DNV·GL

Certificate No:
TAE00000E3

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
ESA 250 V, FCA 250 V

Issued to
TriCab (Australia) Pty Ltd
PORT MELBOURNE VICTORIA, Australia

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

Application :

Instrumentation and communication

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Type	Voltage class (V)	Temp. class (°C)
ESA 250 V	**250**	**90**
FCA 250 V	**250**	**90**

This Certificate is valid until **2019-07-31**.

Issued at **Høvik** on **2015-10-08**

for **DNV GL**

DNV GL local station: **Melbourne**

Approval Engineer: **Marta Alonso Pontes**

Marit Laumann
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.

© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

Job Id: **262.1-019279-1**
Certificate No: **TAE00000E3**

Product description

Type: ESA & FCA 150/250 V

Construction:

Conductors:	Tinned stranded copper, Class 5
Core insulation:	Mica tape + HF HEPR
Individual Screen:	Aluminium/Laminated Tape w/ tinned copper drain wire. Only FCA.
Overall Screen:	Aluminium/Laminated Tape w/ tinned copper drain wire
Separator:	Polyester Tape
Outer sheath:	SHF1

No of cores:	Cross sectional area [mm^{2}]
1, 2, 4, 7, 10, 12, 16, 21, 24, 27,37 pairs	0,5, & 0,75 & 1,0 & 1,5 & 2,5
1, 3, 4, 7 triples	0,75 & 1,5

Application/Limitation

This type of cable is fire resistant in accordance with IEC Publication 60331-21.

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.

The cable may be installed and sized according to IEC 60092-352, except for the condition listed below.

1. Cable ends with flexible rope stranded conductors are to be terminated using approved compression terminals intended and designed for these conductors.

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 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 120 min + 15 min cooling down time
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

Standard	Release	General description	Limitation
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%

Marking of product

TRICAB – ESA or FCA – size – 250 V – IEC 60332-3-22 – IEC 60331-21 - 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 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.

Assessment to be performed at least every second year.

END OF CERTIFICATE