DNV·GL

Certificate No:
TAE00001B8

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
RU (i) S11 & RU (c) S12 250 V

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 (V) 250
Temp. class (°C) 90

This Certificate is valid until **2021-11-06**.

Issued at **Hamburg** on **2016-11-07**
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.

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Job Id:
Certificate No: **TAE00001B8**

Product description

Type: RU (i) S11 & (c) S12 250 V

Construction:

Conductors:	Tinned, stranded copper class 2 or class 5
Core insulation:	HF-EPR
Screen:	Copper/polyester tape w/tinned copper drain wire
Sheath:	SHF 2

Number of cores x conductor cross-section	Overall diameter Nominal	Overall diameter Nominal
	(i)	(c)
mm^2	mm	mm
1 x 2 x 0,75	6.9	6.9
2 x 2 x 0,75	10.7	7.9
3 x 2 x 0,75	11.3	10.6
4 x 2 x 0,75	12.6	11.6
5 x 2 x 0,75	13.8	12.9
7 x 2 x 0,75	15.2	14.0
8 x 2 x 0,75	17.0	15.9
10 x 2 x 0,75	19.5	18.2
12 x 2 x 0,75	20.3	18.8
14 x 2 x 0,75	21.4	19.7
16 x 2 x 0,75	22.5	21.0
19 x 2 x 0,75	24.0	22.2
24 x 2 x 0,75	28.3	26.3
27 x 2 x 0,75	29.1	26.9
30 x 2 x 0,75	30.1	27.9
37 x 2 x 0,75	32.8	30.3
1 x 2 x 1,5	8.1	8.1
2 x 2 x 1,5	13.1	9.5
3 x 2 x 1,5	13.9	13.0
4 x 2 x 1,5	15.4	14.2
5 x 2 x 1,5	16.9	15.7
7 x 2 x 1,5	21.2	17.4
8 x 2 x 1,5	24.2	19.5
10 x 2 x 1,5	25.0	22.3
12 x 2 x 1,5	26.5	23.3
14 x 2 x 1,5	28.0	24.5
16 x 2 x 1,5	29.8	26.1
19 x 2 x 1,5	35.4	27.5
24 x 2 x 1,5	36.2	32.6
27 x 2 x 1,5	37.7	33.3
30 x 2 x 1,5	41.0	34.8
37 x 2 x 1,5	21.2	37.8

Number of cores x conductor cross-section	Overall diameter Nominal	Overall diameter Nominal
	(i)	(c)
mm^2	mm	mm
1 x 2 x 2,5	9.3	9.3
2 x 2 x 2,5	11.1	10.7
3 x 2 x 2,5	16.0	14.9
4 x 2 x 2,5	17.7	16.4
5 x 2 x 2,5	19.4	18.2
7 x 2 x 2,5	21.5	19.8
8 x 2 x 2,5	24.4	22.5
10 x 2 x 2,5	27.9	25.8
12 x 2 x 2,5	28.9	26.9
14 x 2 x 2,5	30.6	28.3
16 x 2 x 2,5	32.5	30.1
1 x 3 x 0,75	7.0	7.3
2 x 3 x 0,75	11.5	11.1
3 x 3 x 0,75	12.0	12.0
4 x 3 x 0,75	13.5	13.2
7 x 3 x 0,75	16.0	15.9
8 x 3 x 0,75	18.5	18.0
10 x 3 x 0,75	21.0	20.6
12 x 3 x 0,75	22.0	21.3
14 x 3 x 0,75	23.0	22.4
1 x 3 x 1,5	8.2	8.6
2 x 3 x 1,5	14.0	13.6
3 x 3 x 1,5	14.5	14.7
4 x 3 x 1,5	16.0	16.1
7 x 3 x 1,5	20.0	19.4
8 x 3 x 1,5	22.5	22.1
10 x 3 x 1,5	26.0	25.3
12 x 3 x 1,5	26.5	26.4
1 x 3 x 2,5	9,2	9.8

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.

Control and instrumentation.
Flame retardant in bunch Cat. A. Halogen free. Low smoke.
Low temperature. Mud resistant.

Type Approval documentation

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 60092-376	2003-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
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 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 - Part 1: Determination of the halogen acid gas content	Low Halogen: <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: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2013-07 2013-09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%
NEK TS 606	2016	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. Carbo Sea 70°C 56d.
IEC 60092-350	2014-08	Annex E: Procedure 8.10: Temperature requirements	Cold bend: -15°C Cold impact: -15°C

Marking of product
NEXANS 448 – RU(i) S11 or RU(c) S12 – Size – 0,6/1 kV – IEC 60332-3-22 Cat. A – 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) 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.

Assessment to be performed at least every second year.

END OF CERTIFICATE