DNV·GL

Certificate No:
TAE0000096

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
XO2TCuZ1-K(AS+), XO3TCuZ1-K(AS+)

Issued to
Top Cable S.A.
Rubi Barcelona, Spain

is found to comply with
Det Norske Veritas' Rules for Classification of Ships

Application :

Control and instrumentation.

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)
XO2TCuZ1-K(AS+)	150/250V	90
XO3TCuZ1-K(AS+)	150/250V	90

This Certificate is valid until **2019-08-27**.

Issued at **Høvik** on **2015-08-28**

for **DNV GL**

DNV GL local station: **Barcelona**

Approval Engineer: **Georgy Abramenko**

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.

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Job Id: **262.1-019366-1**
Certificate No: **TAE0000096**

Product description

Type: XO2Z1TCu-K(AS+), XO3Z1TCu-K(AS+) 150/250V

Construction:	
Conductors:	Annealed, stranded copper
Core insulation:	Mica tape + HF XLPE
Individual screen:	Al/polyester + tinned Cu drain wire (O3 type only)
Common screen:	Al/polyester + tinned Cu drain wire
Armour:	Copper wire braid
Outer sheath:	SHF1

Number of cores x conductor cross-section
XO2Z1-K(AS+):
1 x 2 x 0,75
2 x 2 x 0,75
4 x 2 x 0,75
7 x 2 x 0,75
8 x 2 x 0,75
10 x 2 x 0,75
12 x 2 x 0,75
14 x 2 x 0,75
16 x 2 x 0,75
19 x 2 x 0,75
24 x 2 x 0,75

Number of cores x conductor cross-section
XO3Z1-K(AS+):
1 x 2 x 0,75
2 x 2 x 0,75
4 x 2 x 0,75
7 x 2 x 0,75
8 x 2 x 0,75
10 x 2 x 0,75
12 x 2 x 0,75
14 x 2 x 0,75
16 x 2 x 0,75
19 x 2 x 0,75
24 x 2 x 0,75

Application/Limitation

This cable is fire resistant according to IEC 60331.

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.

Type Approval documentation

Tests carried out

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 60331-1/2	2009-05	Fire resistance / Circuit integrity – Test for method for fire *with shock* at temperature of at least 830ºC for cables rated up to and including 0,6/1 kV	Minimum 90 min
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 + 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	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
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 61034-2	2013-06	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%

Marking of product

TOP CABLE - XO2Z1TCu-K (AS+) – 150/250 V – size - IEC 60092-376 – IEC 60331-1/2 - IEC 60331-21 – IEC 60332-3-22 - Year, or
TOP CABLE - XO3Z1TCu-K (AS+) – 150/250 V – size - IEC 60092-376 – IEC 60331-1/2 - IEC 60331-21 - IEC 60332-3-22 - Year.

Periodical assessment

The scope of the retention/renewal survey 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