DNV·GL

Certificate No:
TAE00000SD

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)
LSM-FRHF 0,6/1 kV or TEMAR PHFX-AFR 0,6/1kV

Issued to
Prysmian Finland Oy
Pikkala, 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 **2016-01-14**

for **DNV GL**

DNV GL local station: **Helsinki**

Approval Engineer: **Marta Alonso Pontes**

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.

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Job Id: **262.1-011072-2**
Certificate No: **TAE00000SD**

Product description

Type: LSM-FRHF 0,6/1 kV or TEMAR PHFX-AFR 0,6/1kV
Construction:
Conductor: Plain or stranded copper class 2
Core insulation: Mica tape + XLPE
Inner covering: Extruded or suitable Tape
Metal covering: Copper wire braid
Sheath: SHF1

No of cores	Cross sectional area [mm^2]
1	25, 35, 50, 70, 95, 120, 150, 185, 240, 300
2	1.5, 2.5
3	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50*, 70*, 95*, 120*, 150*
4	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50*, 70*, 95*, 120*
5, 7, 12, 19, 27	1.5
5, 7, 12, 19	2.5

* Sector shaped

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

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 60331-1/2	2009-05	Fire resistance / Circuit integrity – Test for method for fire with shock at temperature of at least 830ºC for cables rated up to and including 0,6/1 kV	Minimum 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 60332-3-22	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 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 >60%

Marking of product

PRYSMIAN (FI10) – LSM-FRHF or TEMAR PHFX-AFR – size – 0,6/1kV – 60092-353 – 60331 - 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