TYPE APPROVAL CERTIFICATE

Certificate No:
TAE00002BB
Revision No:
2

This is to certify:

That the Electric Power Cable

with type designation(s)
LSM-FRHF (1J2XC4Z1-R, 1J2XC4Z1-K)

Issued to
Türk Prysmian Kablo ve Sistemleri A.S.
Bursa, **Türkiye**

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

Application :

General power and control. Fire resistant.
Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Rated voltage (kV)	**0,6/1**
Temp. class (°C)	**90**

Issued at **Høvik** on **2023-11-10**

This Certificate is valid until **2028-05-01**.
DNV local unit: **Istanbul**

Approval Engineer: **Ivar Bull**

for **DNV**

Digitally Signed By: Elter, Frederik Tore
Location: DNV Høvik, Norway

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.

Product description

Power cables designed according to IEC 60092-353.

Construction:	
Conductors:	-R types: Stranded bare or tinned copper conductor class 2 -K types: Flexible stranded bare or tinnned copper conductor, class 5.
Core insulation:	HF XLPE + mica glass tape
Inner covering:	LSOH filler/ LSOH inner covering or tape
Metal covering:	Bare or tinned copper wire braiding
Screen:	SHF1
Outer sheath:	

No of cores:	Cross sectional area [mm^{2}]
1 to 4	1,5 to 300
5	1,5 to 50
6 to 60	1,5 to 4

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

Data sheets: B.5: LV FIRE RESISTANT POWER CABLES(CLASS 5)(MULTI CORE CABLES)
Test report: Türk Pirelli GE-01E and Q/LV3253, Türk Prysmian Kablo EI-13-16, dated 05.04.2013

Tests carried out

Standard	Release	General description	Limitation
DNV CP-0399	2021-08	Electric 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 60092-353	2016-09	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	
IEC 60331-1	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 min
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 90 min + 15 min cooling down time
IEC 60332-1-2	2015-07	Tests on electric cables under fire conditions. Test for vertical flame propagation for a single insulated wire or cable.	

Standard	Release	General description	Limitation
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.
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: <0,5% Halogen
IEC 60754-2	2019-11	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	2019-11	Measurement of smoke density of cables burning under defined conditions – Part 1: Test apparatus Part 2: Test procedure and requirements	Low smoke Light transmittance >60%

Marking of product

Prysmian □ – type – size – 0,6/1 kV – year – meter -IEC 60331 – IEC 60332-3-22.

□ = Bursa - Mudanya Prysmian factory

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) checked (if not available tests according to 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.

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