DNV·GL

Certificate No:
TAE00001UV

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
Armoured Hybrid cable

Issued to
TELDOR Cables & Systems Ltd.
Israel, Israel

is found to comply with
DNV GL rules for classification – Ships and offshore units

Application :

Combined data and low voltage control, instrumentation and power. Armoured.

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.
Rated voltage (V) 0,6/1 kV
Temp. class (°C) 90

This Certificate is valid until **2023-07-01**.

Issued at **Høvik** on **2018-07-02**
DNV GL local station: **Haifa** 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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Product description

Armoured Hybrid cable composed of combinations of valid DNV GL type approved cables:

Hybrid cable element:	DNVGL TAC numbers:
150/250V Armoured/screened control and instrumentation cables designed according to IEC60092-376	TAE00002UU TAE00002UV
Armoured/screened Fieldbus Data communication cables	TAE00002NM TAE00002NK
Armoured/screened Category cables	TAE00000GE TAE00000GF TAE00000GG TAE00000GH
Armoured coaxial cable	TAE000020S
Fibre optic cables	TAE0000182 TAE0000183
Power cores of 1,0 1,5 and 2,5mm^2 (switchboard wires) designed according to IEC60092-376 and increased voltage class 0,6/1kV	TAE00000NG TAE00000NH

Please refer to DNV GL TAC numbers listed above for details on cable elements. If cross sectional area is listed as AWG, at least same cross section as required by IEC shall be used.

Overall screen (if any):	Aluminium/polyester tape with tinned copper drain wire
Inner sheath:	SHF1 or SHF2
Overall metal covering:	Plain/tinned copper wire braid or copper alloy wire braid or galvanized steel wire braid
Outer sheath:	SHF1 or SHF2 or SHF2 MUD

Thickness of braid wires and sheaths as per IEC 60092-350 Annex A fictitious calculations.

Application/Limitation

If power conductors are operated with voltage above 50V, as a safety measure the braid and/or screen of all instrument and data cables shall be connected to earth potential.

If one power core trips on overcurrent or short circuit, all power cores shall trip simultaneously.

All power, control and data elements of hybrid cable shall serve same consumer.

System designer shall ensure that hybrid cable provides sufficient signal integrity for reliable operation of equipment. Special care shall be taken if analogue signals are transmitted in combined power and data cable. Please refer to guidelines in IEC 60533(2015) Table B.1.

Type Approval documentation

Job Id: **262.1-025553-1**
Certificate No: **TAE00001UV**

Tests carried out

Standard	Release	General description	Limitation
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.	
MUD test according to NEK 606 Ed. 5	2016-01	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. Oil based mud: EDC 95/11 70°C 56d

Please refer to DNV GL TAC numbers listed for details on test standards of individual cable elements.

Marking of product

TELDOR Armored Hybrid cable - DNV GL Type Approval TAE00001UV - Number & Type of cable elements – Voltage class - P/N, B/N, METER MARK

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
- 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