

TOXFREE ZH Z1C4Z1-K (AS) 0,6/1 kV

1. Object

This document defines the design and manufacturing characteristics of the cable type Z1C4Z1-K (AS) manufactured by Top Cable.

2. Design

This type of cable is basically designed, manufactured and tested according to IEC 60502-1 and UNE 21123-4.

3. Applications

Flexible cable for fixed installations. Suitable for transport and distribution of electric power in installations where its required low smoke and halogen free emissions under fire conditions. These cables are adequate for public buildings into different categories of fire hazard.

The 100% coverage screen, made of tinned copper wire braid and overlapping aluminum-polyester tape, makes it suitable for installations where it is necessary to avoid electromagnetic interference caused by nearby circuits.

4. Characteristics

Nominal voltage: 0,6/1 kV

Maximum conductor temperature: 70 °C

Minimum service temperature: -30 °C (static, with protection)

Minimum installation and handling temperature: 0 °C

Maximum short-circuit temperature: 160 °C (maximum 5 s.)

Minimum bending radius (static): 5 x cable Ø

No flame propagation: according to EN 60332-1/ IEC 60332-1

No fire propagation: according to EN 60332-3/ IEC 60332-3

Reaction to fire CPR: Cca-s1a,d1,a1 according to EN 50575

Halogen free: according to EN 60754/ IEC 60754

HCl content < 0,5 %

pH > 4,3

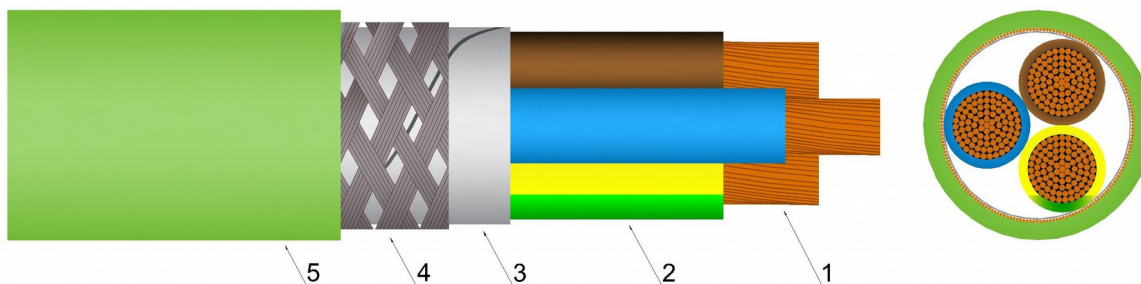
conductivity < 10 µS/mm

Smoke density: according to EN 61034/ IEC 61034

light transmittance > 60 %

TOXFREE ZH Z1C4Z1-K (AS) 0,6/1 kV

5. General make-up of the cable



5.1 Conductor (1)

Electrolytic annealed copper conductor, class 5 according to IEC 60228.

5.2 Insulation (2)

Special polyolefine insulation, with low smoke and halogen free fumes under fire conditions.

The standard identification according to HD 308 is the following:

- 1 x natural
- 2 x blue + brown
- 3 G blue + brown + green/yellow
- 4 G brown + black + grey + green/yellow
- 4 x brown + black + grey + blue
- 5 G brown + black + grey + green/yellow + blue
- 6 or more.....black numbered + green/yellow

5.3 Assembly of cores

The cores are twisted together.

5.4 Screen

Coverage of 100% composed by aluminium-polyester tape (3) and tinned copper braid (4).

5.5 Outer sheath (5)

Polyolefine outer sheath, green colour, with low smoke and halogen free fumes under fire conditions.

TOXFREE ZH

Z1C4Z1-K (AS) 0,6/1 kV

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 amperes, are calculated according to IEC 60364-5-52 and 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 F for single-core and E for multi-core cables).
- Buried installation: one cable in a duct buried at depth of 0,7 m, with soil thermal resistivity of 2,5 K·m/W, and 20 °C of ground temperature (reference method D).
- For cables having 2 conductors or 3 conductors up to 10 mm², it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

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

Voltage drop is the maximum that may occur. It is calculated for the maximum service temperature and for $\cos \varphi = 1$.

n° x Section (mm ²)	Air Inst. (A)	Buried Inst. (A)	Voltaje drop (V/A·km)
2 x 1,5	22	22	28,9
2 x 6	51	46	7,37
3 G 1,5	22	22	28,9
3 G 2,5	30	29	17,7
4 G 1,5	18,5	18	25,1
4 G 6	43	38	6,38

n° x Section (mm ²)	Air Inst. (A)	Buried Inst. (A)	Voltaje drop (V/A·km)
4 G 70	196	143	0,555
4 x 6	43	38	6,38
5 G 1,5	18,5	18	25,1
7 G 1,5	18,5	18	25,1
8 G 1,5	18,5	18	25,1
12 G 1,5	18,5	18	25,1

Table 1

TOXFREE ZH

Z1C4Z1-K (AS) 0,6/1 kV

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/mm ²	452	320	261	202	143	117	101	90	83

Table 2

6.3 Correction factors

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

Correction factors for air temperature other than 30 °C.

Air T. (°C)	20	25	30	35	40	45	50	55	60
Factor	1,08	1,04	1	0,96	0,91	0,87	0,82	0,76	0,71

Table 3

Correction factors for ground temperature other than 20 °C.

Ground T. (°C)	10	15	20	25	30	35	40	45	50
Factor	1,07	1,04	1	0,96	0,93	0,89	0,85	0,80	0,76

Table 4

Correction factors for soil thermal resistivity, that depend of damp, other than 2,5 K·m/W.

Moisture degree of soil	Very damp	Slightly damp	Slightly dry	Dry	Very dry
Therm. Resist. (K · m / W)	1	1,5	2,0	2,5	30
Factor	1,18	1,1	1,05	1	0,96

Table 5

TOXFREE ZH

Z1C4Z1-K (AS) 0,6/1 kV

7. Dimensions

Table 6 shows diameter and weight detailed for every cable.

n° x Section (mm ²)	Diameter (mm)	Weight (V/A·km)	n° x Section (mm ²)	Diameter (mm)	Weight (kg/km)
2 x 1,5	8,5	100	4 G 70	34,6	2.980
2 x 6	11,4	210	4 x 6	13,3	345
3 G 1,5	9,4	130	5 G 1,5	11,0	180
3 G 2,5	10,3	165	7 G 1,5	11,6	225
4 G 1,5	10,2	155	8 G 1,5	12,6	255
4 G 6	13,3	345	12 G 1,5	14,3	345

Table 6