kV    | 6/10               | 90               |
| AFUMEX NAU DHATCUA CL5 8,7/15 kV | 8,7/15             | 90               |

Issued at **Høvik** on **2022-11-28**

This Certificate is valid until **2027-11-26**.

DNV local station: **Area NB/CMC Iberia**

for **DNV**

Approval Engineer: **Ivar Bull**

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**Frederik Tore Elter**  
**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 AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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.



## Product description

AFUMEX NAU DHATCUA CL5 6/10kV,  
AFUMEX NAU DHATCUA CL5 8,7/15 kV

|                    |                                                             |
|--------------------|-------------------------------------------------------------|
| Conductors:        | Flexible copper Class 5                                     |
| Conductor screen:  | Extruded semiconducting compound layer.                     |
| Core insulation:   | EPR                                                         |
| Insulation screen: | extruded semiconducting compound easy stripping layer.      |
| Screening:         | copper wires helically applied with equalizing cooper tape. |
| Inner covering:    | Separator tape                                              |
| Inner sheath:      | SHF1                                                        |
| Armour:            | Copper wire braid                                           |
| Outer sheath:      | SHF1                                                        |

Single core AFUMEX NAU DHATCUA:

| Voltage U0 / U [kV] |         |         |       |       |
|---------------------|---------|---------|-------|-------|
| 3,6/6               | 6/10    | 8,7/15  | 12/20 | 18/30 |
| -                   | -       | -       | -     | -     |
| -                   | -       | -       | -     | -     |
| -                   | -       | -       | -     | -     |
| -                   | -       | -       | -     | -     |
| -                   | -       | -       | -     | -     |
| -                   | 1 x 95  | 1 x 95  | -     | -     |
| -                   | 1 x 120 | 1 x 120 | -     | -     |
| -                   | 1 x 150 | 1 x 150 | -     | -     |
| -                   | 1 x 185 | 1 x 185 | -     | -     |
| -                   | 1 x 240 | 1 x 240 | -     | -     |
| -                   | -       | -       | -     | -     |

## Application/Limitation

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       | Release | General description                                                                                                                                                             | Limitation                                                                  |
|----------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| DNV CP-0401    | 2021-08 | Electric high voltage cables                                                                                                                                                    |                                                                             |
| IEC 60092-350  | 2020-01 | Electrical installations in ships - Part 350: General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications        |                                                                             |
| IEC 60092-360  | 2021-01 | Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables |                                                                             |
| IEC 60092-354  | 2020-02 | Electrical installations in ships – Part 354: Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV up to 30 kV.                           |                                                                             |
| IEC 60332-3-22 | 2018-07 | 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. |

| Standard      | Release | General description                                                                                                                            | Limitation                                          |
|---------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| IEC 60754-1   | 2019-11 | Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content                       | Low Halogen:<br><0,5% Halogen                       |
| IEC 60754-2   | 2019-11 | Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content                       | Halogen free:<br>pH > 4,3<br>Conductivity < 10µS/mm |
| IEC 61034-1/2 | 2019-11 | Measurement of smoke density of cables burning under defined conditions –<br>Part 1: Test apparatus<br>Part 2: Test procedure and requirements | Low smoke<br>Light transmittance >60%               |

### Marking of product

PRYSMIAN SAP AFUMEX NAU DHATCUA 6/10kV 1x[section] + H9 [year] IEC 60332-3-22 IEC 60092-354  
[batch] [meter marking] or

PRYSMIAN SAP AFUMEX NAU DHATCUA 8.7/15kV 1x[section] + H9 [year] IEC 60332-3-22 IEC 60092-354  
[batch] [meter marking]

SAP = Santa Perpetua Plant.

### 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