TOXFREE® MARINE PLUS
XTCuZ1-K (AS+)

Marine armoured fire resistant power cable.

ACCORDING TO: IEC 60092-353

APPLICATION

The Toxfree® Marine Plus XTCuZ1-K (AS+) is specially designed to transmit electric power in the presence of fire, assuring electric supply to emergency circuits, like signalling lights, smoke extractors, acoustic alarms, water pumps, etc. 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 public places and marine applications.

CONSTRUCTION

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

Insulation
Mica Tape + Cross linked polyethylene type HF XLPE 90°C according to IEC 60092-360.
The standard identification is the following:

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

Other colours available on request.

Bedding
Thermoplastic polyolefin, natural colour, with low smoke and halogen free under fire conditions (single-cores and multi-cores from 25 mm^2).

Screen
Aluminium polyester tape screen with overlapping tinned copper braid armour, ensuring 100% screening coverage.

Outer sheath
Low smoke halogen free thermoplastic polyolefin, type SHF1 according to IEC 60092-360.
Orange colour.
Non-toxic, fire retardant and fire resistant.

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).
Minimum service temperature: -40°C (fixed installations).
Lowest installation temperature: -15°C

Fire performance
Flame non-propagation according to IEC 60332-1.
Fire non-propagation according to IEC 60332-3-22.
Fire resistant minimum 90 minutes at 840 °C:
- According to IEC 60331-2 for cable diameter ≤ 20 mm.
- According to IEC 60331-1 for cable diameter > 20 mm.

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 during installation: 6x cable diameter.
Impact resistance: AG3 High severity.

Environmental performance
Chemical & Oil resistance: Acceptable.
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

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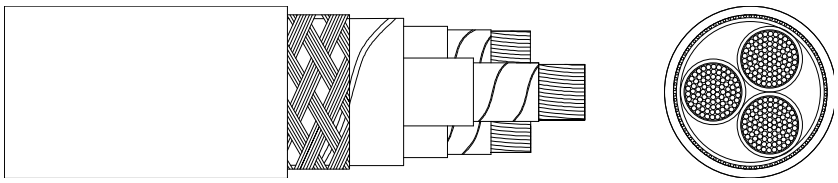
DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Voltage drop (V/A · km) [2]	R20°C (Ω/km)
1 x 16	11,8	240	88	2,68	1,21
1 x 35	15,1	562	147	1,23	0,554
1 x 70	19,1	920	233	0,603	0,272
1 x 95	20,7	1.055	285	0,457	0,206
1 x 120	23,1	1.420	333	0,357	0,161
1 x 150	25,1	1.620	386	0,286	0,129
1 x 185	27,2	2.045	444	0,235	0,106
1 x 240	29,8	2.610	528	0,178	0,0801
1 x 300	32,9	3.195	612	0,142	0,0641
2 x 1,5	10,3	130	23	34,0	13,3
2 x 2,5	10,4	150	31	20,4	7,98
2 x 4	11,9	191	43	12,7	4,95
2 x 6	12,9	239	55	8,45	3,3
2 x 10	15,4	379	75	4,89	1,91
2 x 16	17,2	515	100	3,1	1,21
3 x 1,5	10,4	144	23	34,0	13,3
3 x 2,5	11,5	187	31	20,4	7,98
3 x 4	12,6	242	43	12,7	4,95
3 x 6	14,3	345	55	8,45	3,3
3 x 10	16,7	504	75	4,89	1,91
3 x 16	18,7	693	87	2,68	1,21
3 x 25	23,2	1.175	110	1,73	0,78
3 x 35	26,4	1.550	137	1,23	0,554
3 x 50	29,6	2.065	167	0,860	0,386
3 x 70	33,9	2.845	214	0,603	0,272
3 x 95	37,8	3.560	259	0,457	0,206
3 x 120	43,2	4.595	301	0,357	0,161
3 x 150	47,4	5.605	347	0,286	0,129
3 x 185	52,3	6.765	397	0,235	0,106
3 x 240	57,8	8.645	468	0,178	0,0801
4 x 1,5	11,2	180	20	29,5	13,3
4 x 2,5	11,9	225	28	17,7	7,98
4 x 4	13,3	295	37	11,0	4,95
4 x 6	15,4	435	47	7,32	3,3
4 x 10	17,9	615	65	4,23	1,91
4 x 16	20,5	865	87	2,68	1,21
4 x 25	26,2	1.475	110	1,73	0,78
4 x 35	28,4	1.915	137	1,23	0,554

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Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Voltage drop (V/A · km) [2]	R20°C (Ω/km)
4 x 70	38,9	3.630	214	0,603	0,272
4 x 120	47,8	5.765	301	0,357	0,161
4 x 185	58,1	8.555	397	0,235	0,106
4 x 240	64,4	10.990	468	0,178	0,0801
4 x 300	70,7	13.515	540	0,142	0,0641
5 x 1,5	12,4	210	20	29,5	13,3
5 x 2,5	14,2	308	28	17,7	7,98
5 x 4	15,2	405	37	11,0	4,95
5 x 6	16,8	505	47	7,32	3,3
5 x 10	19,6	740	65	4,23	1,91
5 x 16	22,5	1.055	87	2,68	1,21
7 x 1,5	13,2	265	11	29,5	13,3
7 x 2,5	14,8	375	15	17,7	7,98
10 x 1,5	16,9	400	10	29,5	13,3
12 x 1,5	17,3	460	9	29,5	13,3
12 x 2,5	19,4	585	12	17,7	7,98
14 x 1,5	18,6	520	9	29,5	13,3
19 x 1,5	21,1	650	8	29,5	13,3
19 x 2,5	22,7	840	11	17,7	7,98
24 x 1,5	23,3	795	7	29,5	13,3

[1] 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.
[2] At maximum conductor temperature and $\cos\varphi=1$.
For cables having 2 conductors and 3 conductors up to 10 mm^2, 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.

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SHORT-CIRCUIT CURRENT-CARRYING CAPACITIES

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

CORRECTION FACTORS FOR AIR TEMPERATURE

Air T. (°C)	35	40	45	50	55	60	65	70	75	80
Factor	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.

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