

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)
Fp(C(s)Fp) (Fp 0,5...10 mm²)

Issued to

LEONI HighTemp Solutions GmbH
Halver, Germany

is found to comply with

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

Application :

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

Rated voltage (kV) 0,3/0,5

Temp. class (°C) 130 / 180 / 200 / 260

Issued at **Hamburg** on **2018-05-29**

This Certificate is valid until **2023-05-28**.

DNV GL local station: **Essen**

for **DNV GL**

Approval Engineer: **Carsten Hunsalz**

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Arne Schaarmann
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

ETFE, FEP or PTFE insulated and sheathed connection cables

Type:	Fp(C(s)Fp) (Fp 0,5...10 mm ²)
Rated voltage :	300 / 500 V
Operating temperature :	- 65°C up to 130°C ETFE or FEP (20000h) copper plain - 65°C up to 180°C FEP (20000h) copper tinned - 65°C up to 200°C PTFE or FEP (20000h) copper silvered - 65°C up to 260°C PTFE (20000h) copper nickel-plated
Conductor :	Copper- plain / tinned / silvered / nickel-plated, class 2/5
Core insulation :	ETFE, FEP or PTFE
Inner sheath selective:	ETFE, FEP, PTFE, ST1/2, SHF2/3, SE1, SH
Braid / screen:	Copper- plain / tinned / silvered / nickel-plated or Galvanisiert steel, steel V4A, steel zincked
Outer sheath:	ETFE, FEP or PTFE
Number of cores:	Cross-sectional area:
2 to 24	0,5 - 2,5 mm ²
1 to 4	6 - 10 mm ²
1 to 5	4 mm ²

Application/Limitation

Measures for limitation of the propagation of fire along cable bundles are required (fire stops)

Heat-resistant cables (wires) for use e.g. at diesel engines, turbines, boilers

Type Approval documentation

Test Report:	LEONI dated 14.08.2012 and 21.09.2012
Data Sheet:	LEONI Article 18973 Version 6.0 dated 15.10.2012

Tests carried out

Standard	Issued	General description	Limitation
NEMA HP3 /HP4	2012	Standard for Electrical & Electronic PTFE /FEP Insulated High Temperature Hook-Up Wire	
VDE 0207-6	2004-10	Insulating and sheath mixtures for cables and insulated wires	
VG 95218-29	2016-11	Cables and insulated wires - Part 29: Cables, longitudinal watertight, transversal watertight	only transversal watertight tested
ISO 14752	2007	Chemical resistance	
IEC 60228	2004-11	Conductors of insulated cables	
IEC 60332-1-2	2015-07	Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable –Procedure for 1 kW pre-mixed flame	

Job Id: **262.1-026812-1**
Certificate No: **TAE00002HU**

Marking of product

Example: LEONI HighTemp Solutions GmbH - Fp(C(s)Fp) (Fp 10 mm²) – 300/500V

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