Cable catalogue for electric power distribution

Top Cable

Top Cable

INTRODUCTION

PRODUCT RANGE


Top Cable


Top Cable


DT.1


Technology Center

INTRODUCTION

A TEAM COMMITTED TO MANUFACTURING **CABLES OF THE HIGHEST STANDARD**

Teamwork is at the core of everything we do. Just like our cables, our carefully selected workforce is bound together by strength of purpose. We are committed to investing in the skills and wellbeing of our human capital, which ensures our electric cables are manufactured to the highest standards for our clients worldwide.

All Top Cable products meet the standards set by European certifying bodies. We pride ourselves on high company standards and select the best raw materials, adopt rigorous quality control systems and employ the latest technology for all our products.

Teamwork centred on excellence is why Top Cable is one of Europe's leading cable manufacturers.

VALUE ADDED SERVICE

We value our clients, and prompt service comes as standard. As we continue to improve the customer experience, we have invested in two state-of-the-art logistics centres that boast the latest warehouse management systems. These sophisticated infrastructures enable our clients to make significant reductions to their storage, distribution and administration costs.

Top Cable are a reliable manufacturer and supplier of a comprehensive range of industrial power cables. We also offer expert technical support with design and cable selection, as well as project management and logistics through to after-sales service support.


Top Cable
TROESTER
EXCELLENCE IN EXTRUSION

AN **INTEGRATED** MANUFACTURING PROCESS

Since its founding in 1985, Top Cable has continued to invest in technological advancement through ongoing R&D&I programmes. We develop new cable solutions for new incoming markets, meeting our customers' most pressing needs. As our reputation goes before us, customers worldwide appreciate Top Cable as a leading technical cable manufacturer of outstanding quality.

We established our Top Cable Design & Development Centre with research laboratories to support our constant drive to deliver high-performance cables suitable for multiple applications in various industries.


E 4
AIR-PAK
AIR PAK

EUROPEAN **CONSTRUCTION PRODUCTS REGULATION**

The Construction Products Regulation (CPR) was issued 1st July 2016 by the European Union. Its purpose is to ensure that the manufacture and selection of materials used in construction across the European Union meet recognised quality standards. By harmonising EU standards, higher safety levels for fire and dangerous substances are created, as well as greater clarity and traceability of the materials used in construction.

The CPR applies to all products intended for use in construction in public places, housing, civil engineering works, electrical connections for buildings, or external lighting. When you choose Top Cable products, the compliance of your cables with the current CPR requirements is guaranteed, giving you certainty you can rely on.

CPR
COMPLIANT
Construction Products Regulation
EN 50575

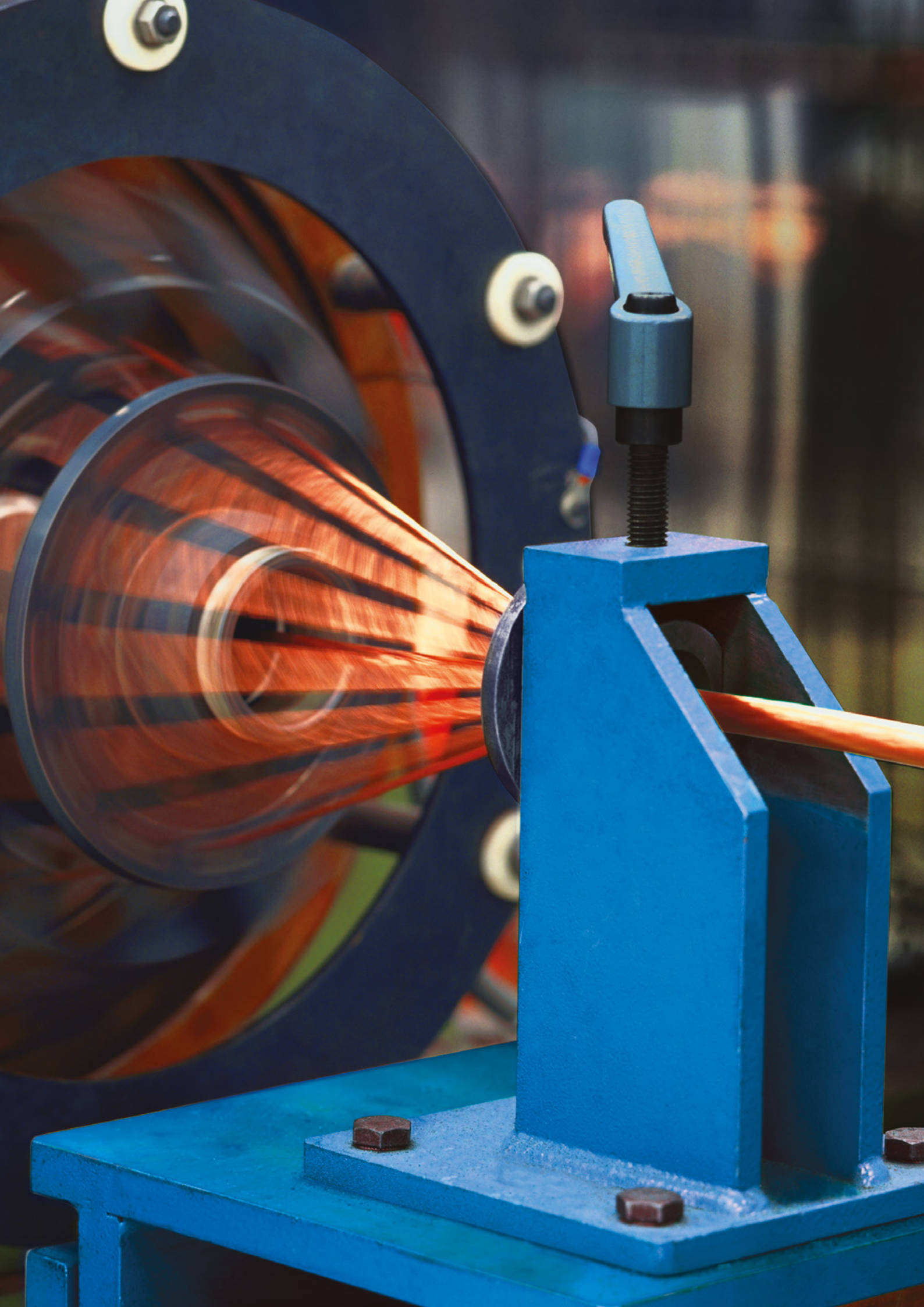
Top Cable


Top Cable

MEDIUM VOLTAGE CABLES MANUFACTURER

Our medium voltage product range is produced at our plant close to the vibrant city of Barcelona, using state of the art technology and the latest generation of machinery.

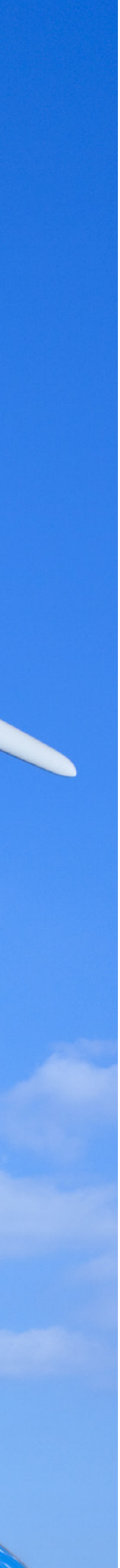
The factory is equipped with a modern Research, Development and Innovation centre staffed by a team of cable production experts. The Centre designs and produces cables according to most international quality standards, and conducts development testing and certification of medium voltage cables.



A **COMPREHENSIVE CABLE** RANGE

We manufacture a broad selection of cables that range from control cables for specialised applications to larger power cables for medium voltage applications across various industries. We supply cables for construction projects, railway, mining, marine, aeronautical, military, OEMs, and renewable energy plants.

Conductors are available for manufacture in copper and aluminium, with insulating materials varying depending on the application. We select each cable component according to specific requirements, and then the end product is manufactured to the highest specifications, meeting international standards such as ISO 9002, IEC, EN and CE.



OUR CORPORATE **SOCIAL & ENVIRONMENTAL** RESPONSIBILITIES

Any statements we could make about sales growth, benefits or assets would be misplaced if we as a company lacked awareness of our social and environmental responsibilities.

Top Cable is committed to protecting the environment and we express this belief by using processes that are friendly to the environment through all stages of our production. Sustainable Social Development is an essential goal for our company, and we work to educate the general public on the importance of sustaining our green planet for future generations.

PRODUCT RANGE

Top Cable

RUBBER
CABLES

XTREM®
H07RN-F

Flexible rubber cable, for industrial use.

ACCORDING TO: EN 50525-2-21 / IEC 60092-353 / IEC 60245

100% Green Energy Cable Production

Eca

APPLICATION

Xtrem® H07RN-F rubber cables are designed to supply power to low voltage appliances including electric motors and submersible pumps in deep water installations, as well as many other electrical equipment.

Thanks to its extraordinary flexibility and mechanical strength, the Xtrem® H07RN-F cable is ideal for power transmission in both fixed installation or mobile service. The use nominal voltage up to 1000 V is accepted in fixed protected assemblies. Top Cable Xtrem® H07RN-F cables are designed to power all types of electrical equipment including motors and submersible pumps in deep water installations (AD8).

- Industrial use.
- Mobile use.
- Robotics.
- Windmills
- Temporary site installations.

CONSTRUCTION

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

Insulation
Thermosetting rubber insulation type EI7 according to EN 50363-1. The standard identification according to HD 308 and HD 186, is the following:

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

Outer sheath
Thermosetting flexible rubber outer sheath type EM2 according to EN 50363-2-1. Black colour.

CHARACTERISTICS

Electrical performance
Low voltage: 450/750V.

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) and -25°C (mobile use).

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Reaction to fire CPR: E_{ca} according to EN 50575.

Mechanical performance
Minimum bending radius:
3 x cable diameter < 12 mm.
4 x cable diameter ≥ 12 mm.
Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: excellent.
Grease & mineral oils resistance: excellent.
Water resistance: AD8 Submersion.
Cable for submersible pumps in drinkable water according to AS/NZS 4020. Deep wells | Drinkable water | AWQC.

Installation conditions
Open Air.
Submersible pumps cable.

Other
Meter by meter marking.

STANDARDS / COMPLIANCE

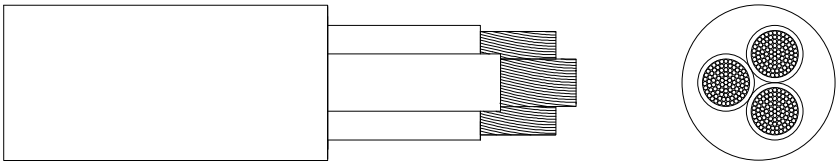
According to
EN 50525-2-21 / IEC 60092-353 / IEC 60245

Standards and approvals
HAR / AENOR / DNV / RoHS / CE

CPR (Construction Products Regulation)
E_{ca}

XTREM® H07RN-F

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Fixed Inst. (A) [1]	Mobile Service (A) [2]	Voltage drop (V/A · km) [3]
1 x 1,5	5,9	45	28	16	30,7
1 x 2,5	6,5	60	39	25	18,4
1x4	7,4	85	53	34	11,4
1x6	8,1	110	68	43	7,63
1 x 10	9,9	175	93	60	4,42
1 x 16	11,2	240	124	79	2,80
1 x 25	13,0	345	161	104	1,80
1 x 35	14,6	460	200	129	1,28
1 x 50	17,0	635	242	162	0,893
1 x 70	19,1	845	310	202	0,629
1 x 95	21,4	1.100	377	240	0,476
1 x 120	23,3	1.375	437	280	0,372
1 x 150	25,8	1.695	504	321	0,298
1 x 185	28,1	2.045	575	363	0,245
1 x 240	31,3	2.635	679	433	0,185
1 x 300	34,4	3.275	783	497	0,148
1 x 400	39,0	4.270	940	586	0,112
1 x 500	41,9	5.370	1.083	670	0,0888
1 x 630	47,8	6.960	1.254	784	0,0664
2 x 1	7,7	75	21	10	45,1
2 x 1,5	8,5	100	26	16	30,7
2 x 2,5	10,1	145	36	25	18,4
2 x 4	11,8	200	49	34	11,4
2 x 6	12,7	250	63	43	7,63
2 x 10	17,7	485	86	60	4,42
2 x 16	20,2	670	115	79	2,80
2 x 25	24,5	995	149	105	1,80
2 x 35	26,3	1.240	185	130	1,28
2 x 50	31,9	1.765	225	165	0,893
2 x 70	36,0	2.335	289	205	0,629
3 G 1	8,3	95	21	10	45,1
3 G 1,5	9,3	125	26	16	30,7
3 G 2,5	11,1	185	36	25	18,4
3 G 4	12,7	260	49	35	11,4
3 G 6	14,3	335	63	44	7,63
3 G 10	19,6	630	86	62	4,42
3 G 16	21,8	855	115	82	2,80
3 G 25	26,1	1.250	149	109	1,80
3 G 35	29,4	1.650	185	135	1,28
3 G 50	33,7	2.235	225	169	0,893
3 G 70	38,3	2.970	289	211	0,629
3 G 95	44,0	3.930	352	250	0,476
3 G 120	47,5	4.815	410	292	0,372
3 G 150	52,0	5.900	473	335	0,298
3 G 185	57,7	7.165	542	378	0,245
4 G 1	9,2	120	21	10	45,1
4 G 1,5	10,4	160	26	16	30,7
4 G 2,5	12,1	225	36	20	18,4
4 G 4	14,0	320	49	30	11,4
4 G 6	15,7	425	63	37	7,63
4 G 10	21,4	775	86	52	4,42
4 G 16	24,6	1.080	115	69	2,80
4 G 25	29,5	1.610	149	92	1,80
4 G 35	32,7	2.100	185	114	1,28
4 G 50	37,7	2.865	225	143	0,893
4 G 70	42,3	3.795	289	178	0,629
4 G 95	48,4	4.995	352	210	0,476
4 G 120	53,0	6.110	410	246	0,372
4 G 150	58,0	7.565	473	282	0,298
4 G 185	64,0	9.180	542	319	0,245
4 G 240	72,0	11.940	641	377	0,185
5 G 1	9,9	145	21	10	45,1
5 G 1,5	11,3	185	26	16	30,7
5 G 2,5	13,5	280	36	20	18,4

XTREM® H07RN-F

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Fixed Inst. (A) [1]	Mobile Service (A) [2]	Voltage drop (V/A · km) [3]
5 G 4	15,6	395	49	30	11,4
5 G 6	17,7	530	63	38	7,63
5 G 10	23,9	945	86	54	4,42
5 G 16	27,0	1.320	115	71	2,80
5 G 25	32,5	1.960	149	94	1,80
5 G 35	35,8	2.545	185	114	1,28
5 G 50	41,9	3.535	225	143	0,893
5 G 70	47,2	4.680	289	178	0,629
5 G 95	53,5	6.090	352	210	0,476
5 G 120	58,0	7.455	410	246	0,372
5 G 150	65,1	9.300	473	282	0,298
5 G 185	71,4	11.240	542	319	0,245
7 G 1,5	15,0	315	26	16	30,7
7 G 2,5	17,1	435	36	25	18,4
7 G 4	20,2	640	49	34	11,4
8 G 1,5	15,5	350	26	16	30,7
8 G 2,5	18,4	510	36	25	18,4
8 G 4	21,8	740	49	34	11,4
10 G 2,5	19,2	560	36	25	18,4
10 G 4	22,8	830	49	34	11,4
12 G 1,5	17,5	445	26	16	30,7
12 G 2,5	20,6	650	36	25	18,4
12 G 4	24,4	950	49	34	11,5
14 G 2,5	21,7	745	36	25	18,4
16 G 1,5	19,6	580	26	16	30,7
16 G 2,5	22,5	845	36	25	18,4
18 G 1,5	20,5	645	26	16	30,7
18 G 2,5	23,6	920	36	25	18,4
19 G 1,5	21,2	680	26	16	30,7
19 G 2,5	25,1	1.005	36	25	18,4
24 G 1,5	23,4	815	26	16	30,7
24 G 2,5	27,3	1.190	36	25	18,4
27 G 1,5	24,5	895	26	16	30,7
27 G 2,5	28,7	1.315	36	25	18,4

[1] Reference method F for single-core and method E for multicore cables according to IEC60364-5-52 in open air at 30°C ambient temperature. It is supposed a single-phase circuit.

[2] One cable in open air at 30°C ambient temperature according to EN 50565. For cables having 4 or 5 cores, it is supposed a three-phase circuit. For the rest of the cables it is supposed a single-phase circuit.

[3] At 60°C conductor temperature, cos φ= 1 and single-phase circuit.

XTREM®
DN-F 1,8/3 kV

Flexible rubber cable, for industrial use.

BASED ON: UNE 21150

100% Green Energy Cable Production

E_{ca}

APPLICATION

Xtrem® DN-F cables are designed to supply power to low voltage appliances like submersible pumps in deep water installations, mining installations as well as many other types of electrical equipment.

CONSTRUCTION

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

Insulation
Thermosetting rubber insulation, type EPR according to UNE 21150.
The standard identification of insulated conductors, according to UNE 21089-1 and 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
5 G	Brown + Black + Grey + Blue + Green/Yellow

Insulation
Thermosetting flexible rubber outer sheath, type SE1 according to UNE 21150. Black colour.

CHARACTERISTICS

Electrical performance
Low voltage: 1,8/3 kV.

Thermal performance
Maximum service temperature: 90°C.
Maximum short-circuit temperature: 250°C (max. 5 s).
Minimum service temperature: -40°C (static with protection) and -35°C (mobile service).

Fire performance
Flame non-propagation according to UNE-EN 60332-1 / IEC 60332-1.
Reaction to fire CPR: E_{ca} according to EN 50575.

Mechanical performance
Minimum bending radius:
3 x cable diameter < 12 mm.
4 x cable diameter ≥ 12 mm.
Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: excellent.
Grease & mineral oils resistance: excellent.
Water resistance:
AD8 Submersion.
Submersible pumps.
Deep wells.
Drinkable water.

STANDARDS / COMPLIANCE

Based to
UNE 21150

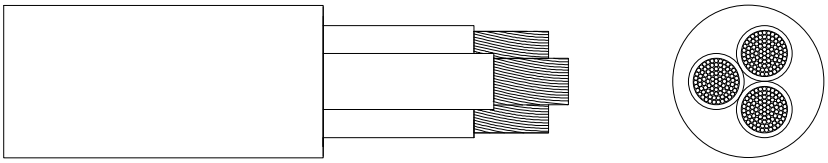
Standards and approvals
RoHS / CE

RoHS Compliant

CE

XTREM®
DN-F 1,8/3 kV

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-Section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
1 x 185	28,6	2.070	575	0,270
1 x 240	31,3	2.635	679	0,204

[1] Reference method F for single-core and method E for multicore cables according to IEC60364-5-52 in open air at 30°C ambient temperature.
[2] At maximum service temperature and cosφ=1.
For all cables it is supposed a single-phase circuit.

TOXFREE®XTREM ZH H07ZZ-F (AS)

100% Green Energy Cable Production

The extra-flexible LSHF rubber cable for mobile service.

ACCORDING TO: EN 50525-3-21

$B2_{ca}$

APPLICATION

Toxfree® Xtrem ZH H07ZZ-F (AS) is a flexible cable for mobile service, suitable for installations where low smoke and halogen free fumes under fire conditions are required.

Suitable for installations where the cable must withstand medium mechanical stress, for machines in industrial and agricultural workshops, for motors and transportable machines on construction sites, for windmills and for agricultural applications.

- Industrial use.
- Mobile use.
- Windmills.

CONSTRUCTION

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

Insulation
Halogen free thermosetting rubber insulation, type EI8 according to EN 50363-5.
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
5 G	Brown + Black + Grey + Blue + Green/Yellow
6 or more	Black numbered + Green/Yellow

Outer sheath
Halogen free thermosetting flexible rubber outer sheath type EM8, according to EN 50363-6. Black colour.

CHARACTERISTICS

Electrical performance
Low voltage 450/750 V.

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).

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Fire non-propagation according to EN 60332-3 / IEC 60332-3.
Reaction to fire CPR: $B2_{ca}$-s1b, d1,a1, according to EN 50575 (see cross-section).
Low smoke emission according to EN 61034 / IEC 61034:
Light transmittance > 60%.
Low corrosive gases emission according to UNE-EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius: 3x cable diameter < 12 mm.
4x cable diameter ≥ 12 mm.
Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: excellent.
Grease & mineral oils resistance: excellent.
Water resistance:AD7 immersion.

Installation conditions
Open Air.
In conduit.

Other
Meter by meter marking.

STANDARDS / COMPLIANCE

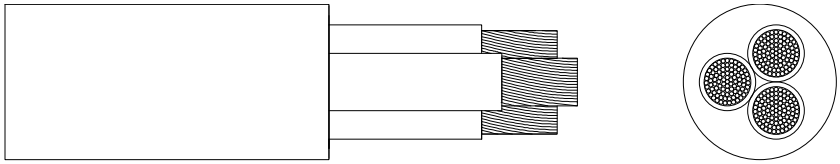
According to
EN 50525-3-21

Standards and approvals
HAR / AENOR / CE

CPR (Construction Products Regulation)
$B2_{ca}$-s1b, d1,a1. (according to cross-section)

TOXFREE® XTREM ZH
H07ZZ-F (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-Section (mm^2)	Diameter (mm)	Weight (kg/km)	Fixed Inst. (A) [1]	Mobile Service (A) [2]	Voltage drop (V/A · km) [3]
1 x 6	8,2	115	53	38	6,63
1 x 10	9,9	180	74	53	3,84
1 x 16	11,2	255	101	71	2,43
1 x 25	13,1	370	135	94	1,57
1 x 35	14,7	485	169	117	1,11
1 x 50	17,1	670	207	148	0,776
1 x 70	19,2	895	268	185	0,546
1 x 95	21,7	1.125	328	222	0,414
1 x 120	23,8	1.425	383	260	0,320
1 x 150	26,2	1.770	444	300	0,259
1 x 185	28,8	2.130	510	341	0,213
1 x 240	32,0	2.735	607	407	0,161
1 x 300	34,9	3.360	703	468	0,129
1 x 630	48,8	7.055	1.088	742	0,057
2 x 1	8,3	95	21	10	45,2
2 x 1,5	8,7	110	26	16	31,9
2 x 2,5	10,4	160	36	25	18,5
2 x 4	12,0	220	49	34	11,5
2 x 6	13,5	290	63	43	7,66
2 x 10	17,8	505	86	60	4,43
2 x 16	21,4	730	115	79	2,81
2 x 25	25,5	1.060	149	105	1,81
3 G 1	8,8	110	21	10	45,2
3 G 1,5	9,7	140	26	16	30,9
3 G 2,5	11,4	200	36	25	18,5
3 G 4	13,0	275	49	35	11,5
3 G 6	14,3	352	63	44	7,66
3 G 10	19,8	650	86	62	4,43
3 G 16	22,4	895	115	82	2,81
3 G 25	26,8	1.305	149	109	1,81
3 G 35	29,7	1.700	185	135	1,29
3 G 50	35,4	2.395	225	169	0,896
3 G 70	39,6	3.155	289	211	0,631
4 G 1	9,7	135	17	10	39,2
4 G 1,5	10,6	170	23	16	26,7
4 G 2,5	12,6	245	32	20	16,0
4 G 4	14,5	340	42	30	9,95
4 G 6	16,3	460	54	37	6,63
4 G 10	21,3	790	75	52	3,84
4 G 16	24,3	1.105	100	69	2,43
4 G 25	30,2	1.685	127	92	1,57
4 G 35	33,3	2.180	158	114	1,11
4 G 50	38,6	3.020	192	143	0,776
4 G 70	43,1	3.995	246	178	0,546
4 G 95	50,5	5.260	298	210	0,414
5 G 1	10,5	160	17	10	39,2
5 G 1,5	11,6	205	23	16	26,7
5 G 2,5	13,9	295	32	20	16,0
5 G 4	16,3	435	42	30	9,95
5 G 6	17,9	555	54	38	6,63
5 G 10	23,6	975	75	54	3,84
5 G 16	27,3	1.380	100	71	2,43
5 G 25	33,0	2.055	127	94	1,57
5 G 35	35,8	2.640	158	114	1,11

[1] Reference method F for single-core and method E for multicore cables according to IEC60364-5-52 in open air at 30°C ambient temperature.
[2] One cable in open air at 30°C ambient temperature according to EN 50565.
[3] At 60°C conductor temperature and cos φ= 1.
For cables having 2 or 3 cores, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

TOPWELD® H01N2-D

The special cable for welding.

ACCORDING TO: EN 50525-2-81

100% Green Energy Cable Production

APPLICATION

Topweld® H01N2-D is a harmonized, flexible, rubber welding cable specially designed for transmitting high currents between the welding generator and the electrode. Its flexibility makes using the welding tool easier and it also prevents knots from forming in the cable that could cause the internal conductor to break.
It can also be used in automatic welding and machine tools, conveyor systems and production or assembly lines, for example in automobile assembly lines.

- Welding.
- Industrial use.
- Mobile use.
- Robotics.
- Conveyors.

CONSTRUCTION

Conductor
Electrolytic annealed copper conductor class D (extra-flexible) according to EN 50525-2-81.

Insulation
Flexible rubber insulating outer sheath type EM5, according to EN 50363-2-2.
Black colour.

CHARACTERISTICS

Electrical performance
Low voltage: 100/100 V.

Thermal performance
Maximum service temperature: 85°C.
Maximum short-circuit temperature: 250°C (max. 5 s).
Minimum service temperature: -20°C (mobile use).

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

Mechanical performance
Minimum bending radius: 5x cable diameter.
Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: Excellent.
Grease & mineral oils resistance: Excellent.

Installation conditions
Open Air.

Other
Meter by meter marking.

STANDARDS / COMPLIANCE

According to
EN 50525-2-81

Standards and approvals
HAR / AENOR / RoHS / CE

TOPWELD®
H01N2-D

DIMENSIONS & ADMISSIBLE INTENSITIES

			Current rating (A) for single cycle for 5 min.				
Cross-section (mm^2)	Diameter (mm)	Weight (kg)	100%	85%	60%	35%	Voltage drop (V/A · km) [1]
1 x 10	8,0	140	100	103	108	122	2,450
1 x 16	9,1	195	135	145	175	230	1,560
1 x 25	10,3	280	180	195	230	300	0,998
1 x 35	11,4	375	245	245	290	375	0,709
1 x 50	13,4	520	285	305	365	480	0,493
1 x 70	15,5	725	355	380	460	600	0,348
1 x 95	17,4	945	430	470	560	730	0,264
1 x 120	19,3	1.195	500	540	650	850	0,206
1 x 150	21,4	1.475	580	630	750	980	0,166
1 x 185	23,3	1.780	665	720	860	1.120	0,136

Current-carrying capacities, in amperes, are calculated according to HD 516 and it is supposed an ambient temperature of 25 °C and single on-load period not exceeding 5 minutes. The on-load time period is expressed as a percentage of five minutes.

[1] For 10 metres of cable carrying 100 A. At 85°C conductor temperature and for direct current.

PANEL WIRE **CABLES**

TOPFLEX® MS TRI-RATED / H07V2-K

100% Green Energy Cable Production

Internal wiring of electrical cabinets. (UL, CSA, BS, UNE)

ACCORDING TO: EN 50525-2-31 / BS 6231 / UL 758 / CSA C22.2 /

E_{ca}

APPLICATION

Topflex® MS Tri-rated H07V2-K cable has been designed for the internal wiring of electrical cabinets, switch boards and small electrical devices. Due to its manufacturing characteristics, it can be used in conduit or in flexible motor ducts, transformers and other machinery in general.

•. Industrial use. • Electrical panel wiring.

CONSTRUCTION

Conductor

Electrolytic annealed copper conductor, class 5 (flexible), according to EN 60228, IEC 60228 and BS 6360.

Insulation

Flexible PVC, extra sliding, high service temperature type TI3 according to EN 50363-3, and Class 43 UL 1581. The special characteristics of the material ensure good easy-slide properties to the cable.

The standard identification of insulated conductors is the following:

Blue	RAL 5012
Brown	RAL 8003
Black	RAL 9005
Red	RAL 3000
Green/Yellow	RAL 6018/1021
Grey	RAL 7000
Dark Blue	RAL 5010
White	RAL 9010
Orange	RAL 2003
Violet	RAL 4005
Pink	RAL 3015

CHARACTERISTICS

Electrical performance

Low voltage

H05V2-K 300/500 V. - H07V2-K 450/750 V

BS 600/1000 V. - UL 600V. - CSA 600V

Thermal performance

Maximum service temperature: 90°C s/HD and BS, 105°C s / UL and CSA.

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

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

Fire performance

Flame non-propagation according to EN 60332-1 / IEC 60332-1. VW-1 and FT2 according to UL 2556

Reaction to fire CPR: E_{ca} according to EN 50575.

Mechanical performance

Minimum bending radius: 5x cable diameter.

Environmental performance

Chemical & Oil resistance: Acceptable.

Water resistance: AD3 Sprays.

CROSS SECTION	PACKAGING
0,50-6 mm^2	100 m reels (or barrels upon request)
10-16 mm^2	100 m reels or bulk drums
25 mm^2 onwards	100 m reels or bulk drums

STANDARDS / COMPLIANCE

According to

EN 50525-2-31 / UL 758 / CSA C22.2 / BS 6231.

Standards and approvals

HAR / AENOR / UL LISTED / RoHS / CE.

CPR (Construction Products Regulation)

E_{ca}

TOPFLEX® MS
TRI-RATED / H07V2-K

DIMENSIONS & ADMISSIBLE INTENSITIES

Section (mm²)	AWG	EN 50525-2-31	BS 6231	UL 758	UL 2556	CSA 22.2
0,50	22	H05V2-K	CK	Style 1015	FT2	Type TEW
0,75	20	H05V2-K	CK	Style 1015	FT2	Type TEW
1	18	H05V2-K	CK	Style 1015	FT2	Type TEW
1,5	16	H07V2-K	CK	Style 1015	FT2	Type TEW
2,5	14	H07V2-K	CK	Style 1015	FT2	Type TEW
4	12	H07V2-K	CK	Style 1015	FT2	Type TEW
6	10	H07V2-K	CK	Style 1015	FT2	Type TEW
10	8	H07V2-K	CK	Style 1028	FT2 - VW-1	Type TEW
16	6	H07V2-K	CK	Style 1283	FT2 - VW-1	Type TEW
25	4	H07V2-K	CK	Style 1283	FT2 - VW-1	Type TEW
35	2	H07V2-K	CK	Style 1283	FT2 - VW-1	Type TEW
50	1	07V2-K	CK	Style 1284	FT2 - VW-1	Type TEW
70	2/0	07V2-K	CK	Style 1284	FT2 - VW-1	Type TEW
95	3/0	07V2-K	CK	Style 1284	FT2 - VW-1	Type TEW
120	4/0	07V2-K	CK	Style 1284	FT2 - VW-1	Type TEW
150	250 MCM	07V2-K	CK	Style 1284	FT2 - VW-1	---
185	350 MCM	07V2-K	CK	Style 1284	FT2 - VW-1	---
240	450 MCM	07V2-K	CK	Style 1284	FT2 - VW-1	---
300	550 MCM	07V2-K	---	Style 1284	FT2 - VW-1	---
400	750 MCM	07V2-K	---	Style 1284	FT2 - VW-1	---

Equivalences and designation applicable for every size and standard

Cross-Section (mm²)	Diameter (mm)	Weight (kg/km)	Current (A) 2 cond. [1]	Current (A) 3 cond. [1]	Voltage drop (V/A · km) [2]
1 x 0,50	2,5	10	12	10	99,5
1 x 0,75	2,7	13	15	13	66,6
1 x 1	2,8	15	18	16	49,9
1 x 1,5	3	20	23	20	34,0
1 x 2,5	3,5	30	31	28	20,4
1 x 4	4	45	42	37	12,7
1 x 6	4,6	65	54	48	8,45
1 x 10	6,4	115	75	66	4,89
1 x 16	8,1	180	100	88	3,10
1 x 25	9,5	265	133	117	2,00
1 x 35	10,6	355	164	144	1,42
1 x 50	13,1	505	198	175	0,99
1 x 70	14,8	685	253	222	0,696
1 x 95	16,6	890	306	269	0,527
1 x 120	17,8	1.115	354	312	0,412
1 x 150	20,2	1.400	393	342	0,330

TOPFLEX® MS
TRI-RATED / H07V2-K

Cross-Section (mm^2)	Diameter (mm)	Weight (kg/km)	Current (A) 2 cond. [1]	Current (A) 3 cond. [1]	Voltage drop (V/A · km) [2]
1 x 185	21,9	1.675	449	384	0,270
1 x 240	24,3	2.180	528	450	0,205
1 x 300	27,7	2.790	603	514	0,164
1 x 400	31,6	3.650	725	620	0,124

[1] Reference method B1 for 90°C insulation cables according to IEC 60364-5-52 in open air at 30°C ambient temperature.

[2] At maximum service temperature, $\cos\varphi=1$ and single-phase circuit.

TOPFLEX® V-K
H05V-K & H07V-K

100% Green Energy Cable Production

Electric cabinet wiring and domestic use.

ACCORDING TO: EN 50525-2-31 / IEC 60227-3

Eca

APPLICATION

Topflex® H05V-K & H07V-K cable has been specially designed for installations that require a flexible cable due to the complex nature of their layout.
This cable is especially suitable for domestic wiring.
It may also be used for equipment wiring, distributors, cabinets and lighting.
It is also recommended for installation under false ceilings. Cables with cross section up to 1 mm^2 are especially suited for signalling and monitoring installations.

CONSTRUCTION

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

Insulation
Extra sliding flexible polyvinyl chloride insulation type TI1 according to EN 50363-3.
The standard identification of insulated conductors is the following:

Blue	RAL 5012
Brown	RAL 8003
Black	RAL 9005
Red	RAL 3000
Green/Yellow	RAL 6018/1021
Grey	RAL 7000
Dark Blue	RAL 5010
White	RAL 9010
Orange	RAL 2003
Violet	RAL 4005
Pink	RAL 3015

CHARACTERISTICS

Electrical performance
Low voltage 300/500 V · 450/750 V.
Rated Voltage:
H05V-K (up to 1 mm^2): 300/500 V.
H07V-K (from 1,5 mm^2 onwards): 450/750 V.

Thermal performance
Maximum service temperature: 70°C.
Maximum short-circuit temperature: 160°C (max. 5 s).
Minimum installation and handling temperature: 5°C.
Minimum service temperature: -40°C (fixed and protected installations).

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Reaction to fire CPR: E_{ca} according to EN 50575.
Reduced halogen emission. Chlorine < 15%.

Mechanical performance
Minimum bending radius: 5x cable diameter.

Environmental performance
Chemical & Oil resistance: Acceptable.

Installation conditions
In conduit.

Other
Meter by meter marking. (from 10 mm^2 onwards).

STANDARDS / COMPLIANCE

According to
EN 50525-2-31 / IEC 60227-3

Standards and approvals
HAR / AENOR / SEC / RoHS / CE

CPR (Construction Products Regulation)
E_{ca}

TOPFLEX® V-K
H05V-K & H07V-K

DIMENSIONS & ADMISSIBLE INTENSITIES

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	In conduit 2 cond. (A) [1]	In conduit 3 cond. (A) [1]	Voltage drop (V/A · km) [2]
1 x 0,50	2,1	8	8	-	93,4
1 x 0,75	2,3	11	11	-	62,4
1 x 1	2,5	13	14	-	46,8
1 x 1,5	2,9	19	17,5	15,5	31,9
1 x 2,5	3,6	30	24	21	19,2
1 x 4	4,1	44	32	28	11,9
1 x 6	4,6	61	41	36	7,92
1 x 10	5,9	105	57	50	4,58
1 x 16	7,0	160	76	68	2,90
1 x 25	8,7	245	101	89	1,87
1 x 35	9,9	335	125	110	1,33
1 x 50	11,8	480	151	134	0,926
1 x 70	13,5	655	192	171	0,653
1 x 95	15,6	865	232	207	0,494
1 x 120	17,3	1.095	269	239	0,386
1 x 150	19,3	1.380	-	275	0,310
1 x 185	21,5	1.675	-	314	0,254
1 x 240	24,5	2.210	-	370	0,192
1 x 300	26,9	2.795	-	430	0,153

[1] Reference method B1 for two and three loaded conductors installed in conduit on a wall according to IEC60364-5-52 in open air at 30°C ambient temperature.

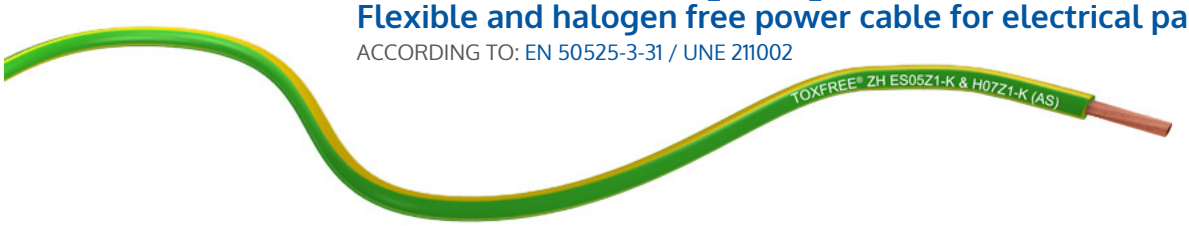
[2] At 70°C conductor temperature, cos φ= 1 and single-phase circuit.

TOXFREE® ZH

ES05Z1-K (AS) & H07Z1-K(AS)

Flexible and halogen free power cable for electrical panel wiring.

ACCORDING TO: EN 50525-3-31 / UNE 211002



$B2_{ca}$

APPLICATION

Toxfree® ES05Z1-K (AS)/H05Z1-K & H07Z1-K (AS) Type 2 is a LSHF safety cable. In the event of fire, it does not emit toxic gases, nor does it give off corrosive gases, avoiding any possible damage to people or electronic equipment.
For these reasons it is highly recommended for use in public places such as: hospitals, schools, museums, airports, bus terminals, shopping malls, offices, laboratories, etc.

CONSTRUCTION

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

Insulation
Polyolefin insulation, halogen free and low smoke under fire conditions type TIZ1 according to UNE 211002, type TI7 according to EN 50363-7 and UL 1581 (table 47.1).

The standard identification of insulated conductors is the following:

Blue	RAL 5015
Brown	RAL 8003
Black	RAL 9005
Red	RAL 3000
Green/Yellow	RAL 6018/1021
Grey	RAL 7000
Dark Blue	RAL 5010
White	RAL 9010

Other colours available on request.

CHARACTERISTICS

Electrical performance
Low voltage 300/500 V · 450/750 V.
Rated Voltage: ES05Z1-K/H05Z1-K (up to 1 mm^2): 300/500 V.
H07Z1-K (from 1,5 mm^2 onwards): 450/750 V.

Thermal performance
Maximum service temperature: 70°C.
Maximum short-circuit temperature: 160°C (max. 5 s).
Minimum service temperature: -40°C (fixed and protected installations).

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.
Reaction to fire CPR: B2ca-s1a, d1, a1, according to EN 50575.
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.

Environmental performance
Chemical & Oil resistance: Acceptable.

STANDARDS / COMPLIANCE

According to
EN 50525-3-31 / UNE 211002

Standards and approvals
HAR / AENOR / RoHS / CE / SEC

CPR (Construction Products Regulation)
$B2_{ca}$-s1a, d1, a1

TOXFREE® ZH
ES05Z1-K (AS) & H07Z1-K(AS)

DIMENSIONS & ADMISSIBLE INTENSITIES

Cross-section (mm^2)	Diameter (mm)	Weight (Kg/km)	In conduit 2 cond. (A) [1]	In conduit 3 cond. (A) [1]	Voltage drop (V/A · km) [2]
1 x 0,75	2,3	11	11	-	62,4
1 x 1	2,5	13	14	-	46,8
1 x 1,5	2,9	20	17,5	15,5	31,9
1 x 2,5	3,6	30	24	21	19,2
1 x 4	4,1	45	32	28	11,9
1 x 6	4,7	65	41	36	7,92
1 x 10	6,0	110	57	50	4,58
1 x 16	7,0	160	76	68	2,90
1 x 25	8,8	250	101	89	1,87
1 x 35	9,9	340	125	110	1,33
1 x 50	11,8	480	151	134	0,926
1 x 70	13,5	660	192	171	0,653
1 x 95	15,6	875	232	207	0,494
1 x 120	17,0	1.100	269	239	0,386
1 x 150	18,9	1.375	300	262	0,310
1 x 185	21,5	1.680	341	296	0,254
1 x 240	24,5	2.205	400	346	0,192

[1] Reference method B1 for two and three loaded conductors installed in conduit on a wall according to IEC60364-5-52 in open air at 30°C ambient temperature.
[2] At 70°C conductor temperature, cos φ= 1 and single-phase circuit.

TOXFREE® ZH
H05Z-K & H07Z-K

100% Green Energy Cable Production

Flexible and halogen free 90°C cable for electrical panel wiring.

ACCORDING TO: EN 50525-3-41

Dca

APPLICATION

Toxfree® ZH H05Z-K & H07Z-K is a flexible cable for fixed and protected installations.
It is highly recommended for use in public places such as: hospitals, schools, museums, airports, bus terminals, shopping malls, offices, laboratories, etc.
Not suitable for wet places or immersed.

- Domestic use.
- Public places.
- Electrical panel wiring.

CONSTRUCTION

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

Insulation
Halogen free thermosetting flexible rubber insulation, type EI5 according to EN 50363-5.
The standard identification of insulated conductors is the following:

Blue	RAL 5015
Brown	RAL 8003
Black	RAL 9005
Red	RAL 3000
Green/Yellow	RAL 6018/1021
Grey	RAL 7000
White	RAL 9010

Other colours available on request.

CHARACTERISTICS

Electrical performance
Low voltage: 300/500 V. 450/750 V.
Rated Voltage: H05Z-K (up to 1 mm^2): 300/500 V.
H07Z-K (from 1,5 mm^2 onwards): 450/750 V.

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).

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Reaction to fire CPR: D_{ca}-s1b, d1, a1 according to EN 50575 (see cross-section).
LSHF (Low Smoke Zero Halogen) according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034:
Light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius: 5x cable diameter.

Environmental performance
Chemical & Oil resistance: Acceptable.

Installation conditions
In conduit.

STANDARDS / COMPLIANCE

According to
EN 50525-3-41

Standards and approvals
HAR / AENOR / RoHS / CE

CPR (Construction Products Regulation)
D_{ca}-s1b, d1, a1 (according to cross-section)

TOXFREE® ZH
H05Z-K & H07Z-K

DIMENSIONS & ADMISSIBLE INTENSITIES

Cross-section (mm²)	Diameter (mm)	Weight (Kg/km)	Open Air (A) [1] (2 cores)	Open Air (A) [1] (3 cores)	Voltage drop (V/A · km) [2]
1 x 1	2,4	13			49,72
1 x 1,5	2,9	20	23	20	33,91
1 x 2,5	3,6	30	31	28	20,35
1x4	4,1	45	42	37	12,62
1x6	4,7	60	54	48	8,41
1 x 10	6,0	105	75	66	4,87
1 x 16	7,0	160	100	88	3,08
1 x 25	8,8	245	133	117	1,99
1 x35	9,9	340	164	144	1,41
1 x 50	11,8	470	198	175	0,98
1 x 70	13,2	650	253	222	0,69
1 x 95	15,4	860	306	269	0,52
1 x 120	16,9	1.080	354	312	0,41
1 x 150	19,0	1.345	393	342	0,32

[1] Reference method B1 according to IEC 60364-5-52 in open air at 30°C ambient temperature. Two or three loaded conductors installed in conduit on a wall.

[2] At maximum service temperature, cosφ=1 and single-phase circuit.

TOXFREE® ZH
H07Z1-U/R (AS)

Halogen free power cable for electrical panel wiring.

ACCORDING TO: EN 50525-3-31 / UNE 211002

100% Green Energy Cable Production

$B2_{ca}$

APPLICATION

Toxfree® ZH H07Z1-U/R Type 2 is a LSHF safety cable. In the event of fire, it does not emit toxic gases, nor does it give off corrosive gases, avoiding any possible damage to people or electronic equipment. For these reasons it is highly recommended for use in public places such as: hospitals, schools, museums, airports, bus terminals, shopping malls, offices, laboratories, etc.

CONSTRUCTION

Conductor
Electrolytic annealed copper conductor class 1 (H07Z1-U) or class 2 (H07Z1-R) according to EN 60228 and IEC 60228.

Insulation
Polyolefin insulation, halogen free and low smoke under fire conditions, type TIZ1 according to UNE 211002 and type TI7 according to EN 50363-7.
The standard identification of insulated conductors is the following:

Blue	RAL 5015
Brown	RAL 8003
Black	RAL 9005
Red	RAL 3000
Green/Yellow	RAL 6018/1021
Grey	RAL 7000
Dark Blue	RAL 5010
White	RAL 9010

Other colours available on request.

CHARACTERISTICS

Electrical performance
Low voltage: 450/750 V.

Thermal performance
Maximum service temperature: 70˚C.
Maximum short-circuit temperature: 160˚C (max. 5 s).
Minimum service temperature: -40˚C (fixed and protected installations).

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.
Reaction to fire CPR: B2ca-s1a, d1, a1, according to EN 50575.
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.

Environmental performance
Chemical & Oil resistance: Acceptable.

STANDARDS / COMPLIANCE

According to
EN 50525-3-31 / UNE 211002

Standards and approvals
HAR / AENOR / RoHS / CE

CPR (Construction Products Regulation)
$B2_{ca}$-s1a, d1, a1

TOXFREE® ZH
H07Z1-U/R (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES

Cross-section (mm^2)	Diameter (mm)	Weight (Kg/km)	In conduit 2 cond. (A) [1]	In conduit 3 cond. (A) [1]	Voltage drop (V/A · km) [2]
1 x 1,5	2,8	20	17,5	15,5	31,9
1 x 2,5	3,3	30	24	21	19,2
1 x 4	3,8	45	32	28	11,9
1 x 6 (*)	4,7	70	41	36	7,92
1 x 10 (*)	5,8	110	57	50	4,58
1 x 16 (*)	6,7	165	76	68	2,90

[1] Reference method B1 for two and three loaded conductors installed in conduit on a wall according to IEC60364-5-52 in open air at 30°C ambient temperature.

[2] At maximum service temperature, cosφ=1.and single-phase circuit.

XLPE / PVC POWER **CABLES**

POWERFLEX® RV-K

Industrial flexible cable for power transmission.

ACCORDING TO: IEC 60502-1 / UNE 21123-2

100% Green Energy Cable Production

E_{ca}

APPLICATION

Powerflex® RV-K cable is suitable for all types of low voltage industrial-type connections, in urban grids, building installations, etc. Its high flexibility makes the installation process substantially easier and, as a result, is particularly suitable for use in difficult layouts. It can be buried or installed in a tube as well as outdoors without requiring additional protection. This cable can withstand damp conditions including total immersion in water (AD7).

CONSTRUCTION

Conductor

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

Insulation

Cross-linked polyethylene insulation type DIX-3 according to HD 603-1 and type XLPE according to IEC 60502-1.

The standard identification of insulated conductors according to HD 308 and UNE-21089-1, is the following:

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

Outer sheath

Flexible PVC outer sheath, type DMV-18 according to HD 603-1 and type ST2 according to IEC 60502-1. Black 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 (on cable surface).

Fire performance

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

Reaction to fire CPR: E_{ca} according to EN 50575.

Reduced halogen emission. Chlorine <15%.

Mechanical performance

Minimum bending radius: 5x cable diameter.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical & Oil resistance: Good.

UV Resistant according to UNE 211605.

Water resistance: AD7 immersion.

Installation conditions

Open Air.

Buried.

In conduit.

In tray.

STANDARDS / COMPLIANCE

According to

IEC 60502-1 / UNE 21123-2

Standards and approvals

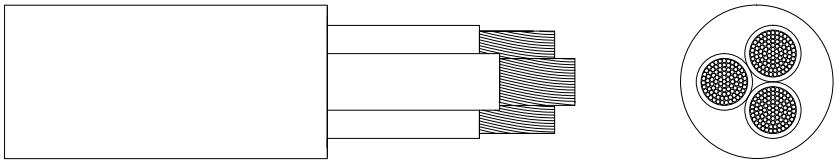
AENOR / BUREAU VERITAS / KEMA-KEUR /RoHS / CE

CPR (Construction Products Regulation)

E_{ca}

POWERFLEX®
RV-K

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 1,5	5,7	45	28	27	33,9
1 x 2,5	6,2	55	39	35	20,3
1 x 4	6,7	70	53	46	12,6
1 x 6	7,3	90	68	58	8,41
1 x 10	8,2	135	93	77	4,87
1 x 16	9,2	190	124	100	3,08
1 x 25	11,0	285	161	129	1,98
1 x 35	12,1	385	200	155	1,41
1 x 50	13,8	520	242	183	0,984
1 x 70	15,7	715	310	225	0,693
1 x 95	17,6	925	377	270	0,525
1 x 120	19,2	1.165	437	306	0,410
1 x 150	21,5	1.450	504	343	0,328
1 x 185	23,9	1.750	575	387	0,270
1 x 240	26,9	2.280	679	448	0,204
1 x 300	29,6	2.830	783	502	0,163
1 x 400	33,8	3.735	930	592	0,123
1 x 500	37,4	4.780	1.070	670	0,097
1 x 630	42,7	6.280	1.232	762	0,073
1 x 800	51,5	8.235	1.426	870	0,056
1 x 1000	59,9	10.410	1.640	988	0,044
2 x 1,5	8,2	90	26	27	33,9
2 x 2,5	9,2	120	36	35	20,3
2 x 4	10,3	165	49	46	12,6
2 x 6	11,3	215	63	58	8,41
2 x 10	13,2	320	86	77	4,87
2 x 16	14,9	450	115	100	3,08
2 x 25	20,8	810	149	129	1,98
2 x 35	22,0	1.000	185	155	1,41
2 x 50	25,7	1.375	225	183	0,984
2 x 70	29,5	1.880	289	225	0,693
2 x 95	33,0	2.430	352	270	0,525
3 G 1,5	8,9	110	26	27	33,9
3 G 2,5	9,8	145	36	35	20,3
3 G 4	11,0	200	49	46	12,6
3 G 6	12,1	265	63	58	8,41
3 G 10	14,3	405	86	77	4,87
3 x 16	16,4	595	115	100	3,08
3 x 25	20,7	955	149	129	1,98
3 x 35	23,1	1.275	185	155	1,41
3 x 50	26,8	1.750	225	183	0,984
3 x 70	29,6	2.370	289	225	0,693
3 x 95	35,0	3.140	352	270	0,525
3 x 120	39,8	4.115	410	306	0,41
3 x 150	44,7	5.130	473	343	0,328
3 x 185	49,9	6.285	542	387	0,270
3 x 240	54,1	7.875	641	448	0,204

Top Cable

POWERFLEX®
RV-K

Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Buried (A) [2]	Voltage drop (V/A · km) [3]
3 x 300	62,3	10.100	741	502	0,163
3x16+1x10	17,6	700	115	100	3,08
3x25+1x16	22,7	1.140	149	129	1,98
3x35+1x16	25,0	1.480	185	155	1,41
3x50+1x25	29,1	2.050	225	183	0,984
3x70+1x35	33,8	2.850	289	225	0,693
3x95+1x50	38,2	3.700	352	270	0,525
3x120+1x70	42,1	4.750	410	306	0,410
3x150+1x70	46,8	5.800	473	343	0,328
3x185+1x95	53,5	7.200	542	387	0,270
3x240+1x120	58,5	9.100	641	448	0,204
4 G 1,5	9,7	130	26	27	33,9
4 G 2,5	10,7	175	36	35	20,3
4 G 4	12,0	245	49	46	12,6
4 G 6	13,4	330	63	58	8,41
4 G 10	15,7	505	86	77	4,87
4 x 16	18,2	750	115	100	3,08
4 x 25	24,1	1.245	149	129	1,98
4 x 35	26,3	1.675	185	155	1,41
4 x 50	31,3	2.315	225	183	0,984
4 x 70	36,1	3.205	289	225	0,693
4 x 95	40,2	4.130	352	270	0,525
4 x 120	44,6	5.245	410	306	0,410
4 x 150	49,8	6.575	473	343	0,328
4 x 185	56,1	8.050	542	387	0,270
4 x 240	64.5	10.695	641	448	0,204
5 G 1,5	10,4	155	26	27	33,9
5 G 2,5	11,6	215	36	35	20,3
5 G 4	13,2	300	49	46	12,6
5 G 6	14,7	405	63	58	8,41
5 G 10	17,1	625	86	77	4,87
5 G 16	20,2	935	115	100	3,08
5 G 25	26,6	1.555	149	129	1,98
5 G 35	29,3	2.080	185	155	1,41
5 G 50	34,5	2.895	225	183	0,984
5 G 70	38,7	3.930	289	225	0,693
5 G 95	44,6	5.190	352	270	0,525
5 G 120	49,7	6.560	410	306	0,410
5 G 150	55,6	8.145	473	343	0,328
5 G 185	62,5	9.975	542	387	0,270
5 G 240	71,8	13.210	641	448	0,204
7 G 1,5	11,2	190	26	27	33,9
7 G 2,5	12,4	265	36	35	20,3
10 G 1,5	13,2	260	26	27	33,9
10 G 2,5	16,3	380	36	35	20,3
12 G 1,5	14,2	295	26	27	33,9
12 G 2,5	15,7	420	36	35	20,3
14 G 1,5	14,9	315	26	27	33,9
24 G 1,5	20,4	550	26	27	33,9

[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 cosφ=1.

In all cases it is supposed a single-phase circuit.

POWERFLEX® PLUS YMvKf

100% Green Energy Cable Production

The universal cable for power transmission with improved fire proof properties.

ACCORDING TO: HD 604-4-D / IEC 60502-1

C_{ca}

APPLICATION

Powerflex® Plus YMvKf cable is suitable for all types of industrial low voltage connections, urban grids, building installations, etc. This cable is fire retardant and is recommended for use in public places and hazardous industries. Its flexibility makes installation substantially easier, making it highly suitable for difficult layouts. This cable can also be used in buried installations or in tubes or outdoors without requiring additional protection. This cable withstands damp conditions and even total submersion in water (AD7).

CONSTRUCTION

Conductor

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

Insulation

Cross-linked polyethylene insulation, type XLPE according to IEC 60502-1 and HD 604. The standard identification of insulated conductors, according to HD 308 is the following:

1 x	Black
2 x	Blue + Brown
3 x	Blue + Brown + Grey
4 G	Brown + Black + Grey + Green/Yellow
5 G	Brown + Black + Grey + Blue + Green/Yellow

Outer sheath

Flexible PVC/ST2 outer sheath, according to IEC 60502-1 and HD 604.Grey colour.

CHARACTERISTICS

Electrical performance

Low voltage 0,6/1kV.

Thermal performance

Maximum service temperature: 90°C.

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

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

Fire performance

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

Fire non-propagation according to EN 60332-3-24/IEC 60332-3-24.

Reaction to fire CPR: C_{ca}-s2,d2,a3 according to 50575.

Reduced halogen emission. Chlorine <15%.

Mechanical performance

Minimum bending radius: x5 cable diameter.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical & Oil resistance: Acceptable..

UV Resistant according to UNE 211605.

Water resistance AD7 immersion.

STANDARDS / COMPLIANCE

According to

HD 604-4-D / IEC 60502-1

Standards and approvals

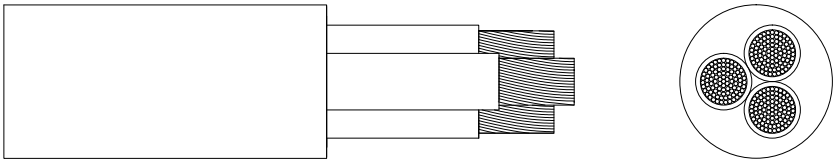
AENOR / BUREAU VERITAS / KEMA-KEUR /RoHS / CE.

CPR (Construction Products Regulation)

C_{ca}-s2,d2,a3.

POWERFLEX® PLUS
YMvKf

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air [1]	Buried [2]	Voltage drop (V/A · km) [3]
1 x 10	8,2	145	93	77	4,87
1 x 16	9,2	200	124	100	3,08
1 x 25	10,9	295	161	129	1,98
1 x 35	11,8	385	200	155	1,41
1 x 50	13,6	525	242	183	0,984
1 x 70	15,4	715	310	225	0,693
1 x 95	17,5	925	377	270	0,525
1 x 120	19,1	1.160	437	306	0,410
1 x 150	21,3	1.440	504	343	0,328
1 x 185	23,4	1.735	575	387	0,270
1 x 240	26,2	2.260	679	448	0,204
1 x 300	29,1	2.860	783	502	0,163
1 x 400	33,8	3.765	940	563	0,123
1 x 500	37,5	4.805	1.083	637	0,097
1 x 630	43,7	6.340	1.254	719	0,073
2 x 10	15,4	410	86	77	4,87
2 x 16	17,1	555	115	100	3,08
2 x 25	20,6	815	149	129	1,98
2 x 35	22,9	1.070	185	155	1,41
3 G 10	16,1	495	86	77	4,87
3 x 16	18,1	690	115	100	3,08
3 x 25	21,4	1.015	149	129	1,98
3 x 35	23,8	1.340	185	155	1,41
3 x 50	27,6	1.840	225	183	0,984
3 x 70	30,3	2.460	289	225	0,693
3 x 95	35,6	3.245	352	270	0,525
3 x 120	39,8	4.105	410	306	0,410
3 x 150	43,9	5.080	473	343	0,328
3 x 185	48,6	6.160	542	387	0,270
3 x 240	54,7	8.020	641	448	0,204
3 x 16 + 1 x 10	19,1	795	115	100	3,08
3 x 25 + 1 x 16	23,9	1.165	149	129	1,98
3 x 35 + 1 x 25	25,3	1.580	185	155	1,41
3 x 50 + 1 x 25	28,8	2.060	225	183	0,984
3 x 70 + 1 x 35	32,9	2.810	289	225	0,693
3 x 95 + 1 x 50	37,1	3.675	352	270	0,525
4 G 10	17,5	660	86	77	4,87
4 G 16	19,7	850	115	100	3,08
4 G 25	23,2	1.250	149	129	1,98
4 G 35	25,4	1.655	185	155	1,41

POWERFLEX® PLUS
YMvKf

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air [1]	Buried [2]	Voltage drop (V/A · km) [3]
4 G 50	30,8	2.310	225	183	0,984
4 G 70	35,4	3.175	289	225	0,693
4 G 95	39,2	4.095	352	270	0,525
4 G 120	44,4	5.215	410	306	0,410
4 G 150	48,7	6.460	473	343	0,328
4 G 185	54,2	7.860	542	387	0,270
4 G 240	61,5	10.265	641	448	0,204
4 x 35 + 1 G 25	28,2	1.940	185	155	1,41
4 x 50 + 1 G 25	32,6	2.575	225	183	0,984
4 x 70 + 1 G 35	37,6	3.545	289	225	0,693
4 x 95 + 1 G 50	42,2	4.620	352	270	0,525
5 G 10	19,0	720	86	77	4,87
5 G 16	21,6	1.030	115	100	3,08
5 G 25	25,9	1.540	149	129	1,98
5 G 35	28,3	2.035	185	155	1,41
5 G 50	34,0	2.830	225	183	0,984
5 G 70	38,6	3.880	289	225	0,693
5 G 95	44,2	5.070	352	270	0,525
5 G 120	48,7	6.395	410	306	0,410
5 G 150	53,9	7.930	473	343	0,328
5 G 185	60,5	9.660	542	387	0,270
5 G 240	68,6	12.635	641	448	0,204

[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 $\cos\varphi=1$.

For all cables is supposed a single-phase circuit.

POWERHARD® F RVFV-K

Armoured cable with double steel or aluminium tape armour.

ACCORDING TO: IEC 60502-1 / UNE 21123-2

100% Green Energy Cable Production

E_{ca}

APPLICATION

Powerhard® F RVFV-K cable is especially suitable for fixed installations that may be subject to mechanical aggression. It is highly recommended for use in installations where the presence of rodents could imply a threat to the cable (such as warehouses, production plants and agricultural facilities). At the same time, its use is recommended for street lighting installations.

CONSTRUCTION

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

Insulation
Cross-linked polyethylene insulation type DIX-3 according to UNE-HD 603 and type XLPE according to IEC 60502-1. The standard identification according to HD 308 is:

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

Separation sheath
Extruded PVC separation sheath.

Armour
Double steel or aluminium tape armour. Aluminium armour is used in single-core cables to avoid parasite currents that may overheat the cable. Steel tape armour is used in multicore cables.

Outer sheath
Flexible PVC outer sheath typeDMV-18 according to UNE-HD 603 and type ST2 according to IEC 60502-1. Black colour.

CHARACTERISTICS

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

Thermal performance
Maximum service temperature: 90oC.

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

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

Minimum installation and handling temperature: 0oC.

Fire performance
Flame non-propagation according to EN 60332-1 and IEC 60332-1.

Reaction to fire CPR: Eca, according to EN 50575.

Reduced halogen emission. Chlorine <15%.

Mechanical performance
Minimum bending radius: 10 x cable diameter.

Impact resistance: AG4 High severity.

Rodent proof.

Environmental performance
Chemical & Oil resistance: Good.

UV Resistant according to UNE 211605.

Water resistance: AD7 immersion.

Installation conditions
Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

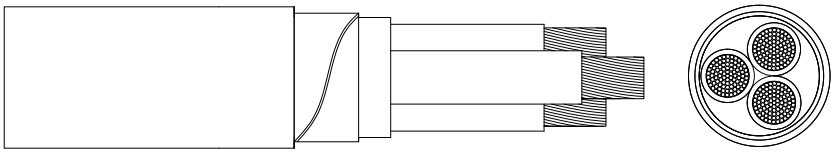
According to
IEC 60502-1 / UNE 21123-2.

Standards and approvals
BUREAU VERITAS / RoHS / CE.

CPR (Construction Products Regulation)
E_{ca}.

POWERHARD® F
RVFV-K

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 16	14,4	370	124	100	3,08
1 x 25	16	485	161	129	1,98
1 x 35	17,1	595	200	155	1,41
1 x 50	18,6	730	242	183	0,984
1 x 70	20,3	960	310	225	0,639
1 x 95	22,4	1.255	377	270	0,525
1 x 120	24,4	1.510	437	306	0,410
1 x 150	26,3	1.810	504	343	0,328
1 x 185	28,3	2.215	575	387	0,270
1 x 240	31,3	2.805	679	448	0,204
1 x 300	34	3.420	783	502	0,163
1 x 400	38,6	4.225	930	592	0,123
1 x 500	42,3	5.330	1.070	670	0,097
2 x 1,5	12,3	225	26	27	33,9
2 x 2,5	13,2	270	36	35	20,3
2 x 4	14,1	320	49	46	12,6
2 x 6	15,7	420	63	58	8,41
2 x 10	17,1	530	86	77	4,87
2 x 16	18,6	690	115	100	3,08
2 x 25	21,8	960	149	129	1,98
3 G 1,5	12,8	255	26	27	33,9
3 G 2,5	13,8	300	36	35	20,3
3 x 4	15,1	380	49	46	12,6
3 x 6	16,4	485	63	58	8,41
3 x 10	17,8	630	86	77	4,87
3 x 16	19,6	845	115	100	3,08
3 x 25	23,9	1.270	149	129	1,98
3 x 35	26,2	1.630	185	155	1,41
3 x 50	29,8	2.105	225	183	0,984
3 x 70	33,3	2.755	289	225	0,639
3 x 95	40,1	3.960	352	270	0,525
3 x 16 + 1 x 10	20,5	960	115	100	3,08
3 x 25 + 1 x 16	25	1.355	149	129	1,98
3 x 35 + 1 x 16	27,3	1.695	185	155	1,41
3 x 50 + 1 x 25	31,5	2.315	225	183	0,984
3 x 70 + 1 x 35	36	3.120	289	225	0,639
3 x 95 + 1 x 50	41,6	4.425	352	270	0,525
3 x 120 + 1 x 70	46,8	5.895	410	306	0,410
3 x 150 + 1 x 70	51,5	7.005	473	343	0,328
3 x 185 + 1 x 95	56,5	8.730	542	387	0,270
3 x 240 + 1 x 120	63,4	11.040	641	448	0,204
4 G 1,5	13,7	285	26	27	33,9
4 G 2,5	14,6	345	36	35	20,3
4 x 4	16,1	440	49	46	12,6
4 x 6	17,2	560	63	58	8,41
4 x 10	18,9	750	86	77	4,87

POWERHARD® F
RVFV-K

Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Buried (A) [2]	Voltage drop (V/A · km) [3]
4 x 16	21	1.025	115	100	3,08
4 x 25	26	1.550	149	129	1,98
4 x 35	28,8	2.050	185	155	1,41
4 x 50	32,8	2.645	225	183	0,984
4 x 70	39,9	3.900	289	225	0,639
4 x 95	43,8	4.895	352	270	0,525
4 x 120	49,2	6.330	410	306	0,410
4 x 150	54,8	7.800	473	343	0,328
4 x 185	60,3	9.360	542	387	0,270
4 x 240	67,4	12.100	641	448	0,204
5 G 1,5	14,3	315	26	27	33,9
5 G 2,5	15,6	395	36	35	20,3
5 G 4	17	500	49	46	12,6
5 G 6	18,6	625	63	58	8,41
5 G 10	20,7	900	86	77	4,87
5 G 16	23,1	1.245	115	100	3,08
5 G 25	28,5	1.785	149	129	1,98
5 G 35	31,5	2.355	185	155	1,41
5 G 50	37,1	3.255	225	183	0,984
5 G 70	42,5	4.725	289	225	0,639
5 G 95	47,9	6.065	352	270	0,525
5 G 120	53,5	7.580	410	306	0,410
6 G 1,5	14,3	325	26	27	29,5
6 G 2,5	15,9	420	36	35	17,7
6 G 4	17,5	540	49	46	11,0
7 G 1,5	14,1	335	26	27	33,9
7 G 2,5	15,6	430	36	35	20,3
7 G 4	17,3	565	49	46	12,6
10 G 1,5	16,4	435	26	27	33,9
10 G 2,5	17,7	555	36	35	20,3
12 G 1,5	17,1	480	26	27	33,9
12 G 2,5	18,8	620	36	35	20,3
12 G 4	22,4	880	49	46	12,6
14 G 1,5	18,6	545	26	27	29,5
14 G 2,5	20,8	725	36	35	17,7
16 G 1,5	19,3	600	26	27	29,5
16 G 2,5	21,3	785	36	35	17,7
19 G 1,5	20	660	26	27	33,9
19 G 2,5	22,5	890	36	35	20,3
19 G 4	25,9	1.230	49	46	12,6
24 G 1,5	22	775	26	27	33,9
24 G 2,5	24,5	1.045	36	35	20,3
24 G 4	30	1.510	49	46	12,6
27 G 1,5	23,4	850	26	27	33,9
27 G 2,5	27,0	1.170	36	35	20,3
37 G 1,5	25,9	1.065	26	27	33,9
37 G 2,5	29,4	1.465	36	35	20,3
61 G 1,5	36,9	2.285	26	27	33,9

[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 $\cos\varphi=1$.

For all cables is supposed a single-phase circuit.

POWERHARD® M RVhMVh-K

Galvanized steel wire armour cable.

ACCORDING TO: IEC 60502-1

100% Green Energy Cable Production

Eca

APPLICATION

POWERHAR® M RVhMVh-K cable has been specially designed for installations in potentially explosion hazard locations (ATEX provided that local regulations allow it). It is highly recommended for petrol stations, petrochemical plants, flammable product warehouses, etc. It can also be used in production plants, agricultural facilities, street lighting and installations where the cable is subject to high mechanical aggression. This cable is also available in hydrocarbon resistant version.

CONSTRUCTION

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

Insulation
Cross-linked polyethylene insulation type DIX-3 according to HD 603 and XLPE according to IEC 60502-1.
The standard identification of insulated conductors according to HD 308, is the following:

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

Inner covering
PVC.

Armour
Galvanized steel wire armour. Aluminium armour is used in single-core cables to avoid parasite currents that may overheat the cable.

Outer sheath
PVC outer sheath type ST2 according to IEC 60502-1. Black 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 (on cable surface).

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Reaction to fire CPR: Eca according to EN 50575.
Reduced halogen emission. Chlorine <15%.

Mechanical performance
Minimum bending radius: 10x cable diameter.
Impact resistance: AG2 High severity.
Rodent proof.

Environmental performance
Chemical & Oil resistance: Good.
UV Resistant: UNE 211605.
Potentially explosion hazard locations (ATEX).
Water resistance: AD7 immersion.

Installation conditions
Open Air.
Buried.
In conduit.

STANDARDS / COMPLIANCE

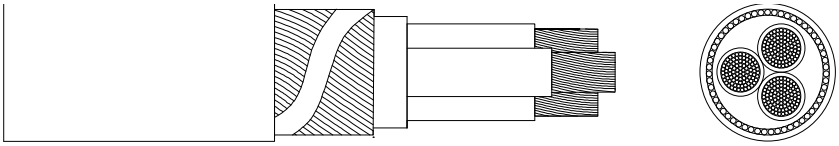
According to
IEC 60502-1

Standards and approvals
BUREAU VERITAS / RoHS / CE

CPR (Construction Products Regulation)
E_{ca}

POWERHARD® M
RVhMVh-K

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 16	14,8	375	124	100	3,08
1 x 25	16,5	495	161	129	1,98
1 x 35	17,4	600	200	155	1,41
1 x 50	19,2	770	242	183	0,984
1 x 70	21,0	985	310	225	0,693
1 x 95	22,7	1.220	377	270	0,525
1 x 120	24,5	1.480	437	306	0,41
1 x 150	26,2	1.775	504	343	0,328
1 x 185	28,5	2.110	575	387	0,27
1 x 240	31,6	2.690	679	448	0,204
1 x 300	34,3	3.330	783	502	0,163
1 x 400	39,2	4.320	940	563	0,123
1 x 500	45,2	5.710	1.083	637	0,097
1 x 630	51,4	7.385	1.254	719	0,073
2 x 1,5	11,3	250	26	27	33,9
2 x 2,5	12,3	300	36	35	20,3
2 x 4	13,4	365	49	46	12,6
2 x 6	14,4	430	63	58	8,41
2 x 10	17,0	660	86	77	4,87
2 x 16	18,7	770	115	100	3,08
2 x 25	24,4	1.415	149	129	1,98
2 x 35	26,1	1.675	185	155	1,41
2 x 50	30,0	2.195	225	183	0,984
2 x 70	33,9	2.830	289	225	0,639
3 x 1,5	12,0	280	26	27	33,9
3 x 2,5	12,9	335	36	35	20,3
3 x 4	14,1	410	49	46	12,6
3 x 6	15,3	500	63	58	8,41
3 x 10	17,8	695	86	77	4,87
3 x 16	20,2	1.080	115	100	3,08
3 x 25	25,2	1.615	149	129	1,98
3 x 35	28,8	2.245	185	155	1,41
3 x 50	31,6	2.610	225	183	0,984
3 x 70	37,0	4.040	289	225	0,639
3 x 95	42,3	5.085	352	270	0,525
3 x 16 + 1 x 10	22,9	1.345	115	100	3,08
3 x 25 + 1 x 16	26,3	1.820	149	129	1,98
3 x 35 + 1 x 16	28,4	2.195	185	155	1,41
3 x 50 + 1 x 25	32,8	2.910	225	183	0,984
3 x 70 + 1 x 35	39,8	4.585	289	225	0,639
3 x 95 + 1 x 50	43,8	5.670	352	270	0,525
4 x 1,5	12,8	315	26	27	33,9
4 x 2,5	13,6	375	36	35	20,3
4 x 4	15,3	480	49	46	12,6
4 x 6	16,6	590	63	58	8,41
4 x 10	19,1	815	86	77	4,87

POWERHARD® M
RVhMVh-K

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Buried (A) [2]	Voltage drop (V/A · km) [3]
4 x 16	23,8	1.415	115	100	3,08
4 x 25	27,6	1.945	149	129	1,98
4 x 35	29,4	2.390	185	155	1,41
4 x 50	34,5	3.180	225	183	0,984
4 x 70	41,3	4.955	289	225	0,639
4 x 95	45,8	6.130	352	270	0,525
4 x 120	50,9	7.450	410	306	0,41
4 x 150	55,3	8.895	473	343	0,328
4 x 185	60,4	10.500	542	387	0,27
4 x 240	68,0	13.285	641	448	0,204
5 G 1,5	13,5	350	26	27	33,9
5 G 2,5	14,6	435	36	35	20,3
5 G 4	16,5	555	49	46	12,6
5 G 6	17,9	680	63	58	8,41
5 G 10	22,8	1.265	86	77	4,87
5 G 16	25,7	1.665	115	100	3,08
5 G 25	29,8	2.295	149	129	1,98
5 G 35	32,5	2.875	185	155	1,41
5 G 50	38,1	3.825	225	183	0,984
5 G 70	45,1	5.860	289	225	0,639
6 G 1,5	14,2	385	26	27	33,9
6 G 2,5	15,7	490	36	35	20,3
7 G 1,5	14,2	400	26	27	33,9
7 G 2,5	15,7	510	36	35	20,3
10 G 1,5	16,3	510	26	27	33,9
10 G 2,5	17,7	640	36	35	20,3
12 G 1,5	17,4	575	26	27	33,9
12 G 2,5	20,9	1.000	36	35	20,3
14 G 1,5	18,1	620	26	27	33,9
14 G 2,5	22,3	1.105	36	35	20,3
16 G 1,5	21,2	965	26	27	33,9
16 G 2,5	23,2	1.205	36	35	20,3
19 G 1,5	21,9	1.035	26	27	33,9
19 G 2,5	24,1	1.305	36	35	20,3
24 G 1,5	23,8	1.145	26	27	33,9
24 G 2,5	26,1	1.500	36	35	20,3
27 G 1,5	25,0	1.295	26	27	33,9

[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 cosφ=1.
In all cases it is supposed a single-phase circuit.

POWERHARD®
RV / U-1000 R2V

Copper cable for power transmission.

ACCORDING TO: IEC 60502-1 / UNE 21123-2 / XP C 32-321

100% Green Energy Cable Production

E_{ca}

APPLICATION

Powerhard® RV / U-1000 R2V cable has been specially designed for low voltage industrial-type connections, urban grids, buildings installations, etc. It can be buried or installed in a tube as well as outdoors without requiring additional protection.

Lastly, the Powerhard® RV / U-1000 R2V cable can withstand damp conditions including total submersion in water (AD8).

CONSTRUCTION

Conductor

Electrolytic annealed copper rigid, class 1 (up to 4 mm^2) or class 2 (from 6 mm^2) according to EN 60228 and IEC 60228.

Insulation

Cross-linked polyethylene insulation type XLPE according to IEC 60502-1, type DIX3 according to HD 603-1 and compound insulation according to XP C 32-321.

The standard identification of insulated conductors according to UNE 21089-1 and HD 308, is the following:

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

Outer sheath

PVC outer sheath, type ST2 according to IEC 60502-1, type DMV-18 according to HD 603-1, and compound outer sheath according to XP C 32-321. Black colour. The outer sheath for each cross-section (up to 25mm^2) is marked with a unique colour stripe.

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).

Fire performance

Flame non-propagation according to EN 60332-1 / IEC 60332-1 / NF C 32-070.

Reaction to fire CPR: E_{ca} according to EN 50575.

Reduced halogen emission. Chlorine <15%.

Mechanical performance

Minimum bending radius: 5x cable diameter.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical & Oil resistance: Good.

UV Resistant according to UNE 211605 and NF-C 32-323.

Water resistance: AD8 Submersion.

Installation conditions

Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

According to

IEC 60502-1 / UNE 21123-2 / XP C 32-321

Standards and approvals

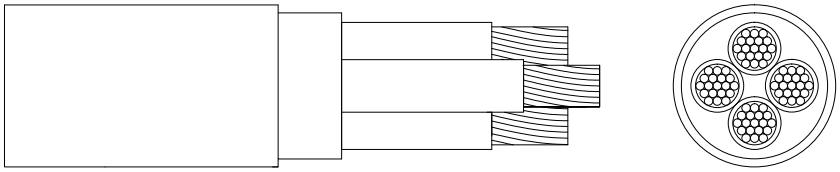
AENOR / BUREU VERITAS / NF-USE / RoHS / CE

CPR (Construction Products Regulation)

E_{ca}

POWERHARD®
RV / U-1000 R2V

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	In duct Buried (A) [2]	Voltage drop (V/A · km) [3]
1 x 6	7,3	105	53	44	6,83
1 x 10	8,0	145	74	58	4,06
1 x 16	8,9	200	101	75	2,54
1 x 25	10,9	310	135	96	1,61
1 x 35	11,8	410	169	115	1,16
1 x 50	13,3	530	207	135	0,86
1 x 70	15,0	745	268	167	0,594
1 x 95	17,2	1.015	328	197	0,428
1 x 120	19,1	1.260	383	223	0,339
1 x 150	21,0	1.550	444	251	0,275
1 x 185	22,9	1.935	510	281	0,218
1 x 240	26,3	2.500	607	324	0,167
1 x 300	29,2	3.095	703	365	0,133
1 x 400	33,1	4.015	823	426	0,104
2 x 1,5	8,2	100	26	25	31,0
2 x 2,5	8,8	130	36	33	19,0
2 x 4	10,1	175	49	43	11,8
2 x 6	11,7	245	63	53	7,88
2 x 10	13,1	340	86	71	4,68
2 x 16	14,6	480	115	91	2,94
3 x 1,5	8,5	115	23	21	26,8
3 x 2,5	9,6	155	32	28	16,4
3 x 4	10,6	215	42	36	10,2
3 x 6	12,4	295	54	44	6,83
3 x 10	13,8	430	75	58	4,06
3 x 16	15,8	630	100	75	2,54
3 x 25	20,8	1.025	127	96	1,61
3 x 35	23,5	1.390	158	115	1,16
3 x 50	27,2	1.840	192	135	0,86
3 x 70	31,0	2.575	246	167	0,594
4 x 1,5	9,3	140	23	21	26,8
4 x 2,5	10,2	185	32	28	16,4
4 x 4	11,6	260	42	36	10,4
4 x 6	13,2	370	54	44	6,83
4 x 10	15,0	530	75	58	4,06
4 x 16	17,2	785	100	75	2,54
4 x 25	23,6	1.325	127	96	1,61
4 x 35	26,1	1.765	158	115	1,16
4 x 50	30,1	2.335	192	135	0,86
4 x 70	34,4	3.285	246	167	0,594
4 x 95	39,4	4.460	298	197	0,428

POWERHARD®
RV / U-1000 R2V

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	In duct Buried (A) [2]	Voltage drop (V/A · km) [3]
4 x 120	44.4	5.610	346	223	0,339
4 x 150	48,7	6.885	399	251	0,275
4 x 185	53,7	8.590	456	281	0,218
4 x 240	61,8	11.200	538	324	0,167
5 G 1,5	10,1	160	23	21	26,8
5 G 2,5	11,3	225	32	28	16,4
5 G 4	12,6	315	42	36	10,2
5 G 6	14,8	445	54	44	6,83
5 G 10	16,9	660	75	58	4,06
5 G 16	19,8	1.020	100	75	2,54
5 G 25	26,1	1.625	127	96	1,61
5 G 35	28,7	2.160	158	115	1,16
5 G 50	33,4	2.870	192	135	0,86

[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 D1 according to IEC 60364-5-52. In duct 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 $\cos\varphi=1$.

For cables having 2 conductors, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

POWERHARD®
RV Al / U-1000 AR2V

Aluminium cable for power transmission.

ACCORDING TO: UNE-HD 603-5N / XP C 32-321 / IEC 60502-1

100% Green Energy Cable Production

E_{ca}

APPLICATION

Powerhard® RV Al/ U-1000 AR2V cable is suitable for all types of underground networks for public power distribution, as well as low voltage connexions in industrial plants, urban networks, buildings, etc. Due to its rigidity, its use is recommended in installations with a simple configuration where a flexible cable is not needed.

- Industrial use.
- Distribution network.

CONSTRUCTION

Conductor
Aluminium conductor, class 2 according to EN 60228 and IEC 60228.

Insulation
Cross-linked polyethylene insulation type DIX-3 according to HD 603, type XLPE according to IEC 60502-1 and compound insulation according to XP C 32-321. 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 G	Brown + Black + Grey + Green/Yellow
4 x	Brown + Black + Grey + Blue

Outer sheath
Flexible PVC outer sheath, type DMV-18 according to HD 603, type ST2 according to IEC 60502-1 and compound outer sheath according to XP C 32-321. Black 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).

Fire performance
Flame non-propagation according to EN 60332-1 and IEC 60332-1.
Reaction to fire CPR: E_{ca}, according to EN 50575.
Reduced halogen emission. Chlorine <15%.

Mechanical performance
Minimum bending radius: 5x cable diameter.
Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: Good.
UV Resistant according to UNE 211605 and XP-C 32-321.
Water resistance: AD8 Submersion.

Installation conditions
Open Air.
Buried.
In conduit.

STANDARDS / COMPLIANCE

According to
UNE-HD 603-5N / XP C 32-321 / IEC 60502-1.

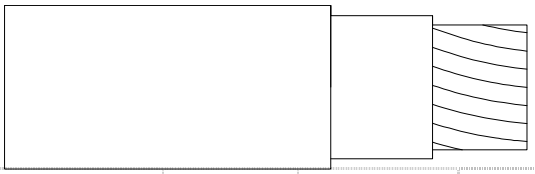
Standards and approvals
AENOR / NF-USE / RoHS / CE.

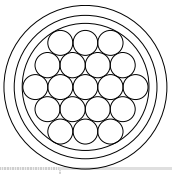
CPR (Construction Products Regulation)
E_{ca}.

AENOR · NF-USE · CPR · RoHS Compliant · CE

POWERHARD®
RV Al / U-1000 AR2V

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 16	8,5	95	92	76	4,894
1 x 25	10,5	145	121	98	3,075
1 x 35	11,2	170	150	117	2,224
1 x 50	12,9	225	184	139	1,642
1 x 70	14,6	290	237	170	1,135
1 x 95	16,3	395	289	204	0,820
1 x 120	17,7	465	337	233	0,648
1 x 150	19,9	590	389	261	0,527
1 x 185	21,5	700	447	296	0,420
1 x 240	24,8	930	530	343	0,320
1 x 300	26,6	1.080	613	386	0,256
1 x 400	30,0	1.395	740	448	0,199
1 x 500	34,1	1.740	856	505	0,155
1 x 630	38,4	2.225	996	572	0,120
3 x 70	30,6	1.255	211	170	1,135
3 x 95	33,0	1.555	257	204	0,820
3 x 120	37,3	1.980	300	233	0,648
3 x 1 x 120	38,1	1.410	296	174	0,648
3 x 150	40,7	2.385	346	261	0,527
3 x 1 x 150	42,8	1.790	342	195	0,527
3 x 150 + 1 x 70	43,7	2.685	346	261	0,527
3 x 185	45,2	2.945	397	296	0,420
3 x 240	51,2	3.800	470	343	0,320
3 x 300	56,4	4.590	543	386	0,256
3 x 300 + 1 x 150	59,4	5.030	543	386	0,256
4 x 35	25,2	840	135	117	2,224
4 x 50	28,6	1.075	164	139	1,642
4 x 95	36,9	1.915	257	204	0,820
4 x 120	41,2	2.390	300	233	0,648
4 x 1 x 120	42,7	1.880	296	174	0,648
4 x 150	45,3	2.935	346	261	0,527
4 x 185	50,5	3.830	397	296	0,420
4 x 240	57,2	4.950	470	343	0,320

[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 cosφ=1.
For all cables is supposed a single-phase circuit.

XLPE LSHF SAFETY **CABLES**

TOXFREE® ZH N2XH flex

Halogen free (LSHF) power cable for public places.

ACCORDING TO: IEC 60502-1

100% Green Energy Cable Production

$B2_{ca}$

APPLICATION

Toxfree® ZH N2XH flex is a LSHF safety cable for fixed installations. In the event of fire, it does not emit toxic gases, nor does it give off corrosive gases, avoiding any possible damage to people or electronic equipment. For these reasons it is highly recommended for use in public places such as: hospitals, schools, museums, airports, bus terminals, shopping malls, offices, laboratories, etc.

CONSTRUCTION

Conductor

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

Insulation

Cross-linked polyethylene insulation type XLPE according to IEC 60502-1.

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

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

Outer sheath

Low Smoke Halogen Free (LSHF) polyolefin outer sheath. Black 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 (on cable surface).

Fire performance

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

Fire non-propagation according to EN 60332-3-24 / IEC 60332-3-24 and EN 50399.

Reaction to fire CPR: $B2_{ca}$-s1a,d1,a1 according to EN 50575.

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

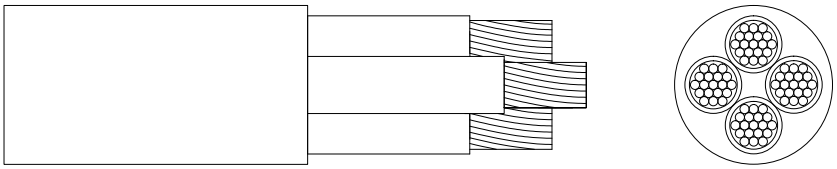
KEMA-KEUR / CE

CPR (Construction Products Regulation)

$B2_{ca}$-s1a, d1, a1

TOXFREE® ZH N2XH flex

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	7,5	85	29	30	17,7
1 x 4	8,1	100	40	39	11,0
1 x 6	8,6	125	53	49	7,32
1 x 10	9,2	165	74	65	4,23
1 x 16	10,2	225	101	84	2,68
1 x 25	11,3	305	135	107	1,73
1 x 35	12,2	400	169	129	1,23
1 x 50	13,9	535	207	153	0,86
1 x 70	15,8	730	268	188	0,603
1 x 95	17,6	945	328	226	0,457
1 x 120	19,5	1.185	383	257	0,357
1 x 150	21,7	1.470	444	287	0,286
1 x 185	23,8	1.770	510	324	0,235
1 x 240	26,7	2.310	607	375	0,178
1 x 300	29,5	2.905	703	419	0,142
1 x 400	34,2	3.825	823	493	0,108
1 x 500	37,9	4.885	946	558	0,085
1 x 630	43,1	6.410	1.088	634	0,064
2 x 1,5	9,8	130	26	26	34,0
2 x 2,5	10,7	165	36	34	20,4
2 x 4	11,1	190	49	44	12,7
2 x 6	12,2	245	63	56	8,45
2 x 10	13,6	355	86	73	4,89
2 x 16	15,3	495	100	84	3,1
3 G 1,5	11,3	170	26	26	34,0
3 G 2,5	12,1	210	36	34	20,4
3 G 4	12,2	240	49	44	12,7
3 G 6	13,4	315	63	56	8,45
3 G 10	14,8	450	86	73	4,89
3 x 16	16,8	645	100	84	2,68
3 x 25	21,4	1.020	127	107	1,73
3 x 35	23,8	1.345	158	129	1,23
3 x 50	27,2	1.825	192	153	0,86
3 x 70	30,3	2.470	246	188	0,603
3 x 16 + 1 x 10	19,1	800	100	84	2,68
3 x 25 + 1 x 16	22,5	1.165	127	107	1,73
3 x 35 + 1 x 16	24,4	1.480	158	129	1,23
3 x 50 + 1 x 25	28,6	2.050	192	153	0,86
3 x 70 + 1 x 35	32,9	2.815	246	188	0,603
3 x 95 + 1 x 50	37,1	3.690	298	226	0,457
3 x 120 + 1 x 70	40,8	4.700	346	257	0,357
3 x 150 + 1 x 70	45,9	5.725	399	287	0,286
3 x 185 + 1 x 95	51,4	7.000	456	324	0,235
3 x 240 + 1 x 120	58,6	9.185	538	375	0,178
3 x 300	61	10.180	621	419	0,142
4 G 1,5	11,7	185	23	23	29,3

TOXFREE® ZH N2XH flex

Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Buried (A) [2]	Voltage drop (V/A · km) [3]
4 G 2,5	12,2	225	32	30	17,7
4 G 4	13,2	290	42	39	11,0
4 G 6	14,7	385	54	49	7,32
4 G 10	16,3	565	75	65	4,23
4 x 16	18,8	815	100	84	2,68
4 x 25	23,8	1.275	127	107	1,73
4 x 35	25,9	1.700	158	129	1,23
4 x 50	30,1	2.310	192	153	0,86
4 x 70	34,8	3.185	246	188	0,603
4 x 95	39,9	4.184	298	226	0,457
4 x 120	44,8	5.305	346	257	0,357
4 x 150	49,3	6.548	399	287	0,286
4 x 185	54,8	7.965	456	324	0,235
4 x 240	31,7	10.370	538	375	0,178
4 x 300	68,0	13.055	621	419	0,142
5 G 1,5	13,1	235	23	23	29,3
5 G 2,5	14,4	300	32	30	17,7
5 G 4	14,8	360	42	39	11,0
5 G 6	16,3	470	54	49	7,32
5 G 10	18,0	685	75	65	4,23
5 G 16	20,9	1.000	100	84	2,68
5 G 25	25,9	1.550	127	107	1,73
5 G 35	28,3	2.050	158	129	1,23
5 G 50	33,7	2.840	192	153	0,86
5 G 70	38,6	3.905	246	188	0,603
5 G 95	43,5	5.080	298	226	0,457
5 G 120	19,5	6.395	346	257	0,357
5 G 150	55,1	7.935	399	287	0,286
5 G 185	61,1	9.665	456	324	0,235
5 G 240	68,8	12.620	538	375	0,178

[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 cosφ=1.

For cables having 2 and 3 conductors up to 10 mm^2 it is supposed a single-phase circuit. For the rest of the cables, it is supposed a three-phase circuit.

TOXFREE® ZH
RZ1-K (AS) / YMz1Kf

Flexible LSHF power cable, for public places.

ACCORDING TO: IEC 60502-1 / UNE 21123-4

100% Green Energy Cable Production

$B2_{ca}$
C_{ca}

APPLICATION

Toxfree® ZH RZ1-K (AS) / YMz1Kf is a LSHF safety cable. In the event of fire, it does not emit toxic gases, nor does it give off corrosive gases, avoiding any possible damage to people or electronic equipment. For these reasons it is highly recommended for use in public places such as: hospitals, schools, museums, airports, bus terminals, shopping centers, offices, laboratories, etc.

- Industrial use.
- Public places

CONSTRUCTION

Conductor

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

Insulation

Cross-linked polyethylene type XLPE according to IEC 60502-1 and 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 G	Blue + Brown + Green/Yellow
3 x	Brown + Black + Grey
3 x + 1 x	Brown + Black + Grey + Blue (reduced cross-section)
4 G	Brown + Black + Grey + Green/Yellow
4 x	Brown + Black + Grey + Blue
5 G	Brown + Black + Grey + Blue + Green/Yellow
6 or more	Black numbered + Green/Yellow

Outer sheath

Low Smoke Halogen Free (LSHF) polyolefin outer sheath. Green 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 IEC 60332-1 / EN 60332-1.

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

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

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 / UNE 21123-4

Standards and approvals

AENOR / KEMA-KEUR / RoHS / CE

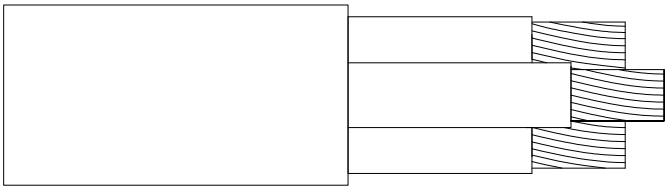
CPR (Construction Products Regulation)

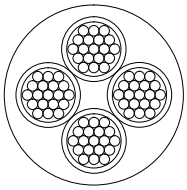
$B2_{ca}$-s1a,d1,a1 (according to cross-section) or

C_{ca}-s1a,d1,a1 (according to cross-section)

TOXFREE® ZH
RZ1-K (AS) / YMz1Kf

DIMENSIONS & ADMISSIBLE INTENSITIES





Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Buried (A) [2]	Voltage drop (V/A · km) [3]
1 x 2,5	7,1	75	39	35	20,3
1 x 4	7,6	95	53	46	12,6
1 x 6	8,2	120	68	58	8,41
1 x 10	9,1	165	93	77	4,87
1 x 16	10,1	225	124	100	3,08
1 x 25	11,3	305	161	129	1,98
1 x 35	12,2	400	200	155	1,41
1 x 50	13,9	535	242	183	0,984
1 x 70	15,8	730	310	225	0,693
1 x 95	17,6	945	377	270	0,525
1 x 120	19,5	1.185	437	306	0,410
1 x 150	21,7	1.470	504	343	0,328
1 x 185	23,8	1.770	575	387	0,270
1 x 240	26,7	2.310	679	448	0,204
1 x 300	29,5	2.905	783	502	0,163
1 x 400	34,2	3.825	930	592	0,123
1 x 500	37,9	4.885	1.070	670	0,097
1 x 630	43,1	6.410	1.232	762	0,073
2 x 1,5	9,3	125	26	27	33,9
2 x 2,5	9,8	145	36	35	20,3
2 x 4	10,8	190	49	46	12,6
2 x 6	11,8	245	63	58	8,41
2 x 10	13,6	355	86	77	4,87
2 x 16	15,3	495	115	100	3,08
3 G 1,5	10,4	155	26	27	33,9
3 G 2,5	10,9	190	36	35	20,3
3 G 4	11,9	240	49	46	12,6
3 G 6	13,0	310	63	58	8,41
3 G 10	14,8	450	86	77	4,87
3 x 16	16,8	645	115	100	3,08
3 x 25	21,4	1.020	149	129	1,98
3 x 35	23,8	1.345	185	155	1,41
3 x 50	27,2	1.825	225	183	0,984
3 x 70	30,3	2.470	289	225	0,693
3 x 95	35,2	3.245	352	270	0,525
3 x 120	39,1	4.095	410	306	0,410
3 x 150	43,9	5.105	473	343	0,328
3 x 185	48,6	6.195	542	387	0,270
3 x 16 + 1 x 10	19,1	800	115	100	3,08
3 x 25 + 1 x 16	22,5	1.165	149	129	1,98
3 x 35 + 1 x 16	24,4	1.480	185	155	1,41
3 x 50 + 1 x 25	28,6	2.050	225	183	0,984
3 x 70 + 1 x 35	32,9	2.815	289	225	0,693

TOXFREE® ZH
RZ1-K (AS) / YMz1Kf

Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Buried (A) [2]	Voltage drop (V/A · km) [3]
3 x 95 + 1 x 50	37,1	3.690	352	270	0,525
3 x 120 + 1 x 70	40,8	4.700	410	306	0,410
3 x 150 + 1 x 70	45,9	5.725	473	343	0,328
3 x 185 + 1 x 95	51,4	7.000	542	387	0,270
3 x 240 + 1 x 120	58,6	9.185	641	448	0,204
3 x 300	61,0	10.180	741	502	0,163
4 G 1,5	11,2	180	26	27	33,9
4 G 2,5	11,9	225	36	35	20,3
4 G 4	12,9	290	49	46	12,6
4 G 6	14,3	380	63	58	8,41
4 G 10	16,3	565	86	77	4,87
4 x 16	18,8	815	115	100	3,08
4 x 25	23,8	1.275	149	129	1,98
4 x 35	25,9	1.700	185	155	1,41
4 x 50	30,1	2.310	225	183	0,984
4 x 70	34,8	3.185	289	225	0,693
4 x 95	39,9	4.185	352	270	0,525
4 x 120	44,8	5.305	410	306	0,410
4 x 150	49,3	6.548	473	343	0,328
4 x 185	54,8	7.965	542	387	0,270
4 x 240	61,7	10.370	641	448	0,204
4 x 300	68,0	13.055	741	502	0,163
5 G 1,5	12,6	230	26	27	33,9
5 G 2,5	13,2	275	36	35	20,3
5 G 4	14,4	355	49	46	12,6
5 G 6	15,9	470	63	58	8,41
5 G 10	18,0	685	86	77	4,87
5 G 16	20,9	1.000	115	100	3,08
5 G 25	25,9	1.550	149	129	1,98
5 G 35	28,3	2.050	185	155	1,41
5 G 50	33,7	2.840	225	183	0,984
5 G 70	38,6	3.905	289	225	0,693
5 G 95	43,5	5.080	352	270	0,525
5 G 120	49,5	6.395	410	306	0,410
5 G 150	55,1	7.935	473	343	0,328
5 G 185	61,1	9.665	542	387	0,270
5 G 240	68,8	12.620	641	448	0,204

[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 it is supposed a single-phase circuit.

TOXFREE® ZH YMz1K & XG

Halogen free (LSHF) power cable for public places.

ACCORDING TO: HD 604 / DEKRA K 42D-1-5-C

100% Green Energy Cable Production

$B2_{ca}$

APPLICATION

Toxfree® ZH YMz1K & XG is a LSHF safety cable for fixed installations. In the event of fire, it does not emit toxic gases, nor does it give off corrosive gases, avoiding any possible damage to people or electronic equipment. For these reasons it is highly recommended for use in public places such as: hospitals, schools, museums, airports, bus terminals, shopping malls, offices, laboratories, etc.

- Industrial use.
- Public places.

CONSTRUCTION

Conductor

Electrolytic annealed copper, class 1 according to EN 60228 and IEC 60228.

Insulation

Cross-linked polyethylene insulation type XLPE according to HD 604.

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

1 x	Black
2 x	Blue + Brown
3 G	Blue + Brown + Green/Yellow
4 G	Brown + Black + Grey + Green/Yellow
5 G	Brown + Black + Grey + Blue + Green/Yellow

Outer sheath

Low Smoke Halogen Free (LSHF) polyolefin outer sheath. Grey colour, non-toxic and fire retardant.

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).

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.

Reaction to fire CPR: $B2_{ca}$-s1a,d1,a1 according to 50575

LSHF (Low Smoke Halogen Free) according to EN60754-1 / 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: 8x cable diameter.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical & Oil resistance: acceptable.

UV Resistant according to EN 50618.

Water resistance: AD5 Jets.

STANDARDS / COMPLIANCE

According to

HD 604 / DEKRA K 42D-1-5-C.

Standards and approvals

AENOR / KEMA-KEUR / RoHS / CE

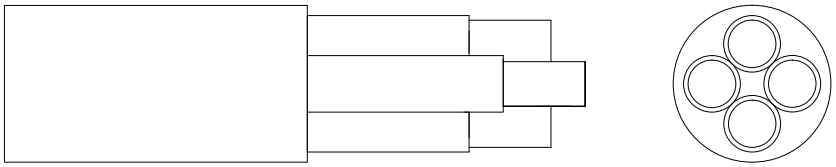
CPR (Construction Products Regulation)

$B2_{ca}$-s1a, d1, a1.

AENOR · KEMA KEUR · CPR · RoHS Compliant · CE

TOXFREE® ZH
YMz1K & XG

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Buried (A) [2]	Voltage drop (V/A·km) [3]
2 x 1,5	11,0	175	26	27	30,8
2 x 2,5	11,0	185	36	35	18,8
2 x 4	11,8	235	49	46	11,7
2 x 6	12,7	295	63	58	7,85
3 G 1,5	11,8	210	26	27	30,8
3 G 2,5	12,3	245	36	35	18,8
3 G 4	12,7	290	49	46	11,7
3 G 6	13,7	370	63	58	7,85
4 G 1,5	12,5	240	23	23	26,7
4 G 2,5	13,1	285	32	30	16,3
4 G 4	13,7	345	42	39	10,1
4 G 6	14,8	445	54	49	6,80
5 G 1,5	13,9	295	23	23	26,7
5 G 2,5	14,3	340	32	30	16,3
5 G 4	14,7	405	42	39	10,1
5 G 6	15,9	525	54	49	6,80

[1] Reference 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 $\cos\varphi=1$.

For cables having 2 and 3 conductors up to 10 mm^2, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

TOXFREE® ZH FR-N1 X1G1

Halogen free (LSHF) power cable for public places.

ACCORDING TO: NF C 32-323

100% Green Energy Cable Production

C_{ca}

APPLICATION

Toxfree® ZH FR-N1 X1G1-U and FR-N1 X1G1-R is a LSHF safety cable. In the event of fire, it does not emit toxic gases, nor does it give off corrosive gases, avoiding any possible damage to people or electronic equipment. For these reasons it is highly recommended for use in public places such as: hospitals, schools, museums, airports, bus terminals, shopping centers, offices, laboratories, etc.

CONSTRUCTION

Conductor

Electrolytic annealed copper conductor, class 1 (FR-N1 X1G1-U from 1,5 mm^2 to 4 mm^2) or class 2 (FR-N1 X1G1-R to 6 mm^2), according to EN 60228 and IEC 60228.

Insulation

Cross-linked polyethylene type XLPE according to IEC 60502-1 and type DIX-3 according to HD 603.

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

2 x	Blue + Brown
3 G	Blue + Brown + Green/Yellow
3 x	Brown + Black + Grey
4 G	Brown + Black + Grey + Green/Yellow
4 x	Brown + Black + Grey + Blue
5 G	Brown + Black + Grey + Blue + Green/Yellow

Outer sheath

Low Smoke Halogen Free (LSHF) polyolefin outer sheath. Green 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: -0oC

Fire performance

Flame non-propagation according to EN 60332-1 / IEC 60332-1 / NF EN 50265-2-1 (category C).

Fire non-propagation according to EN 60332-3 / IEC 60332-3 and NF C 32-070 (category C1).

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

Reaction to fire CPR: C_{ca}-s1a,d1,a1 according to EN 50575.

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.

Water resistance: AD5 Jets.

Installation conditions

Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

According to

NF C 32-323

Standards and approvals

NF-USE / RoHS / CE

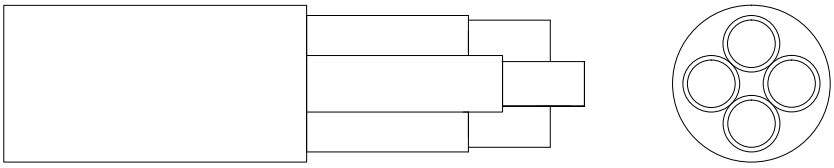
CPR (Construction Products Regulation)

C_{ca}-s1a, d1, a1

NF-USE

TOXFREE® ZH FR-N1 X1G1

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]
2 x 1,5	9,4	125	26	27	34,0
2 x 2,5	9,6	140	36	35	20,4
2 x 4	10,5	190	49	46	12,7
2 x 6	12,2	255	63	58	8,45
3 G 1,5	10,2	150	26	27	34,0
3 G 2,5	10,6	185	36	35	20,4
3 G 4	11,5	240	49	46	12,7
3 G 6	13,2	325	63	58	8,45
4 G 1,5	10,9	175	23	23	29,5
4 G 2,5	11,4	215	32	30	17,7
4 G 4	12,4	290	42	39	11,0
4 G 6	14,4	395	54	49	7,32
5 G 1,5	12,5	230	23	23	29,5
5 G 2,5	12,7	270	32	30	17,7
5 G 4	13,7	355	42	39	11,0
5 G 6	16,1	490	54	49	7,32

[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 cosφ=1.

For cables having 2 conductors and 3 conductors up to 10 mm^2, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

TOXFREE® PLUS 331 ZH RZ1-K (AS+)

100% Green Energy Cable Production

LSHF and fire resistant power cable, for emergency circuits.

ACCORDING TO: IEC 60502-1

$B2_{ca}$

APPLICATION

Toxfree® Plus 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.
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 according to EN 50575.

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.

STANDARDS / COMPLIANCE

According to

IEC 60502-1

Standards and approvals

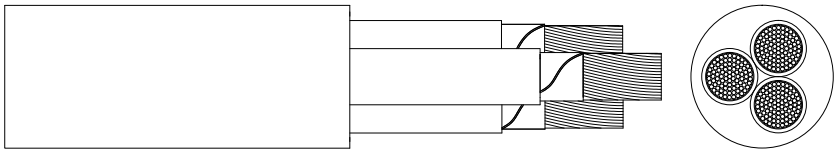
RoHS / CE

CPR (Construction Products Regulation)

$B2_{ca}$-s1a,d1,a1

TOXFREE® PLUS 331 ZH
RZ1-K (AS+)

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm²)	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 cosφ=1. For all cables is supposed a single-phase circuit.

TOXFREE® ZH RZ1FZ1-K (AS)

Halogen free (LSHF) armoured cable with steel or aluminium tape armour.

ACCORDING TO: IEC 60502-1 / UNE 21123-4

100% Green Energy Cable Production

C_{ca}

APPLICATION

Toxfree® ZH RZ1FZ1-K (AS) is an armoured LSHF 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. Its use is highly recommended for public places, in installations with presence of rodents, and installations where the cable is subject to risk of mechanical aggression.

CONSTRUCTION

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

Insulation
Cross-linked polyethylene type XLPE according to IEC 60502-1 and type DIX-3 according to HD 603.
The standard identification of insulated conductors according to UNE 21089 and HD 308 is the following:

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

Armour bedding
Low smoke zero halogen (LSHF) polyolefin inner sheath.

Armour
Double steel or aluminium tape armour. Aluminium armour is used in single-core cables to avoid parasite currents that may overheat the cable. Steel tape is used in the multicore cables.

Outer sheath
LSHF polyolefin outer sheath type ST8 according to IEC 60502-1 and type DMZ-E according UNE 21123-4. Green colour.

CHARACTERISTICS

Electrical performance
Low voltage: 0,6/1kV

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)

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.
Reaction to fire CPR: C_{ca}-s1b,d1,a1, according to EN 50575.
LSHF (Low Smoke Halogen Free) according to EN60754-1 / IEC60754-1
Low smoke emission according to EN 61034 / IEC 61034:
Light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius: 10x cable diameter.
Impact resistance: AG4 High severity.
Rodent proof.

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

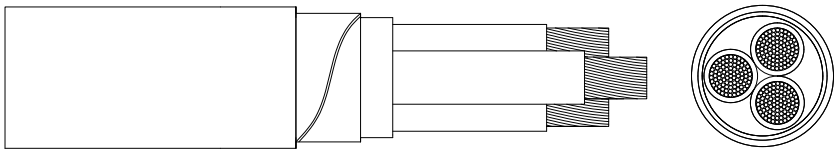
According to
IEC 60502-1 / UNE 21123-4

Standards and approvals
RoHS / CE

CPR (Construction Products Regulation)
C_{ca}-s1b, d1, a1

TOXFREE® ZH
RZ1FZ1-K (AS)

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 10	15,6	355	74	65	4,23
1 x 16	15,6	390	101	84	2,68
1 x 25	16,2	465	135	107	1,73
1 x 35	17,3	575	169	129	1,23
1 x 50	19,0	735	207	153	0,86
1 x 70	20,9	955	268	188	0,603
1 x 95	22,6	1.190	328	226	0,457
1 x 120	24,2	1.445	383	257	0,357
1 x 150	26,3	1.740	444	287	0,286
1 x 185	28,7	2.075	510	324	0,235
1 x 240	31,7	2.645	607	375	0,178
1 x 300	34,4	3.260	703	419	0,142
1 x 400	38,4	4.225	823	493	0,107
1 x 630	48,7	6.985	1.088	634	0,063
2 x 1,5	12,3	235	26	27	34,0
2 x 2,5	13,2	275	36	35	20,4
2 x 4	14,3	335	49	46	12,7
2 x 6	15,3	400	63	58	8,45
2 x 10	17,2	535	86	77	4,89
2 x 16	19,0	700	115	100	3,1
2 x 25	23,0	1.015	149	129	2,0
2 x 35	25,1	1.280	185	155	1,42
3 G 1,5	13,0	265	26	27	34,0
3 G 2,5	13,9	315	36	35	20,4
3 G 4	15,0	380	49	46	12,7
3 G 6	16,1	465	63	58	8,45
3 G 10	18,3	640	86	77	4,89
3 x 16	20,3	855	100	84	2,68
3 x 25	23,8	1.220	127	107	1,73
3 x 35	26,6	1.585	158	129	1,23
3 x 50	30,3	2.115	192	153	0,86
3 x 70	34,9	2.870	246	188	0,603
3 x 95	40,1	4.025	298	226	0,457
3 x 120	43,8	4.940	346	257	0,357
3 x 150	48,7	6.050	399	287	0,286

TOXFREE® ZH
RZ1FZ1-K (AS)

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A)[1]	Buried (A)[2]	Voltage drop (V/A·km)[3]
3 x 185	54,9	7.405	456	324	0,235
3 x 240	61,5	9.450	538	375	0,178
4 G 1,5	13,8	295	23	23	29,5
4 G 2,5	14,7	355	32	30	17,7
4 G 4	16,0	440	42	39	11,0
4 G 6	17,4	550	54	49	7,32
4 G 10	19,7	765	75	65	4,23
4 x 16	22,2	1.039	100	84	2,68
4 x 25	25,8	1.480	127	107	1,73
4 x 35	28,5	1.940	158	129	1,23
4 x 50	33,7	2.645	192	153	0,86
4 x 70	39,7	3.940	246	188	0,603
4 x 95	44,0	4.980	298	226	0,457
4 x 120	48,6	6.205	346	257	0,357
4 x 150	54,2	7.675	399	287	0,286
4 x 185	60,1	9.210	456	324	0,235
4 x 240	67,6	11.870	538	375	0,178
4 x 300	74,9	14.760	621	419	0,142
4 x 500	97,3	25.240	835	558	0,085
5 G 1,5	14,7	335	23	23	29,5
5 G 2,5	15,6	400	32	30	17,7
5 G 4	17,2	510	42	39	11,0
5 G 6	18,7	640	54	49	7,32
5 G 10	21,2	900	75	65	4,23
5 G 16	24,1	1.240	100	84	2,68
5 G 25	28,5	1.805	127	107	1,73
5 G 35	31,5	2.355	158	129	1,23

[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 $\cos\varphi=1$.

For cables having 2 conductors or 3 conductors up to 10 mm^2, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

TOXFREE® ZH
RZ1MZ1-K (AS)

Halogen free (LSHF) armoured cable with galvanized steel wire armour (ATEX).

ACCORDING TO: IEC 60502-1

100% Green Energy Cable Production

C_{ca}

APPLICATION

Toxfree® RZ1MZ1-K (AS) is a LSHF is a safety cable. In case of fire, it does not emit toxic or corrosive gases, protecting people and avoiding possible damage to electronic equipment. Therefore its use is recommended for public places, in hazardous areas with explosive gas atmospheres (ATEX), and installations where the cable is subject to risk of mechanical aggression.

CONSTRUCTION

Conductor

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

Insulation

Cross-linked polyethylene type DIX-3 according to HD 603 and type XLPE according to IEC 60502-1. The standard identification of insulated conductors according to HD 308 is:

1 x	Natural
2 x	Blue + Brown
3 G	Blue + Brown + Green/Yellow
3 x	Brown + Black + Grey
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

Armour bedding

Low smoke zero halogen (LSHF) polyolefin separation sheath.

Armour

Galvanized steel wire armour. Aluminium armour is used in single core cables to avoid parasite currents that may overheat the cable.

Outer sheath

Low Smoke Halogen Free (LSHF) polyolefin type ST8 according to IEC 60502-1. Black colour.

CHARACTERISTICS

Electrical performance

Low voltage: 0,6/1 kV

Thermal performance

Maximum service temperature: 90ºC.
Maximum short-circuit temperature: 250ºC (max. 5 s).
Minimum service temperature: -50 °C according to GOST 31996.
Minimum installation and handling temperature: 0 °C

Fire performance

Flame non-propagation according to EN 60332-1 and IEC 60332-1.
Fire non-propagation according to EN 60332-3, IEC 60332-3 and EN 50399.
Reaction to fire CPR: C_{ca}-s1b, d1, a1, according to EN 50575.
Low Smoke Halogen Free according to EN 60754-1 and IEC 60754.
Low smoke emission according to EN 61034 and IEC 61034:
Light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 and IEC 60754-2.

Mechanical performance

Minimum bending radius: 10 x cable diameter.
Impact resistance: AG4 High severity.
Rodent proof.

Environmental performance

Chemical & Oil resistance: acceptable.
Hydrocarbon resistant
UV Resistant according to EN 50618.
Potentially explosion hazard locations (ATEX)
Water resistance: AD5 Jets.

Installation conditions

Open Air.
Buried.
In Conduit.

STANDARDS / COMPLIANCE

According to

IEC 60502-1.

Standards and approvals

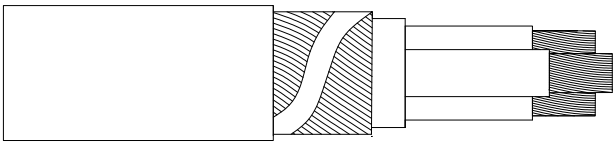
CE / RoHS.

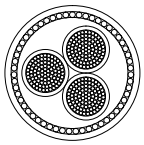
CPR (Construction Products Regulation)

C_{ca} -s1b, d1, a1.

TOXFREE® ZH
RZ1MZ1-K (AS)

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 10	14,6	341	93	77	4,87
1 x 16	15,3	405	124	100	3,08
1 x 25	17,6	550	161	129	1,98
1 x 35	18,7	665	200	155	1,41
1 x 50	20,3	825	242	183	0,984
1 x 70	22,0	1.050	310	225	0,693
1 x 95	23,8	1.275	377	270	0,525
1 x 120	25,5	1.545	437	306	0,410
1 x 150	27,6	1.855	504	343	0,328
1 x 185	29,7	2.190	575	387	0,270
1 x 240	32,5	2.765	679	448	0,204
1 x 300	37,7	3.405	783	502	0,163
1 x 400	42,1	4.440	930	592	0,123
1 x 500	45,8	5.810	1.070	670	0,097
1 x 630	51,6	7.545	1.232	762	0,073
1 x 800	61,1	9.760	1.426	870	0,056
2 x 1,5	11,9	270	26	27	33,9
2 x 2,5	12,8	315	36	35	20,3
2 x 4	13,9	385	49	46	12,6
2 x 6	14,9	455	63	58	8,41
2 x 10	17,0	615	86	77	4,87
2 x 16	19,3	820	115	100	3,08
2 x 25	25,5	1.495	149	129	1,98
2 x 35	27,6	1.785	185	155	1,41
3 G 1,5	12,6	295	26	27	33,9
3 G 2,5	13,5	350	36	35	20,3
3 G 4	14,6	430	49	46	12,6
3 G 6	15,9	520	63	58	8,41
3 G 10	18,1	735	86	77	4,87
3 x 16	22,7	1.345	115	100	3,08
3 x 25	26,3	1.800	149	129	1,98
3 x 35	29,3	2.245	185	155	1,41
3 x 50	32,7	2.875	225	183	0,984
4 G 1,5	13,4	355	26	27	33,9
4 G 2,5	14,3	400	36	35	20,3
4 G 4	15,8	500	49	46	12,6
4 G 6	17,2	610	63	58	8,41

TOXFREE® ZH
RZ1MZ1-K (AS)

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Buried (A) [2]	Voltage drop (V/A · km) [3]
4 G 10	19,7	870	86	77	4,87
4 x 16	24,5	1.505	115	100	3,08
4 x 25	29,0	2.040	149	129	1,98
4 x 35	31,2	2.505	185	155	1,41
4 x 50	36,2	3.305	225	183	0,984
4 x 70	42,3	5.100	289	225	0,693
4 x 95	46,3	6.170	352	270	0,525
4 x 120	51,5	7.690	410	306	0,410
4 x 150	57,1	9.240	473	343	0,328
4 x 185	62,6	10.955	542	387	0,270
4 x 240	69,6	13.720	641	448	0,204
5 G 1,5	14,1	370	26	27	33,9
5 G 2,5	15,3	455	36	35	20,3
5 G 4	17,0	580	49	46	12,6
5 G 6	18,5	735	63	58	8,41
5 G 10	23,5	1.325	86	77	4,87
5 G 16	26,6	1.755	115	100	3,08
5 G 25	31,2	2.385	149	129	1,98
5 G 35	34,2	3.010	185	155	1,41
5 G 50	39,3	3.995	225	183	0,984
5 G 70	45,5	5.960	289	225	0,693
7 G 1,5	14,6	420	26	27	33,9
7 G 2,5	16,1	535	36	35	20,3
10 G 1,5	17,7	570	26	27	33,9
10 G 2,5	19,8	725	36	35	20,3
12 G 1,5	17,4	580	26	27	33,9
12 G 2,5	22,2	1.065	36	35	20,3
16 G 1,5	21,6	995	26	27	33,9
18 G 1,5	22,8	1.070	26	27	33,9
19 G 1,5	22,8	1.080	26	27	33,9
24 G 1,5	24,4	1.235	26	27	33,9
37 G 1,5	28,0	1.580	26	27	33,9

[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 $\cos\varphi=1$.

For all cables is supposed a single-phase circuit.

TOXFREE® ZH RZ1 (AS) Al

Aluminium halogen free (LSHF) cable for power transmission.

ACCORDING TO: IEC 60502–1 / UNE 21123-4

100% Green Energy Cable Production

$B2_{ca}$

APPLICATION

Toxfree® ZH RZ1 (AS) Al is an aluminium LSHF cable for fixed installations. These cables are specially recommended for installation in public places and in installations where safety is a priority.

CONSTRUCTION

Conductor

Aluminium conductor, class 2, according to EN 60228 and IEC 60228.

Insulation

Cross-linked polyethylene (XLPE) insulation according to IEC 60502-1 and type DIX-3 according to HD 603.

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

1 x	Natural
3 x	Brown + Black + Grey
4 x	Brown + Black + Grey + Blue

Outer sheath

Low Smoke Halogen Free (LSHF) polyolefin outer sheath. Green colour.

Other outer sheath colours available on request.

CHARACTERISTICS

Electrical performance

Low voltage: 0,6/1 kV

Thermal performance

Maximum service temperature: 90°C.

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

Minimum service temperature: -40ºC (fixed and protected installations)

Minimum installation and handling temperature: -0ºC.

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.

Reaction to fire CPR: $B2_{ca}$ -s1a, d1, a1 (for single core cables) and $B2_{ca}$ -s1b, d1, a1 (for multicore cables), according to EN 50575.

LSHF (Low Smoke Halogen Free) according to EN 60754-1 / IEC60754-1.

Low smoke emission according to EN 61034 / IEC 61034:

Light transmittance > 60%.

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 UNE 211605 and EN 50618.

Water resistance: AD5 Jets.

STANDARDS / COMPLIANCE

According to

IEC 60502–1 / UNE 21123-4.

Standards and approvals

RoHS / CE.

CPR (Construction Products Regulation)

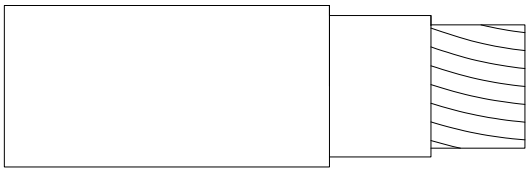
$B2_{ca}$ -s1a, d1, a1 (single core cables) .

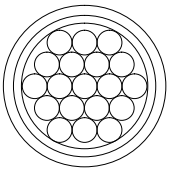
$B2_{ca}$ -s1b, d1, a1 (multicore cables).

CPR EN 50575 · RoHS Compliant · CE

TOXFREE® ZH
RZ1 (AS) Al

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 25	10,9	150	121	98	3,075
1 x 35	12	200	150	117	2,225
1 x 50	13,3	245	184	139	1,643
1 x 70	15,4	325	237	170	1,135
1 x 95	16,7	415	289	204	0,820
1 x 120	18,1	485	337	233	0,648
1 x 150	20,3	625	389	261	0,528
1 x 185	22,4	725	447	296	0,420
1 x 240	25,2	970	530	343	0,320
1 x 300	28,2	1.170	613	386	0,256
1 x 400	31,2	1.455	740	444	0,199
3 x 120	37,7	2.080	300	233	0,648
4 x 150	46,8	2.985	346	261	0,528
4 x 185	52,5	3.840	397	296	0,420
4 x 240	58,2	4.890	470	343	0,320
4 x 300	66,3	6.045	543	386	0,256

[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 $\cos\varphi=1$.

For all cables, a single-phase circuit is supposed.

TOXFREE® ZH Z1Z1-U

Halogen free (LSHF) cables for fixed installations

ACCORDING TO: HD 604.5D / VDE 0250-215

100% Green Energy Cable Production

$B2_{ca}$

APPLICATION

Toxfree® ZH Z1Z1-U is a LSHF safety cable. In the event of fire, it does not emit toxic gases, nor does it give off corrosive gases, avoiding any possible damage to people or electronic equipment. For these reasons it is highly recommended for use in public places such as: hospitals, schools, museums, airports, bus terminals, shopping malls, offices, laboratories, etc.

- Industrial use.
- Public places.

CONSTRUCTION

Conductor

Electrolytic annealed copper, class 1, according to EN 60228 and IEC 60228.

Insulation

Low smoke halogen free (LSHF) polyolefin insulation.

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

3 G	Brown + Blue + Green/Yellow
5 G	Brown + Black + Grey + Blue + Green/Yellow

Outer sheath

Low smoke halogen free (LSHF) polyolefin under fire conditions.

Light grey colour.

CHARACTERISTICS

Electrical performance

Low voltage: 300/500 V.

Thermal performance

Maximum service temperature: 70°C.

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

Minimum service temperature: -30°C (fixed installation).

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.

Reaction to fire CPR: $B2_{ca}$-s1a,d1,a1, according to EN 50575.

LSHF (Low Smoke Zero Halogen) 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: 8x cable diameter.

Environmental performance

Chemical & Oil resistance: Acceptable.

UV Resistant according to EN 50618.

Water resistance: AD5 Jets.

Other

Meter by meter marking.

STANDARDS / COMPLIANCE

According to

HD 604.5D / VDE 0250-215

Standards and approvals

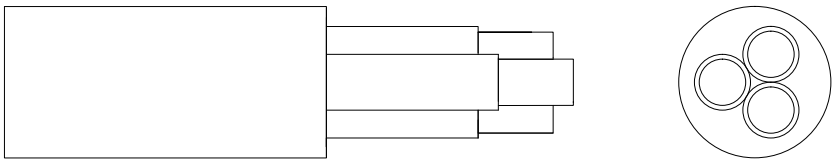
RoHS / CE.

CPR (Construction Products Regulation)

$B2_{ca}$-s1a,d1,a1.

TOXFREE® ZH
Z1Z1-U

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (Kg/km)	R20 (Ω/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
3 G 1,5	7,9	110	12,1	18,5	25,0
3 G 2,5	8,7	145	7,41	25	15,3
5 G 1,5	9,2	155	12,1	18,5	25,0
5 G 2,5	10,2	210	7,41	25	15,3

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

[2] At maximum service temperature and cosφ=1.

In all cases it is supposed three loaded conductors.

TOXFREE® ZH H05Z1Z1-F

Flexible and halogen free cable for fixed installations.

ACCORDING TO: EN-50525-3-11

100% Green Energy Cable Production

$B2_{ca}$

APPLICATION

Toxfree® ZH H05Z1Z1-F is a LSHF safety cable. In the event of fire, it does not emit toxic gases, nor does it give off corrosive gases, avoiding any possible damage to people or electronic equipment. For these reasons it is highly recommended for use in public places such as: hospitals, schools, museums, airports, bus terminals, shopping malls, offices, laboratories, etc.

- Industrial use.
- Public places

CONSTRUCTION

Conductor

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

Insulation

Low smoke zero halogen (LSHF) polyolefin insulation type TI6 according to EN 50363-7.

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

2 x	Blue + Brown
3 G	Blue + Brown + Green/Yellow
3 X	Brown + Black + Grey
4 X	Brown + Black + Grey + Blue
4 G	Brown + Black + Grey + Green/yellow
5 G	Brown + Black + Grey + Blue + Green/yellow

Outer sheath

Low Smoke Halogen Free (LSHF) polyolefin type TM7 according to EN 50363-8. White colour, non-toxic and fire retardant. Other outer sheath colours available on request.

CHARACTERISTICS

Electrical performance

Low voltage: 300/500 V.

Thermal performance

Maximum service temperature: 70°C.

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

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

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.

Reaction to fire CPR: $B2_{ca}$-s1a,d1,a1 according to EN 50575.

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: 8x cable diameter.

Environmental performance

Chemical & Oil resistance: Acceptable.

Water resistance: AD5 Jets.

Installation conditions

Open Air.

In conduit.

STANDARDS / COMPLIANCE

According to

EN 50525-3-11

Standards and approvals

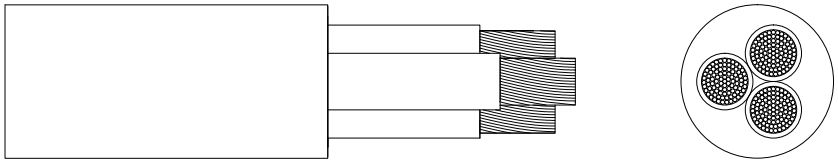
RoHS / CE

CPR (Construction Products Regulation)

$B2_{ca}$-s1a, d1, a1

TOXFREE® ZH
H05Z1Z1-F

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
2 x 1,5	7,1	85	16	31,8
2 x 2,5	8,8	130	25	19,1
3 G 1,5	8,0	105	16	31,8
3 G 2,5	9,8	165	25	19,1
4 G 1,5	8,9	135	16	27,5
4 G 2,5	10,8	200	20	16,5
5 G 1,5	10,0	165	16	27,5
5 G 2,5	12,0	245	20	16,5

[1] One cable in open air at 30°C ambient temperature according to EN 50565-1.

[2] At maximum service temperature and cos φ= 1.

For cables with 2 or 3 conductors it is supposed a single-phase circuit. For cables with 4 or 5 conductors it is supposed a three-phase circuit.

CONTROL & SCREENED **CABLES**

TOPFLEX® VV-F
H05VV-F

Flexible cable for connecting small electrical appliances.

ACCORDING TO: EN 50525-2-11 / IEC 60227-5

100% Green Energy Cable Production

E_{ca}

APPLICATION

Topflex® VV-F H05VV-F cable has been specially designed for connecting small home appliances such as vacuum cleaners, washing machines, refrigerators, etc. It is recommended for household installations and can also be used for light mobile services. These cables are also suitable for fixed applications in furniture, wall partitions, and in hollow spaces of prefabricated building parts.

- Mobile use.
- Domestic use.
- Domestic appliances.
- Temporary appliances.

CONSTRUCTION

Conductor

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

Insulation

Flexible PVC type TI2 according to EN 50363-3.

The standard identification of insulated conductors, according to UNE 21089 and HD 308 is the following:

2 x	Blue + Brown
3 G	Blue + Brown + Green/Yellow
4 G	Brown + Black + Grey + Green/Yellow
5 G	Brown + Black + Grey + Blue + Green/Yellow

Outer sheath

Flexible PVC outer sheath, type TM2 according to EN 50363-4-1. Grey, white or black are the sandard outer sheath colours. Other colours available on request.

CHARACTERISTICS

Electrical performance

Low voltage: 300/500 V.

Thermal performance

Maximum service temperature: 60°C.

Maximum short-circuit temperature: 150°C (max. 5 s).

Minimum service temperature: 5°C

Fire performance

Flame non-propagation based on EN 60332-1/IEC 60332-1.

Reaction to fire CPR: E_{ca} according to EN 50575.

Low halogen emission. Chlorine <15%.

Mechanical performance

Minimum bending radius:

3 x cable diameter < 12 mm.

4 x cable diameter ≥ 12 mm.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical & Oil resistance: Good.

Water resistance: AD5 Jets.

Installation conditions

Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

According to:

EN 50525-2-11 / IEC 60227.

Standards and approvals

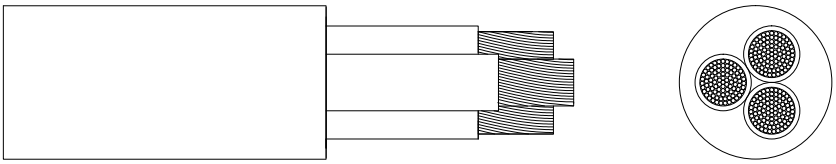
HAR / AENOR / SEC / RoHS / CE.

CPR (Construction Products Regulation)

E_{ca}.

TOPFLEX® VV-F
H05VV5-F

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
2 x 0,75	6,2	55	6	60,3
2 x 1	6,3	60	10	45,2
2 x 1,5	7,1	80	16	30,9
2 x 2,5	9,1	125	25	18,5
2 x 4	10,6	175	32	11,5
3 G 0,75	6,6	65	6	60,3
3 G 1	6,8	75	10	45,2
3 G 1,5	8,0	100	16	30,9
3 G 2,5	9,8	155	25	18,5
3 G 4	11,2	215	32	11,5
4 G 0,75	7,0	75	6	52,2
4 G 1	7,7	90	10	39,2
4 G 1,5	8,9	125	16	26,7
4 G 2,5	10,8	190	20	16,0
4 G 4	12,3	265	25	9,95
5 G 0,75	8,0	100	6	52,2
5 G 1	8,3	110	10	39,2
5 G 1,5	10	150	16	26,7
5 G 2,5	11,9	240	20	16,0
5 G 4	13,9	335	25	9,95

[1] Reference method E for one cable with adequate ventilation according to IEC60364-5-52 in open air at 30°C ambient temperature.

[2] At 60°C conductor temperature and cos $\varphi = 1$.

For cables with 2 or 3 conductors it is supposed a single-phase circuit, for cables with 4 or 5 conductors it is supposed a three-phase circuit.

FLEXTEL® 110 ES05VV-F

Flexible multi-conductor control cable for mobile use.

ACCORDING TO: UNE 21031-5-1 C

100% Green Energy Cable Production

E_{ca}

APPLICATION

Flextel® 110 ES05VV-F is a flexible cable for mobile service. Suitable for the connection of machinery parts used in manufacturing, including machine tools. Suitable for indoor use. Its installation is recommended in fixed ducts.

- Mobile use.
- Domestic use.

CONSTRUCTION

Conductor

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

Insulation

Flexible PVC insulation, type TI2 according to EN 50363-3

The standard identification of insulated conductors according to EN 50334 is the following:

6 or more Black numbered + Green/Yellow

Outer sheath

Flexible PVC outer sheath, type TM2 according to EN 50363-4-1. Grey or black colour.

CHARACTERISTICS

Electrical performance

Low voltage: 300/500 V.

Test voltage: 2000 V / 5 min.

Thermal performance

Maximum service temperature: 60°C.

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

Minimum service temperature: 0°C (mobile service) and -30°C (fixed installation).

Fire performance

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

Reaction to fire CPR: E_{ca} according to EN 50575.

Low halogen emission. Chlorine <15%.

Mechanical performance

Minimum bending radius: 5x cable diameter.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical & Oil resistance: Acceptable.

UV Resistant according to UNE 211605.

Water resistance: AD5 Jets.

Installation conditions

Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

According to:

UNE 21031-5-1 C

Standards and approvals

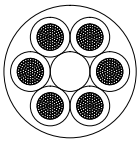
RoHS / CE

CPR (Construction Products Regulation)

E_{ca}

FLEXTEL® 110
ES05VV-F

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
6 x 1	7,9	110	10	45,2
7 x 1	7,9	115	10	45,2
8 x 1	8,6	135	10	45,2
10 x 1	9,7	165	10	45,2
12 x 1	10,3	190	10	45,2
14 x 1	10,7	215	10	45,2
16 x 1	11,4	245	10	45,2
19 x 1	12,1	280	10	45,2
24 x 1	13,7	345	10	45,2
27 x 1	14,4	380	10	45,2
30 x 1	14,7	410	10	45,2
33 x 1	15,7	460	10	45,2
37 x 1	17,2	535	10	45,2
44 x 1	18,9	635	10	45,2
52 x 1	20,1	740	10	45,2
61 x 1	21,7	870	10	45,2

[1] Reference for one cable with adequate ventilation according to EN 50565-1 in open air at 30°C ambient temperature.

[2] At 60°C conductor temperature and cos φ= 1.

For all cables it is supposed a single-phase circuit where not all conductors are fully charged.

FLEXTEL® 140 H05VV5-F

Flexible oil resistant control cable, for mobile use.

ACCORDING TO: EN 50525-2-51 / IEC 60227.

100% Green Energy Cable Production

E_{ca}

APPLICATION

Flextel® H05VV5-F is a cable for signalling and control systems. It is especially suitable for connecting industrial equipment and machine tools. Due to its properties, it is recommended for robotics and light mobile services. Its special vinylic outer sheath compound is particularly resistant to mineral oils and other chemical agents. It can be installed in either dry or humid environments.

- Industrial use.
- Mobile use.
- Robotics.

CONSTRUCTION

Conductor

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

Insulation

Flexible PVC type TI2 according to EN 50363-3. The standard identification of insulated conductors, according to EN 50334 and HD 308 is the following:

2 x	Black numbered
3 or more	Black numbered + Green/Yellow

Outer sheath

Flexible PVC outer sheath, type TM5 according to EN 50363-4-1. Grey colour. Oil resistant.

CHARACTERISTICS

Electrical performance

Low voltage: 300/500 V.

Thermal performance

Maximum service temperature: 60°C.

Maximum short-circuit temperature: 150°C (max. 5 s).

Minimum service temperature: 5°C

Fire performance

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

Reaction to fire CPR: E_{ca}, according to EN 50575.

Mechanical performance

Minimum bending radius:

3 x cable diameter < 12 mm.

4 x cable diameter ≥ 12 mm.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical & Oil resistance: excellent.

Grease & mineral oils resistance: excellent.

Water resistance: AD5 Jets.

Installation conditions

Open Air.

In conduit.

STANDARDS / COMPLIANCE

According to

EN 50525-2-51 / IEC 60227

Standards and approvals

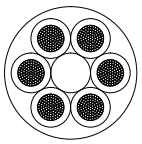
HAR / AENOR / RoHS / CE

CPR (Construction Products Regulation)

E_{ca}

FLEXTEL® 140
H05VV5-F

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
2 x 0,75	6,2	50	6	60,3
3 G 0,75	6,5	60	6	60,3
4 G 0,75	7,0	75	6	60,3
5 G 0,75	8,0	95	6	60,3
7 G 0,75	9,6	125	6	60,3
8 G 0,75	9,6	135	6	60,3
12 G 0,75	11,3	190	6	60,3
18 G 0,75	13,8	280	6	60,3
27 G 0,75	16,5	395	6	60,3
36 G 0,75	19,3	510	6	60,3
2 x 1	6,3	55	10	45,2
3 G 1	6,8	70	10	45,2
4 G 1	7,6	90	10	45,2
5 G 1	8,3	105	10	45,2
6 G 1	9,0	125	10	45,2
7 G 1	10,1	145	10	45,2
8 G 1	10,1	160	10	45,2
10 G 1	11,2	195	10	45,2
12 G 1	12,1	225	10	45,2
14 G 1	12,6	265	10	45,2
16 G 1	14	305	10	45,2
18 G 1	14,8	335	10	45,2
24 G 1	16,2	420	10	45,2
27 G 1	17,6	470	10	45,2
30 G 1	17,9	510	10	45,2
33 G 1	18,8	565	10	45,2
36 G 1	19,9	605	10	45,2
44 G 1	22,6	740	10	45,2
52 G 1	23,6	870	10	45,2
60 G 1	25,5	995	10	45,2
2 x 1,5	7,1	75	16	30,9
3 G 1,5	8,0	100	16	30,9
4 G 1,5	8,9	125	16	30,9
5 G 1,5	10,0	155	16	30,9
6 G 1,5	10,7	180	16	30,9
7 G 1,5	11,9	205	16	30,9
8 G 1,5	11,9	225	16	30,9
10 G 1,5	13,1	275	16	30,9
12 G 1,5	13,8	315	16	30,9
14 G 1,5	15,1	365	16	30,9
16 G 1,5	16,3	425	16	30,9
18 G 1,5	17	465	16	30,9
24 G 1,5	19,6	610	16	30,9
27 G 1,5	20,8	670	16	30,9
30 G 1,5	21,7	730	16	30,9
33 G 1,5	22,7	800	16	30,9

FLEXTEL® 140
H05VV5-F

Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
36 G 1,5	23,3	875	16	30,9
44 G 1,5	26	1.060	16	30,9
52 G 1,5	28,1	1.240	16	30,9
60 G 1,5	29,7	1.420	16	30,9
2 x 2,5	9,1	120	25	18,5
3 G 2,5	9,6	145	25	18,5
4 G 2,5	10,8	185	25	18,5
5 G 2,5	12	230	25	18,5
6 G 2,5	12,8	265	25	18,5
7 G 2,5	13,9	305	25	18,5
8 G 2,5	14,3	345	25	18,5
10 G 2,5	15,7	415	25	18,5
12 G 2,5	16,8	480	25	18,5
14 G 2,5	18,5	560	25	18,5
16 G 2,5	19,7	650	25	18,5
18 G 2,5	20,9	720	25	18,5
24 G 2,5	23,5	925	25	18,5
27 G 2,5	25	1.025	25	18,5
30 G 2,5	26,3	1.120	25	18,5
33 G 2,5	27,4	1.235	25	18,5
36 G 2,5	28,7	1.340	25	18,5
44 G 2,5	33,2	1.630	25	18,5
52 G 2,5	34,6	1.900	25	18,5
60 G 2,5	37,1	2.215	25	18,5

[1] Reference for one cable with adequate ventilation according to EN 50565-1 in open air at 30°C ambient temperature. For all cables it is supposed a single-phase circuit where not all conductors are fully charged.

[2] At 60°C conductor temperature and cos φ= 1.

FLEXTEL® 200 VV-K

Flexible 0,6/1 kV control cable.

ACCORDING TO: IEC 60502-1

100% Green Energy Cable Production

E_{ca}

APPLICATION

Flextel® 200 VV-K cable is suitable for fixed installations with complex layouts where flexible cables are required. It is also ideal for connecting motors or frequency converters. The characteristics of the outer sheath material make this cable extremely versatile as it provides a high level of protection in all types of environments.

- Industrial use

CONSTRUCTION

Conductor

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

Insulation

Flexible insulation type PVC/A according to IEC 60502-1.

The standard identification of insulated conductors, according to HD 308 and HD 186 is the following:

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

* Other identifications are possible on request.

Outer sheath

Flexible PVC outer sheath, type ST1 according to IEC 60502-1. Black colour. Other colours available on request.

CHARACTERISTICS

Electrical performance

Low voltage: 0,6/1 kV.

Thermal performance

Maximum service temperature: 70°C.

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

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

Fire performance

Flame non-propagation based on EN 60332-1 / IEC 60332-1.

Low halogen emission. Chlorine <15%.

Reaction to fire CPR: E_{ca} according to EN 50575.

Mechanical performance

Minimum bending radius: 5x cable diameter.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical & Oil resistance: Good.

UV Resistant according to UNE 211605, Annex A.2

Water resistance: AD5 Jets.

Installation conditions

Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

According to:

IEC 60502-1

Standards and approvals

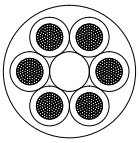
RoHS / CE

CPR (Construction Products Regulation)

E_{ca}

FLEXTEL® 200 VV-K

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 10	8,8	155	60	50	3,97
1 x 16	9,8	215	82	64	2,51
1 x 25	11,6	315	110	82	1,62
1 x 35	12,7	415	137	98	1,15
1 x 50	14,6	570	167	116	0,802
1 x 70	16,0	755	216	143	0,565
1 x 95	18,2	990	264	169	0,428
1 x 120	20,1	1.245	308	192	0,335
1 x 150	22,4	1.545	356	217	0,268
1 x 185	24,7	1.870	409	243	0,220
1 x 240	27,5	2.425	485	280	0,166
2 x 1,5	8,4	100	22	22	31,9
2 x 2,5	9,7	140	30	29	19,2
2 x 4	11,6	210	40	37	11,9
2 x 6	12,7	265	51	46	7,92
2 x 10	14,6	380	70	60	4,58
2 x 16	16,5	530	94	64	2,9
3 x 1,5	8,9	120	22	22	31,9
3 x 2,5	10,3	170	30	29	19,2
3 x 4	12,4	255	40	37	11,9
3 x 6	13,6	325	51	46	7,92
3 x 10	15,8	485	70	60	4,58
3 x 16	18,0	680	80	64	2,51
3 x 25	21,5	1.050	101	82	1,62
3 x 35	24,7	1.415	126	98	1,15
4 x 1,5	9,7	145	18,5	18	27,6
4 x 2,5	11,3	210	25	24	16,6
4 x 4	13,5	310	34	30	10,3
4 x 6	14,9	405	43	38	6,86
4 x 10	17,4	605	60	50	3,97
4 x 16	20,2	895	80	64	2,51
5 x 1,5	10,5	175	18,5	18	27,6
5 x 2,5	12,3	250	25	24	16,6
5 x 4	14,9	370	34	30	10,3
5 x 6	16,5	490	43	38	6,86
5 x 10	19,3	745	60	50	3,97
5 x 16	22,3	1.080	80	64	2,51
6 x 1,5	9,5	155	22	22	31,9
6 x 2,5	11,4	235	30	29	19,2
7 x 1,5	9,5	170	22	22	31,9
7 x 2,5	11,4	260	30	29	19,2
7 x 4	14,9	430	40	37	11,9
7 x 6	16,6	585	51	46	7,92
7 x 10	20,7	960	70	60	4,88
8 x 1,5	10,3	195	22	22	31,9
8 x 2,5	12,5	300	30	29	19,2
10 x 1,5	11,5	235	22	22	31,9
10 x 2,5	14,1	365	30	29	19,2
12 x 1,5	11,9	270	22	22	31,9
12 x 2,5	14,3	415	30	29	19,2
12 x 6	21,3	940	51	46	7,92
12 x 10	27,3	1.585	70	60	4,88

FLEXTEL® 200
VV-K

Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Buried (A) [2]	Voltage drop (V/A · km) [3]
14 x 1,5	13,0	315	22	22	31,9
14 x 2,5	16,0	490	30	29	19,2
16 x 1,5	13,8	355	22	22	31,9
16 x 2,5	17,2	555	30	29	19,2
19 x 1,5	14,5	405	22	22	31,9
19 x 2,5	17,9	635	30	29	19,2
24 x 1,5	16,7	505	22	22	31,9
24 x 2,5	20,6	790	30	29	19,2
27 x 1,5	17,4	550	22	22	31,9
30 x 1,5	18,2	605	22	22	31,9
37 x 1,5	19,8	740	22	22	31,9
44 x 1,5	21,9	870	22	22	31,9
52 x 1,5	23,4	1.020	22	22	31,9
61 x 1,5	25,4	1.210	22	22	31,9

[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 D1 according to IEC 60364-5-52. In a duct 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 $\cos\varphi=1$.

For cables having 2 conductors or 3 cores up to 10 mm^2, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

For cables having 6 or more conductors, it is supposed a single-phase circuit that not all conductors are fully charged.

TOXFREE® ZH Z1Z1-K (AS)

Flexible and halogen free (LSHF) power cable for public places.

BASED TO: IEC 60502-1 / UNE 21123-4

100% Green Energy Cable Production

$B2_{ca}$

APPLICATION

Toxfree® ZH Z1Z1-K (AS) is a LSHF safety cable. In the event of fire, it does not emit toxic gases, nor does it give off corrosive gases, avoiding any possible damage to people or electronic equipment. For these reasons it is highly recommended for use in public places such as: hospitals, schools, museums, airports, bus terminals, shopping malls, offices, laboratories, etc.

- Industrial use.
- Public places.

CONSTRUCTION

Conductor

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

Insulation

Special low smoke and halogen free polyolefin insulation.

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

6 G or more	Black numbered + Green/Yellow

Outer sheath

Low Smoke Halogen Free (LSHF) polyolefin outer sheath. Green colour, non-toxic and fire retardant. Other outer sheath colours available on request.

CHARACTERISTICS

Electrical performance

Low voltage: 0,6/1 kV.

Thermal performance

Maximum service temperature: 70°C.

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

Minimum service temperature: -40°C (static, with protection).

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.

Reaction to fire CPR: $B2_{ca}$-s1a,d1,a1 according to EN 50575.

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: UNE 211605 and EN 50618.

Water resistance: AD5 Jets.

Installation conditions

Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

Based to:

IEC 60502-1 / UNE 21123-4

Standards and approvals

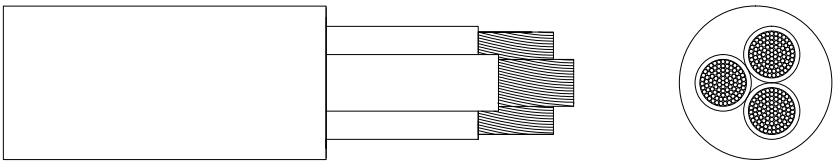
RoHS / CE

CPR (Construction Products Regulation)

$B2_{ca}$-s1a,d1,a1

TOXFREE® ZH
Z1Z1-K (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Buried in duct (A) [2]	Voltage drop (V/A · km) [3]
7 G 1,5	11,2	220	22	22	31,8
7 G 2,5	12,7	305	30	29	19,1
8 G 1,5	12,3	250	22	22	31,8
8 G 2,5	13,8	345	30	29	19,1
10 G 1,5	13,2	295	22	22	31,8
10 G 2,5	14,7	415	30	29	19,1
12 G 1,5	13,9	335	22	22	31,8
19 G 1,5	16,7	500	22	22	31,8
24 G 1,5	18,8	615	22	22	31,8

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

[2] Reference method D1 according to IEC 60364-5-52. Buried in duct 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 $\cos\varphi=1$.

For 6 or more conductors, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

SCREENFLEX® 110/200 LiYCY VC4V-K

100% Green Energy Cable Production

Flexible screened PVC cable, for safe signal transmission.

ACCORDING TO: EN 50525 (for 300/500 V cables) / IEC 60502 (for 0,6/1 kV cables).

E_{ca}
C_{ca}

APPLICATION

Screenflex® 110 LiYCY VC4V-K is a screened control cable. It is used in all types of signal transmission connections where the voltage induced by an exterior electromagnetic field may affect the signal transmitted. Its most common applications are control circuits, electronic equipment connections, computer systems, etc.

CONSTRUCTION

Conductor

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

Insulation

Flexible PVC insulation, type TI2 according to EN 50363-3 and type PVC/A according to IEC 60502-1.

The standard identification of insulated conductors according to HD 308 and EN 50334 is the following:

1 x	Natural
2 x	Blue + Brown
3 G	Blue + Brown + Green/Yellow
3 x	Brown + Black + Grey
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.

Other identifications (JZ, OZ, J, O) are available on request.

Screen

Aluminium-polyester tape screen with overlapping tinned copper braid, ensuring full screening coverage.

Outer sheath

Flexible PVC type TM2 according to EN 50363-4-1 and type ST1 according to IEC 60502-1. Black or grey colour (grey for fire non-propagation).

The ripcord allows you to gently tear the outer-sheath and remove it without damaging the screen.

CHARACTERISTICS

Electrical performance

Low voltage: 300/500 V. (up to 1,5 mm^2).

0,6/1kV (from 2,5mm^2 onwards).

Thermal performance

Maximum service temperature: 70°C.

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

Minimum service temperature: -40°C (static, with protection).

Fire performance

Flame non-propagation based on EN 60332-1/IEC 60332-1.

Fire non-propagation based on EN 60332-3/IEC 60332-3 (only grey outer sheath).

Reaction to fire CPR according to EN 50575:

C_{ca} -s2, d1, a3 (grey outer sheath 300/500 V)

C_{ca} -s3, d1, a3 (grey outer sheath 0,6/1 kV).

E_{ca} (black outer sheath).

Low halogen emission. Chlorine <15%.

Mechanical performance

Minimum bending radius: 5x cable diameter.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical & Oil resistance: Good.

UV Resistant based on UNE 211605.

Water resistance: AD5 Jets.

STANDARDS / COMPLIANCE

According to:

EN 50525 / IEC 60502-1.

Standards and approvals

RoHS / CE.

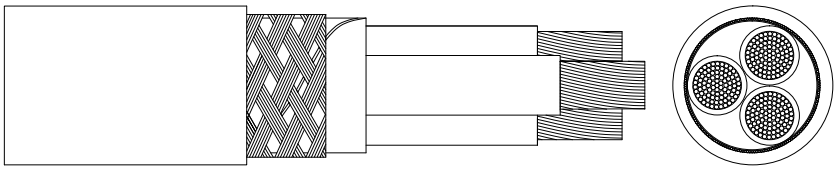
CPR (Construction Products Regulation)

C_{ca} -s2, d1, a3 (grey outer sheath 300/500V)

E_{ca} (black outer sheath).

SCREENFLEX® 110/200
LiYCY VC4V-K

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
2 x 0,75	6,2	55	6	62,4
2 x 1	6,3	60	10	46,8
2 x 1,5	7,3	75	16	31,9
3 G 0,75	6,5	65	6	62,4
3 G 1	6,6	70	10	46,8
3 G 1,5	7,7	95	16	31,9
4 G 0,75	6,9	75	6	62,4
4 G 1	7,0	85	10	46,8
4 G 1,5	8,4	120	16	31,9
5 G 0,75	7,4	90	6	62,4
5 G 1	7,8	105	10	46,8
5 G 1,5	9,5	150	16	31,9
6 G 0,75	7,9	105	6	62,4
6 G 1	8,3	125	10	46,8
6 G 1,5	10,2	175	16	31,9
7 G 0,75	8	110	6	62,4
7 G 1	8,3	130	10	46,8
7 G 1,5	10,2	190	16	31,9
8 G 0,75	8,7	125	6	62,4
8 G 1	9,3	155	10	46,8
8 G 1,5	11	215	16	31,9
10 G 0,75	9,7	150	6	62,4
10 G 1	10,3	185	10	46,8
10 G 1,5	12,5	265	16	31,9
12 G 0,75	10,3	170	6	62,4
12 G 1	10,8	210	10	46,8
12 G 1,5	12,9	300	16	31,9
14 G 0,75	10,7	195	6	62,4
14 G 1	11,1	235	10	46,8
14 G 1,5	13,7	340	16	31,9
16 G 0,75	11,4	220	6	62,4
16 G 1	12	270	10	46,8
16 G 1,5	14,5	370	16	31,9
19 G 0,75	12	245	6	62,4
19 G 1	12,8	310	10	46,8
19 G 1,5	15,4	450	16	31,9
24 G 0,75	13,4	305	6	62,4
24 G 1	14,2	380	10	46,8
24 G 1,5	17,5	555	16	31,9
30 G 0,75	14,4	380	6	62,4
30 G 1	15,5	465	10	46,8
30 G 1,5	19	680	16	31,9
37 G 1	16,9	560	10	46,8
37 G 1,5	20,5	815	16	31,9
52 G 1	19,4	730	10	46,8
61 G 1	20,5	835	10	46,8

[1] One cable with adequate ventilation and ambient temperature of 30 °C according to EN 50565-1.

[2] At maximum service temperature and cosφ=1.

For all cables is supposed a single-phase circuit where not all conductors are fully charged.

SCREENFLEX® 110/200
LiYCY VC4V-K

Cross-section (mm²)	Diameter (mm)	Weight (kg/km)	Open air (A) [3]	Buried (A) [4]	Voltage drop (V/A · km) [5]
1 x 10	11,7	225	60	50	3,97
1 x 16	12,6	290	82	64	2,51
1 x 25	14,5	405	110	82	1,62
1 x 35	15,6	510	137	98	1,15
1 x 50	17,5	675	167	116	0,802
1 x 70	19,6	900	216	143	0,565
1 x 95	21,7	1.140	264	169	0,428
1 x 120	23,3	1.395	308	192	0,335
1 x 150	25,6	1.715	356	217	0,268
1 x 185	27,4	2.010	409	243	0,220
1 x 240	31,4	2.650	485	280	0,166
1 x 300	34,3	3.255	561	316	0,133
2 x 2,5	8,6	110	30	29	19,2
2 x 4	11,4	180	40	37	11,9
2 x 6	12,5	225	51	46	7,92
2 x 10	15,2	350	70	60	4,58
2 x 16	17,5	485	94	78	2,90
2 x 25	21,4	670	119	99	1,87
2 x 35	24,2	895	148	119	1,33
3 G 2,5	9,4	145	30	29	19,2
3 G 4	11,7	225	40	37	11,9
3 G 6	12,9	285	51	46	7,92
3 G 10	16,1	450	70	60	4,58
3 x 16	18,7	630	80	64	2,51
3 x 25	23,1	965	101	82	1,62
3 x 35	25,2	1.255	126	98	1,15
3 x 50	29,6	1.745	153	116	0,802
3 x 70	33,6	2.360	196	143	0,565
4 x 2,5	10,2	180	25	24	16,6
4 x 4	12,6	275	34	30	10,3
4 x 6	14,4	360	43	38	6,86
4 x 10	17,5	570	60	50	3,97
4 x 16	20,1	815	80	64	2,51
4 x 25	24,5	1.225	101	82	1,62
4 x 35	28,2	1.655	126	98	1,15
4 x 50	32,3	2.270	153	116	0,802
4 x 70	37,5	3.105	196	143	0,565
4 x 95	42,6	4.020	238	169	0,428
5 G 2,5	11,2	220	25	24	16,6
5 G 4	14,3	340	34	30	10,3
5 G 6	16,0	450	43	38	6,86
5 G 10	19,6	725	60	50	3,97
5 G 16	22,3	1.030	80	64	2,51
5 G 25	28,1	1.565	101	82	1,62
5 G 35	31,3	2.100	126	98	1,15
6 G 2,5	12,4	255	30	29	19,2
7 G 2,5	12,5	275	30	29	19,2
10 G 2,5	14,9	375	30	29	19,2
12 G 2,5	15,6	445	30	29	19,2
14 G 2,5	16,9	505	30	29	19,2
16 G 2,5	17,8	575	30	29	19,2
19 G 2,5	18,9	665	30	29	19,2
24 G 2,5	21,4	825	30	29	19,2
27 G 2,5	22,4	925	30	29	19,2
30 G 2,5	23,3	1.015	30	29	19,2
37 G 2,5	25,5	1.280	30	29	19,2

[3] 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.

[4] Reference method D1 according to IEC 60364-5-52. In a duct buried at 0,7 m depth with soil thermal resistivity of 2,5 K·m/W and 20°C of ground temperature.

[5] At maximum service temperature and $\cos\varphi=1$.

For cables having 2 conductors or 3 cores up to 10 mm^2, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

For cables having 6 or more conductors, it is supposed a single-phase circuit that not all conductors are fully charged

TOXFREE® ZH
Z1C4Z1-K (AS)

Halogen free (LSHF) screened power cable.

BASED TO: IEC 60502-1 / UNE 21123-4

100% Green Energy Cable Production

C_{ca}

APPLICATION

Toxfree® Z1C4Z1-K is a screened LSHF 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 highly recommended for public places and for all installations where it is necessary avoid to electric interference of nearby circuits.

CONSTRUCTION

Conductor

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

Insulation

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

The standard identification of insulated conductors according to UNE 21089-1 and 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

Screen

Coverage of 100% composed by aluminium-polyester tape and tinned copper braid.

Outer sheath

Low Smoke Halogen Free (LSHF) polyolefin. Green colour, non-toxic and fire retardant. The ripcord allows you to gently tear the outer sheath allowing you to gently peel it away without damaging the screen.

Other outer sheath colours available on request.

CHARACTERISTICS

Electrical performance

Low voltage: 0,6/1 kV

Thermal performance

Maximum service temperature: 70°C.

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

Minimum service temperature: -40°C (static, with protection).

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.

Reaction to fire CPR: C_{ca}-s1a,d1,a1 according to 50575.

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

Based to

IEC 60502-1 / UNE 21123-4

Standards and approvals

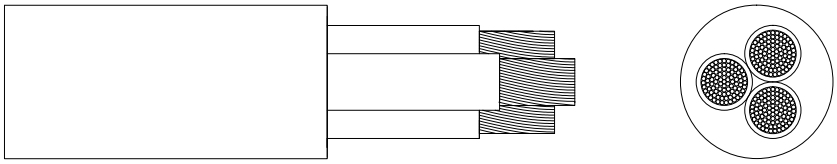
RoHS / CE

CPR (Construction Products Regulation)

C_{ca}-s1a, d1, a1

TOXFREE® ZH
Z1C4Z1-K (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Buried in duct (A) [2]	Voltage drop (V/A · km) [3]
2 x 1,5	8,6	105	22	22	31,8
2 x 2,5	9,9	135	30	29	19,1
2 x 4	10,8	170	40	37	11,8
2 x 6	11,5	210	51	46	7,9
3 G 1,5	9,4	130	22	22	31,8
3 G 2,5	10,3	165	30	29	19,1
3 G 4	11,5	215	40	37	11,8
3 G 6	12,6	280	51	46	7,9
3 x 10	16,4	460	70	60	4,6
3 x 16	18,4	640	94	78	2,9
3 x 25	22,4	970	119	99	1,9
3 x 35	25,2	1.275	148	119	1,3
3 x 50	29,5	1.760	180	140	0,92
4 G 1,5	10,2	155	18,5	18	25,1
4 G 2,5	11,0	200	25	24	16,5
4 G 4	12,5	270	34	30	10,3
4 G 6	13,4	350	43	38	6,8
4 G 10	18,0	585	60	50	4,0
4 G 16	20,7	835	80	64	2,5
4 G 70	36,1	3.070	196	143	0,56
5 G 1,5	11,0	180	18,5	18	25,1
5 G 2,5	12,0	240	25	24	16,5
5 G 4	13,7	325	34	30	10,3
5 G 6	15,2	425	43	38	6,8
5 G 10	19,8	720	60	50	4,0
5 G 16	23,0	1.035	80	64	2,5
5 G 25	27,2	1.550	101	82	1,6
5 G 35	29,8	2.045	126	98	1,2
5 G 50	36,5	2.860	153	116	0,80
7 G 1,5	11,8	230	18,5	18	25,1
8 G 1,5	12,8	260	18,5	18	25,1
10 G 1,5	13,8	305	18,5	18	25,1
12 G 1,5	14,6	350	18,5	18	25,1

[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 D1 according to IEC 60364-5-52. Buried in duct 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 $\cos\varphi=1$.

For cables having 2 conductors or 3 conductors up to 10 mm^2, it is supposed a single-phase circuit. For the rest of the cables it is supposed a three-phase circuit.

TOPDRIVE® VFD (EMC) ROZ1-K (AS) 0,6/1 kV

100% Green Energy Cable Production

Flexible LSHF screened cable for Variable Frequency Drive cables (VFD cables).

ACCORDING TO: IEC 60502-1 / IEC 60092-353

C_{ca}

APPLICATION

TOPDRIVE® VFD (EMC) ROZ1-K (AS) cable has been specially designed for Variable Frequency Drive Motors and installations where it is necessary to limit the effects of electromagnetic interference (EMI). This is a flexible cable for fixed installations, for variable speed motors or pumps.

CONSTRUCTION

Conductor

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

Protective Conductor

The ground conductor is divided into three conductors; the equivalent cross-section is approximately 50% of the section of the phase conductor. For 4G cables, ground conductor has the same cross-section as the phase conductors.

Insulation

Cross-linked polyethylene type XLPE according to IEC 60502-1, type HF XLPE 90oC according to IEC 60092-360.

The standard identification of insulated conductors is the following:

3 x +3 G Grey + Brown + Black + Green/Yellow (3 G) (from 6 mm^2 onwards)

4 G Grey + Brown + Black + Green/Yellow (up to 4 mm^2)

Assembly of cores

For 3x+3G cables, the three phase conductors are cabled helically with the three protective conductors distributed in the interstices. For 4G cables, the three phase conductors and protection conductor are cabled helically.

Screen

Aluminium-polyester tape screen helically placed over the insulated conductors. Over the tape there is a tinned copper braid screen. The tape and the braid act as a double screen to cut out all of the electromagnetic interference, with a minimum total section of 10% of the phase conductor, ensuring a total shielding coverage.

Outer sheath

Polyolefin LSHF outer sheath, type ST8 according to IEC 60502-1 and type SHF1 according to IEC 60092-360. black colour. The ripcord allows you to tear the outer sheath without damaging the screen.

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)

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.

Reaction to fire CPR: C_{ca}-s1a, d1, a1 according to EN 50575.

LSHF (Low Smoke Halogen Free) according to EN60754-1 / 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: 10x 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 / IEC 60092-353

Standards and approvals

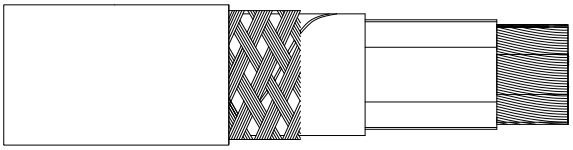
BUREAU VERITAS / DNV-GL / ABS / LLOYD'S REGISTER / RoHS / CE

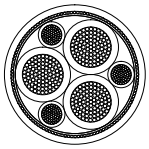
CPR (Construction Products Regulation)

C_{ca}-s1a, d1, a1

TOPDRIVE® VFD (EMC)
ROZ1-K (AS) 0,6/1 kV

DIMENSIONS & ADMISSIBLE INTENSITIES





Cross-section (mm^2)	Diameter under the braid (mm)	Outer diameter (mm)	Weight (Kg/km)	Open air (A) [1]	Buried (A) [2]	R20°C (Ω/km)	Voltage drop (V/A · km) [3]
3 x 6 + 3 G 1,5	10,5	15	390	63	58	3,30	8,41
3 x 10 + 3 G 1,5	11,1	15,6	510	86	77	1,91	4,87
3 x 16 + 3 G 2,5	14,0	18,9	750	115	100	1,21	3,08
3 x 16 + 3 G 6	16,9	22,2	915	115	100	1,21	3,08
3 x 25 + 3 G 4	16,9	22,3	1.135	149	129	0,780	1,98
3 x 25 + 3 G 6	16,9	22,3	1.185	149	129	0,780	1,98
3 x 35 + 3 G 6	19,5	24,9	1.495	185	155	0,554	1,41
3 x 50 + 3 G 10	22,7	28,1	2.035	225	183	0,386	0,984
3 x 70 + 3 G 10	26,2	31,1	2.565	289	225	0,272	0,693
3 x 70 + 3 G 16	26,2	31,6	2.790	289	225	0,272	0,693
3 x 95 + 3 G 16	30,1	35,5	3.450	352	270	0,206	0,525
3 x 120 + 3 G 16	33,3	39,5	4.320	410	306	0,161	0,410
3 x 120 + 3 G 25	33,3	39,4	4.550	410	306	0,161	0,410
3 x 150 + 3 G 25	38,4	44,8	5.445	473	343	0,129	0,328
3 x 185 + 3 G 35	41,6	48,4	6.675	542	387	0,106	0,270
3 x 240 + 3 G 50	49,2	56,3	8.765	641	448	0,0801	0,204
3 x 300 + 3 G 50	54,5	62,1	10.650	741	502	0,0641	0,163
4 G 1,5	6,9	11,4	185	26	27	13,30	33,9
4 G 2,5	7,7	12,2	230	36	35	7,98	20,3
4 G 4	9,2	13,7	300	49	46	4,95	12,6
4 G 6	10,6	15,1	385	63	58	3,30	8,41
4 G 10	12,7	17,2	560	86	77	1,91	4,87

[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 it is supposed a single-phase circuit.

TOPDRIVE® VFD (EMC) ROZ1-K (AS) 1,8/3 kV

100% Green Energy Cable Production

Flexible LSHF screened cable for Variable Frequency Drive cables (VFD cables).

ACCORDING TO: IEC 60502-1 / IEC 60092-353

C_{ca}

APPLICATION

TOPDRIVE® VFD (EMC) ROZ1-K (AS) cable has been specially designed for Variable Frequency Drive Motors and installations where it is necessary to limit the effects of electromagnetic interference (EMI). This is a flexible cable for fixed installations, for variable speed motors or pumps.

CONSTRUCTION

Conductor

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

Protective Conductor

The ground conductor is divided into three conductors; the equivalent cross-section is approximately 50% of the section of the phase conductor.

Insulation

Cross-linked polyethylene type XLPE according to IEC 60502-1, type HF XLPE 90oC according to IEC 60092-351.

The standard identification of insulated conductors is the following:

3 x +3 G Grey + Brown + Black + Green/Yellow (3 G) (from 6 mm^2 onwards)

Assembly of cores

For 3x+3G cables, the three phase conductors are cabled helically with the three protective conductors distributed in the interstices.

Screen

Aluminium-polyester tape screen helically placed over the insulated conductors. Over the tape there is a tinned copper braid screen. The tape and the braid act as a double screen to cut out all of the electromagnetic interference, with a minimum total section of 10% of the phase conductor, ensuring a total shielding coverage.

Outer sheath

Polyolefin LSHF outer sheath, type ST8 according to IEC 60502-1 and type SHF1 according to IEC 60092-360. black colour. The ripcord allows you to tear the outer sheath without damaging the screen.

CHARACTERISTICS

Electrical performance

Low voltage: 1,8/3 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)

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.

Reaction to fire CPR: C_{ca}-s1a, d1, a1 according to EN 50575.

LSHF (Low Smoke Halogen Free) according to EN60754-1 / 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: 10x 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 / IEC 60092-353

Standards and approvals

BUREAU VERITAS / DNV-GL / ABS / LLOYD'S REGISTER / RoHS / CE

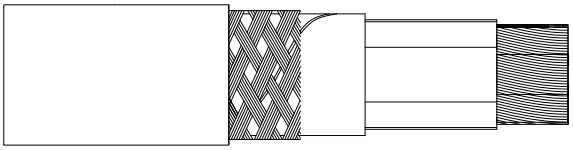
CPR (Construction Products Regulation)

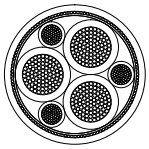
C_{ca}-s1a, d1, a1

sales@topcable.com | www.topcable.com

TOPDRIVE® VFD (EMC)
ROZ1-K (AS) 1,8/3 kV

DIMENSIONS & ADMISSIBLE INTENSITIES





Cross-section (mm^2)	Diameter under the braid (mm)	Outer diameter (mm)	Weight (Kg/km)	Open air (A) [1]	Buried (A) [2]	R20°C (Ω/km)	Voltage drop (V/A · km) [3]
3 x 50 + 3 G 10	27,0	32,4	2.240	225	183	0,386	0,984
3 x 70 + 3 G 10	30,1	35,5	2.840	289	225	0,272	0,693
3 x 95 + 3 G 16	34,0	40,2	3.795	352	270	0,206	0,525
3 x 120 + 3 G 16	36,7	43,1	4.560	410	306	0,161	0,410
3 x 150 + 3 G 25	41,6	48,2	5.670	473	343	0,129	0,328
3 x 185 + 3 G 35	45,3	52,2	6.895	542	387	0,106	0,270
3 x 240 + 3 G 50	50,7	58,0	8.955	641	448	0,0801	0,204
3 x 300 + 3 G 50	55,8	63,6	10.820	741	502	0,0641	0,163

[1] Reference 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 it is supposed a single-phase circuit.

TOPDATA®
VHOV-K (PAR-POS) & VOV-K (POS) 300/500V

100% Green Energy Cable Production

Flexible instrumentation screened cable.

BASED TO: EN 50288-7

E_{ca}

APPLICATION

TopData® VHOV-K (PAR-POS) & VOV-K (POS) is a flexible screened cable for signalling and control on industrial machinery facilities. The collective screen (VOV-K) and individual and collective screen (VHOV-K) make them especially suitable for areas where electrical noise protection is required.

CONSTRUCTION

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

Insulation
Flexible PVC.

The standard identification of insulated conductors is the following:

2 x Pairs numbered (black + blue).

Other colours available on request.

Assembly of cores
Stranded conductors in pairs.

Individual screen (VHOV-K (PAR-POS)
Individual polyester (per pair) composed by aluminium / polyester tape with 100% coverage + tinned copper drain wire.

Assembly of pairs
Cabled in concentric layers.

Collective Screen
Aluminium / polyester tape with 100% coverage + tinned copper drain wire.

Outer sheath
Flexible PVC sheath black color. The ripcord allows you to gently tear the outer-sheath and remove it without damaging the screen.

CHARACTERISTICS

Electrical performance
Low voltage: 300/500 V.

Thermal performance
Maximum service temperature: 70°C.

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

Minimum service temperature: -30°C (fixed and protected installations).

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

Reaction to fire CPR: E_{ca} according to EN 50575.

Low halogen emission. Chlorine < 15%.

Mechanical performance
Minimum bending radius: 5x cable diameter.

Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: Good.

UV Resistant according to UNE 211605.

Water resistance: AD5 Jets.

Installation conditions
Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

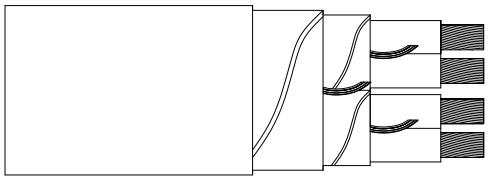
Based to
EN 50288-7

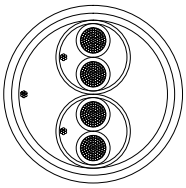
Standards and approvals
RoHS / CE

CPR (Construction Products Regulation)
E_{ca}

TOPDATA®
VHOV-K (PAR-POS) & VOV-K (POS) 300/500V

DIMENSIONS & ADMISSIBLE INTENSITIES





Tipo VOV-K

Cross-section (mm^2)	Diameter (mm)	Weight (Kg/km)	Resistance at 20°C (Ω/km)	Capacity between cond. (F/km)
1 x 2 x 0,75	5,7	45	26,0	0,601
2 x 2 x 0,75	8,0	65	26,0	0,601
4 x 2 x 0,75	9,4	115	26,0	0,601
2 x 2 x 1	8,6	90	19,5	0,641
4 x 2 x 1	9,8	140	19,5	0,641
10 x 2 x 1	15,0	335	19,5	0,641
12 x 2 x 1	15,8	365	19,5	0,641
1 x 2 x 1,5	6,8	65	13,3	0,661
2 x 2 x 1,5	10,0	125	13,3	0,661
4 x 2 x 1,5	11,9	200	13,3	0,661
8 x 2 x 1,5	15,5	365	13,3	0,661
10 x 2 x 1,5	18,4	455	13,3	0,661
12 x 2 x 1,5	19,0	520	13,3	0,661

Tipo VHOV-K

Cross-section (mm^2)	Diameter (mm)	Weight (Kg/km)	Resistance at 20°C (Ω/km)	Capacity between cond. (F/km)
2 x 2 x 0,75	8,8	90	26,0	0,601
4 x 2 x 0,75	10,4	145	26,0	0,601
8 x 2 x 0,75	13,6	260	26,0	0,601
12 x 2 x 0,75	16,6	370	26,0	0,601
16 x 2 x 0,75	17,9	470	26,0	0,601
2 x 2 x 1	9,4	105	19,5	0,641
3 x 2 x 1	9,7	130	19,5	0,641
4 x 2 x 1	10,8	165	19,5	0,641
10 x 2 x 1	16,4	370	19,5	0,641
1 x 2 x 1,5	6,8	65	13,3	0,661
2 x 2 x 1,5	10,3	140	13,3	0,661
4 x 2 x 1,5	13,0	225	13,3	0,661
8 x 2 x 1,5	17,0	415	13,3	0,661
10 x 2 x 1,5	20,2	510	13,3	0,661
12 x 2 x 1,5	21,1	600	13,3	0,661

SOLAR
CABLES

TOPSOLAR® PV H1Z2Z2-K

TÜV solar PV cable.

ACCORDING TO: EN 50618 / IEC 62930 / UTE C 32-502

100% Green Energy Cable Production

Cca

APPLICATION

The TOPSOLAR® PV H1Z2Z2-K cable, which is TÜV certified according to EN 50618 and AENOR certified according to IEC 62930, it is suitable for both fixed and mobile solar installations (solar farms, rooftop solar installations and floating plants).
It is a highly flexible cable compatible with all major connectors and specially designed for the connection of photovoltaic panels.
This versatile single-conductor cable is designed to meet the varying needs of the solar industry.
Suitable for wet, damp and humid locations.

- Solar PV installations string cable.

CONSTRUCTION

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

Insulation
Halogen free cross linked rubber insulation.
Insulation requirements according to table B1 in Annex B of EN 50618 and IEC 62930.

Outer sheath
Halogen free cross linked flexible rubber outer sheath.
Outer sheath requirements according to table B1 in Annex B of EN 50618 and IEC 62930.
Red or black colour.

CHARACTERISTICS

Electrical performance
Low voltage: 1,5/1,5 (1,8) kV DC.
1,0/1,0 kV AC.

Thermal performance
Maximum service temperature: 120°C during 20.000 h.
Maximum short-circuit temperature: 250°C (max. 5 s).
Minimum service temperature: -40°C (fixed and protected installations).

Fire performance
Flame non-propagation according to EN 60332-1-2 / IEC 60332-1-2.
Fire non-propagation according to EN 50399.
Reaction to fire CPR: C_{ca}-s1b, d2, a1, according to EN 50575.
LSHF (Low Smoke Halogen Free) according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034:
Light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius:
4 x cable diameter (cable diameter ≤ 8 mm)
5 x cable diameter (8 < cable diameter ≤ 12 mm)
6 x cable diameter (cable diameter > 12 mm).
Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: Excellent.
Grease & mineral oils resistance: Excellent.
Ozone resistant according to EN 50618.
UV Resistant according to EN 50618.
Water resistance: AD8 Submersion.

Installation conditions
Open Air.
Buried.
In conduit.

STANDARDS / COMPLIANCE

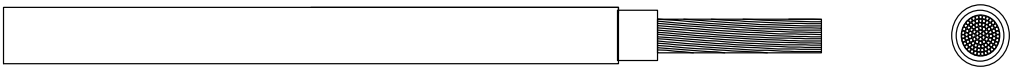
According to
EN 50618/ IEC 62930 / UTE C 32-502

Standards and approvals
TÜV (from 2.5 to 25mm² in Black and Red) / RETIE / AENOR/ RoHS / CE

CPR (Construction Products Regulation)
C_{ca}-s1b, d2, a1

TOPSOLAR® PV H1Z2Z2-K

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-Section (mm^2)	Diameter (mm)	Weight (kg/km)	Single cable free in air (A)	Single cable on surfaces (A)	To cables adjacent on surface (A)	Voltage drop (V/A · km)
1 x 1,5	4,5	35	30	29	24	38,1
1 x 2,5	5,0	45	41	39	33	22,8
1 x 4	5,4	60	55	52	44	14,3
1 x 6	6,0	80	70	67	57	9,49
1 x 10	7,0	120	98	93	79	5,46
1 x 16	8,2	180	132	125	107	3,47
1 x 25	10,2	280	176	167	142	2,23
1 x 35	11,5	375	218	207	176	1,58
1 x 50	13,3	525	276	262	221	1,10
1 x 70	15,0	720	347	330	278	0,772
1 x 95	17,0	930	416	395	333	0,585
1 x 120	18,7	1.175	488	464	390	0,457
1 x 150	21,0	1.475	566	538	453	0,368
1 x 185	23,5	1.805	644	612	515	0,301
1 x 240	26,3	2.345	775	736	620	0,228

The tolerances on the nominal outer diameters are:
Cables with outer diameter d ≤ 7 mm. → -0,1 +0,2 mm
Cables with outer diameter 7 < d < 10 mm. → -0,1 +0,3 mm
Cables with outer diameter d ≥ 10 mm. → -0,2 +0,4 mm

Current-carrying capacities, in amperes, are according to EN 50618 (ambient temperature of 60 °C). In all cases it is supposed a direct current circuit. Voltage drop is calculated with conductor temperature of 120 °C.

TOPSOLAR® PV Al 1500 V

Aluminium PV cable.

ACCORDING TO: IEC 60502-1

100% Green Energy Cable Production

E_{ca}

APPLICATION

TOPSOLAR® PV DC Feeder Aluminium cable is suitable for all types of underground and open air solar installations. This cable is recommended for connections between string boxes and photovoltaic inverters in large scale rooftops or ground farms.

- Solar PV installations.
- Heavy impact and armoured versions also available.

CONSTRUCTION

Conductor

Aluminium conductor, class 2 according to EN 60228 and IEC 60228.

Insulation

Cross-linked polyethylene insulation, type XLPE according to IEC 60502-1. Natural colour.

Outer sheath

Special UV resistant PVC, type ST2 according to IEC 60502-1. Black colour.

CHARACTERISTICS

Electrical performance

Low voltage: 1,5/1,5 (1,8) kV DC according to EN 50618.

1,8/3 (3,6) kV AC according to IEC 60502-1.

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 (on cable surface).

Fire performance

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

Reaction to fire CPR: E_{ca}, according to EN 50575

Reduced halogen emission. Chlorine <15%.

Mechanical performance

Minimum bending radius: 5x cable diameter.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical resistance: Good.

Grease & mineral oils resistance: Good.

UV Resistant according to EN 50618 and HD 605/A1.

Water resistance: AD8 Submersion.

STANDARDS / COMPLIANCE

According to

IEC 60502-1

Standards and approvals

CE / RoHS.

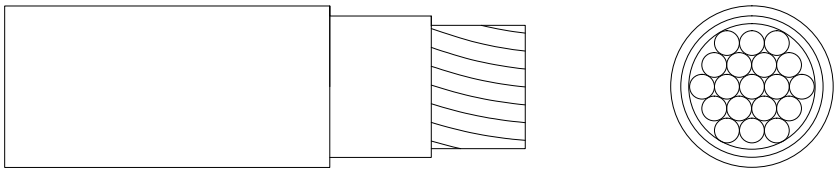
CPR (Construction Products Regulation)

E_{ca}

CPR Compliant EN 50575 · RoHS Compliant · CE

TOPSOLAR® PV
Al 1500 V

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (Kg/km)	R20ºC (Ω/km)	Open air (A) [1]	Buried (A) [2]	Voltage drop (V/A · km) [3]
1 x 16	11,1	140	1,910	87	76	4,894
1 x 25	12,2	175	1,200	121	98	3,075
1 x 35	13,4	215	0,868	150	117	2,225
1 x 50	14,5	255	0,641	184	139	1,643
1 x 70	16,6	340	0,443	237	170	1,135
1 x 95	17,7	425	0,320	289	204	0,820
1 x 120	19,3	520	0,253	337	233	0,648
1 x 150	20,7	610	0,206	389	261	0,528
1 x 185	22,5	740	0,164	447	296	0,420
1 x 240	24,9	930	0,125	530	343	0,320
1 x 300	27,0	1.095	0,100	613	386	0,256
1 x 400	30,0	1.395	0,0778	740	444	0,199
1 x 500	34,3	1.755	0,0605	856	510	0,155
1 x 630	38,4	2.225	0,0469	996	588	0,120
2 x 240	50,2	3.510	0,125	470	343	0,320
3 x 1 x 240	53,5	2.810	0,125	466	257	0,320
4 x 95	42,0	2.300	0,320	257	204	0,820
4 x 120	46,1	2.800	0,253	300	233	0,648
4 x 150	49,3	3.320	0,206	346	261	0,528
4 x 1 x 120	46,5	2.100	0,253	296	195	0,648
4 x 1 x 150	49,9	2.465	0,206	342	196	0,528
4 x 1 x 240	60,0	3.745	0,125	466	257	0,320

[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 $\cos\varphi=1$.

For all cables is supposed a single-phase circuit

TOXFREE® ZH OUTDOOR
H07Z1-K (AS) type 2 CuSn

Flexible and halogen free earthing connections.

ACCORDING TO: EN 50525-3-31 / UNE 211002

100% Green Energy Cable Production

$B2_{ca}$

APPLICATION

Toxfree® ZH Outdoor H07Z1-K is a LSHF safety cable specially engineered for earthing connections in outdoor installations. The tinned copper and the special UV resistant compound make the cable resistant against corrosion and UV rays degradation.

CONSTRUCTION

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

Insulation
UV resistant (LSHF) polyolefin insulation type TI7 according to EN 50363-7.
The standard identification of insulated conductors is the following:

Green/Yellow RAL 6018/1021
Other colours available on request.

CHARACTERISTICS

Electrical performance
Low voltage: 450/750 V.

Thermal performance
Maximum service temperature: 70°C.
Maximum short-circuit temperature: 160°C (max. 5 s).
Minimum service temperature: -40°C (fixed and protected installations).

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Fire non-propagation according to EN 60332-3-24 / IEC 60332-3-24 and EN 50399.
Reaction to fire CPR: $B2_{ca}$-s1a, d1, a1, according to EN 50575.
LSHF (Low Smoke Zero Halogen) 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.

Environmental performance
Chemical & Oil resistance: Excellent.
Grease & mineral oils resistance: Excellent.
UV Resistant according to EN 50618.
Ozone resistant according to EN 50618.

STANDARDS / COMPLIANCE

According to
EN 50525-3-31 / UNE 211002

Standards and approvals
HAR / AENOR / BUREAU VERITAS / RoHS / CE

CPR (Construction Products Regulation)
$B2_{ca}$-s1a, d1, a1

LOW VOLTAGE **SPECIAL CABLES**

TOPFLAT®
H05VVH6-F & H07VVH6-F

Flat cables for lifts, cranes, hoists and conveyor systems.

ACCORDING TO: HD 359 / EN 50214 / IEC 60277-6

100% Green Energy Cable Production

APPLICATION

The Topflat® H05VVH6-F & H07VVH6-F is a flat cable specially designed for cranes, lifts, hoists, drum reeling and conveyor systems.
The hanging length of the cable can reach up to 35m and its pull out speed can reach up to 1,6 m/s (overlaying cables is not recommended when installing).

- Industrial use.
- Mobile services.
- Bridge cranes.
- Lifts, elevators.
- Conveyors.

CONSTRUCTION

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

Insulation
Flexible PVC insulation type TI2, according to EN 50363-3.
The standard identification of insulated conductors according to HD 308 and EN 50334, is the following:

4 G	Brown + Black + Grey + Green/yellow
6 or more	Black numbered + Green/yellow

Lay-up
Insulated conductors are placed side by side in parallel arrangement forming a flat cable.

Outer sheath
Flexible PVC outer sheath type TM2 according to EN 50363-4-1.
Black colour.
The ripcord allows you to gently tear the outer sheath without damaging the screen.

CHARACTERISTICS

Electrical performance
Low voltage: 300/500 V - 450/750 V
Nominal voltage:
H05VVH6-F (up to 1 mm^2): 300/500 V.
H07VVH6-F (from 1,5 mm^2): 450/750 V.

Thermal performance
Maximum conductor temperature: 70°C.
Maximum short circuit temperature: 160°C (maximum 5 s).
Minimum operating temperature: 0°C (mobile service).

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Low halogen emission. Chlorine < 15%.

Mechanical performance
Minimum bending radius on pulleys (to 20 ± 10°C):
Festooned as in gantry cranes: 10 x smaller dimension
Deflected by pulleys: 10 x smaller dimension
Free movement: 5 x smaller dimension
Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: Acceptable.
Water resistance: AD5 Jets.

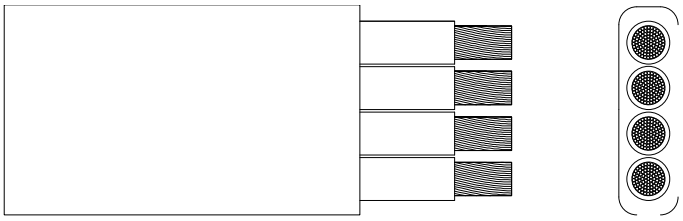
STANDARDS / COMPLIANCE

According to:
HD 359 / EN 50214 / IEC 60277-6

Standards and approvals
HAR / AENOR / CE/ RoHS

TOPFLAT®
H05VVH6-F & H07VVH6-F

DIMENSIONS & ADMISSIBLE INTENSITIES



TOPFLAT® H05VVH6-F

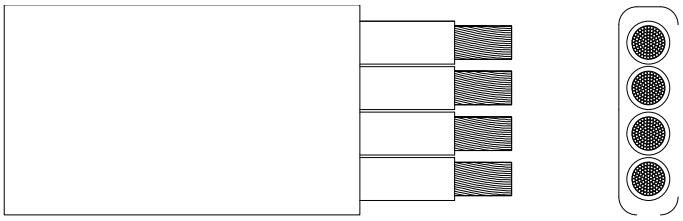
Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
6 G 0,75	17 x 3,9	115	14	62,4
8 G 0,75	22 x 3,9	175	14	62,4
10 G 0,75	26 x 3,9	195	14	62,4
12 G 0,75	31 x 3,9	230	14	62,4
16 G 0,75	40 x 3,9	305	14	62,4
18 G 0,75	45 x 3,9	345	14	62,4
20 G 0,75	50 x 3,9	380	14	62,4
24 G 0,75	60 x 3,9	450	14	62,4
6 G 0,75	17 x 3,9	115	14	62,4
8 G 0,75	22 x 3,9	175	14	62,4
10 G 0,75	26 x 3,9	195	14	62,4
12 G 0,75	31 x 3,9	230	14	62,4
*16 G 0,75	40 x 3,9	305	14	62,4
18 G 0,75	45 x 3,9	345	14	62,4
20 G 0,75	50 x 3,9	380	14	62,4
24 G 0,75	60 x 3,9	450	14	62,4
4 G 1	12 x 4,1	100	14	40,5
6 G 1	18 x 4,1	140	17	46,8
8 G 1	23 x 4,1	185	17	46,8
12 G 1	33 x 4,1	270	17	46,8
16 G 1	44 x 4,1	355	17	46,8
20 G 1	55 x 4,1	440	17	46,8
24 G 1	65 x 4,1	525	17	46,8

* These cables are not covered by the reference standard, so that their marks do not carry the letter H of the Harmonized.

[1] Reference method E for multicore cables according to IEC 60364-5-52. One vertical cable with adequate ventilation in open air at 30°C ambient temperature.
[2] At maximum service temperature and cosφ=1.
For cables having 4 conductors it is supposed a three-phase circuits
For cables having 6 or more conductors it is supposed a single-phase circuit where not all conductors are fully charged.

TOPFLAT®
H05VVH6-F & H07VVH6-F

DIMENSIONS & ADMISSIBLE INTENSITIES



TOPFLAT® H07VVH6-F

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
4 G 1,5	17 x 4,9	150	18,5	27,6
6 G 1,5	22 x 4,9	215	22	31,9
8 G 1,5	27 x 4,9	270	22	31,9
10 G 1,5	34 x 4,9	335	22	31,9
12 G 1,5	39 x 4,9	395	22	31,9
*16 G 1,5	53 x 5,2	530	22	31,9
4 G 2,5	21 x 5,9	220	25	16,6
6 G 2,5	27 x 5,9	310	30	19,2
8 G 2,5	34 x 5,9	395	30	19,2
12 G 2,5	50 x 5,9	590	30	19,2
4 G 4	23 x 7,0	305	34	10,3
12 G 4	56 x 7,0	830	40	11,9
4 G 6	25 x 7,2	390	43	6,86
8 G 6	43 x 7,2	735	51	7,9
4 G 10	30 x 9,3	640	60	3,97
4 G 16	35 x 10,5	930	80	2,51
4 G 25	44 x 13,1	1.435	101	1,62
*4 G 35	48 x 14,4	1.880	126	1,15
*4 G 50	57 x 16,2	2.580	153	0,802
*4 G 70	61 x 17,5	3.375	196	0,565
*4 G 95	69 x 19,5	4.375	238	0,427

* These cables are not covered by the reference standard, so that their marks do not carry the letter H of the Harmonized.

[1] Reference method E for multicore cables according to IEC 60364-5-52. One vertical cable with adequate ventilation in open air at 30°C ambient temperature.
[2] At maximum service temperature and cosφ=1.
For cables having 4 conductors it is supposed a three-phase circuits
For cables having 6 or more conductors it is supposed a single-phase circuit where not all conductors are fully charged.

X-PUR® H07BQ-F

Flexible cable for mobile service.

ACCORDING TO: EN 50525-2-21

100% Green Energy Cable Production

APPLICATION

The cable X-PUR® H07BQ-F is a flexible cable for mobile service. Suitable for installations where the cable must withstand medium mechanical stress, for machines in industrial and agricultural workshops, for motors and transportable machines on construction sites, for windmills and for agricultural exploitations.

CONSTRUCTION

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

Insulation
Cross-linked elastomeric insulation, type EI6 according to EN 50363-1.
The standard identification, according to HD 308 and HD 186, is the following:

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

Lay - up
The cores are twisted together.

Outer sheath
Thermoplastic polyurethane type TMPU according to EN 50363-10-2.
Orange colour.

CHARACTERISTICS

Electrical performance
Low voltage: 450/750 V.

Thermal performance
Maximum service temperature: 90°C.
Maximum short-circuit temperature: 250°C (max. 5 s).
Minimum service temperature: -40°C (static with protection).

Fire performance
Flame non propagation: according to EN 60332-1 (not <HAR> requirement).

Mechanical performance
Minimum bending radius:
3x cable diameter (cable <12 mm)
4x cable diameter (cable ≥12 mm)
Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: Excellent.

Installation conditions
Open air.

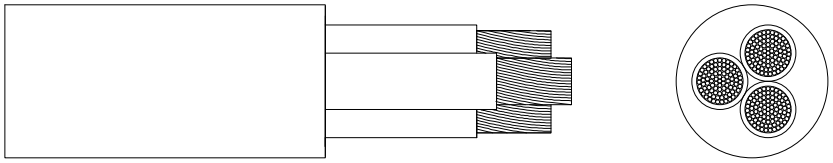
STANDARDS / COMPLIANCE

According to
EN 50525-2-21.

Standards and approvals
HAR / AENOR / CE / RoHS.

X-PUR® H07BQ-F

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Fixed Inst. (A) [1]	Mobil Service (A) [2]	Voltage drop (V/A ·km) [3]
1 x 95 *	19,6	955	328	222	0,414
1 x 185 *	26,3	1.800	510	341	0,213
2 x 1,5	7,7	75	26	16	30,9
3 G 1,5	8,2	95	26	16	30,9
3 G 2,5	9,5	145	36	25	18,5
3 G 4	11,2	210	49	35	11,5
4 G 1,5	9,1	125	23	16	26,7
4 G 2,5	10,7	180	32	20	16,0
4 G 4	13,2	245	42	30	10,0
5 G 1,5	10,1	150	23	16	26,7
5 G 2,5	12,4	210	32	20	16,0
5 G 4	14,6	335	42	30	10,0
5 G 6	16,2	455	54	38	6,61
5 G 50 *	38,8	3.125	192	148	0,773
6 G 1,5 *	12,9	195	23	16	26,7

* 07BQ-F (these cables are outside of the range of the standard)

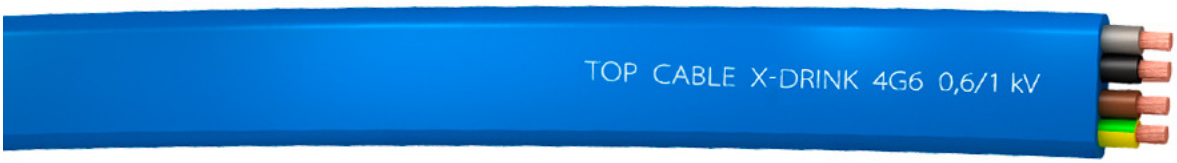
[1] Reference method F for single-core and method E for multicore cables according to IEC60364-5-52 in open air at 30°C ambient temperature.
[2] One cable in open air at 30°C ambient temperature according to EN 50565.
[3] At 60°C conductor temperature and cos φ= 1.
For cables having 2 or 3 cores, it is supposed a single–phase circuit. For the rest of the cables it is supposed a three-phase circuit.

X-DRINK®
0,6/1 kV

Cables for submersed pumps and drinking water.

BASED TO: IEC 60502-1

100% Green Energy Cable Production



APPLICATION

X-DRINK® 0,6/1 kV is a flexible cable suitable for being permanently submerged, such as: submerged pumps for drinking water, wells and aquariums. It is also suitable for lighting systems, filtering and swimming pool's cleaning.
Finally, its use is recommended in electrical installations for the production, processing and preservation of food and beverage systems.
Submersible (up to 600 meters deep).

CONSTRUCTION

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

Insulation
Cross-linked polyethylene type XLPE according to IEC 60502-1.
The standard identification of insulated conductors according to HD 308 is the following:

3 x	Brown+ Black+ Grey
4 G	Brown + Black + Grey + Green/yellow
4 x	Brown + Black + Grey + Blue

Lay-up
Insulated conductors are placed side by side in parallel arrangement forming a flat cable.
On request, Top Cable X-DRINK® 0,6/1 kV is also available in a round version.

Outer sheath
Flexible polyolefin.
Blue 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 (mobile service and fixed service).

Mechanical performance
Minimum bending radius: 5x cable diameter.
Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: Excellent.
Water performance:
AD8 (submersion).
Submersible pump cable for drinking water according to AS/NZS 4020
For deep wells.
Submersible up to 600 metres depth.
AWQC.
Drinkable water.

Installation conditions
Submerged.

STANDARDS / COMPLIANCE

Based to:
IEC 60502-1

Standards and approvals
CE / RoHS

RoHS Compliant

CE

X-DRINK®
0,6/1 kV

DIMENSIONS & ADMISSIBLE INTENSITIES

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Voltage drop (V/A · km) [2]
3 x 1,5	11,6 x 4,9	85	26	34,0
3 x 2,5	13,5 x 5,3	120	36	20,4
3 x 4	15,2 x 6,3	170	49	12,7
3 x 6	16,8 x 6,8	230	63	8,45
3 x 10	19,8 x 8,2	365	86	4,89
3 x 16	23,2 x 9,4	540	100	2,68
3 x 25	30,8 x 11,4	855	127	1,73
3 x 35	34,3 x 12,7	1.160	158	1,23
3 x 50	39,6 x 14,6	1.605	192	0,86
3 x 70	44,6 x 16,4	2.190	246	0,603
3 x 95	49,6 x 18,2	2.825	298	0,457
3 x 120	55,5 x 20,3	3.600	346	0,357
3 x 150	62,0 x 22,6	4.455	399	0,286
3 x 185	68,5 x 24,9	5.395	456	0,235
4 G 4	20,5 x 6,3	230	42	11,0
4 G 6	22,7 x 6,8	310	54	7,32
4 G 10	26,7 x 8,2	490	75	4,23
4 G 16	31,1 x 9,4	725	100	2,68
4 G 25	38,8 x 11,4	1.120	127	1,73
4 G 35	43,6 x 12,7	1.520	158	1,23
4 G 50	50,6 x 14,6	2.100	192	0,86
4 G 70	58,4 x 16,7	2.900	246	0,603
4 G 95	65,0 x 18,5	3.745	298	0,457
4 x 120	71,6 x 20,3	4.725	346	0,357

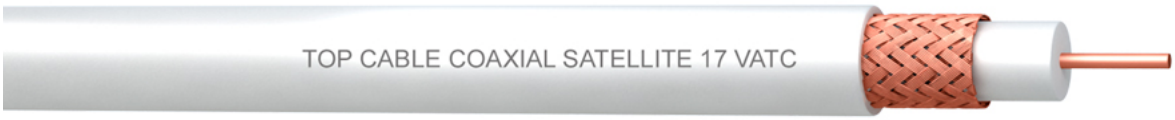
[1] Reference method E according to IEC 60364-5-52 in open air at 30°C ambient temperature.
[2] At maximum service temperature and cosφ=1.
For cables having 3 conductors up to 10 mm^2, it is supposed single-phase circuit. For the rest of the cables, it is supposed a three-phase circuit.

COAXIAL SATELLITE 17 VATC

Coaxial cable for television signals.

ACCORDING TO: EN 50117-1

100% Green Energy Cable Production



D_{ca}

APPLICATION

Coaxial cable for the reception and distribution of digital terrestrial, analogue and digital satellite television signals. These cables do not have a rated voltage and cannot be used in electric power transmission circuits.

- Digital terrestrial television.
- Analogical satellite.
- Digital.

CHARACTERISTICS

Electrical performance

These cables do not have a rated voltage and cannot be used in electric power transmission circuits.

Thermal performance

Maximum conductor temperature: 70°C.

Minimum service temperature: -15°C (mobile service).

Installation conditions

Open air.

In conduit.

On tray.

CONSTRUCTION

Conductor

Electrolytic annealed copper conductor, class 1, according to EN 60228 and IEC 60228.

Insulation

Polyethylene HDPE according to EN 50290-2-23.

Screen

Copper screen and aluminum-polyester tape with overlapping copper braid, ensuring 100% screening coverage.

Outer sheath

PVC, white colour.

TECHNICAL DATA

Outer sheath colour	Diameter (mm^2)	Weight (kg/km)	Impedance
white	7	27,0	75 +- 3 Ω

STANDARDS / COMPLIANCE

According to:

EN 50117-1.

Standards and approvals

CE / RoHS.

CPR (Construction Products Regulation)

D_{ca} -s1a,d1,a1.

COAXIAL SATELLITE 21 VATC

Coaxial cable for television signals.

ACCORDING TO: EN 50117-1

100% Green Energy Cable Production

E_{ca}

APPLICATION

Coaxial cable for the reception and distribution of digital terrestrial, analogue and digital satellite television signals with enhanced screen.

- Digital terrestrial television.
- Analogical satellite.
- Digital.

CHARACTERISTICS

Electrical performance
These cables do not have a rated voltage and cannot be used in electric power transmission circuits.

Thermal performance
Maximum conductor temperature: 70°C.
Minimum service temperature: -15°C (mobile service).

Installation conditions
Open air.
In conduit.
On tray.

CONSTRUCTION

Conductor
Electrolytic annealed copper conductor, class 1, according to EN 60228 and IEC 60228.

Insulation
Polyethylene HDPE according to EN 50290-2-23.

Screen
Copper or aluminum screen and aluminum-polyester tape with overlapping copper braid, ensuring 100% screening coverage.

Outer sheath
PVC, white colour.

TECHNICAL DATA

Outer sheath colour	Diameter (mm^2)	Weight (kg/km)	Impedance
white	7	27,0	75 +- 3 Ω

STANDARDS / COMPLIANCE

According to:
EN 50117-1

Standards and approvals
CE / RoHS

CPR (Construction Products Regulation)
E_{ca}.

PARALLEL AUDIO CABLE

Cable for connecting music equipment speakers

ACCORDING TO: UNE 211030

100% Green Energy Cable Production

APPLICATION

Cable specially indicated in domestic installations for connecting music equipment speakers and for broadcasting music signals throughout the home.

- Speaker connection.

CONSTRUCTION

Conductor

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

Insulation

PVC TI2 according to EN 50363-3. Red and Black.

The standard identification of insulated conductors is the following:

- Bicolor audio cable	Red + Black
- Audio cable OFC	Transparent + Transparent

CHARACTERISTICS

Electrical performance

These cables have no assigned voltage and cannot be used in electric power transport circuits.

Thermal performance

Maximum service temperature: 70°C.

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

Minimum service temperature: -15 °C (static with protection).

Fire performance

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

Mechanical performance

Minimum bending radius: x5 cable diameter.

STANDARDS / COMPLIANCE

According to:

UNE 211030.

Standards and approvals

AENOR / RoHS.

AENOR

RoHS Compliant

PARALLEL AUDIO CABLE

TECHNICAL DATA

TWO-COLOURS AUDIO CABLE

Cross-Section (mm^2)	External size (mm)	Resistance [Ω/km]
2 x 0,5	1,90 x 4,00	39
2 x 0,75	2,10 x 4,40	26
2 x 1	2,30 x 4,80	19,5
2 x 1,5	2,55 x 5,30	13,3
2 x 2,5	3,00 x 6,20	7,98
2 x 4,0	4,10 x 8,50	4,95

OFC CONDUCTOR AUDIO CABLE

Cross-Section (mm^2)	External size (mm)	Resistance [Ω/km]
2 x 1	2,9 x 6,1	19,5
2 x 1,5	3,3 x 6,8	13,3
2 x 2,5	3,9 x 8,0	7,98
2 x 4	4,6 x 9,4	4,95
2 x 6	6,1 x 12,7	3,3

TOXFREE® ZH
ALARMS Z1OZ1-K (AS)

Cable for alarm systems

ACCORDING TO: UNE 211025-1

100% Green Energy Cable Production

C_{ca}

APPLICATION

The TOXFREE® ZH ALARMS Z1OZ1-K (AS) cable is designed to comply with the regulations of Fire Detection and Alarm systems. It is recommended to be used in public places. It should not be used for direct connection to the power supply network or other low impedance sources.

- Fire detection.
- Fire alarms.

CONSTRUCTION

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

Insulation
Special polyolefin insulation with low smoke emission and halogen-free. Conductor identification: red, black.

Screen
Overlapping aluminium-polyester tape screen with 100% coverage + tinned copper drain wire.

Outer sheath
Fire-retardant polyolefin outer sheath, red colour, with low smoke emission and halogen-free fumes in case of fire.

TECHNICAL DATA

Cross-section (mm²)	Diameter (mm)	Weight (kg/km)
2 x 1,5	6,9	70

CHARACTERISTICS

Electrical performance
Low voltage: 300/500V.

Thermal performance
Maximum service temperature: 70°C.
Maximum short-circuit temperature: 160°C (max. 5 s).
Minimum service temperature: -40 °C (static with protection).

Fire performance
Flame non-propagation according to EN 50200/IEC 60331-2.

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

Halogen free according to EN 60754 / IEC 60754.

HCl content < 0.5% PH> 4.3.

Smoke density according to EN 61034 / IEC 61034.

Light transmittance> 60%.

Reaction to fire CPR: C_{ca}-s1a, d1, a1, according to EN 50575.

Mechanical performance
Minimum bending radius: x5 cable diameter.

Environmental performance
Chemical & Oil: acceptable.
Water resistance: AD3 Sprays.

Installation conditions
Open air.
In conduit.
On tray.

STANDARDS / COMPLIANCE

According to:
UNE 211030.

Standards and approvals
AENOR / RoHS.

CPR (Construction Products Regulation)
C_{ca}-s1a,d1,a1 .

TOXFREE® ZH
ALARMS Z1OZ1-K (AS+)

Fire resistant cable for alarm systems

ACCORDING TO: UNE 211025-1

100% Green Energy Cable Production

C_{ca}

APPLICATION

The TOXFREE® ZH ALARMS Z1OZ1-K (AS +) fire resistant cable is designed to comply with the regulations of Fire Detection and Alarm systems. It is recommended to be used in public places. It should not be used for direct connection to the power supply network or other low impedance sources.

- Fire detection.
- Fire alarms.

CONSTRUCTION

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

Insulation
Mica tape and special polyolefin insulation with low smoke emission and halogen-free. Conductor identification: red, black.

Screen
Overlapping aluminium-polyester tape screen with 100% coverage + tinned copper drain wire.

Outer sheath
Fire-retardant polyolefin outer sheath, red colour, with low smoke emission and halogen-free fumes in case of fire.

TECHNICAL DATA

Cross-section (mm²)	Diameter (mm)	Weight (kg/km)
2 x 1,5	7,6	80
2 x 2,5	8,3	100

CHARACTERISTICS

Electrical performance
Low voltage: 300/500V.

Thermal performance
Maximum service temperature: 70°C.
Maximum short circuit temperature: 160°C (maximum 5 s).
Minimum operating temperature: -40°C (static, with protection).

Fire performance
Flame non-propagation according to EN 50200 / IEC 60331-2.
Fire non-propagation according to EN 60332-3 / IEC 60332-3 / EN 50399.
Fire resistant according to IEC 60331-2 / EN 50200.
Halogen free according to EN 60754 / IEC 60754.
HCl content < 0.5% PH> 4.3.
Smoke density according to EN 61034 / IEC 61034.
Light transmittance> 60%.
Reaction to fire CPR: C_{ca}-s1a, d1, a1, according to EN 50575.

Mechanical performance
Minimum bending radius: x5 cable diameter.

Environmental performance
Chemical & Oil: acceptable.
Water resistance: AD3 Sprays.

Installation conditions
Open air.
In conduit.
On tray.

STANDARDS / COMPLIANCE

According to:
UNE 211025.

Standards and approvals
CE / RoHS.

CPR (Construction Products Regulation)
C_{ca}-s1a,d1,a1 .

CPR EN 50575 · RoHS Compliant · CE

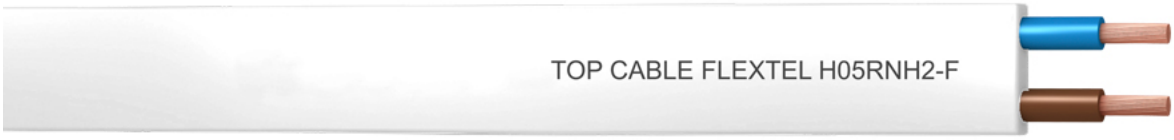
sales@topcable.com | www.topcable.com

FLEXTEL®
H05RNH2-F

Flexible cable for temporary installations

ACCORDING TO: EN 50525-2-82 / IEC 60245

100% Green Energy Cable Production



APPLICATION

Flextel® H05RNH2-F is a flexible cable for mobile service. Suitable for temporary installations, both indoor and outdoor. The rectangular outer sheath with calibrated dimension makes it especially suitable for special lamp holders adapted to this type of cable.

CONSTRUCTION

Conductor

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

Insulation

Thermosetting rubber insulation, type EI4 according to EN 50363-1.

The standard identification of insulated conductors is the following:

2 x Blue + Brown

Outer sheath

Thermosetting rubber outer sheath, white colour, type EM2 according to EN 50363-2-1. Other colours available under request.

CHARACTERISTICS

Electrical performance

Low voltage: 300/500 V.

Thermal performance

Maximum service temperature: 60°C.

Maximum short-circuit temperature: 200°C (max. 5 s).

Minimum service temperature: -40 °C (static with protection).

Fire performance

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

Low halogen emission. Chlorine < 15%.

Mechanical performance

Minimum bending radius: 10 x cable diameter.

Impact resistance: AG2 Medium severity.

Environmental performance

Chemical & Oil resistance: Good.

TECHNICAL DATA

Cross-section (mm^2)	Dimension (mm)	Weight (kg/km)
2 x 1,5	13,5 x 5,5	125

STANDARDS / COMPLIANCE

According to:

EN 50525-2-82 / IEC 60245.

Standards and approvals

CE / RoHS

RoHS Compliant

CE

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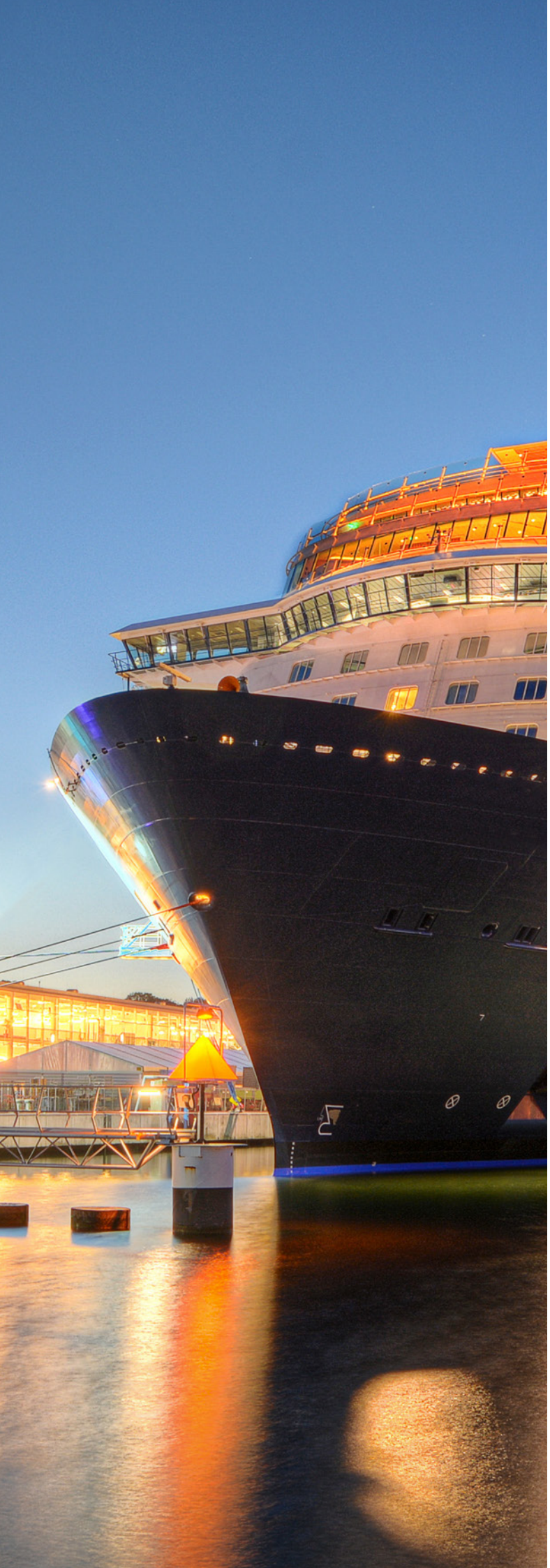


MARINE
CABLES

TOXFREE® MARINE XZ1-K (AS)

The marine power cable.

ACCORDING TO: IEC 60092-353

100% Green Energy Cable Production

APPLICATION

The Toxfree® 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 conductor, class 5 (flexible), according to EN 60228 and IEC 60228.

Insulation
Cross-linked polyethylene (XLPE) insulation, 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
4 x	Brown + Black + Grey + Blue
5 or more conductors	Black numbered

Other colours available on request.

Outer sheath
Low smoke halogen free (LSHF) polyolefin outer sheath type SHF1 according to IEC 60092-360. Black 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).
Lowest installation temperature: -15°C
Minimum service temperature: -40°C (fixed and protected installations).

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Fire non-propagation according to EN 60332-3-22 / IEC 60332-3-22.
LSHF (Low Smoke Halogen free) according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034:
light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius:
≤ 25mm 4x cable diameter.
> 25mm 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.

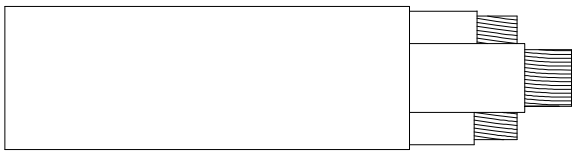
STANDARDS / COMPLIANCE

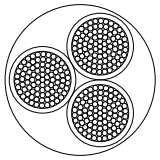
According to
IEC 60092-353

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

TOXFREE® MARINE
XZ1-K (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES





Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Resistance at 20°C (Ω/km)	Voltage drop (V/A · km) [2]
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® MARINE
XZ1-K (AS)

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Resistance at 20°C (Ω/km)	Voltage drop (V/A · km) [2]
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

[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 service temperature and cosφ=1.
For cables having 2 conductors and 3 conductors up to 10 mm^2, it is supposed a single-phase circuit. For cables having more of 5 conductors is supposed that all are loaded. For the rest of the cables it is supposed a three-phase circuit.

TOXFREE® MARINE PLUS XZ1-K (AS+)

The marine fire resistant power cable.

ACCORDING TO: IEC 60092-353

100% Green Energy Cable Production

APPLICATION

The Toxfree® Marine Plus XZ1-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 conductor class 5 (flexible) according to IEC 60228.

Insulation
Mica Tape + Cross linked polyethylene insulation 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.

Outer sheath
Low smoke halogen free (LSHF) thermoplastic polyolefin outer sheath 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 service 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 according to IEC 60331-2 (overall diameter ≤ 20 mm) and IEC 60331-1 (overall diameter > 20 mm).
LSHF (Low Smoke Halogen Free) according to IEC 60754-1.
Low smoke emission according to IEC 61034:
light transmittance > 60%.
Low corrosive gases emission according to IEC 60754-2.

Mechanical performance
Minimum bending radius:
≤ 25mm 4x cable diameter.
> 25mm 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.

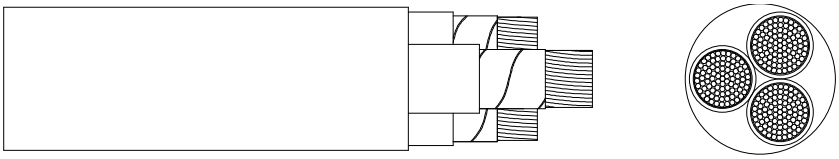
STANDARDS / COMPLIANCE

According to
IEC 60092-353

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

TOXFREE® MARINE PLUS
XZ1-K (AS+)

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Voltage drop (V/A · km) [2]	Resistance at 20°C (Ω/km)
1 x 2,5	5,9	51	25	17,7	7,98
1 x 4	6,4	68	35	11,0	4,95
1 x 6	7,0	89	46	7,32	3,3
1 x 10	7,9	133	64	4,23	1,91
1 x 16	9,1	195	88	2,68	1,21
1 x 25	10,9	290	117	1,73	0,78
1 x 35	12,2	393	147	1,23	0,554
1 x 50	13,9	540	180	0,86	0,386
1 x 70	15,8	741	233	0,60	0,272
1 x 95	17,9	969	285	0,46	0,206
1 x 120	19,5	1.212	333	0,36	0,161
1 x 150	21,8	1.504	386	0,29	0,129
1 x 185	24,4	1.828	444	0,24	0,106
1 x 240	27,4	2.379	528	0,18	0,0801
1 x 300	30,1	2.981	612	0,14	0,0641
2 x 1,5	9,2	121	23	34,0	13,3
2 x 2,5	10,1	154	31	20,4	7,98
2 x 4	11,4	209	43	12,7	4,95
2 x 6	12,4	266	55	8,45	3,3
2 x 10	14,5	395	75	4,89	1,91
2 x 16	16,1	542	100	3,10	1,21
3 x 1,5	10,0	140	23	34,0	13,3
3 x 2,5	11,0	186	31	20,4	7,98
3 x 4	12,2	247	43	12,7	4,95
3 x 6	13,3	321	55	8,45	3,3
3 x 10	15,7	489	75	4,89	1,91
3 x 16	17,9	701	87	2,68	1,21
3 x 25	22,3	1.097	110	1,73	0,78
3 x 35	25,3	1.470	137	1,23	0,554
3 x 50	28,9	2.013	167	0,86	0,386
3 x 70	31,6	2.677	214	0,60	0,272
3 x 95	37,7	3.575	259	0,46	0,206
3 x 120	41,5	4.480	301	0,36	0,161
3 x 150	46,4	5.566	347	0,29	0,129
3 x 185	52,0	6.806	397	0,24	0,106
3 x 240	58,4	8.813	468	0,18	0,0801
4 x 1,5	11,1	170	20	29,5	13,3
4 x 2,5	12,0	221	28	17,7	7,98

TOXFREE® MARINE PLUS
XZ1-K (AS+)

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Voltage drop (V/A · km) [2]	Resistance at 20°C (Ω/km)
4 x 4	13,3	298	37	11,0	4,95
4 x 6	14,9	400	47	7,32	3,3
4 x 10	17,4	609	65	4,23	1,91
4 x 16	20,1	883	87	2,68	1,21
4 x 25	25,1	1.379	110	1,73	0,78
4 x 35	27,3	1.820	137	1,23	0,554
4 x 50	32,7	2.558	167	0,86	0,386
4 x 70	37,0	3.467	214	0,60	0,272
4 x 95	42,0	4.524	259	0,46	0,206
4 x 120	46,2	5.675	301	0,36	0,161
4 x 150	51,6	7.083	347	0,29	0,129
4 x 185	57,9	8.654	397	0,24	0,106
4 x 240	65,1	11.243	468	0,18	0,0801
5 x 1,5	12,0	199	20	29,5	13,3
5 x 2,5	13,2	264	28	17,7	7,98
5 x 4	14,9	364	37	11,0	4,95
5 x 6	16,6	490	47	7,32	3,3
5 x 10	19,3	747	65	4,23	1,91
5 x 16	22,4	1.088	87	2,68	1,21
7 x 1,5	12,9	240	11	29,5	13,3
7 x 2,5	14,7	334	15	17,7	7,98
10 x 1,5	15,6	337	10	29,5	13,3
12 x 1,5	16,6	395	9	29,5	13,3
12 x 2,5	19,5	561	12	17,7	7,98
14 x 1,5	17,8	394	9	29,5	13,3
16 x 1,5	19,2	454	8	29,5	13,3
19 x 1,5	20,0	514	8	29,5	13,3
19 x 2,5	23,0	730	11	17,7	7,98
24 x 1,5	22,7	640	7	29,5	13,3
27 x 1,5	24,0	709	7	29,5	13,3
27 x 2,5	27,8	1.023	9	17,7	7,98

[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 service temperature and cosφ=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.

TOXFREE® MARINE XTCuZ1-K (AS)

100% Green Energy Cable Production

The marine power cable.

ACCORDING TO: IEC 60092-353

APPLICATION

The Toxfree® Marine XTCuZ1-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.

CONSTRUCTION

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

Insulation
Cross-linked polyethylene insulation, 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
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 (LSHF) thermoplastic polyolefin outer sheath type SHF1 according to IEC 60092-360. Black 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).
Lowest installation temperature: -15°C
Minimum service temperature: -40°C (fixed and protected installations).

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Fire non-propagation according to EN 60332-3-22 / IEC 60332-3-22.
LSHF (Low Smoke Halogen Free) according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034:
light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius: 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.

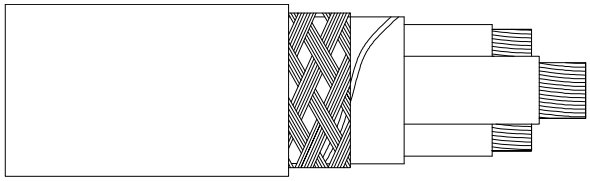
STANDARDS / COMPLIANCE

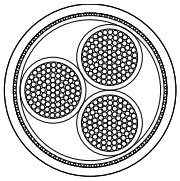
According to
IEC 60092-353

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

TOXFREE® MARINE
XTCuZ1-K (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES





Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Resistance at 20°C (Ω/km)	Voltage drop (V/A · km) [2]
1 x 2,5	8,2	110	25	7,98	17,7
1 x 4	8,9	135	35	4,95	11,0
1 x 6	9,5	160	46	3,30	7,32
1 x 10	10,5	215	64	1,91	4,23
1 x 16	11,5	275	88	1,21	2,68
1 x 25	13,4	385	117	0,78	1,73
1 x 35	14,3	490	147	0,554	1,23
1 x 50	16,7	680	180	0,386	0,860
1 x 70	18,7	900	233	0,272	0,603
1 x 95	20,2	1.125	285	0,206	0,457
1 x 120	22,4	1.400	333	0,161	0,357
1 x 150	24,3	1.700	386	0,129	0,286
1 x 185	26,4	2.020	444	0,106	0,235
1 x 240	29,5	2.585	528	0,0801	0,178
1 x 300	32,6	3.245	612	0,0641	0,142
1 x 400	37,7	4.240	716	0,0486	0,108
1 x 630	47,3	7.045	947	0,0287	0,064
2 x 1,5	8,6	115	23	13,3	34,0
2 x 2,5	9,5	135	31	7,98	20,4
2 x 4	10,7	180	43	4,95	12,7
2 x 6	11,3	220	55	3,3	8,45
2 x 10	15,3	475	75	1,91	4,89
2 x 16	17,3	630	100	1,21	3,1
3 x 1,5	9,1	135	23	13,3	34,0
3 x 2,5	10,0	170	31	7,98	20,4
3 x 4	11,4	225	43	4,95	12,7
3 x 6	12,4	285	55	3,3	8,45
3 x 10	15,5	475	75	1,91	4,89
3 x 16	17,7	655	87	1,21	2,68
3 x 25	22,1	1.120	110	0,78	1,73
3 x 35	24,6	1.470	137	0,554	1,23
3 x 50	28,7	2.005	167	0,386	0,860
3 x 70	32,1	2.685	214	0,272	0,603
3 x 95	36,2	3.445	259	0,206	0,457

TOXFREE® MARINE
XTCuZ1-K (AS)

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open air (A) [1]	Resistance at 20°C (Ω/km)	Voltage drop (V/A · km) [2]
3 x 120	41,1	4.450	301	0,161	0,357
3 x 150	45,7	5.470	347	0,129	0,286
3 x 185	50,6	6.620	397	0.106	0,235
3 x 240	57,2	8.565	468	0,0801	0,178
4 x 1,5	9,9	155	20	13,3	29,5
4 x 2,5	10,9	205	28	7,98	17,7
4 x 4	12,4	275	37	4,95	11,0
4 x 6	13,8	405	47	3,3	7,32
4 x 10	17,1	585	65	1,91	4,23
4 x 16	19,9	840	87	1,21	2,68
4 x 25	24,7	1.400	110	0,78	1,73
4 x 35	26,5	1.825	137	0,554	1,23
4 x 50	32,3	2.530	167	0,386	0,860
4 x 70	36,1	3.400	214	0,272	0,603
4 x 95	40,8	4.475	259	0,206	0,457
4 x 120	46,2	5.635	301	0,161	0,357
4 x 150	50,7	6.955	347	0,129	0,286
4 x 185	56,2	8.415	397	0,106	0,235
4 x 240	63,7	10.920	468	0,0801	0,178
5 x 1,5	10,9	190	20	13,3	29,5
5 x 2,5	12,1	245	28	7,98	17,7
5 x 4	14,3	385	37	4,95	11,0
5 x 6	15,7	480	47	3,3	7,32
5 x 10	18,6	710	65	1,91	4,23
5 x 16	21,8	1.020	87	1,21	2,68
5 x 25	27,0	1.700	110	0,78	1,73
5 x 35	29,6	2.235	137	0,554	1,23
5 x 50	35,2	3.065	167	0,386	0,860
7 x 1,5	11,5	230	11	13,3	29,5
7 x 2,5	13,8	360	15	7,98	17,7
12 x 1,5	15,2	405	9	13,3	29,5
12 x 2,5	16,6	530	12,5	7,98	17,7

[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 service temperature and cosφ=1.
For cables having 2 conductors and 3 conductors up to 10 mm^2, it is supposed a single-phase circuit. For cables having more of 5 conductors is supposed that all are loaded. For the rest of the cables it is supposed a three-phase circuit.

TOXFREE® MARINE PLUS XTCuZ1-K (AS+)

Marine armoured fire resistant power cable.

ACCORDING TO: IEC 60092-353

100% Green Energy Cable Production

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

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

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 (LSHF) thermoplastic polyolefin outer sheath 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 service 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 EN 60332-1 / IEC 60332-1.
Fire non-propagation according to EN 60332-3-22 / IEC 60332-3-22.
Fire resistant according to EN 60331-2 (overall diameter ≤ 20 mm) and IEC 60331-1 (overall diameter > 20 mm).
LSHF (Low Smoke Halogen Free) according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034:
light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius: 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.

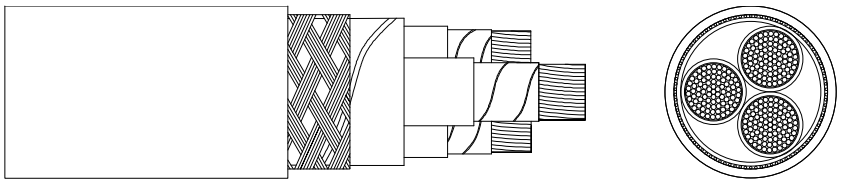
STANDARDS / COMPLIANCE

According to
IEC 60092-353

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

TOXFREE® MARINE PLUS
XTCuZ1-K (AS+)

DIMENSIONS & ADMISSIBLE INTENSITIES



Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Voltage drop (V/A · km) [2]	Resistance at 20°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	0,60	0,272
1 x 95	20,7	1.055	285	0,46	0,206
1 x 120	23,1	1.420	333	0,36	0,161
1 x 150	25,1	1.620	386	0,29	0,129
1 x 185	27,2	2.045	444	0,24	0,106
1 x 240	29,8	2.610	528	0,18	0,0801
1 x 300	32,9	3.275	612	0,14	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	0,86	0,386
3 x 70	33,9	2.845	214	0,60	0,272
3 x 95	37,8	3.560	259	0,46	0,206
3 x 120	43,2	4.595	301	0,36	0,161
3 x 150	47,4	5.605	347	0,29	0,129
3 x 185	52,3	6.765	397	0,24	0,106
3 x 240	57,8	8.645	468	0,18	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

TOXFREE® MARINE PLUS
XTCuZ1-K (AS+)

Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Voltage drop (V/A · km) [2]	Resistance at 20°C (Ω/km)
4 x 70	38,9	3.630	214	0,60	0,272
4 x 120	47,8	5.765	301	0,36	0,161
4 x 185	58,1	8.555	397	0,24	0,106
4 x 240	64,4	10.990	468	0,18	0,0801
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 service temperature and cosφ=1.
For cables having 2 conductors and 3 conductors up to 10 mm^2, it is supposed a single-phase circuit. For cables having more of 5 conductors is supposed that all are loaded. For the rest of the cables it is supposed a three-phase circuit.

TOXFREE® MARINE XOxZ1-K (AS) XOxTCuZ1-K (AS)

The marine armoured instrumentation cable.

100% Green Energy Cable Production

APPLICATION

The Toxfree Marine XOxZ1-K (AS) and XOxTCuZ1-K (AS) cable with halogen frees is a safety instrumentation and telecommunication 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.

CONSTRUCTION

Conductor
Electrolytic annealed copper conductor class 5 (flexible) according to EN 60228 (conductor resistance according to IEC 60092-376, Table 6).

Insulation
Cross-linked polyethylene insulation type HF XLPE 90°C according to IEC 60092-360.
The standard identification of insulated conductors is the following:
Pair White + Blue (each core numbered with the pair number)
Other colours available on request.

Assembly of cores
Stranded conductors in pairs.

Individual screen (XO3Z1-K and XO3TCuZ1-K)
Aluminium + polyester tape with 100% coverage + tinned copper drain wire applied over the assembled cores.

Assembly of pairs
Cabled in concentric layers.

Collective screen
Aluminium + polyester tape with 100% coverage + tinned copper drain wire applied over the assembled pairs

Braid armour (XO2TCuZ1-K and XO3TCuZ1-K)
Tinned copper wire braid armour over the collective screen.

Outer sheath
Low smoke halogen free (LSHF) thermoplastic polyolefin outer sheath type SHF1 according to IEC 60092-360. Grey colour, fire retardant.

CHARACTERISTICS

Electrical performance
Instrumentation: 150/250 V.

Thermal performance
Maximum service 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 EN 60332-1 / IEC 60332-1.
Fire non-propagation according to EN 60332-3-22 / IEC 60332-3-22.
LSHF (Low Smoke Halogen Free) according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034:
light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 and IEC 60754-2.

Mechanical performance
Minimum bending radius:
≤ 25mm 4x cable diameter.
> 25mm 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.

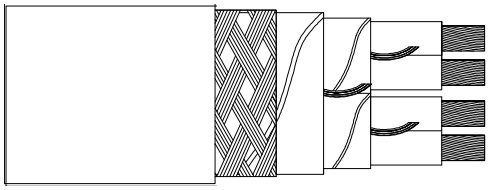
STANDARDS / COMPLIANCE

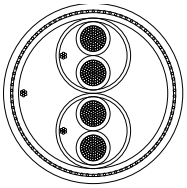
According to
IEC 60092-376

Standards and approvals
ABS / DNV-GL / BUREAU VERITAS / CE / RoHS

TOXFREE® MARINE
XOxZ1-K (AS)
XOxTCuZ1-K (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES





XO2Z1-K (AS)				
Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Resistance at 20°C (Ω/km)
1 x 2 x 0,75	6,7	55	17,1	27,6
2 x 2 x 0,75	9,0	95	13,7	27,6
4 x 2 x 0,75	10,3	130	11,2	27,6
7 x 2 x 0,75	13,5	205	9,2	27,6
10 x 2 x 0,75	16,1	265	8,6	27,6
14 x 2 x 0,75	17,8	370	7,4	27,6
19 x 2 x 0,75	20,0	480	6,5	27,6
24 x 2 x 0,75	23,5	605	6,5	27,6

XO3Z1-K (AS)				
Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Resistance at 20°C (Ω/km)
2 x 2 x 0,75	10,1	115	13,7	27,6
4 x 2 x 0,75	11,5	180	11,2	27,6
7 x 2 x 0,75	13,9	265	9,2	27,6
10 x 2 x 0,75	18,1	380	8,6	27,6
14 x 2 x 0,75	19,6	495	7,4	27,6
19 x 2 x 0,75	22,0	660	6,5	27,6
24 x 2 x 0,75	26,2	830	6,5	27,6

XO2TCuZ1-K (AS)				
Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Resistance at 20°C (Ω/km)
1 x 2 x 0,75	7,6	95	17,1	27,6
2 x 2 x 0,75	9,8	130	13,7	27,6
4 x 2 x 0,75	11,8	180	11,2	27,6
7 x 2 x 0,75	13,9	260	9,2	27,6
10 x 2 x 0,75	17,0	390	8,6	27,6
14 x 2 x 0,75	17,5	480	7,4	27,6
19 x 2 x 0,75	21,2	615	6,5	27,6
24 x 2 x 0,75	25,0	780	6,5	27,6

TOXFREE® MARINE
XOxZ1-K (AS)
XOxTCuZ1-K (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES

XO3TCuZ1-K (AS)				
Cross-section (mm^2)	Diameter (mm)	Weight (kg/km)	Open Air (A) [1]	Resistance at 20°C (Ω/km)
2 x 2 x 0,75	10,6	155	13,7	27,6
4 x 2 x 0,75	12,0	220	11,2	27,6
7 x 2 x 0,75	15,8	380	9,2	27,6
10 x 2 x 0,75	18,9	490	8,6	27,6
14 x 2 x 0,75	21,1	645	7,4	27,6
19 x 2 x 0,75	23,6	820	6,5	27,6
24 x 2 x 0,75	27,6	1.020	6,5	27,6

[1] Reference method E according to IEC 60092-352 and IEC 60364-5-52 in open air at 30°C ambient temperature.
For cables having more than 1 unit a factor is applied according to the Table A6 of the IEC 60092-352 standard

MEDIUM VOLTAGE **CABLES**

X-VOLT® AL (-OL/-2OL) RHZ1

100% Green Energy Cable Production

Medium Voltage aluminium cable, XLPE insulation.

ACCORDING TO: IEC 60502-2

APPLICATION

X-VOLT® RHZ1 is a Medium Voltage aluminium cable halogen-free for fixed installations. Suitable for transport and distribution of electric power in medium voltage networks.

CONSTRUCTION

Conductor
Aluminium conductor class 2 according to EN 60228 and IEC 60228.
Optionally, with longitudinal sealing (cable type -2OL).

Internal semiconductor
Screen over the conductor, made of thermosetting semiconductor material.

Insulation
Cross-linked polyethylene type XLPE according to IEC 60502-2, natural colour.
Cross linked in catenary line with nitrogen atmosphere through a triple layer extrusion process.

External semiconductor
Screen over the insulation, made of thermosetting and strippable semiconductor material.

Metallic screen
Copper wires and copper tape screen, with a minimum cross-section of 16mm^2.

Longitudinal sealing
Hygroscopic tape completely covering the screen (cable type –OL and -2OL).

Outer sheath
Polyethylene outer sheath type ST7 according to IEC 60502-2.
Red colour.

CHARACTERISTICS

Electrical performance
Medium Voltage: 6/10 kV, 8,7/15 kV, 12/20 kV and 18/30 kV.

Thermal performance
Maximum service temperature: 90°C.
Maximum short-circuit temperature: 250°C (max 5 s)
Minimum service temperature: -15°C.

Fire performance
Halogen free: according to EN 60754-1 / IEC 60754-1.

Mechanical performance
Minimum bending radius: 15x cable diameter.
Abrasion resistant.
Tear resistant.

Environmental performance
UV Resistant according to UNE 211605.

Installation conditions
Open Air.
Buried.
In conduit.

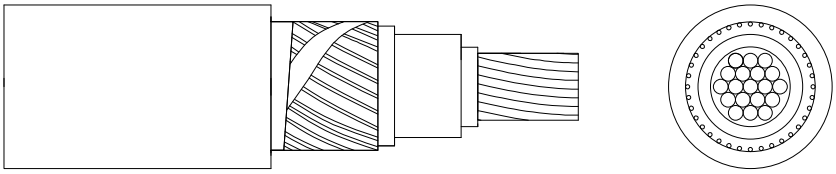
STANDARDS / COMPLIANCE

According to
IEC 60502-2

Standards and approvals
AENOR

X-VOLT® AL (-OL/-2OL) RHZ1

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® RHZ1 6/10 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 50	H16	8,1	15,3	21,2	540	0,641	0,119	0,251	184	152
1 x 150	H16	13,9	21,1	27,0	915	0,206	0,100	0,381	368	281
1 x 240	H16	18,0	25,2	31,5	1.260	0,125	0,094	0,462	502	367
1 x 400	H16	22,8	30,0	36,2	1.760	0,0778	0,090	0,587	673	470
1 x 500	H16	26,3	34,0	41,1	2.135	0,0605	0,087	0,652	777	542

X-VOLT® RHZ1 8,7/15 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ωkm)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 95	H16	11,2	20,4	26,3	790	0,320	0,113	0,255	280	221
1 x 150	H16	13,9	23,1	29,2	1.000	0,206	0,105	0,297	368	281
1 x 240	H16	18,0	27,2	33,5	1.355	0,125	0,098	0,363	502	367
1 x 300	H16	20,0	29,2	35,7	1.550	0,100	0,095	0,395	577	414
1 x 400	H16	22,8	32,2	39,2	1.910	0,0778	0,093	0,443	673	470
1 x 500	H16	26,3	36,0	43,3	2.250	0,0605	0,090	0,504	777	542
1 x 630	H16	29,8	39,2	46,7	2.735	0,0469	0,087	0,555	895	615
1 x 800	H16	34,0	43,7	51,4	3.305	0,0367	0,085	0,627	1.036	700

X-VOLT® RHZ1 12/20 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 50	H16	8,0	20,0	24,9	660	0,641	0,130	0,174	184	152
1 x 70	H16	10,0	21,0	26,9	765	0,443	0,121	0,201	230	186
1 x 95	H16	11,2	22,2	28,3	870	0,320	0,170	0,217	280	221
1 x 120	H16	12,7	23,7	29,8	980	0,253	0,113	0,237	324	252
1 x 150	H16	13,9	24,9	31,2	1.085	0,206	0,110	0,254	368	281
1 x 185	H16	16,0	28,0	36,3	1.225	0,164	0,106	0,275	424	317
1 x 240	H16	18,0	29,0	35,5	1.455	0,125	0,102	0,308	502	367
1 x 300	H16	20,0	31,0	37,7	1.655	0,100	0,099	0,334	577	414
1 x 400	H16	22,8	34,0	41,0	2.010	0,0778	0,096	0,373	673	470
1 x 500	H16	26,3	37,8	45,3	2.390	0,0605	0,093	0,424	777	542
1 x 630	H16	29,8	41,0	48,7	2.870	0,0469	0,090	0,466	895	615
1 x 1000	H16	39,0	50,5	58,8	4.315	0,0291	0,085	0,591	1.188	795

X-VOLT® AL (-OL/-2OL)
RHZ1

X-VOLT® RHZ1 18/30 kV										
Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	$R_{20°C}$ (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 50	H16	8,0	23,6	29,7	845	0,641	0,141	0,135	184	152
1 x 70	H16	10,0	25,6	31,9	970	0,443	0,132	0,154	230	186
1 x 95	H16	11,2	26,8	33,1	1.080	0,320	0,127	0,165	280	221
1 x 120	H16	12,7	28,3	34,8	1.205	0,253	0,122	0,179	324	252
1 x 150	H16	13,9	29,5	36,5	1.325	0,206	0,119	0,190	368	281
1 x 185	H16	16,0	31,6	38,4	1.500	0,164	0,114	0,199	424	317
1 x 240	H16	18,0	33,6	40,7	1.735	0,125	0,110	0,228	502	367
1 x 300	H16	20,0	35,6	42,9	1.950	0,100	0,107	0,247	577	414
1 x 400	H16	22,8	38,6	45,9	2.320	0,0778	0,103	0,274	673	470
1 x 500	H16	26,3	42,4	50,1	2.720	0,0605	0,099	0,308	777	542
1 x 630	H16	29,8	45,6	53,1	3.220	0,0469	0,095	0,342	895	615
1 x 800	H16	34,0	50,1	58,2	3.860	0,0367	0,093	0,378	1.036	700
1 x 1000	H16	39,0	55,1	63,6	4.740	0,0291	0,090	0,423	1.188	795

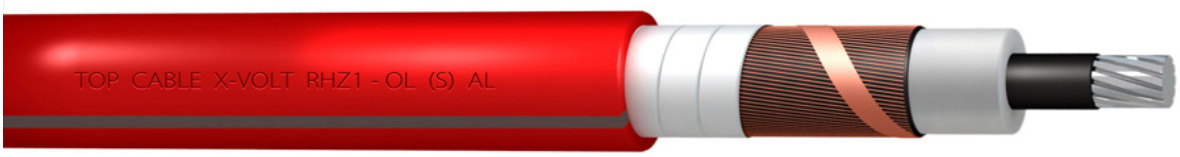
[1] Three single-core cables in open air at 30°C ambient temperature according to IEC 60502-2.
[2] Three single-core cables direct buried at 0,8 m depth with soil thermal resistivity of 1,5 K·m/W and 20°C of ground temperature.
Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.
In all cases it is supposed a three-phase circuit.

X-VOLT® AL (-OL/-2OL) RHZ1 (S)

100% Green Energy Cable Production

Medium Voltage aluminium cable, XLPE insulation.

ACCORDING TO: IEC 60502-2 / UNE-HD 620-10E (type 10E-4)



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APPLICATION

X-VOLT® RHZ1 (S) is a Medium Voltage aluminium cable halogen-free and no flame propagation for fixed installations. Suitable for transport and distribution of electric power in medium voltage networks.

CONSTRUCTION

Conductor
Aluminium conductor class 2 according to EN 60228 and IEC 60228.
Optionally, with longitudinal sealing (cable type -2OL).

Internal semiconductor
Screen over the conductor, made of thermosetting semiconductor material.

Insulation
Cross-linked polyethylene type XLPE according to IEC 60502-2 and type DIX3 according to HD 620-1, natural colour.
Cross linked in catenary line with nitrogen atmosphere through a triple layer extrusion process.

External semiconductor
Screen over the insulation, made of thermosetting and strippable semiconductor material.

Metallic screen
Copper wires and copper tape screen, with a minimum cross-section of 16mm^2.

Longitudinal sealing
Hygroscopic tape completely covering the screen (cable type –OL and -2OL).

Outer sheath
Polyolefin outer sheath type ST7 according to IEC 60502-2 and type DMZ2 according to HD 620-1.
Red colour with two grey stripes.
Other colours under request.

CHARACTERISTICS

Electrical performance
Medium Voltage: 6/10 kV, 8,7/15 kV, 12/20 kV and 18/30 kV.

Thermal performance
Maximum service temperature: 90°C.
Maximum short-circuit temperature: 250°C (max 5 s)
Minimum service temperature: -15°C.

Fire performance
Flame non-propagation according to EN 60332-1 /IEC 60332-1.
Fire non-propagation according to EN 50399.
Reaction to fire CPR: E_{ca} according to EN 50575.
Halogen free: according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034.
Light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius: 15x cable diameter.
Abrasion resistant.
Tear resistant.

Environmental performance
UV Resistant according to UNE 211605.

Installation conditions
Open Air.
Buried.
In conduit.

STANDARDS / COMPLIANCE

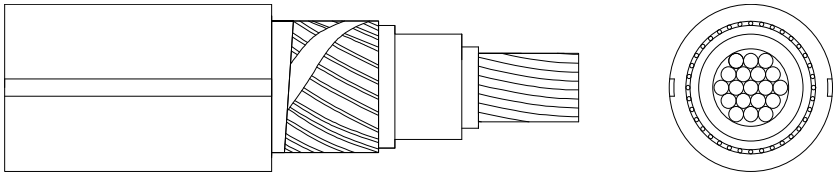
According to
IEC 60502-2 / UNE-HD 620-10E (type 10E-4)

Standards and approvals
AENOR

CPR (Construction Products Regulation)
E_{ca}

X-VOLT® AL (-OL/-2OL) RHZ1 (S)

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® RHZ1 (S) 6/10 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 120	H16	12,7	20,5	27,4	950	0,253	0,108	0,323	324	252

X-VOLT® RHZ1 (S) 8,7/15 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 120	H16	12,7	22,7	30,0	1.070	0,253	0,113	0,258	324	252
1 x 240	H16	18,0	28,0	35,7	1.575	0,125	0,102	0,336	502	367

X-VOLT® RHZ1 (S) 12/20 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 95	H16	11,2	23,2	30,5	1.050	0,320	0,122	0,202	280	221
1 x 120	H16	12,7	24,7	32,4	1.190	0,253	0,118	0,221	324	252
1 x 150	H16	13,9	25,9	33,6	1.300	0,206	0,115	0,235	368	281
1 x 185	H16	15,5	27,5	35,2	1.450	0,164	0,111	0,255	424	317
1 x 240	H16	18,0	30,0	38,2	1.695	0,125	0,106	0,285	502	367
1 x 300	H16	20,0	32,0	39,7	1.890	0,100	0,102	0,309	577	414
1 x 400	H16	22,8	35,0	42,8	2.250	0,0778	0,099	0,345	673	470
1 x 630	H16	29,8	42,0	49,9	3.110	0,0469	0,091	0,429	895	615

X-VOLT® RHZ1 (S) 18/30 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 95	H16	11,2	28,2	35,9	1.325	0,320	0,132	0,155	280	221
1 x 120	H16	12,7	29,7	37,9	1.465	0,253	0,128	0,168	324	252
1 x 150	H16	13,9	30,9	39,1	1.585	0,206	0,124	0,178	368	281
1 x 185	H16	15,5	32,5	40,7	1.745	0,164	0,120	0,192	424	317
1 x 240	H16	18,0	35,0	19,0	1.995	0,125	0,114	0,213	502	367
1 x 400	H16	22,8	40,0	47,8	2.590	0,0778	0,105	0,254	673	470
1 x 630	H16	29,8	47,0	54,9	3.500	0,0469	0,097	0,313	895	615

[1] Three single-core cables in open air at 30°C ambient temperature according to IEC 60502-2.
[2] Three single-core cables direct buried at 0,8 m depth with soil thermal resistivity of 1,5 K·m/W and 20°C of ground temperature.
Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.
In all cases it is supposed a three-phase circuit.

X-VOLT® AL (-OL/-2OL) RHZ1 (AS)

100% Green Energy Cable Production

Medium Voltage aluminium cable, XLPE insulation.

ACCORDING TO: IEC 60502-2 / UNE-HD 620-10E (type 10E-5)

C_{ca}

APPLICATION

X-VOLT® RHZ1 (AS) is a Medium Voltage aluminium cable halogen-free with low smoke emission and no fire propagation properties for fixed installations. Suitable for transport and distribution of electric power in medium voltage networks.

CONSTRUCTION

Conductor
Aluminium conductor class 2 according to EN 60228 and IEC 60228.
Optionally, with longitudinal sealing (cable type -2OL).

Internal semiconductor
Screen over the conductor, made of thermosetting semiconductor material.

Insulation
Cross-linked polyethylene type XLPE according to IEC 60502-2 and type DIX3 according to HD 620-1, natural colour.
Cross linked in catenary line with nitrogen atmosphere through a triple layer extrusion process.

External semiconductor
Screen over the insulation, made of thermosetting and strippable semiconductor material.

Metallic screen
Copper wires and copper tape screen, with a minimum cross-section of 16mm^2.

Longitudinal sealing
Hygroscopic tape completely covering the screen (cable type –OL and -2OL).

Filling
Additional fireproof polyolefin layer, halogen free.

Outer sheath
Polyolefin outer sheath type ST7 according to IEC 60502-2 and type DMZ2 according to HD 620-1.
Red colour with two green stripes.
Other colours under request.

CHARACTERISTICS

Electrical performance
Medium Voltage: 6/10 kV, 8,7/15 kV, 12/20 kV and 18/30 kV.

Thermal performance
Maximum service temperature: 90°C.
Maximum short-circuit temperature: 250°C (max 5 s)
Minimum service temperature: -15°C.

Fire performance
Flame non-propagation according to EN 60332-1 /IEC 60332-1.
Fire non-propagation according to EN 50399.
Reaction to fire CPR: C_{ca}-s1b,d2,a1 according to EN 50575
Halogen free: according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034.
Light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius: 15x cable diameter.
Abrasion resistant.
Tear resistant.

Environmental performance
UV Resistant according to UNE 211605.

Installation conditions
Open Air.
Buried.
In conduit.

STANDARDS / COMPLIANCE

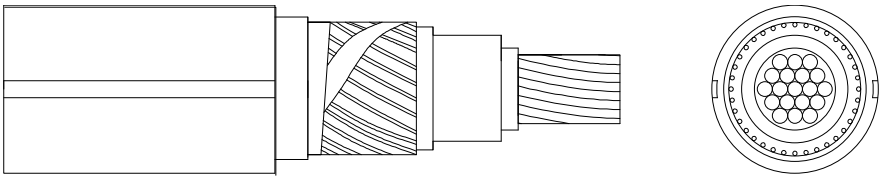
According to
IEC 60502-2 / UNE-HD 620-10E (type 10E-5)

Standards and approvals
AENOR

CPR (Construction Products Regulation)
C_{ca}-s1b, d2, a1

X-VOLT® AL (-OL/-2OL) RHZ1 (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® RHZ1 (AS) 12/20 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 120	H16	12,7	24,7	41,0	2.040	0,253	0,133	0,221	324	252
1 x 630	H16	29,8	41,3	55,8	3.970	0,0469	0,099	0,470	895	615
1 x 1000	H16	39,0	50,5	65,0	5.570	0,0291	0,091	0,591	1.188	795

X-VOLT® RHZ1 (AS) 18/30 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 300	H16	20,0	37,0	51,5	3.075	0,100	0,111	0,253	577	414
1 x 630	H16	29,8	47,0	61,5	4.540	0,0469	0,099	0,342	924	615

[1] Three single-core cables in open air at 30°C ambient temperature according to IEC 60502-2.
[2] Three single-core cables direct buried at 0,8 m depth with soil thermal resistivity of 1,5 K·m/W and 20°C of ground temperature.
Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.
In all cases it is supposed a three-phase circuit.
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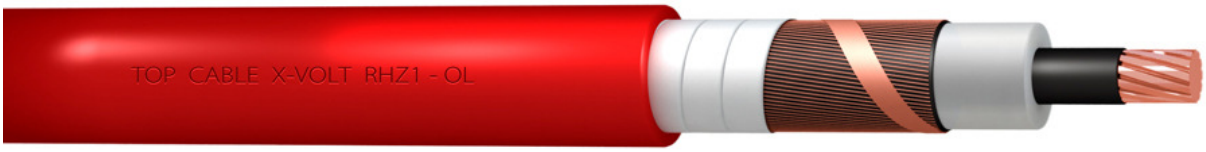
X-VOLT® CU (-OL/-2OL) RHZ1

100% Green Energy Cable Production

Medium Voltage copper cable, XLPE insulation.

ACCORDING TO: IEC 60502-2



APPLICATION

X-VOLT® RHZ1 (S) is a Medium Voltage copper cable halogen-free for fixed installations. Suitable for transport and distribution of electric power in medium voltage networks.

CONSTRUCTION

Conductor
Electrolytic annealed copper conductor class 2 according to EN 60228 and IEC 60228.
Optionally, with longitudinal sealing (cable type -2OL).
Internal semiconductor
Screen over the conductor, made of thermosetting semiconductor material.
Insulation
Cross-linked polyethylene type XLPE according to IEC 60502-2, natural colour.
Cross linked in catenary line with nitrogen atmosphere through a triple layer extrusion process.
External semiconductor
Screen over the insulation, made of thermosetting and strippable semiconductor material.
Metallic screen
Copper wires and copper tape screen, with a minimum cross-section of 16mm^2.
Longitudinal sealing
Hygroscopic tape completely covering the screen (cable type –OL and -2OL).
Filling
Additional fireproof polyolefin layer, halogen free.
Outer sheath
Polyethylene outer sheath type ST7 according to IEC 60502-2.
Red colour.

CHARACTERISTICS

Electrical performance
Medium Voltage: 6/10 kV, 8,7/15 kV, 12/20 kV and 18/30 kV.

Thermal performance
Maximum service temperature: 90°C.
Maximum short-circuit temperature: 250°C (max 5 s)
Minimum service temperature: -15°C.

Fire performance
Halogen free: according to EN 60754-1 / IEC 60754-1.

Mechanical performance
Minimum bending radius: 15x cable diameter.
Abrasion resistant.

Environmental performance
UV Resistant according to UNE 211605.

Installation conditions
Open Air.
Buried.

STANDARDS / COMPLIANCE

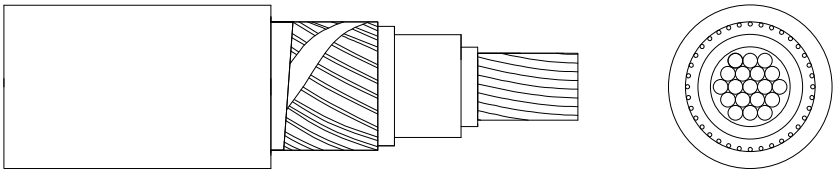
According to
IEC 60502-2

Standards and approvals
AENOR

AENOR

X-VOLT® CU (-OL/-2OL) RHZ1

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® RHZ1 6/10 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 35	H16	7,2	14,4	20,3	715	0,524	0,124	0,231	198	166
1 x 50	H16	8,5	15,7	21,6	850	0,387	0,118	0,259	238	196
1 x 70	H16	10,0	17,2	23,1	1.070	0,268	0,112	0,291	296	239
1 x 95	H16	11,1	18,6	24,5	1.325	0,193	0,108	0,321	361	285
1 x 120	H16	12,8	20,0	25,9	1.555	0,153	0,103	0,351	417	323
1 x 150	H16	15,0	22,2	28,3	1.885	0,124	0,099	0,398	473	361
1 x 185	H16	16,5	23,7	29,4	2.260	0,0991	0,095	0,430	543	406
1 x 240	H16	18,1	25,3	31,6	2.785	0,0754	0,094	0,463	641	469
1 x 300	H16	22,0	29,5	36,0	3.415	0,0601	0,090	0,552	735	526
1 x 400	H16	25,3	33,0	40,1	4.360	0,0470	0,088	0,626	845	590
1 x 500	H16	26,5	34,2	40,7	5.280	0,0366	0,086	0,652	1.002	670

X-VOLT® RHZ1 8,7/15 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 35	H16	7,2	16,4	22,3	775	0,524	0,130	0,188	198	166
1 x 70	H16	10,0	19,2	25,1	1.135	0,268	0,117	0,234	296	239
1 x 95	H16	11,1	20,3	25,8	1.390	0,193	0,112	0,252	361	285
1 x 120	H16	12,8	22,0	28,1	1.635	0,153	0,109	0,279	417	323
1 x 150	H16	15,0	24,2	30,3	1.965	0,124	0,103	0,315	473	361
1 x 185	H16	16,5	25,7	32,0	2.365	0,0991	0,100	0,339	543	406
1 x 240	H16	18,1	27,3	33,8	2.840	0,0754	0,098	0,365	641	469
1 x 300	H16	22,0	31,5	38,7	3.545	0,0601	0,094	0,432	735	526
1 x 400	H16	25,3	35,0	41,5	4.450	0,0470	0,090	0,488	845	590
1 x 500	H16	26,5	36,2	43,7	5.445	0,0366	0,089	0,507	1.002	670
1 x 630	H16	32,4	42,1	49,2	6.935	0,0283	0,085	0,602	1.110	772

X-VOLT® RHZ1 12/20 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 95	H16	11,1	22,1	28,2	1.535	0,193	0,118	0,216	361	285
1 x 120	H16	12,8	23,8	30,1	1.790	0,153	0,113	0,239	417	323
1 x 150	H16	15,0	26,0	32,3	2.130	0,124	0,107	0,268	473	361
1 x 185	H16	16,5	27,5	34,0	2.535	0,0991	0,105	0,288	543	406
1 x 240	H16	18,1	29,1	36,3	3,040	0,0754	0,103	0,309	641	469
1 x 300	H16	20,6	33,3	40,7	3.760	0,0601	0,098	0,365	735	526
1 x 500	H16	26,5	38,0	45,3	5.680	0,0366	0,093	0,427	1.002	670
1 x 630	H16	32,4	43,9	51,6	7.255	0,0283	0,088	0,504	1.110	772

X-VOLT® CU (-OL/-2OL)
RHZ1

X-VOLT® RHZ1 18/30 kV										
Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	$R_{20°C}$ (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 150	H16	15,0	30,6	37,8	2.410	0,124	0,117	0,201	473	361
1 x 185	H16	16,5	32,1	39,3	2.815	0,0991	0,114	0,215	543	406
1 x 240	H16	18,1	33,7	40,8	3.320	0,0754	0,110	0,229	641	469
1 x 500	H16	26,5	42,6	50,3	6.045	0,0366	0,099	0,281	1.002	670

[1] Three single-core cables in open air at 30°C ambient temperature according to IEC 60502-2.
[2] Three single-core cables direct buried at 0,8 m depth with soil thermal resistivity of 1,5 K·m/W and 20°C of ground temperature.
Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.
In all cases it is supposed a three-phase circuit.

X-VOLT® CU (-OL/-2OL) RHZ1 (S)

100% Green Energy Cable Production

Medium Voltage copper cable, XLPE insulation.

ACCORDING TO: IEC 60502-2 / UNE-HD 620-10E (type 10E-4)

E_{ca}

APPLICATION

X-VOLT® RHZ1 (S) is a Medium Voltage copper cable halogen-free and no flame propagation properties for fixed installations. Suitable for transport and distribution of electric power in medium voltage networks.

CONSTRUCTION

Conductor
Electrolytic annealed copper conductor class 2 according to EN 60228 and IEC 60228.
Optionally, with longitudinal sealing (cable type -2OL).

Internal semiconductor
Screen over the conductor, made of thermosetting semiconductor material.

Insulation
Cross-linked polyethylene type XLPE according to IEC 60502-2 and type DIX3 according to HD 620-1, natural colour.
Cross linked in catenary line with nitrogen atmosphere through a triple layer extrusion process.

External semiconductor
Screen over the insulation, made of thermosetting and strippable semiconductor material.

Metallic screen
Copper wires and copper tape screen, with a minimum cross-section of 16mm^2.

Longitudinal sealing
Hygroscopic tape completely covering the screen (cable type –OL and -2OL).

Filling
Additional fireproof polyolefin layer, halogen free.

Outer sheath
Polyolefin outer sheath type ST7 according to IEC 60502-2 and type DMZ2 according to HD 620-1.
Red colour with two grey stripes.
Other colours under request.

CHARACTERISTICS

Electrical performance
Medium Voltage: 6/10 kV, 8,7/15 kV, 12/20 kV and 18/30 kV.

Thermal performance
Maximum service temperature: 90°C.
Maximum short-circuit temperature: 250°C (max 5 s)
Minimum service temperature: -15°C.

Fire performance
Flame non-propagation according to EN 60332-1 /IEC 60332-1.
Fire non-propagation according to EN 50399.
Reaction to fire CPR: E_{ca} according to EN 50575
Halogen free: according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034.
Light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius: 15x cable diameter.
Abrasion resistant.
Tear resistant.

Environmental performance
UV Resistant according to UNE 211605.

Installation conditions
Open Air.
Buried.
In conduit.

STANDARDS / COMPLIANCE

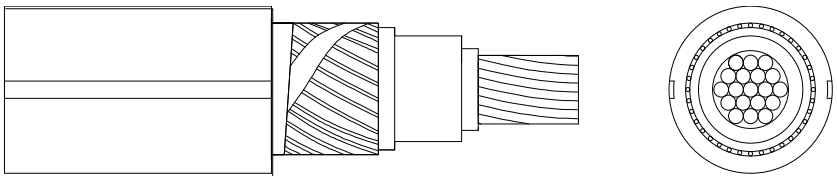
According to
IEC 60502-2 / UNE-HD 620-10E (type 10E-4)

Standards and approvals
AENOR

CPR (Construction Products Regulation)
E_{ca}

X-VOLT® CU (-OL/-2OL) RHZ1 (S)

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® RHZ1 (S) 6/10 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 70	H16	10,0	17,2	25,1	1.215	0,268	0,117	0,270	296	239
1 x 240	H16	18,1	25,3	31,6	2.810	0,0754	0,094	0,463	641	469

X-VOLT® RHZ1 (S) 8,7/15 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 185	H16	16,5	25,7	32,0	2.435	0,0991	0,100	0,339	543	406
1 x 400	H16	25,3	35,0	42,1	4.585	0,0470	0,091	0,488	845	590
1 x 500	H16	26,5	36,2	43,5	5.555	0,0366	0,090	0,507	1.002	670

X-VOLT® RHZ1 (S) 12/20 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 95	H16	11,1	22,1	28,2	1.535	0,193	0,118	0,216	361	285
1 x 120	H16	12,8	23,8	30,1	1.790	0,153	0,113	0,239	417	323
1 x 150	H16	15,0	26,0	32,3	2.130	0,124	0,107	0,268	473	361
1 x 185	H16	16,5	27,5	34,0	2.535	0,0991	0,105	0,288	543	406
1 x 240	H16	18,1	29,1	36,3	3,040	0,0754	0,103	0,309	641	469
1 x 300	H16	20,6	33,3	40,7	3.760	0,0601	0,098	0,365	735	526
1 x 500	H16	26,5	38,0	45,3	5.680	0,0366	0,093	0,427	1.002	670
1 x 630	H16	32,4	43,9	51,6	7.255	0,0283	0,088	0,504	1.110	772

X-VOLT® RHZ1 (S) 18/30 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 150	H16	15,0	30,6	37,8	2.410	0,124	0,117	0,201	473	361
1 x 185	H16	16,5	32,1	39,3	2.815	0,0991	0,114	0,215	543	406
1 x 240	H16	18,1	33,7	40,8	3.320	0,0754	0,110	0,229	641	469
1 x 500	H16	26,5	42,6	50,3	6.045	0,0366	0,099	0,281	1.002	670

[1] Three single-core cables in open air at 30°C ambient temperature according to IEC 60502-2.
[2] Three single-core cables direct buried at 0,8 m depth with soil thermal resistivity of 1,5 K·m/W and 20°C of ground temperature.
Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.
In all cases it is supposed a three-phase circuit.

X-VOLT® CU (-OL/-2OL) RHZ1 (AS)

100% Green Energy Cable Production

Medium Voltage copper cable, XLPE insulation.

ACCORDING TO: IEC 60502-2

C_{ca}

APPLICATION

X-VOLT® RHZ1 (AS) is a Medium Voltage copper cable halogen-free with low smoke emission and no fire propagation properties for fixed installations. Suitable for transport and distribution of electric power in medium voltage networks.

CONSTRUCTION

Conductor
Electrolytic annealed copper conductor class 2 according to EN 60228 and IEC 60228.
Optionally, with longitudinal sealing (cable type -2OL).

Internal semiconductor
Screen over the conductor, made of thermosetting semiconductor material.

Insulation
Cross-linked polyethylene type XLPE according to IEC 60502-2, natural colour.
Cross linked in catenary line with nitrogen atmosphere through a triple layer extrusion process.

External semiconductor
Screen over the insulation, made of thermosetting and strippable semiconductor material.

Metallic screen
Copper wires and copper tape screen, with a minimum cross-section of 16mm^2.

Longitudinal sealing
Hygroscopic tape completely covering the screen (cable type –OL and -2OL).

Filling
Additional fireproof polyolefin layer, halogen free.

Outer sheath
Polyolefin outer sheath type ST7 according to IEC 60502-2.
Red colour with two green stripes.
Other colours under request.

CHARACTERISTICS

Electrical performance
Medium Voltage: 6/10 kV, 8,7/15 kV, 12/20 kV and 18/30 kV.

Thermal performance
Maximum service temperature: 90°C.
Maximum short-circuit temperature: 250°C (max 5 s)
Minimum service temperature: -15°C.

Fire performance
Flame non-propagation according to EN 60332-1 /IEC 60332-1.
Fire non-propagation according to EN 50399.
Reaction to fire CPR: C_{ca}-s1b,d2,a1 according to EN 50575
Halogen free: according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034.
Light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius: 15x cable diameter.
Abrasion resistant.
Tear resistant.

Environmental performance
UV Resistant according to UNE 211605.

Installation conditions
Open Air.
Buried.
In conduit.

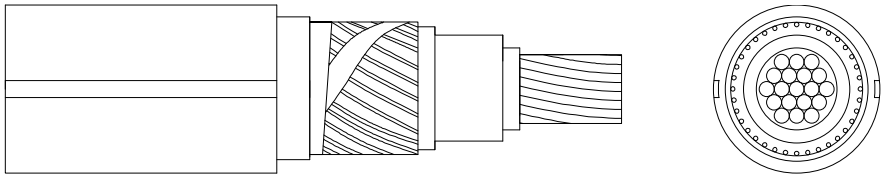
STANDARDS / COMPLIANCE

According to
IEC 60502-2

Standards and approvals
AENOR

X-VOLT® CU (-OL/-2OL) RHZ1 (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® RHZ1 (AS) 6/10 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 70	H16	10,0	17,2	33,5	1.880	0,268	0,135	0,291	296	239
1 x 95	H16	11,1	18,3	34,6	2.170	0,193	0,130	0,315	361	285
1 x 150	H16	15,0	22,2	38,5	2.775	0,124	0,118	0,398	473	361
1 x 185	H16	16,5	23,7	40,0	3.255	0,0991	0,114	0,430	543	406
1 x 240	H16	18,1	25,3	41,6	3.770	0,0754	0,111	0,463	641	469
1 x 300	H16	22,0	29,5	45,8	4.570	0,0601	0,105	0,552	735	526
1 x 400	H16	25,3	33,0	49,5	5.595	0,0470	0,101	0,626	845	590

X-VOLT® RHZ1 (AS) 8,7/15 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 95	H16	11,1	20,3	36,6	2.295	0,193	0,134	0,252	361	285
1 x 150	H16	15,0	24,2	40,5	2.980	0,124	0,122	0,315	473	361
1 x 185	H16	16,5	25,7	42,0	3.410	0,0991	0,118	0,339	543	406
1 x 300	H16	20,6	30,7	45,5	4.260	0,0601	0,109	0,419	735	526
1 x 400	H16	25,3	35,0	49,9	5.525	0,0470	0,102	0,494	845	590

X-VOLT® RHZ1 (AS) 12/20 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 120	H16	12,8	23,8	40,1	2.705	0,153	0,131	0,239	417	323
1 x 240	H16	18,1	29,1	43,9	3.835	0,0754	0,115	0,309	641	469
1 x 300	H16	20,6	33,3	48,1	4.625	0,0601	0,108	0,365	735	526

X-VOLT® RHZ1 (AS) 18/30 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 120	H16	12,8	28,4	45,2	3.705	0,153	0,138	0,180	417	323
1 x 240	H16	18,1	34,0	48,5	4.185	0,0754	0,121	0,232	641	469
1 x 300	H16	20,6	37,9	52,4	5.005	0,0601	0,114	0,268	735	526

[1] Three single-core cables in open air at 30°C ambient temperature according to IEC 60502-2.
[2] Three single-core cables direct buried at 0,8 m depth with soil thermal resistivity of 1,5 K·m/W and 20°C of ground temperature.
Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.
In all cases it is supposed a three-phase circuit.

X-VOLT®
RHZ1 6,35/11kV AL

Medium Voltage aluminium cable, XLPE insulation, halogen free, in triplex formation.

ACCORDING TO: BS 7870-4.10 / IEC 60502-2.

100% Green Energy Cable Production

APPLICATION

Medium Voltage aluminium cables for transmission and distribution of electricity.

Halogen free.

- Distribution networks.

CONSTRUCTION

Conductor

Aluminium conductor, class 2, according to EN 60228 and IEC 60228.

Internal semiconductor

Screen over the conductor, made of thermosetting semiconductor material.

Insulation

Cross-linked polyethylene (XLPE), in dry atmosphere catenary tube, through a triple layer extrusion process.

Cable conductor identification

The conductors are identified with a tape placed along the cable between the outer semiconductor and the screen. Colours are; brown, green and yellow.

External semiconductor

Screen over the insulation, made of thermosetting non-strippable semiconductor material.

Metallic screen

Screen of copper wires and copper tape, applied over the outer semiconductirng layer, with a minimum cross-section of 32mm^2.

Longitudinal sealing

Hygroscopic tape applied over the metallic screen.

Outer sheath

Polyolefin outer sheath, type ST7 according to IEC 60502-2, red colour.

CHARACTERISTICS

Electrical performance

Medium voltage: 6,35/11 kV.

Thermal performance

Maximum service temperature: 90°C.

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

Minimum service temperature: -15°C.

Fire performance

Halogen free: according to EN 50267.

Mechanical performance

Minimum bending radius: x15 cable diameter.

Abrasion resistant.

Tear resistant.

Installation conditions

Open Air.

Buried.

In conduit.

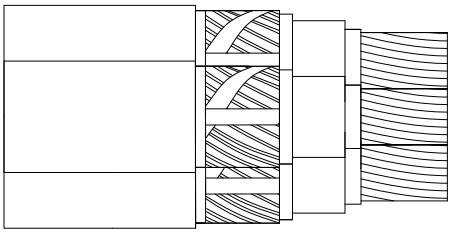
STANDARDS / COMPLIANCE

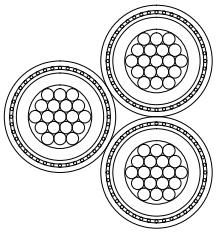
Based on

BS 7870-4.10 / IEC 60502-2.

X-VOLT®
RHZ1 6,35/11kV AL

DIMENSIONS & ADMISSIBLE INTENSITIES





Cross-section (mm2)	Conductor Diameter (mm)	Insulation Diameter (mm)	O. sheath (mm)	Ext Diameter (mm)	Weight (Kg/Km)	R (Ω/km)	X (Ω/km)	C (µzF/km)	Open air (A)	Buried (A)
3 x 1 x 70	10	18,2	24,5	52,8	2.510	0,443	0,116	0,279	230	186
3 x 1 x 95	11,1	19,3	25,6	55,1	2.785	0,32	0,112	0,3	280	221
3 x 1 x 120	12,7	20,9	27,2	58,6	3.100	0,253	0,107	0,331	324	252
3 x 1 x 150	13,9	22,1	28,6	61,6	3.420	0,206	0,105	0,355	368	281
3 x 1 x 185	16	24,2	30,7	66,1	3.845	0,164	0,1	0,395	424	317
3 x 1 x 240	18	26,2	32,9	70,8	4.485	0,125	0,097	0,434	502	367
3 x 1 x 300	20,6	28,8	35,7	76,8	5.110	0,1	0,094	0,484	577	414
3 x 1 x 400	23,4	31,6	38,9	83,7	6.145	0,078	0,091	0,538	673	470

X-VOLT® AL (-OL)

HEPRZ1

Medium Voltage aluminium cable, HEPR insulation.

ACCORDING TO: UNE-HD 620-9E (type 9E-1) / NI 56.43.01

100% Green Energy Cable Production

APPLICATION

X-VOLT® HEPRZ1 Al is a Medium Voltage aluminium cable for the transmission and distribution of electricity.

CONSTRUCTION

Conductor
Aluminium conductor, class 2 according to EN 60228 and IEC 60228.

Internal semiconductor
Screen over the conductor, made of thermosetting semiconductor material.

Insulation
High module ethylene propylene rubber (HEPR) type DIH-2 according to HD 620-1, in dry atmosphere catenary tube, through a triple layer extrusion process. Lead-Free version available on request.

External semiconductor
Screen over the insulation, made of thermosetting and strippable semiconductor material.

Metallic screen
Screen of copper wires and copper tape, with a minimum cross-section of 16mm^2.

Separator
Polyester tape completely covering the screen to facilitate the stripping of the outer sheath.
Optionally, substituted by hygroscopic tape (cables with longitudinal sealing, type -OL).

Outer sheath
Polyolefin outer sheath, type DMZ1 according to HD 620-1.
Red colour.

CHARACTERISTICS

Electrical performance
Medium Voltage 12/20 kV and 18/30 kV.

Thermal performance
Maximum service temperature: 105°C.
Maximum short-circuit temperature: 250°C (max 5 s). Minimum service temperature: -30°C.

Fire performance
Halogen free according to EN 60754-1 / IEC 60754-1.

Mechanical performance
Minimum bending radius: 15x cable diameter.
Abrasion resistant.
Tear resistant.

Environmental performance
UV Resistant according to UNE 211605.

STANDARDS / COMPLIANCE

According to
UNE-HD 620-9E (type 9E-1) / NI 56.43.01

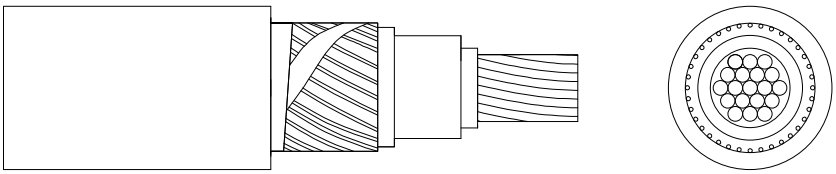
Standards and approvals
AENOR

AENOR

X-VOLT® AL (-OL)

HEPRZ1

DIMENSIONS & ADMISSIBLE INTENSITIES

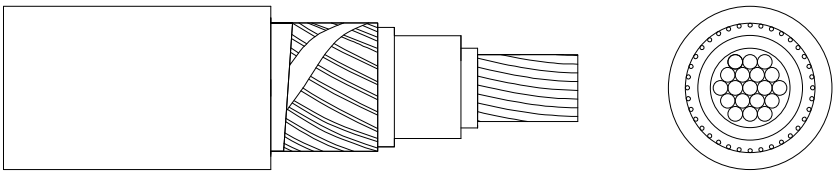


X-VOLT® HEPRZ1 12/20 kV										
Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 50	H16	8,1	17,7	24,1	680	0,641	0,132	0,232	180	145
1 x 70	H16	11,1	20,3	26,7	860	0,443	0,126	0,258	225	180
1 x 95	H25	11,1	20,3	27,4	960	0,320	0,12	0,284	275	215
1 x 120	H16	12,7	21,9	29,1	1.005	0,253	0,117	0,307	320	245
1 x 150	H16	13,9	23,1	30,3	1.110	0,206	0,113	0,331	360	275
1 x 185	H16	15,5	25,1	32,3	1.270	0,164	0,109	0,366	415	315
1 x 240	H16	18,0	27,6	34,4	1.495	0,125	0,105	0,401	495	365
1 x 300	H16	20,0	29,6	36,8	1.690	0,100	0,098	0,428	565	410
1 x 300	H25	20,0	29,6	37,1	1.775	0,100	0,098	0,428	565	410
1 x 400	H16	22,8	32,6	40,3	2.035	0,0778	0,097	0,494	660	470
1 x 500	H16	26,3	36,4	43,6	2.390	0,0605	0,093	0,556	780	540
1 x 630	H16	29,8	39,6	46,8	2.855	0,0469	0,089	0,642	920	620
1 x 800	H16	34,0	44,3	52,5	3.620	0,0367	0,087	0,676	1.065	710
1 x 1000	H16	39,0	49	58,1	4.335	0,0291	0,084	0,762	1.230	805

[1] Three single-core cables in open air at 40°C ambient temperature according to UNE 211435.
[2] Three single-core cables direct buried at 1 m depth with soil thermal resistivity of 1,5 K·m/W and 25°C of ground temperature.
Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.
In all cases it is supposed a three-phase circuit.

X-VOLT® AL (-OL)
HEPRZ1

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® HEPRZ1 18/30 kV

Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 50	H16	8,1	24,3	31,5	1.015	0,641	0,143	0,169	180	145
1 x 95	H16	11,1	25,3	32,5	1.140	0,320	0,131	0,204	275	215
1 x 150	H16	13,9	27,1	34,9	1.355	0,206	0,122	0,235	360	275
1 x 150	H25	13,9	27,1	35,2	1.440	0,206	0,122	0,235	360	275
1 x 240	H16	18,0	31,0	38,2	1.705	0,125	0,107	0,300	495	365
1 x 240	H25	18,0	31,0	38,5	1.785	0,125	0,107	0,300	495	365
1 x 400	H16	22,8	36,4	43,7	2.305	0,0778	0,103	0,340	660	470
1 x 400	H25	22,8	36,4	44,0	2.390	0,0778	0,103	0,340	660	470
1 x 500	H16	26,3	40,2	47,5	2.690	0,0605	0,096	0,398	780	540
1 x 500	H25	26,3	40,2	47,8	2.775	0,0605	0,096	0,398	780	540
1 x 630	H16	29,8	43,4	50,7	3.200	0,0469	0,094	0,436	920	620
1 x 630	H25	29,8	43,4	51,0	3.265	0,0469	0,094	0,436	920	620
1 x 800	H25	34,0	48,5	55,8	3.855	0,0367	0,090	0,471	1.065	710
1 x 1000	H25	39,0	53,7	61,3	4.800	0,0291	0,087	0,521	1.230	805

[1] Three single-core cables in open air at 40°C ambient temperature according to UNE 211435.
[2] Three single-core cables direct buried at 1 m depth with soil thermal resistivity of 1,5 K·m/W and 25°C of ground temperature.
Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.
In all cases it is supposed a three-phase circuit.

X-VOLT® Al

HEPRZ1 (S)

Medium Voltage aluminium cable, HEPR insulation.

ACCORDING TO: UNE-HD 620-9E (type 9E-1)/ IEC 60502-2.

100% Green Energy Cable Production

APPLICATION

X-VOLT® HEPRZ1 Cu/Al is a Medium Voltage aluminium cable for the transmission and distribution of electricity.

X-VOLT HEPRZ1 Cu/Al (S) configuration is halogen free with low smoke emission and no flame propagation properties. X-VOLT HEPRZ1 Al (AS) configuration is halogen-free with low smoke emission and no fire propagation properties.

CONSTRUCTION

Conductor

Aluminium electrolytic annealed conductor, class 2, according to EN 60228 and IEC 60228.

Internal semiconductor

Screen over the conductor, made of thermosetting semiconductor material.

Insulation

High module ethylene propylene rubber (HEPR) type DIH-2 according to HD 620-1, in dry atmosphere catenary tube, through a triple layer extrusion process. Lead-Free version available on request.

External semiconductor

Screen over the insulation, made of thermosetting and strippable semiconductor material.

Metallic screen

Screen of copper wires and copper tape, with a minimum cross-section of 16mm2.

Separator

Polyester tape completely covering the screen to facilitate the stripping of the outer sheath. Optionally, substituted by hygroscopic tape (cables with longitudinal sealing, type -OL and -2OL).

Outer sheath

Fire-retardant and halogen-free polyolefin outer sheath, red colour with two grey bands, type DMZ2 according to HD 620-1.

CHARACTERISTICS

Electrical performance

Medium Voltage 12/20 kV and 18/30 kV.

Thermal performance

Maximum service temperature: 105°C.

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

Minimum service temperature: -30°C.

Fire performance

Flame non-propagation according to EN 60332-1.

Halogen free: according to EN 50267, EN 60754 and IEC 60754.

Low smoke emission according to EN 61034, EN 60754-2 and IEC 60754-2.

Reaction to fire CPR: E_{ca} , according to EN 50575.

Mechanical performance

Minimum bending radius: 15 x cable diameter.

Abrasion resistant.

Tear resistant.

Environmental performance

UV Resistant according to UNE 211605.

STANDARDS / COMPLIANCE

Based on

UNE-HD 620-9E (type 9E-1)/ IEC 60502-2.

Standards and approvals

AENOR

CPR (Construction Products Regulation)

E_{ca}

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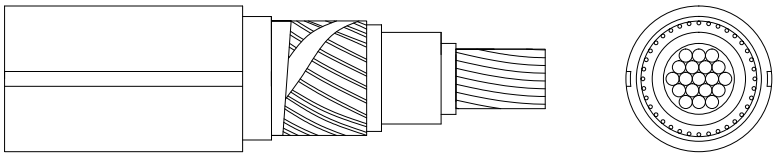
X-VOLT® Al
HEPRZ1 (S)

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® HEPRZ1 (S) AL 12/20kV

Cross-section (mm2)	Screen (mm2)	Conductor Diameter (mm)	Insulation Diameter (mm)	Ext Diameter (mm)	Weight (Kg/Km)	R a 20 °C (/km)	X (/km)	C (µzF/km)	Open air (A) [1]	Buried (A) [2]
1 x 95	H16	11,1	20,7	27,9	1.000	0,32	0,117	0,274	275	215
1 x 120	H16	12,7	22,3	30,1	1.155	0,253	0,113	0,302	320	245
1 x 150	H16	13,9	23,1	30,9	1.245	0,206	0,109	0,335	360	275
1 x 240	H16	18	27,6	35,4	1.650	0,125	0,102	0,394	495	365
1 x 400	H16	22,8	32,5	40,4	2.210	0,0778	0,095	0,496	660	470
1 x 500	H16	26,3	36,4	44,2	2.570	0,0605	0,092	0,547	780	540

X-VOLT® HEPRZ1 (S) AL 18/30kV

Cross-section (mm2)	Screen (mm2)	Conductor Diameter (mm)	Insulation Diameter (mm)	Ext Diameter (mm)	Weight (Kg/Km)	R a 20 °C (/km)	X (/km)	C (µzF/km)	Open air (A) [1]	Buried (A) [2]
1 x 50	H16	8	25,1	32,5	1.220	0,641	0,143	0,169	180	145
1 x 95	H16	11,3	25,7	33	1.325	0,32	0,131	0,204	275	215
1 x 150	H16	14,2	27,6	35,7	1.550	0,206	0,122	0,235	360	275
1 x 150	H25	14,2	27,6	36	1.635	0,206	0,122	0,235	360	275
1 x 240	H16	18	31,4	39,5	1.955	0,125	0,112	0,28	495	365
1 x 240	H25	18	31,4	40,3	1.935	0,125	0,112	0,28	495	365
1 x 400	H25	23,4	37,3	45,7	2.675	0,0778	0,103	0,34	660	470
1 x 500	H25	27	40,9	50,1	3.065	0,0605	0,099	0,38	780	540
1 x 630	H25	30,5	44,4	54,6	3.650	0,0469	0,094	0,436	920	620

[1] Three single-core cables in open air at 30°C ambient temperature according to IEC 60502-2.

[2] Three single-core cables direct buried at 0,8 m depth with soil thermal resistivity of 1,5 K·m/W and 20°C of ground temperature.

Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).

Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.

In all cases it is supposed a three-phase circuit.

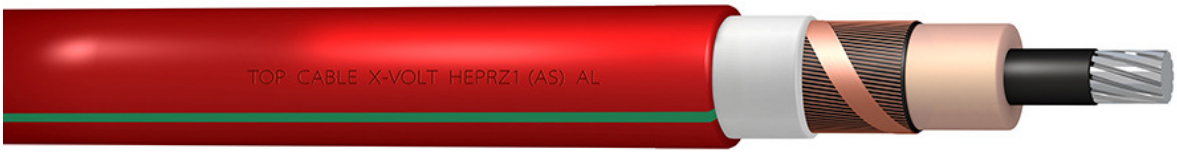
X-VOLT® AL (-OL)

HEPRZ1 (AS)

Medium Voltage aluminium cable, HEPR insulation.

ACCORDING TO: UNE-HD 620-9E (type 9E-5) / NI 56.43.01

100% Green Energy Cable Production



C_{ca}

APPLICATION

X-VOLT® HEPRZ1 (AS) Al is a Medium Voltage aluminium cable halogen-free with low smoke emission and no fire propagation properties for the transmission and distribution of electricity.

CONSTRUCTION

Conductor
Aluminium conductor, class 2 according to EN 60228 and IEC 60228.

Internal semiconductor
Screen over the conductor, made of thermosetting semiconductor material.

Insulation
High module ethylene propylene rubber (HEPR) type DIH-2 according to HD 620-1, in dry atmosphere catenary tube, through a triple layer extrusion process. Lead-Free version available on request.

External semiconductor
Screen over the insulation, made of thermosetting and strippable semiconductor material.

Metallic screen
Screen of copper wires and copper tape, with a minimum cross-section of 16mm^2.

Separator
Polyester tape completely covering the screen to facilitate the stripping of the outer sheath. Optionally, substituted by hygroscopic tape (cables with longitudinal sealing, type -OL).

Filling
Additional fireproof polyolefin layer, halogen free.

Outer sheath
Polyolefin outer sheath, halogen free type DMZ2 according to HD 620-1.
Red colour with two green stripes.

CHARACTERISTICS

Electrical performance
Medium Voltage 12/20 kV and 18/30 kV.

Thermal performance
Maximum service temperature: 105°C.
Maximum short-circuit temperature: 250°C (max 5 s).
Minimum service temperature: -30°C.

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Fire non propagation: according to EN 50399.
Reaction to fire CPR: C_{ca}-s1b,d2,a1, according to EN 50575.
Halogen free: according to EN 60754-1 / IEC 60754-1.
Low smoke emission according to EN 61034 / IEC 61034.
Light transmittance > 60%.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.

Mechanical performance
Minimum bending radius: 15x cable diameter.
Abrasion resistant.
Tear resistant.

Environmental performance
UV Resistant according to UNE 211605.

STANDARDS / COMPLIANCE

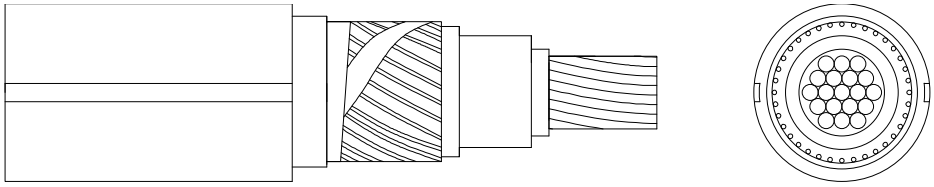
According to
UNE-HD 620-9E (type 9E-5) / NI 56.43.01

Standards and approvals
AENOR

CPR (Construction Products Regulation)
C_{ca}-s1b, d2, a1

X-VOLT® AL (-OL)
HEPRZ1 (AS)

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® HEPRZ1 (AS) 12/20 kV										
Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 50	16	8,0	17,6	31,5	1.270	0,641	0,145	0,219	180	145
1 x 150	16	13,9	23,1	36,9	1.790	0,206	0,121	0,335	360	275
1 x 240	16	18,0	27,6	39,4	2.055	0,125	0,108	0,393	495	365
1 x 400	16	22,8	32,6	44,5	2.675	0,0778	0,101	0,479	660	470
1 x 630	16	29,8	39,6	51,5	3.615	0,0469	0,094	0,600	920	620

X-VOLT® HEPRZ1 (AS) 18/30 kV										
Cross-section (mm^2)	Screen (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
1 x 50	16	8,0	24,2	38,0	1.715	0,641	0,157	0,148	180	145
1 x 150	25	13,9	27,1	41,2	2.180	0,206	0,127	0,245	360	275
1 x 240	25	18,0	31,0	43,1	2.400	0,125	0,114	0,300	495	365
1 x 400	25	22,8	36,4	48,5	3.095	0,0778	0,107	0,352	660	470
1 x 630	25	29,8	43,4	55,6	4.080	0,0469	0,098	0,437	920	620

[1] Three single-core cables in open air at 40°C ambient temperature according to UNE 211435.
[2] Three single-core cables direct buried at 1 m depth with soil thermal resistivity of 1,5 K·m/W and 25°C of ground temperature.
Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.
In all cases it is supposed a three-phase circuit.

X-VOLT®
FR-N20XA8E-AR

Medium Voltage aluminium cable, XLPE insulation, halogen free.

ACCORDING TO: NF C 33-226

100% Green Energy Cable Production

E_{ca}

APPLICATION

X-VOLT® FR-N20XA8E-AR Medium Voltage aluminium cables for the electricity transmission and distribution. Halogen free.

· Distribution networks.

CONSTRUCTION

Conductor

Aluminium conductor, class 2, according to NF-EN 60228 and IEC 60228.

Internal semiconductor

Screen over the conductor, made of thermosetting semiconductor material.

Insulation

Cross-linked polyethylene (XLPE).

External semiconductor

Screen over the insulation, made of thermosetting and strippable semiconductor material.

Longitudinal sealing

Swelling powder.

Metallic screen

Longitudinal aluminium foil with polymer laminate bonded to the outer sheath.

Outer sheath

Polyolefin outer sheath, black colour.

CHARACTERISTICS

Electrical performance

Medium Voltage: 12/20 (24) kV

18/30 (36) kV

Thermal performance

Maximum service temperature: 90°C.

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

Minimum service temperature: -15°C.

Fire performance

Flame non-propagation according to NF C 32-070 c2.

Reaction to fire CPR: E_{ca} according to EN 50575.

Mechanical performance

Minimum bending radius: 13x cable diameter.

Impact resistance: AG2 medium severity.

Environmental performance

UV Resistant according to NF EN 50483.

Water resistance: AD8 Submersion.

Installation conditions

Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

According to

NF C 33-226.

Standards and approvals

CE / RoHS / EDF.

CPR (Construction Products Regulation)

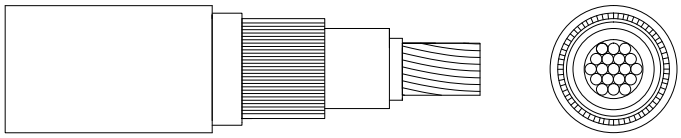
E_{ca}

CPR EN 50575

RoHS Compliant

X-VOLT®
FR-N20XA8E-AR

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® FR-N20XA8E-AR 12/20 kV											
Cross-section (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	Ext Diameter (mm)	Weight (Kg/Km)	R (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]		Buried (A) [2]	
								Trefoil	Flat spaced	Trefoil	Flat spaced
1 x 50	-	-	-	-	-	-	-	184	222	154	159
1 x 95	11,1	23,1	30,3	1.060	0,32	0,122	0,202	280	338	223	231
1 x 240	18	30	38	1.770	0,125	0,106	0,286	502	593	374	380
1 x 400	23,4	36,2	44,4	2.350	0,0778	0,1	0,36	673	769	479	475
1 x 630	30	42,8	51,9	3.365	0,0469	0,094	0,439	929	1059	625	619
3 x 1 x 50	8,1	20,1	57,5	2.280	0,641	0,134	0,165	-	-	-	-
3 x 1 x 95	11,1	23,1	65,2	3.210	0,32	0,122	0,202	-	-	-	-
3 x 1 x 150	13,9	25,9	71,4	3.900	0,206	0,114	0,236	-	-	-	-
3 x 1 x 240	18	30	81,8	5.365	0,125	0,106	0,286	-	-	-	-

X-VOLT® FR-N20XA8E-AR 18/30 kV											
Cross-section (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	Ext Diameter (mm)	Weight (Kg/Km)	R (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]		Buried (A) [2]	
								Trefoil	Flat spaced	Trefoil	Flat spaced
1 x 150	13,9	30,9	38,9	1.640	0,206	0,124	0,179	368	440	284	291
1 x 240	18	35	43,2	2.055	0,125	0,114	0,216	502	593	374	380
1 x 400	23,4	41,2	49,8	2.735	0,0778	0,107	0,265	673	769	479	475
1 x 630	30	47,8	57,3	3.785	0,0469	0,1	0,32	929	1059	625	619
3 x 1 x 150	13,9	30,9	83,5	4.990	0,206	0,124	0,179	-	-	-	-
3 x 1 x 240	18	35	92,7	6.265	0,125	0,114	0,216	-	-	-	-
1 x 150	13,9	30,9	38,9	1.640	0,206	0,124	0,179	368	440	284	291
1 x 240	18	35	43,2	2.055	0,125	0,114	0,216	502	593	374	380
1 x 400	23,4	41,2	49,8	2.735	0,0778	0,107	0,265	673	769	479	475

X-VOLT® Al TSLF

Cable for fixed installations.

ACCORDING TO: HD 620-10K

100% Green Energy Cable Production

E_{ca}

APPLICATION

X-VOLT® TSLF is a halogen free cable for fixed installations.
Suitable for transport and distribution of electric power in medium voltage networks.
This cable is suitable for indoor, outdoor and buried installations.

CONSTRUCTION

Conductor
Aluminium conductor class 2 according to IEC 60228. Hygroscopic tapes applied to achieve longitudinal watertightness on the conductor.

Conductor screen
Cross-linke d se miconductor screen applied over conductor in a triple-extrusion process.

Insulation
Cross-linke d polyethylene insulation type DIX8 according to HD 620-1; natural colour.
Cross-linked in catenary line with nitrogen atmosphere.

Insulation screen
Cross-linked semiconductor screen applied over insulation in a triple-extrusion process. Bonded to the insulation layer.

Longitudinal water-blocking
Hygroscopic tape completely covering the screen.

Metallic screen
Me tallic screen with copper wires, applied over the semi-conducting swellable tape.
The metallic screen shall have a cross section of 25 mm^2 for 95 mm^2 core, 35 mm^2 for 150, 240 and 400 mm^2 core and 50 mm^2 for 630 mm^2 core.

Radial water-blocking barrier
Made up of an aluminium foil/polymer laminate bonde d to the outer sheath.

Outer sheath
Polyethylene outer sheath, type DMP17 according to HD 620-1; black colour (with conductive covering).

CHARACTERISTICS

Electrical performance
Medium voltage: 24 and 36 kV.

Thermal performance
Maximum service temperature: 90°C.
Maximum short-circuit temperature: 250°C (max. 5 s) Minimum service temperature: -15°C.

Fire performance
Halogen free: according to EN 60754 / IEC 60754.
Reaction to fire CPR: E_{ca} according to EN 50575.

Mechanical performance
Minimum bending radius: 15x cable diameter.
Abrasion resistant.
Tear resistant.

Installation conditions
Open Air.
Buried.
In conduit.

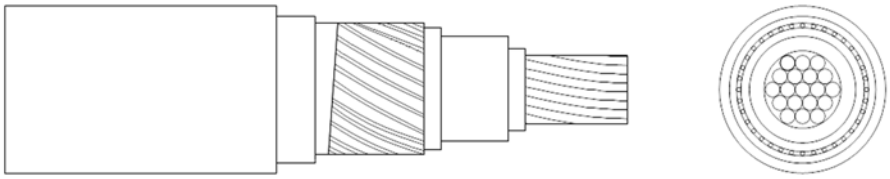
STANDARDS / COMPLIANCE

According to
HD 620-10K

CPR (Construction Products Regulation)
E_{ca}

X-VOLT® Al TSLF

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® TSLF 24kV

Cross-section (mm²)	Conductor Diameter (mm)	Insulation Diameter (mm)	Ext Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]		Buried (A) [2]	
								Trefoil	Flat spaced	Trefoil	Flat spaced
1 x 50	8,10	20,1	26,8	760	0,641	0,134	0,164	184	222	154	159
1 x 95	11,1	23,1	30,3	1.060	0,320	0,122	0,202	280	338	223	231
1 x 240	18,0	30,0	38,0	1.770	0,125	0,106	0,286	502	593	374	380
1 x 400	23,4	36,2	44,4	2.350	0,0778	0,100	0,360	673	769	479	475
1 x 630	30,0	42,8	51,9	3.365	0,0469	0,094	0,439	929	1.059	625	619
3 x 1 x 50	8,1	20,1	57,5	2.280	0,641	0,134	0,165	184	-	154	-
3 x 1 x 95	11,1	23,1	65,2	3.210	0,32	0,122	0,202	280	-	223	-
3 x 1 x 150	13,9	25,9	71,4	3.900	0,206	0,114	0,236	368	-	284	-
3 x 1 x 240	18,0	30,0	81,8	5.365	0,125	0,106	0,286	502	-	374	-

X-VOLT® TSLF 36kV

Cross-section (mm²)	Conductor Diameter (mm)	Insulation Diameter (mm)	Ext Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]		Buried (A) [2]	
								Trefoil	Flat spaced	Trefoil	Flat spaced
1 x 150	13,9	30,9	38,9	1.640	0,206	0,124	0,179	368	440	284	291
1 x 240	18,0	35,0	43,2	2.055	0,125	0,114	0,216	502	593	374	380
1 x 400	23,4	41,2	49,8	2.735	0,0778	0,107	0,265	673	769	479	475
1 x 630	30,0	47,8	57,3	3.785	0,0469	0,100	0,320	929	1.059	625	619
3 x 1 x 150	13,9	30,9	83,5	4.990	0,206	0,124	0,179	368	-	284	-
3 x 1 x 240	18,0	35,0	92,7	6.265	0,125	0,114	0,216	502	-	374	-

[1] Open air installation according to IEC 60502-2: three single-core cables in trefoil or flat spaced formation and ambient temperature of 30 °C; protected from direct sun radiation and with adequate ventilation (supported by cleats and hangers or on perforated tray).
[2] Buried installation according to IEC 60502-2: three single-core cables in trefoil or flat spaced formation direct buried at a depth of 0,7 m, ground temperature of 20 °C and soil thermal resistivity of 1,5 K·m/W.

X-VOLT®
RHVhMVh 3x Cu +H1

100% Green Energy Cable Production

Medium Voltage copper cable, XLPE insulation and hydrocarbon resistant.

ACCORDING TO: IEC 60502-2. / Repsol ED-P-10.01-01

APPLICATION

Medium Voltage copper cable for the transmission and distribution of electricity. This cable is recommended for installations where there may be a risk of oils and/or hydrocarbon type chemical agents coming into contact with the cable.

- Distribution networks.

CONSTRUCTION

Conductor
Electrolytic annealed copper conductor class 2 according to EN 60228 and IEC 60228.

Internal semiconductor
Screen over the conductor, made of thermosetting semiconductor material.

Insulation
Cross-linked polyethylene type XLPE according to IEC 60502-2, in dry atmosphere catenary tube, through a triple layer extrusion process.

External semiconductor
Screen over the insulation, made of thermosetting and strippable semiconductor material.

Cores identification
The cores are identified with a tape placed along the cable between the external semiconductor and the metallic screen.
Colours are: brown, green and yellow.

Metallic screen
Metallic screen made of copper tape. It consists in two copper tapes of 0,1 mm of thickness placed helicoidally and overlapped (H1 screen) over the outer semi-conducting screen.

Assembly of cores
The three cores are assembled helicoidally with the metallic screens in touch.

Separation sheath
PVC separation sheath type ST2 according to IEC 60502-2. The special compound gives a high level of resistance to hydrocarbons and mineral oils.

Armour
Galvanized steel wire wrapped helicoidally around the cable and fixed with a counter-wound metal tape.

Outer sheath
PVC outer sheath type ST2 according to IEC 60502-2. The special compound gives a high level of resistance to hydrocarbons and mineral oils. Red colour.

CHARACTERISTICS

Electrical performance
Medium voltage: 3,6/6 kV, 6/10 kV, 8,7/15 kV, 12/20 kV and 18/30 kV.

Thermal performance
Maximum service temperature: 90°C.
Maximum short-circuit temperature: 250°C (max 5 s).
Minimum service temperature: -15°C.

Fire performance
Flame non-propagation according to EN 60332-1 /IEC 60332-1.1.
Fire non-propagation according to EN 60332-3 / IEC 60332-3.
Reduced halogen emission. Chlorine <15%.

Mechanical performance
Minimum bending radius: 15x cable diameter.
Abrasion resistant.
Tear resistant.

Environmental performance
Chemical resistance: Excellent.
Oil resistant: according to UIC 895 OR.
Hydrocarbon resistant: according to UIC 895 OR.

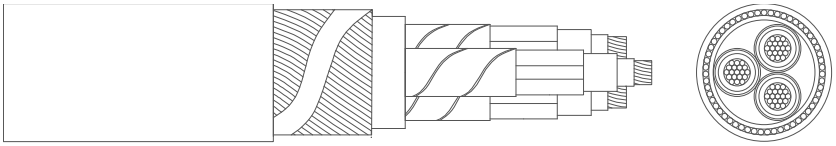
Installation conditions
Open Air.
Buried.
In conduit.

STANDARDS / COMPLIANCE

According to
IEC 60502-2 / Repsol ED-P-10.01-01

X-VOLT® CU
RHVhMVh 3x Cu +H1

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® RHVhMVh 3,6/6 kV

Cross-section (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
3 x 50	8,5	14,5	48,5	5.265	0,387	0,093	0,308	205	181
3 x 70	10,0	16,0	52,1	6.265	0,268	0,089	0,348	253	220
3 x 95	11,1	17,1	54,9	7.600	0,193	0,086	0,377	307	262
3 x 120	12,8	18,8	59,0	8.455	0,153	0,083	0,421	352	298
3 x 150	15,0	21,0	64,1	10.035	0,124	0,080	0,479	397	332
3 x 185	16,5	22,5	67,9	11.670	0,0991	0,079	0,518	453	374
3 x 240	18,1	24,3	72,8	13.735	0,0754	0,078	0,541	529	431

X-VOLT® RHVhMVh 6/10 kV

Cross-section (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
3 x 50	8,5	15,7	51,7	5.650	0,387	0,098	0,259	205	181
3 x 70	10,0	17,2	55,1	6.640	0,268	0,093	0,291	253	220
3 x 95	11,1	18,3	57,9	7.740	0,193	0,090	0,315	307	262
3 x 120	12,8	20,0	62,1	8.920	0,153	0,087	0,351	352	298
3 x 150	15,0	22,2	67,3	10.500	0,124	0,084	0,398	397	332
3 x 185	16,5	23,7	70,7	12.030	0,0991	0,082	0,430	453	374
3 x 240	18,1	25,6	75,4	14.090	0,0754	0,081	0,445	529	431

X-VOLT® RHVhMVh 8,7/15 kV

Cross-section (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
3 x 35	7,2	16,4	53,2	5.710	0,524	0,110	0,188	172	154
3 x 50	8,5	17,7	56,2	6.480	0,387	0,105	0,209	205	181
3 x 70	10,0	19,2	59,8	7.560	0,268	0,100	0,234	253	220
3 x 95	11,1	20,3	62,6	8.685	0,193	0,097	0,252	307	262
3 x 120	12,8	22,0	66,8	9.760	0,153	0,093	0,279	352	298
3 x 150	15,0	24,2	71,8	11.375	0,124	0,089	0,315	397	332
3 x 240	18,1	27,3	80,0	14.970	0,0754	0,085	0,354	529	431

X-VOLT® RHVhMVh 12/20 kV

Cross-section (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	R20°C (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
3 x 35	7,2	18,2	57,5	6.210	0,524	0,117	0,163	172	154
3 x 50	8,5	19,5	60,5	6.960	0,387	0,111	0,181	205	181
3 x 70	10,0	21,0	64,1	8.070	0,268	0,127	0,201	253	220
3 x 95	11,1	22,1	67,5	9.550	0,193	0,102	0,216	307	262
3 x 120	12,8	23,8	70,9	10.410	0,153	0,098	0,239	352	298
3 x 150	15,0	26,0	76,2	12.095	0,124	0,093	0,268	397	332
3 x 185	16,5	27,5	79,9	13.760	0,0991	0,091	0,288	453	374
3 x 240	18,1	29,1	83,9	15.750	0,0754	0,089	0,309	529	431

X-VOLT® CU
RHVhMVh 3x Cu +H1

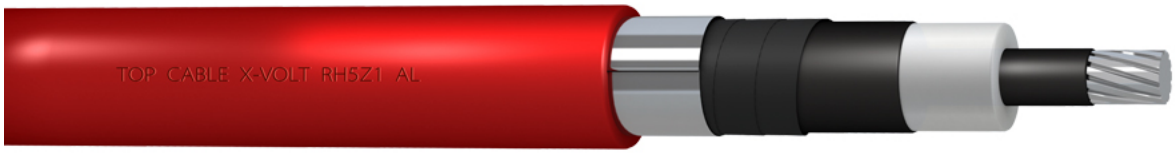
X-VOLT® RHVhMVh 18/30 kV									
Cross-section (mm^2)	Conductor Diameter (mm)	Insulation Diameter (mm)	External Diameter (mm)	Weight (Kg/Km)	$R_{20°C}$ (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]
3 x 50	8,5	24,1	71,5	8.875	0,387	0,125	0,140	205	181
3 x 150	15,0	30,6	86,7	14.180	0,268	0,104	0,201	397	332

[1] Three -core armoured cables in open air at 30°C ambient temperature according to IEC 60502-2.
[2] Three core armoured cables direct buried at 0,8 m depth with soil thermal resistivity of 1,5 K·m/W and 20°C of ground temperature.
Reactance (X) is calculated at 50 Hz and for three single-core cables (in triangle or trefoil formation).
Capacitance values (C) are calculated in base to dimensional items of the cables that are in this specification.
Electrical resistance (R) is calculated at 20°C according to IEC 60228 for copper conductor class 2.
In all cases it is supposed a three-phase circuit.

X-VOLT®
RH5Z1 Al

Medium voltage aluminium cable, XLPE insulation, halogen free with longitudinal aluminium strip screen.

ACCORDING TO: UNE 211620 / ENEL Global Standard GSC 001



100% Green Energy Cable Production

APPLICATION

Aluminium cable for fixed installations. Suitable for transport and distribution of electric power in medium voltage networks. Halogen free. This cable is suitable for indoor, outdoor and buried installations.

CONSTRUCTION

Conductor

Aluminium conductor, class 2, according to EN 60228 and IEC 60228.

Inner semiconducting screen

Cross-linked semiconductor screen applied over conductor in a triple-extrusion process.

Insulation

Cross-linked polyethylene type DIX-3 according to HD 620-1, natural color. Cross-linked in catenary line with nitrogen atmosphere.

Outer semiconducting screen

Cross-linked semiconductor screen applied over insulation in a triple-extrusion process. Strippable.

Water blocking

Semi-conducting swellable tape, placed on metallic screen.

Metallic screen

Aluminium tape of thickness 0,3 mm longitudinally applied on the water-blocking. The tape is overlapped and bonded 5 mm minimum. The screen is longitudinally and continually fixed in the outer sheath.

Outer sheath

Polyethylene outer sheath halogen free, type DMZ1 according to HD 620-1. Red colour.

CHARACTERISTICS

Electrical performance

Medium voltage: 12/20 kV and 18/30 kV.

Thermal performance

Maximum service temperature: 90°C.

Minimum service temperature: -15°C.

Minimum installation temperature: 0 °C

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

Fire performance

Halogen free: according to EN 60754 / IEC 60754.

Mechanical performance

Minimum bending radius permanently installed: 15 x cable diameter.

Minimum bending radius while installation: 20 x cable diameter.

Abrasion resistant.

Environmental performance

UV Resistant according to UNE 211605.

Water resistance: AD8 Submersion.

Installation conditions

Open Air.

Buried.

In conduit.

STANDARDS / COMPLIANCE

According to

UNE 211620 / ENEL Global Standard GSC001.

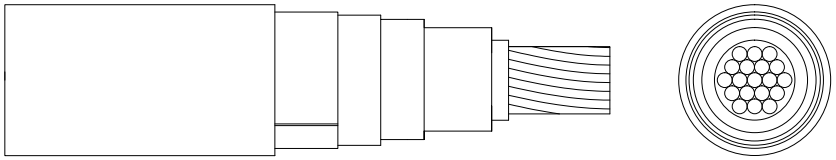
Standards and approvals

AENOR.

AENOR

X-VOLT®
RH5Z1 Al

DIMENSIONS & ADMISSIBLE INTENSITIES



X-VOLT® RH5Z1 AL 12/20 kV

Cross-section (mm²)	Conductor Diameter (mm)	Insulation Diameter (mm)	Ext Diameter (mm)	Width tape (mm)	Section screen (mm²)	Weight (Kg/Km)	R (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]	In conduit (A) [3]
1 x 95	11,1	21,3	28,4	80	24	795	0,320	0,118	0,231	280	221	210
1 x 120	12,7	22,9	30,0	90	27	915	0,253	0,113	0,254	324	252	240
1 x 150	13,9	24,1	31,2	95	28,5	1.020	0,206	0,110	0,271	368	281	267
1 x 185	15,5	25,9	33,0	100	30	1.165	0,164	0,106	0,296	424	317	303
1 x 240	18,0	28,2	35,3	105	31,5	1.385	0,125	0,102	0,33	502	367	351
1 x 300	20,0	30,2	37,3	110	33	1.580	0,100	0,098	0,368	577	414	397
1 x 400	22,8	33,2	40,3	120	36	1.920	0,0778	0,095	0,401	673	470	451
1 x 500	26,3	37,0	44,1	130	39	2.280	0,0605	0,092	0,456	777	542	519
1 x 630	29,8	40,2	47,3	145	43,5	2.750	0,0469	0,088	0,502	895	615	588

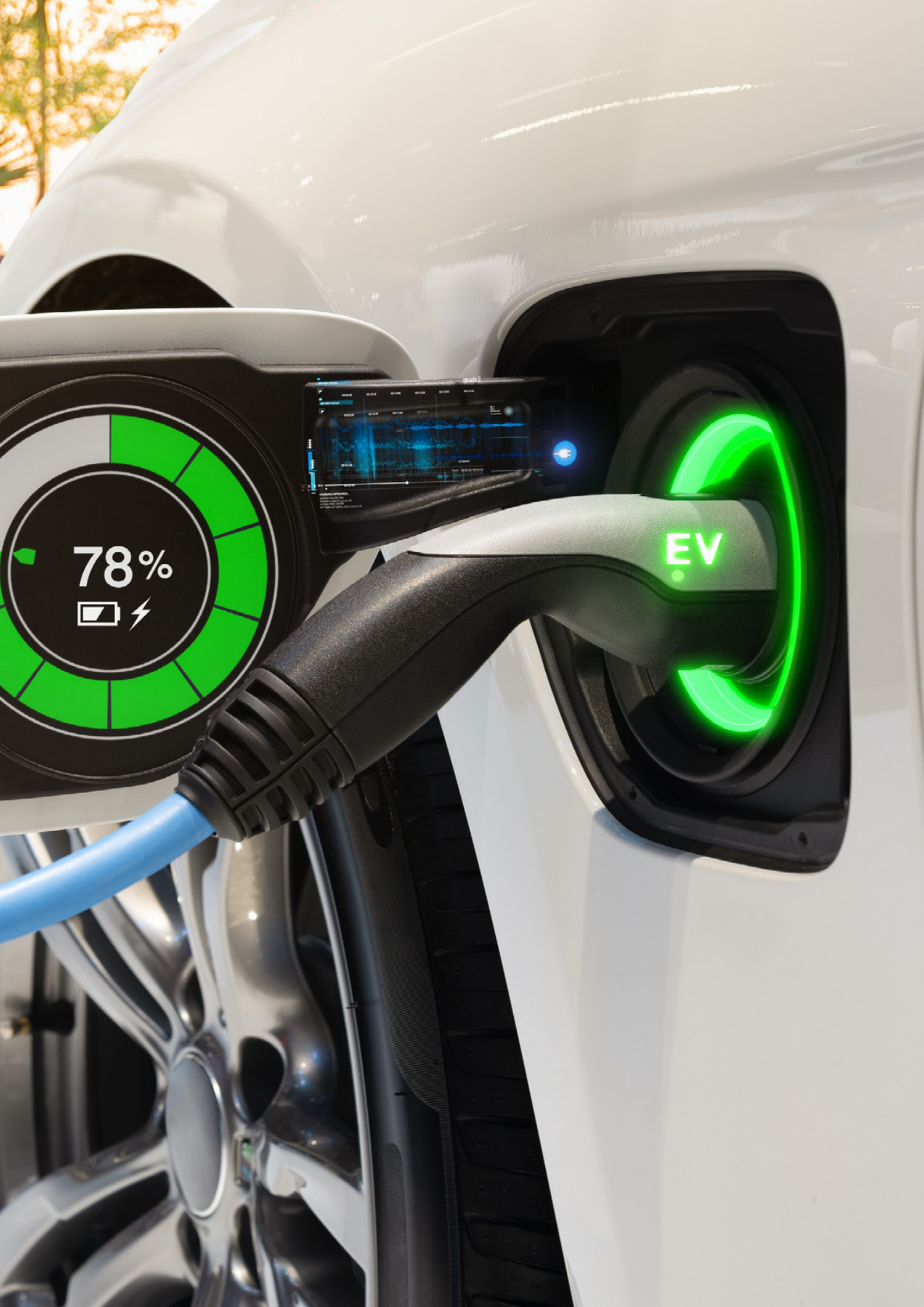
X-VOLT® RH5Z1 AL 18/30 kV

Cross-section (mm²)	Conductor Diameter (mm)	Insulation Diameter (mm)	Ext Diameter (mm)	Width tape (mm)	Section screen (mm²)	Weight (Kg/Km)	R (Ω/km)	X (Ω/km)	C (µF/km)	Open air (A) [1]	Buried (A) [2]	In conduit (A) [3]
1 x 95	11,1	25,5	32,6	100	30	995	0,320	0,127	0,175	280	221	210
1 x 120	12,7	27,1	34,2	100	30	1.115	0,253	0,121	0,191	324	252	240
1 x 150	13,9	28,3	35,4	110	33	1.235	0,206	0,118	0,203	368	281	267
1 x 185	15,5	30,6	37,7	110	33	1.405	0,164	0,113	0,222	424	317	303
1 x 240	18,0	32,4	39,5	120	36	1.625	0,125	0,109	0,244	502	367	351
1 x 300	20,0	35,0	41,1	130	39	1.770	0,100	0,103	0,27	577	414	397
1 x 400	22,8	37,4	44,5	140	42	2.195	0,0778	0,101	0,293	673	470	451
1 x 500	26,3	41,2	48,3	150	45	2.580	0,0605	0,097	0,331	777	542	519
1 x 630	29,8	44,4	51,5	160	48	3.060	0,0469	0,094	0,363	895	615	588
1 x 800	34,0	48,9	56,0	170	51	3.680	0.0367	0,090	0,407	1.036	700	670

[1]Open air installation according to IEC 60502-2: three single-core cables in trefoil formation and ambient temperature of 30 °C; protected from direct sun radiation and with adequate ventilation (supported by cleats and hangers or on perforated tray).

[2]Buried installation according to IEC 60502-2: three single-core cables in trefoil formation direct buried at a depth of 0,8 m, ground temperature of 20 °C and soil thermal resistivity of 1,5 K·m/W.

[3]Buried installation according to IEC 60502-2: three single-core tubed cables (one cable per tube) in trefoil formation and buried tubes in mutual contact at a depth of 0,8 m, ground temperature of 20 °C, soil thermal resistivity of 1,5 K·m/W and thermal resistivity of the tube of 1,2 K · m / W.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