

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Low Voltage Cable**with type designation(s)
FM2XCH-FFR 250 V

Issued to

Untel Kablolari San. ve Tic. A.S.
Dilovasi, Turkey

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards
IEC 60092-350 (2014-08)
IEC 60092-376 (2003-05)
IEC 60331-21 (1999-04)
IEC 60332-3-22 (2009-02)
IEC 60754-1/2 (2011-11)
IEC 61034-1/2 Ed. 3.1 (2013-06)**Application :****Control & Instrumentation.****Fire resistant. Flame retardant Cat. A. Halogen free. Low smoke.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Voltage class (V) 250 V**
Temp. class (°C) 90This Certificate is valid until **2019-06-24**.Issued at **Høvik** on **2015-12-30**DNV GL local station: **Istanbul**Approval Engineer: **Hanwee Low**for **DNV GL**

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.

Job Id: **262.1-008110-3**
Certificate No: **TAE000003C**
Revision No: **2**

Product description

Type: **FM2XCH-FFR 250 V**
Conductors: Plain or tinned stranded copper (class 2 or class 5)
Core insulation: Mica tape + XLPE

Option: Bedding/inner covering/filler
Bedding/Inner covering: Halogen free & flame retardant compound
Filler: Flame retardant & non hygroscopic material

Braiding: Plain or tinned copper wire braid
Outer sheath: Halogen Free Compound (SHF1)

Number of cores x conductor cross-section	Overall diameter nominal
mm ²	mm
1x2x0,75	9
2x2x0,75	11,5
4x2x0,75	15,5
7x2x0,75	18,4
10x2x0,75	22,3
14x2x0,75	24,9
19x2x0,75	28,4
24x2x0,75	31,4

Application/Limitation

This type of cable is fire resistant in accordance with IEC Publication 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: **FR 70-032 Rev. 0 Rev. Tar. 01.09.2009.**
Test reports: **Üntel test reports dated 11/10/2010**

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2008-02	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-376	2003-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
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 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	90 min. test

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Standard	Release	General description	Limitation
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
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
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	2013-06	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke

Marking of product

ÜNTEL – FM2XCH-FFR – size – IEC 60331-21 – IEC 60332 – Cat. A – 0,6/1 kV – Lot no.

Periodical assessment

The scope of the retention/renewal survey 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 survey are:

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

Survey to be performed at least every second year.

END OF CERTIFICATE