

# TYPE APPROVAL CERTIFICATE

**This is to certify:****That the Electric Power Cable**

with type designation(s)

**LM-HF 0,6/1 kV or TEMAR PHFX-U 0,6/1 kV**

Issued to

**Prysmian Finland Oy**  
**OULU, Finland**

is found to comply with

**DNV GL rules for classification – Ships and offshore units****Application :****General power and lighting. Control.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Voltage class (kV) 0,6/1****Temp. class (°C) 90**This Certificate is valid until **2020-06-30**.Issued at **Høvik** on **2016-02-01**DNV GL local station: **Helsinki**Approval Engineer: **Marta Alonso Pontes**for **DNV GL**-----  
**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.

## Product description

Type: LM-HF 0,6/1 kV or TEMAR PHFX-U 0,6/1 kV

Construction:

Conductors: Plain stranded copper class 2 or class 5  
Insulation: XLPE  
Inner covering: Possible extruded in multicore class 5 cables (not for single core cables)  
Outer sheath: SHF1

Class 2:

| No of cores          | Cross sectional area [mm <sup>2</sup> ]                                      |
|----------------------|------------------------------------------------------------------------------|
| 1                    | 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300                              |
| 2                    | 1.5, 2.5, 4, 6                                                               |
| 3                    | 1.5, 2.5, 4, 6, 10, 16, 25, 35*, 50*, 70*, 95*, 120*, 150*, 185*, 240*, 300* |
| 4                    | 1.5, 2.5, 4, 6, 10, 16, 25, 35*, 50*, 70*, 95*, 120*                         |
| 5G                   | 1.5, 2.5, 4, 6, 10, 16, 25                                                   |
| 5, 7, 12, 19, 27, 37 | 1.5                                                                          |
| 5, 7, 12, 19         | 2.5                                                                          |

\* Sector shaped

Class 5 :

| No of cores | Cross sectional area [mm <sup>2</sup> ]     |
|-------------|---------------------------------------------|
| 1           | 25, 35, 50, 70, 95, 120, 150, 185, 240, 300 |
| 2           | 1.5, 2.5, 4, 6                              |
| 3           | 35, 50, 70, 95, 120, 150, 185               |
| 4           | 35, 50, 70, 95, 120, 150, 185               |
| 5G          | 35, 50, 70, 95                              |

## 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                                                                  |
|----------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 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  | 2011-08 | Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV                                                                                      |                                                                             |
| 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 60754-1    | 2011-11 | Test on gases evolved during combustion of materials from cables - Part 1: Determination                                                                                         | Low Halogen: <0,5% Halogen                                                  |

Job Id: **262.1-011072-2**  
Certificate No: **TAE00000SV**

|               |                    |                                                                                                                                          |                                                     |
|---------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
|               |                    | of the halogen acid gas content                                                                                                          |                                                     |
| 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:<br>pH > 4,3<br>Conductivity < 10µS/mm |
| IEC 61034-1/2 | 2013-07<br>2013-09 | Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements                     | Low smoke<br>Light transmittance ≥60%               |

### Marking of product

PRYSMIAN (FI20) – LM-HF or TEMAR PHFX-U – size – 0,6/1kV – 60092-353 - 60332-3-22

### 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 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.

Assessment to be performed at least every second year.

END OF CERTIFICATE