Certificate No:
TAE00004XA

TYPE APPROVAL CERTIFICATE

This is to certify:

That the High Voltage Cable

with type designation(s)
TIOI or TICI or TIOI-FLEX or TICI-FLEX

Issued to
Nexans (Suzhou) Cable Solutions Co.,Ltd
Suzhou, Jiangsu, China

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application :

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

Rated voltage (kV)	**3.6/6kV, 6/10kV, 8.7/15kV, 12/20kV**
Temp. class (°C)	**90**

Issued at **Høvik** on **2024-09-03**
This Certificate is valid until **2029-09-02**.
DNV local station: **Shanghai**

Approval Engineer: **Ivar Bull**

for **DNV**

Frederik Tore Elter
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

Type designations TIOI \ TICI \ TIOI-FLEX \ TICI-FLEX

Conductor :	Stranded annealed tinned or bare copper conductor, Class 2 or Class 5 (-FLEX type)
Conductor screen :	Semi-conductive compound
Insulation :	XLPE
Insulation screen :	Semi-conductive compound
Metallic screen :	Copper tape
Inner sheath :	SHF1
Armor :	Copper wire (O) or Galvanized steel wire (C) Three core cables only
Outer sheath :	SHF1

Voltage rating	No. of Core	Conductor size(mm^2)
3.6/6 kV	1	16~400
	3	16~240
6/10 kV	1	16~300
	3	16~240
8.7/15 kV	1	25~300
	3	25~185
12/20 kV	1	35~300
	3	35~120

Application/Limitation

The requirements 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

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-354	2020-02	Single- and three-core power cables with extruded solid insulation for rated voltages 6kV(U_m=7.2kV) up to 30kV(U_m=36kV)	
IEC 60092-360	2021-01	Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation, telecommunication cables	
IEC 60332-3-22	2018-07	Test for vertical flame spread of vertically mounted bunched wires or cables	Cat. A
IEC 60754-1/2	2019-11	Determination of the amount of halogen acid gas/ Determination of acidity (by pH measurement) and conductivity	Low Halogen <0,5% Halogen free ≥4,3pH, ≤10µS/mm
IEC 60684-2	2011-08	Determination of low levels of fluorine	fluorine content <0.1%
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions	Low smoke >60%
UL 1581	2020	Sunlight(UV) resistance	720hrs
CSA C22.2 No. 03	2019	5.11 Flexibility at any specified temperature	Cold bend: -40°C
CSA C22.2 No. 03	2019	5.12 Abnormal low temperature – impact	Cold impact: -35°C
Nexans test specification based on test procedure IEC 60811-404	2012-03	Optional Oil resistant test	IRM 902 4hrs at 70°C Max change TS: ±40% Max change E@B: ±40%

Marking of product

Voltage rating – Cable type – Size – Nexans 488 – IEC 60332-3-22 – YYYY – MM – 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) 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