



Certificate No:
TAE00004BR

TYPE APPROVAL CERTIFICATE

This is to certify:

That the High Voltage Cable

with type designation(s)
TFOI 6/10 (12) kV

Issued to

Unika Universal Kablo San. ve Tic. A.S.
ISTANBUL, Turkey

is found to comply with

DNV GL rules for classification – Ships and offshore units
DNV GL class programme DNVGL-CP-0401 – Type approval – Electric high voltage cables

Application :

High voltage cable.

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Rated voltage (kV) 6/10 (12)
Temp. class (°C) 90

Issued at **Høvik** on **2021-08-20**

for **DNV**

This Certificate is valid until **2026-08-19**.

DNV local station: **Istanbul**

Approval Engineer: **Ivar Bull**

Marta Alonso Pontes
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

TFOI 6/10 (12) kV

Conductors:	Bare or tinned stranded copper class 2 or class 5
Conductor screen:	Semi-conductive layer
Core Insulation:	XLPE
Insulation screen	Semi-conductive layer + semi conductive tape + copper tape or copper wire braid
Inner covering:	Halogen Free compound
Metal covering:	Bare or tinned copper wire braid
Outer sheath:	SHF1

TFOI 6/10 (12) kV

	No of cores:	Cross sectional area [mm ²]
TFOI	1	16 – 630
TFOI	3	16 – 300

Application/Limitation

The requirement of SOLAS Chapter II-1 Part D Reg.45, 5.2 to limit Fire Propagation along Bunches of Cables or Wires are fulfilled without any additional measures.

Type Approval documentation

Data sheet: UNIKA TFOI 6/10(12) kV Rev 0/0 dated 12.12.2018
 Test reports: HES kablo test report 2021-01 dated 20.05.2021
 TSE test report 615925 06-21 dated 22.06.2021
 Unika Test report XLPE dated 30.10.2020
 Unika Test report SHF1 dated 30.10.2020
 Unika test plan dated 30.03.2021 Rev()

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2020-01	Electrical installations in ships - Part 350: 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	
IEC 60092-354	2020-02	Electrical installations in ships – Part 354: Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV up to 30 kV.	
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	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
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: <0,5% Halogen
IEC 60754-2	2019-11	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions – Part 1: Test apparatus Part 2: Test procedure and requirements	Low smoke Light transmittance >60%

Marking of product

UNIKA – Year – Lot No. - TFOI - size – 6/10 kV – IEC 60092-354 - IEC 60332-3-22

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
- Ensure 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