

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)

TOXFREE MARINE XTCuZ1-K (AS) VFD EMC 0,6/1kV,
TOPDRIVE ZH ROZ1-K(AS) VFD EMC 0,6/1 kV,
TOXFREE MARINE XTCuZ1-K (AS) VFD EMC 1,8/3kV,
TOPDRIVE ZH ROZ1-K(AS) VFD EMC 1,8/3 kV

Issued to

TOP CABLE, S.A.
Rubi, Barcelona, Spain

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)
TOXFREE MARINE XTCuZ1-K (AS) VFD EMC 0,6/1kV	0,6/1	90
TOPDRIVE ZH ROZ1-K(AS) VFD EMC 0,6/1 kV	0,6/1	90
TOXFREE MARINE XTCuZ1-K (AS) VFD EMC 1,8/3kV	1,8/3	90
TOPDRIVE ZH ROZ1-K(AS) VFD EMC 1,8/3 kV	1,8/3	90

Issued at **Høvik** on **2020-12-14**for **DNV GL**This Certificate is valid until **2024-10-24**.DNV GL local station: **Area NB/CMC Iberia**Approval Engineer: **Ivar Bull**

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Marta Alonso Pontes
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: **262.1-019366-5**
 Certificate No: **TAE000002D**
 Revision No: **2**

Place of manufacturing

Alcabe, S.A. Rubi, Barcelona, Spain

Product description

Type: TOXFREE MARINE XTCuZ1-K (AS) VFD EMC 0,6/1kV,
 TOPDRIVE ZH ROZ1-K(AS) VFD EMC 0,6/1 kV,
 TOXFREE MARINE XTCuZ1-K (AS) VFD EMC 1,8/3kV,
 TOPDRIVE ZH ROZ1-K(AS) VFD EMC 1,8/3 kV

Construction:	
Conductors:	Annealed, stranded copper class 5
Core insulation:	HF XLPE
Inner covering:	Halogen free filler
Metal covering:	Copper wire braid, Aluminum-polyester tape (VFD type only)
Outer sheath:	SHF1

0,6/1 kV cables:

Number of cores	Conductor cross-section
1 2 3 4 5 7 10 12 14 16 19 24 27	1,5
1 2 3 4 5 7 12 19 27	2,5
1 2 3 4 5	4 6 10 16 25 35 50
1 2 3 4	70 95 120 150 185 240 300
VFD cables:	
Phase conductors	Ground conductors
3 x 16, 3 x 25, 3 x 35	3 x 6
3 x 50	3 x 10
3 x 70, 3 x 95	3 x 16
3 x 120, 3 x 150	3 x 25
3 x 185	3 x 35
3 x 240 3 x 300	3 x 50

1,8/3kV cables:

Number of cores	Conductor cross-section
3	50 70 95 120 150 185 240 300
VFD cables:	
Phase conductors	Ground conductors
3 x 50	3 x 10
3 x 70, 3 x 95	3 x 16
3 x 120, 3 x 150	3 x 16
3 x 185	3 x 35
3 x 240 3 x 300	3 x 50

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.

Type Approval documentation

Data sheet: TOXFREE MARINE XTCuZ1-K (AS), TOPDRIVE ROZ1-K(AS) VFD EMC, XZ1-K(AS) Rev 0 dated 20/11-2020.

Product construction ROZ1-K(AS) VFD EMC Rev3 dated 01/12-2020.

Test reports: Top Cable dated 1 /4 -2009, Top Cable dated 20/03-2013.

Datasheets and test reports referred in approval letter J50.

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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 60092-350
IEC 60092-353	2016-09	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	
IEC 60332-3-22	2018-07	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 61034-1/2	2013-07	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-TOXFREE MARINE XTCuZ1-K (AS) VFD EMC-0,6/1 kV – size - IEC 60092-353 - IEC 60332-3,
TOP CABLE-TOPDRIVE ZH ROZ1-K(AS) VFD EMC – 0,6/1 kV - IEC 60092-353 - IEC 600332-3,
TOP CABLE-TOXFREE MARINE XTCuZ1-K (AS) VFD EMC - 1,8/3 kV – size -IEC 60092-353 - IEC 60332-3,
TOP CABLE - TOPDRIVE ZH ROZ1-K(AS) VFD EMC – 1,8/3 kV - IEC 60092-353 - IEC 600332-3

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.

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