DNV·GL

Certificate No:
TAE00001WV

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
RFOU (i) S1/S5 & (c) S2/S6 250V, RFOU EMC (i) & (c) 250V

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

is found to comply with
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards
IEC 60092-376 (2003-05)
IEC 60332-3-22 (2009-02)
IEC 60754-1/2 (2011-11)
IEC 61034-1/2 Ed. 3.1 (2013-06)
NEK TS 606 (2009-05) (S-types only)

Application :

Control. Instrumentation. Communication.
Flame retardant in bunch Cat. A. Halogen free. Low smoke.
Mud resistant.

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

Type	Voltage class (V)	Temp. class (°C)
RFOU (i) S1/S5 & (c) S2/S6 250V	**150/250**	**90**
RFOU EMC (i) & (c) 250V	**150/250**	**90**

Issued at **Høvik** on **2017-05-31**
This Certificate is valid until **2019-06-30**.
DNV GL local station: **Katowice**

for **DNV GL**

Approval Engineer: **Ivar Bull**

Andreas Kristoffersen
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: **262.1-015972-3**
Certificate No: **TAE00001WV**

Product description

Type: RFOU (i) S1/S5 250V ; RFOU (c) S2/S6 250V, RFOU EMC (i) 250V and RFOU EMC (c) 250V

Construction:

Conductors:	Circular tinned stranded copper conductor class 2 or class 5
Core insulation:	EPR
Screen:	Copper polyester tape with tinned copper drain wire. Common (c), Individual (i).
Inner covering:	Halogen free compound
Metal covering:	Tinned copper wire braid
For EMC cables:	Cu/PET tape under braid
Outer sheath	SHF Mud

No of cores x conductor cross-section
mm^2
1X2X0,75*
2X2X0,75
4X2X0,75
8X2X0,75
12X2X0,75
16X2X0,75
19X2X0,75
24X2X0,75
1X3X0,75*
2X3X0,75
4X3X0,75
8X3X0,75
12X3X0,75

No of cores x conductor cross-section
mm^2
16X3X0,75
19X3X0,75*
24X3X0,75
1X2X1,5*
2X2X1,5
4X2X1,5
8X2X1,5
10X2X1,5 **
12X2X1,5
16X2X1,5
19X2X1,5
24X2X1,5
1X3X1,5*

No of cores x conductor cross-section
mm^2
2X3X1,5
4X3X1,5
8X3X1,5
12X3X1,5
16X3X1,5
24X3X1,5
1X2X2,5*
2X2X2,5
4X2X2,5
8X2X2,5**
12X2X2,5**

* Only for (i) variants
** Only for (c) variants

Application/Limitation

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 60092-376	2003-05	Cables for control and instrumentation circuits 150/250 V (300 V)	IEC 60092-376
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 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

Standard	Release	General description	Limitation
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	2005-04	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance >60%
NEK 606 Ed. 4	2009-05	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. Carbo Sea 70°C 56d or EDC 95/11 70°C 56d

Marking of product

TF KABLE 3 – RFOU (i) S1/S5 or RFOU (c) S2/S6 or RFOU EMC (i) or RFOU EMC (c) – 150/250V – Size – 60332-3-22 – IEC 60092-376 – Lot No.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type Approval Certificate are complied with and that no alterations are made to the design and/or the material of product.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Check of the results from Production Sample Tests(PST) and Routine Tests(RT) (if not available, PST and RT are to be carried out)
- Review of type approval documentation
- Review of possible changes in design, material and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate

Periodical assessment is to be performed at least every second year.

END OF CERTIFICATE