

**This is to certify:****That the Low Voltage Cable**

with type designation(s)

**FM2XCH, FM2XAH, FM2XCCH, FM2XAAH**

Issued to

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

is found to comply with

**DNV GL rules for classification – Ships, offshore units, and high speed and light craft****Application :****Control & Instrumentation.****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**

| Type    | Rated voltage (V) | Temp. class (°C) |
|---------|-------------------|------------------|
| FM2XCH  | 250               | 90               |
| FM2XAH  | 250               | 90               |
| FM2XCCH | 250               | 90               |
| FM2XAAH | 250               | 90               |

Issued at **Høvik** on **2019-09-08**for **DNV GL**This Certificate is valid until **2024-06-23**.DNV GL local station: **Istanbul**Approval Engineer: **Ivar Bull****Trond Sjøvåg  
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: **262.1-008110-4**  
Certificate No: **TAE000003B**  
Revision No: **3**

## Product description

Type: **FM2XCH 250 V, FM2XAH 250 V, FM2XCCH 250V, FM2XAAH 250 V**  
Conductors: Plain or tinned stranded copper (Class 2 or class 5)  
Core insulation: Cross-Linked PolyEthylene (XLPE)  
Individual screen (if any): Al foil and drain wire over each pair  
  
Option: Bedding/inner covering/filler  
Bedding/Inner covering: Halogen free & flame retardant compound  
Filler: Flame retardant & non hygroscopic material  
  
Common screen: Common copper braid screen (C-types)  
Individual and/or common screen with Al-backed PE tape with Plain or tinned copper drain wire (A- types)  
Braiding: Plain or tinned copper wire braid (C-types)  
Outer sheath: SHF1

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| No of cores:                     | Cross sectional area [mm <sup>2</sup> ] |
|----------------------------------|-----------------------------------------|
| 1, 2, 4, 7, 10, 14, 19, 24 Pairs | 0,75                                    |

## 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

Data sheets: FR 70-022 Rev. 0 Rev. Tar. 01.09.2009  
FR 70-023 Rev. 0 Rev. Tar. 01.09.2009  
FR 70-024 Rev. 0 Rev. Tar. 01.09.2009  
FR 70-025 Rev. 0 Rev. Tar. 01.09.2009

Test reports: Üntel test reports dated 11/10/2010

## Tests carried out

|                | Release | General description                                                                                                                                                              | Limitation                                                                  |
|----------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| DNVGL-CP-0399  | 2016-03 | Class Programme Electric cables                                                                                                                                                  |                                                                             |
| IEC 60092-350  | 2014-08 | General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications                                                       |                                                                             |
| 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 60092-376  | 2017-05 | Electrical installations in ships - Part 376: Cables for control and instrumentation circuits 150/250 V (300 V)                                                                  |                                                                             |
| IEC 60332-3-22 | 2018-07 | Tests on electric 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. |

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|               | Release            | General description                                                                                                                      | Limitation                                          |
|---------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| DNVGL-CP-0399 | 2016-03            | Class Programme Electric cables                                                                                                          |                                                     |
| 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:<br><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:<br>pH > 4,3<br>Conductivity < 10µS/mm |
| IEC 61034-1/2 | 2013-07<br>2013-09 | Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements                     | Low smoke<br>Light<br>transmittance ≥60%            |

### Marking of product

ÜNTEL – FM2XCH or FM2XAH or FM2XCCH or FM2XAAH – size – IEC 60332 – Cat. A – 0,6/1 kV – Lot no.

### 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