Certificate No:
**TAE00004HJ**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Electric Power Cable**

with type designation(s)
**FLAME-X 950 NKOGs 0,6/1 kV**

Issued to
**Tele-Fonika Kable S.A.**
**Myslenice**, **Poland**

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

## Application :

**General power, lighting 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 **2022-10-08**
This Certificate is valid until **2027-10-07**.
DNV local station: **Katowice CMC**

Approval Engineer: **Ivar Bull**

for **DNV**

**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

## Product description

FLAME-X 950 NKOGs 0,6/1 kV

Construction:

| | |
|---|---|
| Conductors: | Plain or tinned stranded copper class 2 |
| Core insulation: | Ceramic HF S95 |
| Inner covering: | Halogen free compound |
| Outer sheath: | SHF1 |

| No of cores: | Cross sectional area [mm$^2$] |
|---|---|
| 1 | 1 - 300 |
| 2 | 1 – 50 |
| 3,4 | 1 - 240 |
| 5 | 1 - 70 |
| 7, 10, 12, 16, 19, 20, 24, 27, 30, 37 | 1,0 1,5 2,5 |

## Application/Limitation

This type of cable is fire resistant in accordance with IEC Publication 60331.

The requirements of SOLAS Amendments 1981 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

| | Release | General description | Limitation |
|---|---|---|---|
| DNV-CP-0399 | 2021-08 | Class Programme Electric cables | |
| IEC 60092-350 | 2020-01 | 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. | Including:<br>Ozone resistance |
| IEC 60092-353 | 2016-09 | Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV | |
| IEC 60331-1/2 | 2018-03 | 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 | 120 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. flame application + 15 min. cooling period. |
| 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 | Bunch test<br>Category A |
| 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:<br><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:<br>pH > 4,3<br>Conductivity < 10µS/mm |
| IEC 61034-1/2 | 2019-11 | Measurement of smoke density of cables burning under defined conditions –<br>Test apparatus, procedure and requirements | Low smoke<br>Light transmittance ≥60% |

| | Release | General description | Limitation |
|---|---|---|---|
| EN 50200 | 2006-06 | Method of test for resistance to fire of unprotected small cables for use in emergency circuits | |

## Marking of product

TF Kable 1 or TFK 1 – FLAME-X 950 NKOGs – size – 0,6/1 kV – IEC 60331 – IEC 60332-3-22

TF Kable 1 or TFK 1 = Myslenice 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) and selected type tests (ref. to applicable class programs) checked (if not available these tests shall 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