DNV·GL

Certificate No:
TAE00001AR

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)
TFOU P1 & TFCU 0,6/1 kV

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

is found to comply with
DNV GL rules for classification – Ships
DNV GL offshore standards
DNV GL rules for classification – High speed and light craft

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.
Voltage class (kV) **0,6/1**
Temp. class (°C) **90**

This Certificate is valid until **2017-06-30**.

Issued at **Hamburg** on **2016-08-08**
DNV GL local station: **Shanghai CMC** for **DNV GL**

Approval Engineer: **Carsten Hunsalz**

Duy Nam Le
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:
Certificate No: **TAE00001AR**

Product description

Type: TFOU P1 & TFCU 0,6/1 kV

Construction:

Conductors:	Tinned stranded copper class 2
Core insulation:	XLPE
Inner covering:	SHF1
Metal covering:	Tinned copper wire braid (O) or Galvanized steel wire braid (C)
Outer sheath:	SHF2

Number of cores x conductor cross-section	Overall Diameter min	Overall Diameter max	Number of cores x conductor cross-section	Overall Diameter min	Overall Diameter max
mm^2	mm	mm	mm^2	mm	mm
1 x 1,5	7,4	8,6	3 x 35	25,0	18,0
1 x 2,5	8,0	9,2	3 x 50	27,5	30,5
1 x 4	8,6	10,0	3 x 70	32,5	36,0
1 x 6	9,0	10,5	3 x 95	36,5	40,5
1 x 10	9,8	11,5	3 x 120	40,0	44,5
1 x 16	11,0	12,5	3 x 150	44,5	49,0
1 x 25	12,5	14,5	3 x 185	49,5	54,5
1 x 35	14,0	16,0	3 x 240	56,0	61,5
1 x 50	15,0	17,5			
1 x 70	17,5	19,5	3 x 70S	29,0	32,5
1 x 95	19,0	21,5	3 x 95S	32,5	36,5
1 x 120	20,5	23,5	3 x 120S	36,0	40,0
1 x 150	22,5	25,5	3 x 150S	40,0	44,0
1 x 185	25,0	28,0	3 x 185S	44,0	48,5
1 x 240	27,5	31,0	3 x 240S	49,5	54,5
1 x 300	30,0	33,5			
1 x 400	33,5	37,5	4 x 1,5	11,5	13,5
			4 x 2,5	13,0	15,0
2 x 1,5	10,5	12,0	4 x 4	15,0	17,0
2 x 2,5	11,5	13,5	4 x 6	15,5	18,0
2 x 4	12,5	14,5	4 x 10	17,5	20,0
2 x 6	14,0	16,0	4 x 16	20,5	23,0
2 x 10	15,5	17,5	4 x 25	25,0	28,0
2 x 16	17,5	20,0	4 x 35	27,5	30,5
2 x 25	21,0	24,0	4 x 50	30,5	33,5
2 x 35	23,5	26,5	4 x 70	36,0	40,0
2 x 50	26,0	29,0	4 x 95	40,5	44,5
2 x 70	30,0	33,0	4 x 120	44,5	49,5
2 x 95	33,5	37,5	4 x 150	49,5	54,0
2 x 120	38,0	42,0	4 x 185	54,5	60,0
			4 x 240	61,5	67,5
3 x 1,5	11,0	13,0			
3 x 2,5	12,0	14,0	4 x 70S	33,0	36,5
3 x 4	13,0	15,0	4 x 95S	37,0	40,5
3 x 6	14,5	16,5	4 x 120S	40,5	45,0
3 x 10	16,5	18,5	4 x 150S	45,0	49,5
3 x 16	18,5	21,0			
3 x 25	22,5	25,5			

Number of cores x conductor cross-section	Overall Diameter min	Overall Diameter max	Number of cores x conductor cross-section	Overall Diameter min	Overall Diameter max
mm^2	mm	mm	mm^2	mm	mm
5 x 1,5	12,5	14,5	24 x 2,5	26,5	29,5
7 x 1,5	14,0	16,0	27 x 2,5	27,0	30,0
10 x 1,5	17,0	19,5	30 x 2,5	28,0	31,0
12 x 1,5	17,5	20,0	37 x 2,5	30,0	33,0
14 x 1,5	18,5	20,5	48 x 2,5	34,5	38,0
19 x 1,5	20,0	23,0			
24 x 1,5	23,0	26,0	5 x 4	16,0	18,5
27 x 1,5	23,5	26,5	7 x 4	17,5	19,5
30 x 1,5	24,5	27,5	10 x 4	21,5	24,0
37 x 1,5	26,5	29,5	12 x 4	22,0	25,0
48 x 1,5	30,0	33,5			
61 x 1,5	33,0	36,5			
5 x 2,5	14,0	16,0			
7 x 2,5	15,5	17,5			
10 x 2,5	19,0	21,5			
12 x 2,5	19,5	22,0			
14 x 2,5	20,5	23,0			
19 x 2,5	23,0	25,5			

S= Sector shaped

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.

General power and lighting. Halogen free. Low smoke.

Type Approval documentation

Tests carried out

Standard	Issued	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 60092-351	2004-04	Insulating materials for shipboard and offshore units, power, control, instrumentation, telecommunication and data cables	
IEC 60092-353	2011-08	Single and multicore non-radial field power cables with extruded solid insulation for rated Voltages of 1 kV and 3 kV	
IEC 60092-359	1999-08	Sheathing materials for shipboard power and telecommunication cables	

Standard	Issued	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 – Determination of the amount of halogen acid gas	Low Halogen: <0,5% Halogen
IEC 61034-2	2005-04	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke
NEK TS 606	2004	Mud resistant	

Marking of product

Product marking: NEXANS 448 – TFOU P1 or TFCU - size - 0,6/1 kV

Periodical assessment

The scope of the Periodical assessment 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