Top Cable

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TOPFLEX TRI-RATED

1. Object

This document defines the design and manufacturing characteristics of the Tri-rated cables manufactured by Top Cable.

2. Applications

Cable suitable for fixed and protected installation, for internal wiring, command and control switchgear and for assemblies of lighting. Cross-sections up to 1 mm2 are only recommended for signal and control circuits.

The multiple-standard design makes them adequate for to be commercialised worldwide without technical barriers, except the sections not covered by some standard.

Approvals available:

UL (EEUU) - Canada c UL us

3. Characteristics

Nominal voltage: Acc. EN (H05V2-K): 300/500 V

Acc. EN (H07V2-K): 450/750 V

Acc. BS (CK): U_0/U: 600/1000 V

Acc. UL (AWM): U: 600 V

Acc. CSA (TEW): U: 600 V

Minimum manipulation temperature: 5 ºC

Minimum service temperature: -40 ºC (fixed protected installation)

Maximum conductor temperature: 90/105 ºC

90 °C according to EN 50525-2-31 and BS 6231

105 °C according to UL 1581 and CSA C22.2

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

Minimum bending radius (static): 5 x cable Ø

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

VW-1 y FT2 according to UL 2556

4. Design

This type of cable is designed, manufactured and tested according to EN 50525-2-31, BS 6231, UL 758 and CSA 22.2

Table 1 show equivalences and designation applicable for every size and standard:

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

Table 1

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5. General make-up of the cable

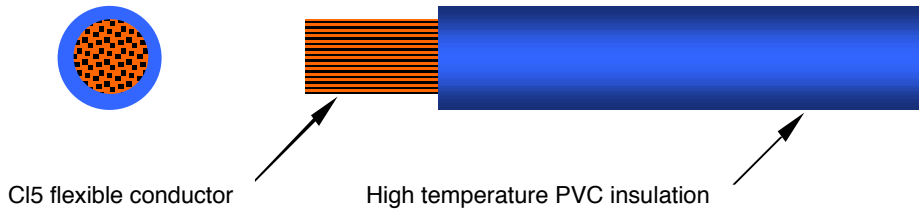
5.1 Conductor

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

5.2 Insulation

High temperature polyvinyl chloride insulation, type TI3 according to EN 50363-1 and Class 43 according to UL 1581. The special characteristics of the material ensure good easy-slide properties to the cable.

5.3 Diagram representation



6.- Current-carrying capacities:

6.1 Nominal current-carrying capacities.

Table 2 shows the current-carrying capacities and voltage drop for each cable.

Current-carrying capacities, in amperes, are calculated according to IEC 60364-5-52 and for the following conditions:

- Air installation: two or three loaded conductors installed in a conduit on a wall, and ambient temperature of 30 °C (ref. method B1 for 90 °C).

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

Voltage drop, in volts per ampere and km, is the maximum that may occur. It is calculated for the maximum conductor temperature, single-phase circuit and for cos φ = 1.

Section (mm2)	Current (A) 2 cond.	3 cond.	Voltage drop (V/A·km)
1 x 0,50	12	10	99,5
1 x 0,75	15	13	66,6
1 x 1	18	16	49,9
1 x 1,5	23	20	34,0
1 x 2,5	31	28	20,4
1 x 4	42	37	12,7
1 x 6	54	48	8,45
1 x 10	75	66	4,89
1 x 16	100	88	3,10
1 x 25	133	117	2,00

Section (mm2)	Current (A) 2 cond.	3 cond.	Voltage drop (V/A·km)
1 x 35	164	144	1,42
1 x 50	198	175	0,990
1 x 70	253	222	0,696
1 x 95	306	269	0,527
1 x 120	354	312	0,412
1 x 150	407	358	0,330
1 x 185	464	408	0,270
1 x 240	546	481	0,205
1 x 300	628	553	0,164
1 x 400	751	661	0,124

Table 2

6.2 Short-circuit current-carrying capacities

The maximum short-circuit current that a cable can withstand depend on the time of reaction of the protection elements installed in the line. The maximum current-carrying capacity in a short-circuit accident, for a specific type of cable, is the result of multiplying the cross section of the cable for the values shown in table 3. These values are taken from IEC 949.

Time (s)	0,1	0,2	0,3	0,5	1	1,5	2	2,5	3
A/m m^2	316	223	182	141	100	82	71	63	58

Table 3

6.3 Correction factors

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

Correction factors for air temperature other than 30 °C.

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

Table 4

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7. Dimensions

Table 5 shows diameter and weight detailed for every cable.

Section (mm2)	Diameter (mm)	Weight (kg/ km)
1 x 0,50	2,4	10
1 x 0,75	2,7	13
1 x 1	2,8	15
1 x 1,5	3,0	20
1 x 2,5	3,5	30
1 x 4	4,0	45
1 x 6	4,6	65
1 x 10	6,3	110
1 x 16	8,0	180
1 x 25	9,4	265

Section (mm2)	Diameter (mm)	Weight (kg/km)
1 x 35	10,5	355
1 x 50	13,1	510
1 x 70	14,5	695
1 x 95	16,1	890
1 x 120	17,8	1.125
1 x 150	20,2	1.415
1 x 185	21,9	1.700
1 x 240	24,3	2.205
1 x 300	27,7	2.800
1 x 400	31,6	3.655

Table 5