

TBF Series

TBF/2517 300V LF

Electronic equipment cable

- Heat resistance ★★★★★
 - Oil resistance ★★★★★
 - Noise resistance ★
 - Flame resistance ★★★★★
 - Torsion resistance ★★★★★
 - Flexibility resistance ★★★★★ ※1
 - Drag chain ★★★★★
- ※1 More than 10 cores is 「3」
- ※The characteristic is an aim.

➤ Application

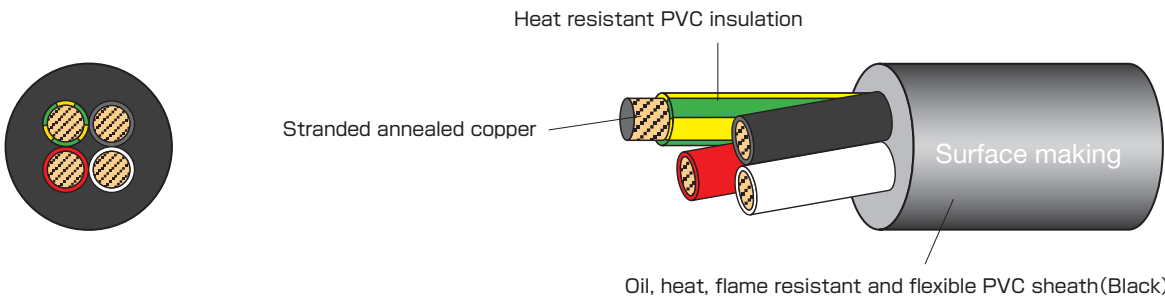
- It is possible to use it for wiring medium or low-speed operational components of machine tool.
- Drag chain test 5 million times or more. (or more ability 10 million times)
- Vibration resistant cable with UL and cUL at 300V,105℃. (Category : AVL V2, AVL V8)
- Fit to Electrical Appliance and Material Safety Law. (19~15AWG)

➤ Feature

- Fine wire conductor use.
- Heat resistant PVC used for insulation.
- Oil and heat resistant PVC used for sheath.
- Flame resisting : UL VW-1, cUL FT1.

➤ Construction figure

Multi core cable



※Cable with more than 10 cores : binder tape on cores.

➤ Surface marking

(1) 22AWG~20AWG cables



(2) 19AWG~15AWG cables



※R15 indicates "Compliant with RoHS Directive 2011/65/EU and Directive (EU) 2015/863 (10 substances)".

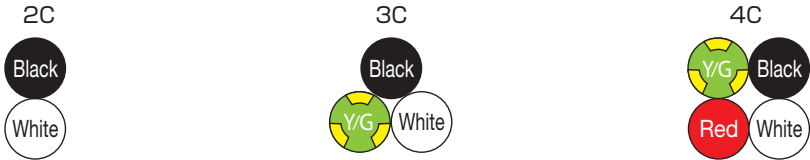
➤➤➤ Meeting standard

Certification	UL AWM	cUL AWM	Electrical Appliance and Material Safety
Applicable standard	UL 758	CSA C22.2 No.210	LawDepartmental order to determine a technical standard of the electrical equipment
Official symbol	UL STYLE 2517	CSA AWM IIA/B	ASEISMATIC HVCTF
Voltage rating	300V	300V	300V
Temperature rating	105℃	105℃	75℃
Conductor	UL 758	CSA C22.2 No.210	JIS C 3102,JIS C 3152
Flame rating	VW-1	FT1	JIS C 3005 4.26.2 b)

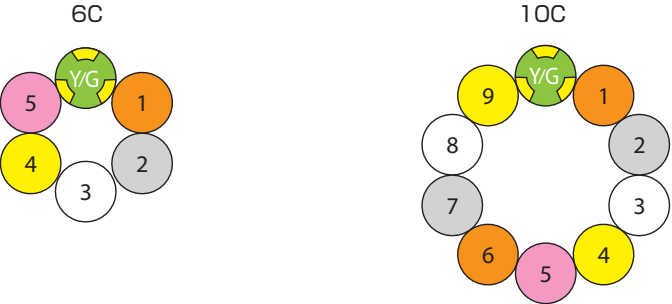


➤ Identification

2C~4C



5C~22AWG



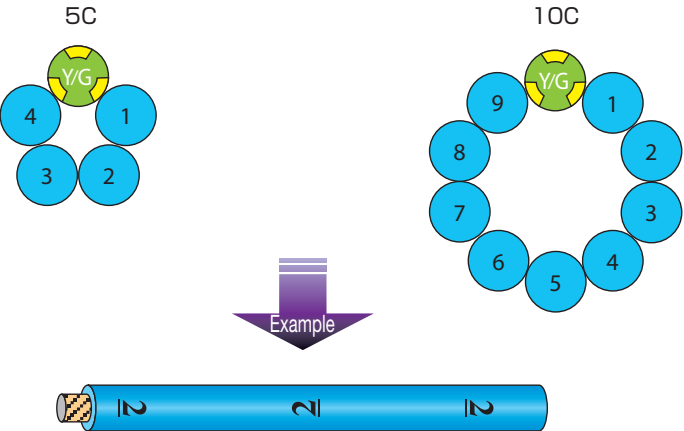
Figures ○ indicate core number in the identification table. ※Y/G indicates green core with yellow stripe(30~50%).

●Identification table

Line number	Color of insulation	Dot mark	Line number	Color of insulation	Dot mark	Line number	Color of insulation	Dot mark
1	Orange		11	Orange	■ ■	21	Orange	■ ■ ■ ■ ■
2	Gray		12	Gray	■ ■ ■ ■ ■	22	Gray	■ ■ ■ ■ ■
3	White		13	White	■ ■ ■ ■ ■	23	White	■ ■ ■ ■ ■
4	Yellow		14	Yellow	■ ■ ■ ■ ■	24	Yellow	■ ■ ■ ■ ■
5	Peach		15	Peach	■ ■ ■ ■ ■	25	Peach	■ ■ ■ ■ ■
6	Orange	■ ■	16	Orange	■ ■ ■ ■ ■	26	Orange	■ ■ ■ ■ ■ (Continuation)
7	Gray	■ ■	17	Gray	■ ■ ■ ■ ■	27	Gray	■ ■ ■ ■ ■ (Continuation)
8	White	■ ■	18	White	■ ■ ■ ■ ■	28	White	■ ■ ■ ■ ■ (Continuation)
9	Yellow	■ ■	19	Yellow	■ ■ ■ ■ ■	29	Yellow	■ ■ ■ ■ ■ (Continuation)
10	Peach	■ ■	20	Peach	■ ■ ■ ■ ■	30	Peach	■ ■ ■ ■ ■ (Continuation)

※A short point is 1mm, the length point is 2mm, the interval is 1mm, and the pitch is about 12mm.

5C~20~15AWG



※Figures ○ indicate black numbering on light blue insulator. ※Y/G indicates green core with yellow stripe(30~50%).

Electronic equipment cable



> Construction table

No. of cores	Conductor			Oil, heat resistant PVC insulation		Oil, heat resistant flexible PVC sheath		Approx. weight (lbs/1000ft) (kg/km)	Electrical Characteristics			Allowable ampacity (A)
	Size (AWG)	Construction (Line/mm)	Outside diameter (mm)	Outside diameter (inch)	Outside diameter (mm)	Overall diameter approx. (inch)	Overall diameter approx. (mm)		Conductor resistance (Ω/km20°C)	Insulation resistance (MΩ km20°C)	Electrical strength (V/1min.)	
2C						0.193	4.9	20(30)				7.0
3C						0.201	5.1	24(35)				7.0
4C						0.217	5.5	28(42)				6.1
5C						0.236	6.0	34(50)				5.6
6C						0.256	6.5	40(60)				5.2
8C	22 (0.3mm ²)	65/0.08 (65/3.2mil)	0.75 (30mil)	0.061	1.55	0.291	7.4	50(75)	less than 59.1	more than 10	2000	4.7
10C						0.339	8.6	60(90)				4.4
12C						0.382	9.7	74(110)				4.1
16C						0.374	9.5	81(120)				3.5
20C						0.409	10.4	97(145)				3.3
30C						0.512	13.0	148(220)				2.9
2C						0.232	5.9	30(45)				9.7
3C						0.244	6.2	37(55)				9.7
4C						0.264	6.7	44(65)				8.5
5C						0.287	7.3	50(75)				7.8
6C						0.311	7.9	60(90)				7.2
7C	20 (0.5mm ²)	108/0.08 (108/3.2mil)	0.96 (38mil)	0.077	1.96	0.335	8.5	71(105)	less than 35.6	more than 10	2000	6.9
8C						0.358	9.1	77(115)				6.6
10C						0.413	10.5	91(135)				6.1
12C						0.461	11.7	118(175)				5.7
16C						0.449	11.4	124(185)				4.9
20C						0.496	12.6	151(225)				4.6
30C						0.650	16.5	249(370)				4.1
2C						0.264	6.7	40(60)				12
3C						0.280	7.1	47(70)				12
4C						0.303	7.7	57(85)				10
5C						0.331	8.4	67(100)				9.7
6C						0.358	9.1	77(115)				9.1
7C	19 (0.75mm ²)	67/0.12 (67/4.7mil)	1.1 (43mil)	0.091	2.30	0.386	9.8	94(140)	less than 25.3	more than 10	2000	8.6
8C						0.417	10.6	108(160)				8.2
10C						0.469	11.9	124(185)				7.5
12C						0.528	13.4	151(225)				7.2
16C						0.512	13.0	161(240)				6.1
20C						0.575	14.6	205(305)				5.7
30C						0.740	18.8	326(485)				5.1
2C						0.299	7.6	54(80)				16
3C						0.315	8.0	64(95)				16
4C						0.343	8.7	77(115)				14
5C						0.374	9.5	94(140)				13
6C						0.406	10.3	108(160)				12
7C	17 (1.25mm ²)	112/0.12 (112/4.7mil)	1.5 (59mil)	0.106	2.70	0.441	11.2	128(190)	less than 15.2	more than 10	2000	11
8C						0.472	12.0	144(215)				11
10C						0.543	13.8	175(260)				10
12C						0.634	16.1	228(340)				9.8
16C						0.618	15.7	252(375)				8.4
20C						0.681	17.3	306(455)				7.8
2C						0.323	8.2	67(100)				21
3C						0.343	8.7	84(125)				21
4C	15 (2mm ²)	80/0.18 (80/7.1mil)	1.8 (71mil)	0.118	3.0	0.374	9.5	104(155)	less than 9.83	more than 10	2000	18
5C						0.406	10.3	124(185)				17
6C						0.445	11.3	148(220)				15
7C						0.480	12.2	171(255)				15

※3c or more has the [Y/G] earth cable of an equal size.
※The test of 2000V/5 minute besides the withstand voltage test on above mentioned UL standard and the CSA standard is applied.
※The size indicated within parenthesis in the above table, describes the appropriate size of Japanese domestic use.

> Allowable ampacity

- The allowable ampacity in this catalog is a recommended value at one in the air construction and the ambient temperature 30°C and in the case of use for Japanese equipment in the wiring.
- Allowable ampacity is calculated based on JCS0168.
- Please multiply the following adjustment factors by the ambient temperature.
- Please select the allowable ampacity value to much of usage.

●Adjustment factors(at ambient temperature)

Ambient temperature(°C)	30	40	50	60	70	80	90	100
Adjustment factors	1.00	0.93	0.86	0.77	0.68	0.58	0.45	0.26

> Movement characteristic

●2~8C

*) 1 Rotary bending	Bending	*) 2 U-shaped turn-back	90° bending	Twist		*) 3 Move bending
A	B	B	B	Straight C	Bending C	D

Examination's time:
S= More than 20 million times
A= More than 10 million times
B= More than 5 million times
C= More than 3 million times
D= More than 1 million times
E= More than 0.5 million times

- *) 1 It is C when overall diameter of the cable is 20mm or more, and D when overall diameter of the cable is 30mm or more.
- *) 2 Our original test showed that no case of wire breakage could be detected for TBF even after 10 million cycles.
- *) 3 When overall diameter of the cable is 20mm or less.

●More than 10C

*) 1 Rotary bending	Bending	U-shaped turn-back	90° bending	Twist		*) 3 Move bending
B	B	B	C	Straight C	Bending C	E

※The longevity of the cable inside a drag chain is dependent on the travel distance.
Please consult our Sales Department when wiring a travel distance of 5m or greater.

> Oil resistance

Insulating oil	Lubricating oil	Cutting oil I	Cutting oil II	Hydraulic oil	Grease
A	A	B	B	B	B

※A~C in the table indicate the characteristics below.

- A:There is no problem on practical use at all.
B:Deterioration slightly no problem almost on practical use.
C:It is sometimes deteriorated to some degree, and not possible to use it.

> Standard sales length

Please contact us (sales rap).