TYPE APPROVAL CERTIFICATE

Certificate No:
TAE000007N

This is to certify:

That the Electric Power Cable

with type designation(s)
HFX-U-FR 0,6/1 kV & FHFX-U-FR 0,6/1 kV, HFX-U-FR-L 0,6/1 kV & FHFX-U-FR-L 0,6/1 kV

Issued to
PRYSMIAN CAVI E SISTEMI ITALIA SRL Stab.to di Merlino
Merlino LO, Italy

is found to comply with
DNV GL rules for classification – Ships and offshore units

Application :

General power and lighting.
Fire resistant. Flame retardant in bunch Cat. A. Halogen free. Low smoke.
Cold bend -40°C. Cold impact -35°C.

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

Type	Voltage class (kV)	Temp. class (°C)
HFX-U-FR 0,6/1 kV & FHFX-U-FR 0,6/1 kV	0,6/1	90
HFX-U-FR-L 0,6/1 kV & FHFX-U-FR-L 0,6/1 kV	0,6/1	90

This Certificate is valid until **2020-10-26**.
Issued at **Høvik** on **2015-12-02**
DNV GL local station: **Milan** for **DNV GL**

Approval Engineer: **Ivar Bull**

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: **262.1-018465-1**
Certificate No: **TAE00000TN**

Product description

HFX-U-FR 0,6/1 kV & FHFX-U-FR 0,6/1 kV,
HFX-U-FR-L 0,6/1 kV & FHFX-U-FR-L 0,6/1 kV

Construction:

Conductors:	Plain or tinned, stranded copper class 2 or 5 (F=Flexible)
Core insulation:	Mica tape + XLPE
Filler/inner covering:	Halogen free compound LSOH. Synthetic and/or fire retardant tape(s) (if any)
Outer sheath:	SHF1

No of Elements:	Cross sectional area [mm^2]
1	1,5 2,5 4 6 10 16 25 35 50 70 95 120 150 185 240 300
2	1,5 2,5 4 6 10 16 25 35 50 70 95
3	1,5 2,5 4 6 10 16 25 35 50 70 95 120 150 185 240
4	1,5 2,5 4 6 10 16 25 35 50 70 95 120 150 185
5	1,5 2,5 4 6 10 16 25 35 50 70 95
4 5 7 10 12 14 16 19 24 27 30 37	1 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

Tests carried out

Standard	Issued	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*	*Single and multicore non-radial field power cables with extruded solid insulation for rated Voltages of 1 kV and 3 kV*	
IEC 60331-21	1999-04	Fire resistance / Circuit integrity – Test for electric cables under fire conditions-Circuit integrity – Part 21	
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 90 minutes flame application + 15 minutes cooling down
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	Bunch test Category A

Standard	Issued	General description	Limitation
IEC 60332-1-2	2006-07	Tests on electric cables under fire conditions. Test for vertical flame propagation for a single insulated wire or cable.	
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: pH > 4,3 Conductivity < 10µS
IEC 60684-2	2003-05	Flexible insulating sleeving – Part 2: Methods of test.	Fluorine content < 0,1%
IEC 61034-1/2	2013-07/09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke
IEC 60092-350	2014-08	Annex E: Cold bend test and impact test for low temperature behaviour	Cold bend: -40°C Cold impact -35°C

Marking of product

PRYSMIAN (**P**) – HFX-U-FR or FHFX-U-FR or HFX-U-FR-L or FHFX-U-FR-L – Size – 0,6/1 kV– IEC 60331 – IEC 60332-3-22 Cat. A – Year.

Periodical assessment

The scope of the Periodical assessment is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the Periodical assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routine Tests (RT) checked
- (if RT- and PST-test reports are 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
- Ensure traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment shall be performed at least every second year.

END OF CERTIFICATE