

TOXFREE MARINE XO2Z1-K, XO3Z1-K XO2TCuZ1-K, XO3TCuZ1-K

1. Object

This document defines the design and manufacturing characteristics of the TOXFREE MARINE XO2Z1-K, XO3Z1-K, XO2TCuZ1-K and XO3TCuZ1-K type manufactured by Top Cable.

2. Design

This type of cable is designed, manufactured and tested according to IEC 60092-376.

Approvals: DNV and ABS

3. Applications

For fixed installations on ships and offshore units in all locations. All cable materials are free of halogens, with low fumes emission and fire retardant. These cables are especially suitable for the installation in ships used as instrumentation and telecommunication cables.

4. Characteristics

Nominal voltage: 150/250 V

Lowest installation temperature: -15 °C

Lowest ambient temperature for fixed installation: -40 °C

Maximum conductor operating temperature: 90 °C

Maximum short-circuit conductor temperature: 250 °C (maximum 5 s)

Minimum bending radius: Overall diameter of cable (D) ≤ 25 mm: 4D

Overall diameter of cable (D) ≥ 25 mm: 6D

No flame propagation: according to IEC 60332-1-2

No fire propagation: according to IEC 60332-3-22 (Category A)

Halogen free: Acid gas emission < 0,5 % according to IEC 60754-1

pH > 4,3 according to IEC 60754-2

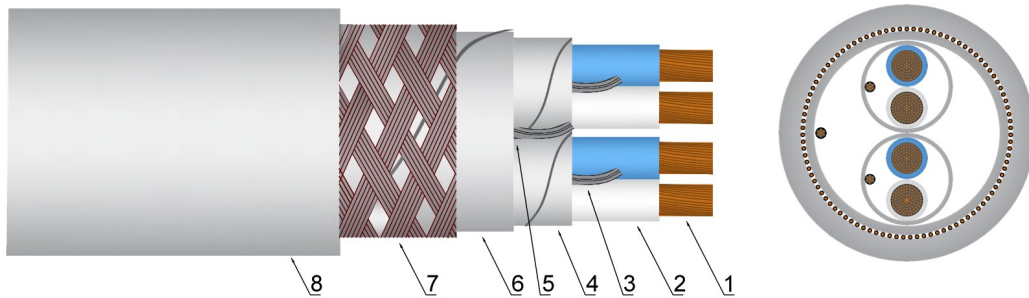
conductivity < 10 μS/mm according to IEC 60754-2

Smoke emission: according to IEC 61034-2

light transmittance > 60 %

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5. General make-up of the cable



5.1 Conductor (1)

Electrolytic annealed tinned copper conductor, class 5 in accordance with IEC 60228 (conductor resistance to IEC 60092-376, Table 6).

5.2 Insulation (2)

Cross-linked polyethylene insulation, type HF XLPE-90 °C according to IEC 60092-360.

The standard identification is the following (others colours under request):

- 2 cond each unit.....blue + white

5.3 Assembly of cores.

The cores are twisted together.

5.4 Individual Screen (4)

Polyester tape + Aluminium bonded to Polyester tape screen with a drain wire (3) in touch with the aluminium, applied over the assembled cores. Only present in XO3Z1-K and XO3TCuZ1-K.

5.5 Assembly of units.

The units are twisted together.

5.6 Collective Screen (6)

Polyester tape + aluminium bonded to polyester tape screen with a drain wire (5) in touch with the aluminium, applied over the assembled units.

5.7 Braid armour (7)

Tinned copper wire braid armour over the collective screen. Only present in XO2TCuZ1-K and XO3TCuZ1-K cables.

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5.8 Outer sheath (8)

Thermoplastic polyolefin, grey colour, with low smoke and halogen free under fire conditions, type SHF1 according to IEC 60092-360.

6. Current-carrying capacities.

6.1 Nominal current-carrying capacities.

Table 1 shows the current-carrying capacities and voltage drop detailed for every cable.

Current-carrying capacities, in ampere, are calculated according to IEC 60092-352 and IEC 60364-5-52 for the following conditions:

- Open air installation: one cable with adequate ventilation and ambient temperature of 30°C, supported by cleats and hangers or on perforated tray. Reference method E.
- For cables having more than 1 unit a factor is applied according to the table A6 of the IEC 60092-352 standard.

For conditions other than this apply the adequate correction factors (point 6.3).

n° x section (mm ²)	Open Air Inst. (A)	Max. Conductor Resistance at 20°C (Ω/Km)
1 x 2 x 0,75	17,1	27,6
2 x 2 x 0,75	13,7	27,6
4 x 2 x 0,75	11,2	27,6
7 x 2 x 0,75	9,2	27,6
10 x 2 x 0,75	8,6	27,6
14 x 2 x 0,75	7,4	27,6
19 x 2 x 0,75	6,5	27,6
24 x 2 x 0,75	6,5	27,6

Table 1

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6.2 Short-circuit current-carrying capacities.

The maximum short-circuit current that a cable can withstand depend on the time of reaction of the protection elements installed in the line. The maximum current-carrying capacity in a short-circuit accident, for a specific type of cable, is the result of multiplying the cross section of the cable for the values shown in table 2. These values are taken from IEC 949.

Time (s)	0,1	0,2	0,3	0,5	1	1,5	2	2,5	3
A/mm2	452	320	261	202	143	117	101	90	83

Table 2

6.3 Correction factors for air temperature other than 30 °C.

The current-carrying capacities must be multiplied with the adequate correction factor when the installation conditions differ from point 6.1.

Air T. (°C)	10	15	20	25	35	40	45	50	55	60
Factor	1,15	1,12	1,08	1,04	0,96	0,91	0,87	0,82	0,76	0,71

Table 3

Other correction factors are found in IEC 60364-5-52 and IEC 60092-352.

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7. Dimensions

n° x section (mm ²)	Diameter (mm)	Weight (Kg/Km)
1 x 2 x 0,75	6,2	50
2 x 2 x 0,75	10,3	90
4 x 2 x 0,75	12,1	140
7 x 2 x 0,75	14,5	210
10 x 2 x 0,75	18,7	290
14 x 2 x 0,75	20,4	370
19 x 2 x 0,75	22,9	460
24 x 2 x 0,75	27,3	555

Table 4: XO2Z1-K Cables

n° x section (mm ²)	Diameter (mm)	Weight (Kg/Km)
1 x 2 x 0,75	6,2	90
2 x 2 x 0,75	10,6	125
4 x 2 x 0,75	12,3	190
7 x 2 x 0,75	14,7	260
10 x 2 x 0,75	19,0	330
14 x 2 x 0,75	20,8	420
19 x 2 x 0,75	23,3	530
24 x 2 x 0,75	27,8	640

Table 5: XO3Z1-K Cables

n° x section (mm ²)	Diameter (mm)	Weight (Kg/Km)
1 x 2 x 0,75	7,2	90
2 x 2 x 0,75	11,3	150
4 x 2 x 0,75	13,1	215
7 x 2 x 0,75	15,9	340
10 x 2 x 0,75	20,2	470
14 x 2 x 0,75	21,9	605
19 x 2 x 0,75	24,4	795
24 x 2 x 0,75	28,8	960

Table 6: XO2TCuZ1-K Cables

n° x section (mm ²)	Diameter (mm)	Weight (Kg/Km)
1 x 2 x 0,75	7,1	135
2 x 2 x 0,75	11,4	185
4 x 2 x 0,75	13,2	265
7 x 2 x 0,75	16,0	390
10 x 2 x 0,75	20,3	510
14 x 2 x 0,75	22,1	655
19 x 2 x 0,75	24,6	865
24 x 2 x 0,75	29,1	1045

Table 7: XO3TCuZ1-K Cables

Top Cable reserves the right to carry out any modification whatsoever without giving previous notice.