



APPLICATION

Toxfree® Plus 331 ZH RZ1-K (AS+) is a fire resistant cable, specially designed to ensure the power supply to emergency circuits in the event of fire. During a fire you need critical circuits to work for life safety (signalling lights, fume extractors, acoustic alarms, water pumps, etc) and a secure plant shutdown. For this reason, its use is highly recommended in public places such as: hospitals, tunnels, offices, production plants, laboratories, hotels, etc...

CONSTRUCTION

Conductor

Electrolytic annealed copper conductor class 5 (flexible) according to EN 60228 and IEC 60228.

Insulation

Mica tape + Cross-linked polyethylene insulation type DIX-3 according to HD 603.

The standard identification of insulated conductors according to HD 308 is the following:

1 x	Natural
2 x	Blue + Brown
3 x	Brown + Black + Grey
3 x + 1 x	Brown + Black + Grey + Blue (reduced cross-section)
4 x	Brown + Black + Grey + Blue
5 G	Brown + Black + Grey + Blue + Green/Yellow

Outer sheath

Fireproof polyolefin outer sheath with low smoke and halogen free fumes under fire conditions.

Orange colour.

CHARACTERISTICS

⚡ Electrical performance

Low voltage: 0,6/1 kV.

🌡 Thermal performance

Maximum service temperature: 90°C.

Maximum short-circuit temperature: 250°C (max. 5 s).

Minimum service temperature: -40°C (fixed and protected installations).

Minimum installation and handling temperature: -0°C

🔥 Fire performance

Flame non-propagation according to EN 60332-1 / IEC 60332-1.

Fire non-propagation according to EN 60332-3 / IEC 60332-3 and EN 50399.

Fire resistant (PH120) minimum 120 minutes at 840 °C:

- According to IEC 60331-2 / EN 50200 for cable diameter ≤ 20 mm.
- According to IEC 60331-1 / EN 50362 for cable diameter > 20 mm.

Fire resistant 180 minutes at 950°C (cat C) category C, W & Z according to BS6387 (300/500V).

Reaction to fire CPR: B2_{ca}-s1a,d1, a1 or C_{ca}-s1b,d1,a1 according to EN 50575 (see cross-section).

LSHF (Low Smoke Halogen Free) according to EN 60754-1 / IEC 60754-1.

Low smoke emission according to EN 61034 / IEC 61034:

Light transmittance > 80%

Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

📏 Mechanical performance

Minimum bending radius: 5x cable diameter.

Impact resistance: AG2 Medium severity.

🌍 Environmental performance

Chemical & Oil resistance: acceptable.

UV Resistant according to EN 50618.

Water resistance: AD5 Jets.

🔧 Installation conditions

Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

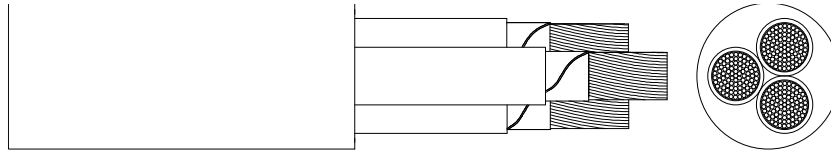
📄 According to
IEC 60502-1

🌐 Standards and approvals
RoHS / CE

📜 CPR (Construction Products Regulation)
B2_{ca}-s1a,d1,a1 (according to cross-section) or
C_{ca}-s1b,d1,a1 (according to cross-section)



DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm ²)	Diameter (mm)	Weight (kg/km)	Open air (A) ¹	Buried (A) ²	Voltage drop (V/A · km) ³
1 x 2.5	7.4	80	39	35	20.3
1 x 4	7.9	100	53	46	12.6
1 x 6	8.4	125	68	58	8.41
1 x 10	9.4	170	93	77	4.87
1 x 16	10.4	230	124	100	3.08
1 x 25	11.8	315	161	129	1.98
1 x 35	13.0	415	200	155	1.41
1 x 50	14.4	550	242	183	0.984
1 x 70	16.2	745	310	225	0.693
1 x 95	18.0	960	377	270	0.525
1 x 120	20.2	1.205	437	306	0.410
1 x 150	22.1	1.490	504	343	0.328
1 x 185	24.3	1.790	575	387	0.270
1 x 240	26.9	2.320	679	448	0.204
1 x 300	30.0	2.950	783	502	0.163
1 x 400	34.8	3.815	930	592	0.123
1 x 500	38.5	4.865	1.070	670	0.097
1 x 630	43.7	6.385	1.232	762	0.073
2 x 1.5	10.2	150	26	27	33.9
2 x 2.5	10.4	165	36	35	20.3
2 x 4	11.4	215	49	46	12.6
2 x 6	12.3	270	63	58	8.41
2 x 10	14.6	395	86	77	4.87
2 x 16	16.6	550	115	100	3.08
3 G 1.5	11.3	185	26	27	33.9
3 G 2.5	11.6	210	36	35	20.3
3 G 4	12.5	265	49	46	12.6
3 G 6	13.5	340	63	58	8.41
3 G 10	15.3	480	86	77	4.87
3 x 16	17.7	685	115	100	3.08
3 x 25	22.5	1.075	149	129	1.98
3 x 35	25.5	1.425	185	155	1.41
3 x 50	28.3	1.895	225	183	0.984
3 x 70	31.1	2.535	289	225	0.693
4 G 1.5	12.2	215	26	27	33.9
4 G 2.5	12.4	250	36	35	20.3
4 G 4	13.6	320	49	46	12.6
4 G 6	15.1	420	63	58	8.41
4 G 10	17.1	605	86	77	4.87
4 x 16	19.5	860	115	100	3.08
4 x 25	25.0	1.345	149	129	1.98
4 x 35	27.3	1.765	185	155	1.41
4 x 50	31.3	2.395	225	183	0.984
4 x 70	36.2	3.285	289	225	0.693
4 x 95	40.4	4.230	352	270	0.525
4 x 120	46.0	5.390	410	306	0.410
4 x 150	50.6	6.675	473	343	0.328
4 x 185	56.5	8.150	542	387	0.270
4 x 240	62.2	10.465	641	448	0.204
5 G 1.5	13.6	265	26	27	33.9
5 G 2.5	13.8	300	36	35	20.3
5 G 4	15.0	385	49	46	12.6
5 G 6	16.4	500	63	58	8.41
5 G 10	18.6	725	86	77	4.87
5 G 16	21.5	1.045	115	100	3.08
5 G 25	27.2	1.630	149	129	1.98
5 G 35	30.5	2.155	185	155	1.41
5 G 50	35.0	2.945	225	183	0.984

¹ Reference method F for single-core and method E for multicore cables according to IEC 60364-5-52 in open air at 30°C ambient temperature.

² Reference method D2 according to IEC 60364-5-52. Directly buried at 0,7 m depth with soil thermal resistivity of 2,5 K·m/W and 20°C of ground temperature.

³ At maximum service temperature and $\cos\varphi=1$.

In all cases are supposed a single-phase circuit.

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)	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

CORRECTION FACTORS FOR GROUND TEMPERATURE

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

CORRECTION FACTORS FOR SOIL THERMAL RESISTIVITY

Moisture degree of soil	Very damp	Slightly damp	Slightly dry	Dry	Very dry
Thermal Resist. (K·m/W)	1	1,5	2	2,5	3
Factor	1,50	1,28	1,12	1	0,90

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 60364-5-52.