



## APPLICATION

The Toxfree<sup>®</sup> Marine XZ1-K (AS) cable with halogen free is a safety cable. In case of fire, it does not emit toxic or corrosive gases, thereby protecting public health and avoiding any possible damage to electronic equipment. For this reason, its use is recommended in marine applications.

- Marine use.
- Public use.

## CONSTRUCTION

### Conductor

Electrolytic annealed copper, class 5 (flexible), according to IEC 60228.

### Insulation

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

The standard identification of insulated conductors is the following:

1 x	Natural
2 x	Blue + Brown
3 x	Brown + Black + Grey
3 G	Blue + Brown + Green/Yellow
4 x	Brown + Black + Grey + Blue
4 G	Brown + Black + Grey + Green/Yellow
5 or more conductors	Black numbered

Other colours available on request.


### Outer sheath


Low smoke halogen free polyolefin, type SHF1 according to IEC 60092-360.


Black colour.


## CHARACTERISTICS


-  **Electrical performance**  
Low voltage: 0,6/1 kV.

-  **Thermal performance**  
Maximum conductor temperature: 90°C.  
Maximum short-circuit temperature: 250°C (max 5 s).  
Lowest installation temperature: -15°C  
Minimum service temperature: -40°C (fixed and protected installations).

-  **Fire performance**  
Flame non-propagation according to IEC 60332-1.  
Fire non-propagation according to IEC 60332-3-22.  
Low smoke halogen free according to IEC 60754-1.  
Low corrosive gases emission according to IEC 60754-2.  
Low smoke emission according to IEC 61034:  
light transmittance > 60%.


-  **Mechanical performance**  
Minimum bending radius:  
 $\varnothing \leq 25\text{mm}$  4x cable diameter.  
 $\varnothing > 25\text{mm}$  6x cable diameter.  
Impact resistance: AG2 medium severity.

-  **Environmental performance**  
Chemical & Oil resistance: Good.  
UV Resistant according to EN 50618.  
Water resistance: AD6 waves.

-  **Installation conditions**  
Open Air.  
In conduit on a bulkhead.  
On a bulkhead.

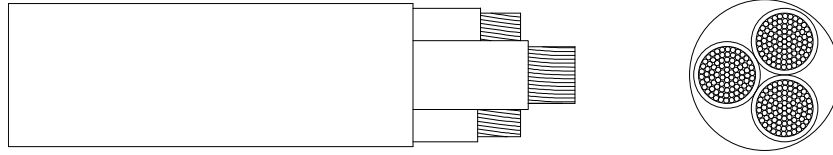
## STANDARDS / COMPLIANCE

-  **According to**  
IEC 60092-353

-  **Standards and approvals**  
ABS / DNV-GL / BUREAU VERITAS / LLOYD'S  
REGISTER / CE / RoHS



## DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm <sup>2</sup> )	Diameter (mm)	Weight (kg/km)	Open Air (A) <sup>1</sup>	R20°C (Ω/km)	Voltage drop (V/A · km) <sup>2</sup>
1 x 2,5	6,1	55	25	7,98	17,7
1 x 4	6,7	75	35	4,95	11,0
1 x 6	7,2	95	46	3,3	7,32
1 x 10	8,2	135	64	1,91	4,23
1 x 16	9,2	190	88	1,21	2,68
1 x 25	10,9	285	117	0,78	1,73
1 x 35	11,8	380	147	0,554	1,23
1 x 50	13,5	520	180	0,386	0,86
1 x 70	15,4	710	233	0,272	0,603
1 x 95	17,2	925	285	0,206	0,457
1 x 120	19,1	1.165	333	0,161	0,357
1 x 150	21,3	1.445	386	0,129	0,286
1 x 185	23,4	1.740	444	0,106	0,235
1 x 240	26,3	2.275	528	0,0801	0,178
1 x 300	29,1	2.870	612	0,0641	0,142
1 x 400	34,0	3.800	716	0,0486	0,108
1 x 500	37,7	4.855	823	0,0384	0,085
2 x 1,5	7,3	80	23	13,3	34,0
2 x 2,5	8,6	115	31	7,98	20,4
2 x 4	9,6	155	43	4,95	12,7
2 x 6	10,5	205	55	3,3	8,45
2 x 10	13,3	350	75	1,91	4,89
2 x 16	14,8	460	100	1,21	3,1
3 x 1,5	8,1	100	23	13,3	34,0
3 x 2,5	9,0	140	31	7,98	20,4
3 x 4	10,3	195	43	4,95	12,7
3 x 6	11,5	260	55	3,3	8,45
3 x 10	13,8	410	75	1,91	4,89
3 x 16	16,1	600	87	1,21	2,68
3 x 25	20,8	965	110	0,78	1,73
3 x 35	23,4	1.295	137	0,554	1,23
3 x 50	27,2	1.790	167	0,386	0,86
3 x 70	30,3	2.430	214	0,272	0,603
3 x 95	35,0	3.180	259	0,206	0,457
3 x 120	39,3	4.045	301	0,161	0,357
3 x 150	44,7	5.075	347	0,129	0,286
3 x 185	49,6	6.175	397	0,106	0,235
3 x 240	55,8	8.035	468	0,0801	0,178

# TOXFREE<sup>®</sup> MARINE XZ1-K (AS)

Cross-section (mm <sup>2</sup> )	Diameter (mm)	Weight (kg/km)	Open Air (A) <sup>1</sup>	R20°C (Ω/km)	Voltage drop (V/A · km) <sup>2</sup>
4 x 1,5	9,0	125	20	13,3	29,5
4 x 2,5	9,8	170	28	7,98	17,7
4 x 4	11,5	245	37	4,95	11,0
4 x 6	12,8	325	47	3,3	7,32
4 x 10	15,5	520	65	1,91	4,23
4 x 16	18,2	770	87	1,21	2,68
4 x 25	23,4	1.225	110	0,78	1,73
4 x 35	25,2	1.625	137	0,554	1,23
4 x 50	30,1	2.270	167	0,386	0,86
4 x 70	35	3.150	214	0,272	0,603
4 x 95	40,3	4.160	259	0,206	0,457
4 x 120	44,6	5.210	301	0,161	0,357
4 x 150	49,7	6.510	347	0,129	0,286
4 x 185	55,2	7.910	397	0,106	0,235
4 x 240	62,1	10.300	468	0,0801	0,178
5 x 1,5	9,6	145	20	13,3	29,5
5 x 2,5	11,0	210	28	7,98	17,7
5 x 4	12,7	295	37	4,95	11,0
5 x 6	14,2	400	47	3,3	7,32
5 x 10	17,2	635	65	1,91	4,23
5 x 16	20,2	950	87	1,21	2,68
5 x 25	25,7	1.510	110	0,78	1,73
5 x 35	28,3	2.015	137	0,554	1,23
5 x 50	33,7	2.795	167	0,386	0,86
5 x 70	38,8	3.870	214	0,272	0,603
7 x 1,5	10,4	185	11	13,3	29,5
7 x 2,5	12,3	265	15	7,98	17,7
12 x 1,5	13,5	295	9	13,3	29,5
14 x 1,5	14,5	340	8,5	13,3	29,5
16 x 1,5	15,5	385	8	13,3	29,5
19 x 1,5	16,3	445	7,5	13,3	29,5
19 x 2,5	19,3	650	11	7,98	17,7
24 x 1,5	18,2	540	7	13,3	29,5
27 x 1,5	19,6	600	6,5	13,3	29,5

<sup>1</sup>Reference method F for single-core and method E for multicore cables according to IEC 60092-352 in open air at 45°C ambient temperature.

<sup>2</sup>At maximum service temperature and  $\cos\phi=1$ .

For cables having 2 conductors and 3 conductors up to 10 mm<sup>2</sup>, are supposed a single-phase circuit. For cables having more of 5 conductors are supposed that all are loaded. For the rest of the cables are supposed a three-phase circuit.

## SHORT-CIRCUIT CURRENT-CARRYING CAPACITIES

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<b>Time (s)</b>	0,1	0,2	0,3	0,5	1	1,5	2	2,5	3
<b>A/mm<sup>2</sup></b>	452	320	261	202	143	117	101	90	83

## CORRECTION FACTORS FOR AIR TEMPERATURE

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<b>Air T. (°C)</b>	35	40	45	50	55	60	65	70	75	80
<b>Factor</b>	1,10	1,05	1	0,94	0,88	0,82	0,74	0,67	0,58	0,47

Other correction factors (for grouping cables, for harmonic currents), that are not in this specification, can be applied. Further information can be found in IEC 60092-352.