

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Electric Power Cable**with type designation(s)
NRC, NRM

Issued to

TriCab (Australia) Pty Ltd
PORT MELBOURNE VICTORIA, Australia

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**

Type	Rated voltage (kV)	Temp. class (°C)
NRC	0,6/1	90
NRM	0,6/1	90

This Certificate is valid until **2023-02-26**.Issued at **Høvik** on **2018-02-27**DNV GL local station: **Melbourne**for **DNV GL**Approval Engineer: **Marta Alonso Pontes**

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.

Job Id: **262.1-019304-1**
Certificate No: **TAE00001G0**

Product description

Type: NRC and NRM (NEK TS 606 code P17 BU)

Construction:

Conductors: Tinned annealed copper Class 2 or Class 5
Core insulation: HF HEPR with glass MICA tape
Outer sheath: SHF2 (NRC) or SHF Mud (NRM)

Number of conductos	Cross section [mm ²]
1	2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 630
2	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120
3	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300, 400
4	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185
5	1.5, 2.5, 4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150

Number of conductos	Cross section [mm ²]
5, 6, 7, 10, 12, 14, 16, 19, 21, 24, 27, 30, 33, 37	1.5, 2.5

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.

This type of cable is fire resistant according to IEC 60331.

Type Approval documentation

Tests carried out

Standard	Issued	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.	
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	0,6/1kV
IEC 60331-21	1999-04	Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to and including 0,6/1,0 kV	Minimum 90 min. flame application + 15 min. cooling period. Done at 1000°C
IEC 60331-1	2009-05	Fire resistance / Circuit integrity – Test for method for fire with shock at temperature of at least 830°C for cables rated up to and including 0,6/1 kV	Minimum 90 min
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	Low

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Standard	Issued	General description	Limitation
		from cables – Determination of the amount of halogen acid gas	Halogen: <0,5% Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables – Determination of the degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS
IEC 61034-1/2	2005-04	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%
NEK 606	2009-05	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	

Marking of product

TRICAB – NRC or NRM – size - 0,6/1kV – IEC 60331-1 or 60331-21 – IEC 60332-3-22 – TR 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) 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