CTIL

Coleman Wires & Cables

SPECIALITYCABLE

Contents

EXPLANATION FOR ORDERING AND TYPE SELECTION

Explanation for ordering and type selection

1. When ordering, please give the type and specification according to the catalogue. If additional requirements are needed, please give the explanation. Our technicians shall provide service for you in time to explain any unclear items.

2. The standard manufacturing length for all the cable and wire products is 1000m, length allowance is not more than ± 0.5%. if fixed-length products required, please give a note in the contract or agreement. The allowance for non-fixed length products not more than ± 3%. But for fixed-length products, only positive value be adopted.

3. Due to limited space, the products described here are of representative specification. We can also supply the other types (different structure, material and property) and specification (number of core, pair, bank and nominal cross-section).

4. The unlisted products can be designed and manufactured according to the requirement of the clients.

5. The products are supplied by cable drum which have two kinds, wooden one and iron-wooden one. The outer package adopts plastic tapes and bamboo curtain to seal. The package for export products adopts special wooden drum, and sealed by nails. For the cable with small outer-diameter and short length, they can be packed in circle and wrapped by composite plastic tape.

6. After ordering and choosing the types, please pay attention to the color of insulation and sheath, sheath marked, product package and storage, the outer diameter and weight , which should be matched with the bridge, joint, and connection box . You'd better to consider these in advance, and give notes in the contract or agreement.

7. Cables in this category of cannot be manufactured locally, may be produced from our technical partners in line with the customers requirement and prevailing international standard.

British and American cable guage contrast list

Guage	Diameter mm		AWG Cross section mm^2	Guage	Diameter mm		AWG Cross section mm^2
	AWG	SWG			AWG	SWG	
0000000	-	12.70	-	23	0.5733	0.6069	0.258
000000	-	1.79	-	24	0.5106	0.5588	0.205
00000	-	10.97	-	25	0.4547	0.5080	0.162
0000	11.68	10.16	107.15	26	0.4049	0.4572	0.129
000	10.40	9.449	84.95	27	0.3606	0.4166	0.102
00	9.266	8.839	67.43	28	0.3211	0.3759	0.081
0	8.252	8.230	53.48	29	0.2859	0.3454	0.064
1	7.348	7.620	42.41	30	0.2548	0.3353	0.052
2	6.544	7.010	33.63	31	0.2268	0.2946	0.040
3	5.827	6.401	26.67	32	0.2019	0.2743	0.032
4	5.189	5.893	21.15	33	0.1798	0.2540	0.025
5	4.621	5.385	16.77	34	0.1601	0.2237	0.020
6	4.115	4.877	13.30	35	0.1426	0.2134	0.016
7	3.665	4.470	10.55	36	0.1270	0.1930	0.013
8	3.262	4.064	8.36	37	0.1131	0.1727	0.010
9	2.906	3.658	6.63	38	0.1007	0.1524	0.008
10	2.588	3.521	5.26	39	0.08969	0.1321	0.0063
11	2.305	2.946	4.17	40	0.07985	0.1219	0.0050
12	2.053	2.642	3.31	41	0.07112	0.1118	0.0040
13	1.828	2.337	2.62	42	0.06335	0.1016	0.0032
14	1.628	2.032	2.08	43	0.05641	0.09144	0.0025
15	1.450	1.829	1.65	44	0.05024	0.08128	0.0020
16	1.291	1.626	1.31	45	0.04473	0.07112	0.0016
17	1.150	1.422	1.04	46	0.03984	0.06096	0.0012
18	1.024	1.219	0.82	47	0.03547	0.05080	0.0010
19	0.9116	1.019	0.65	48	0.03159	0.04064	0.00078
20	0.8118	0.9144	0.52	49	0.02813	0.03048	0.00062
21	0.7229	0.8123	0.41	50	0.02505	0.02540	0.00049
22	0.6439	0.7112	0.33				

Conversion table of common units of length

	km	m	mm	mile	Yd	ft	in	mil	nm
km	1	1000		0.62138	1093. 6	3280.83			0.5399
m		1	1000		1.0936	3.2808	39.37		
mm			1	1	1760		0.03937	39.37	
mile	1.60935				1	3			
Yd		0.9144			0.3333	1			
ft		0.3048					12		
in			25.4				1	1000	
mil			0.0254				0.001	1	
nm	1.852								1

Introduction of cable structure (for reference)

Our company is specialized in producing control, instrument, computer cable, conductors and cable in thermocouple compensation, oil pump, shipboard cable and below 35k V plastic power cable, such more than ten series cable and wires. The main material of conductor is copper, aluminium and alloy; main material of insulation and sheath is rubber and plastic, including silicon rubber, fluorin plastic, elastomers. The structure of cable includes different kinds of shields and screen to satisfy the different requirements. The following introduction is a brief statement of the common material, structure and characteristics of control, instrument, computer, low voltage power cable, just for reference. For the special properties, we like to discuss with the clients.

Conductor:

Besides alloy thread used for conductor in thermocouple compensation, copper is commonly used as conductor material. Generally, single strand, seven strands (Class B, bigger cross section is more than 7 strands), multiple strands (Class R), and multiple conductors are in accordance with IEC60228 and are separated into Class 5 and Class 6. Cable of Class 6 are the softest with most threads. To enhance the capability of antioxidation, anti-cauterization and high temperature resistance, then tinned, silver-gilt and nickel-plated copper are usually adopted. Tinned copper can endure the temperature of 150^{0}C, for silver-gilt 200^{0}C and for nickel plated 260^{0}C. if increase by another 50^{0}C, it can guarantee long-term use without oxidation. The tinned and silver-gilt copper conductor have good weldable property, and silver-gilt conductor also has characteristic of low contact resistance.

Insulation :

Commonly used materials are as PVC, PE, XLPE, PP, EPR, silicon rubber and fluorin plastic, etc, which have good electric, physical property and aging resistant property. The insulated material should be chosen according to the places. PVC is a typical insulated material, mostly used for control and low voltage cable. The commonly used PVC has certain flame-retardant characteristic. Though altering its characteristics, PVC can be enhanced its characteristics of flame-retardant and low smoke and low halogen. It can bear the temperature of 105^{0}C. PE is a commonly used insulated material, has higher volume resistivity and dielectric intensity, lower dielectric constant and medium wasting coefficient. It's an ideal insulated material for computer and instrument cable. XPLE has the similar electric characteristic with PE, but has higher operating and short circuit resistant temperature. The operating temperature can reach 90^{0}C (irradiative cross-link 125^{0}C); short circuit temperature can reach 250^{0}C/5S. After cross-linked, its physical characteristics can be enhanced. EPR has good electric characteristic, and can bear the temperature of 90^{0}C. Silicon rubber and fluoroplastic (F46) are typical high temperature resistant material. They can work at -80^{0}C 200^{0}C for long time. The PFA in fluoroplastic can work -80^{0}C - 260^{0}C for long time. Besides high temperature resistant characteristic, silicon rubber has good property of softness, fluoroplastic has characterisitic of anticauterization.

Sheath:

Commonly used materials are as PVC, PE, PCP, NBR, silicon rubber, fluoroplastic, which have good physical, electric, aging resistant, anti-cauterization, waterproof properties. PVC is a typical sheath material with balance characteristics and low cost. PE has good properties of aging resistant and waterproof. PE with flame retardant ingredient, can be processed to become low smoke and halogen-free flame-retardant materials.

Shield:

Normally used three types of shield, that is copper wire or tinned copper wire braiding shield, copper tape or copper-plastic composite tape wrapped shield and aluminium-plastic composite tape wrapped shield, which are all with the ideal shielded structure, generally can meet the needs of the control, computer instrument cable, suitable for using in the different sites with its specialties. The copper wire braiding shield is flexible and suitable for using the movable sites. The copper tape wrapped shield is a bit of stiff with higher coverage percentage, suitable for using in the fixed laying sites. The aluminium-plastic tape wrapped shield has smaller outer diameter, lighter weight and lower cost, the composite structure can also be used. The cable of multiple groups can be divided into general shield, sub shield, sub plus general shield. In order to reinforce the magnetic screen property, steel wire or steel tape wrapped layer can be added. When selecting the shield type, it should be considered for the electromagnetic interference, cable laying conditions, the transmission signal characteristics in the cable and interference conditions mutually.

Armor:

The galvanized steel wire wrapped or galvanized steel tape winding is often used. It should be used the braiding steel wire or steel tape (or aluminium tape) interlocked armour, in which a bedding is extruded in order to prevent from damage of the steel wire (tape) and core.

Color Mark of the Insulation Core and Sheath Printing Mark:

Insulation cores of the multiple-core control cable are identified by the marked number, with a yellow/green core sometimes. For the multiple-pair computer cable, it is used, the two colors of cores: white and red; for three cores, it is white, red and black. Each group can use other different colors wrapped with numbered binder tape to distinguish from other group, or different colors to identify the cores and groups. Color circle is used for identifying the cable according to DIN, VDE standards. For low-voltage power cable, color is used to identify, 2core: red and blue, 3-core: red, yellow and green, 4-core: red, yellow, green and blue, 5-core: red, yellow, green, black, and blue. According to the China National Standard, the number mark can also be used, 4-core and 5-core, one core marked with “0”. For the compensition wire, there are strict specifications in the standards. This catalogue gives the color mark of the insulation and sheath stipulated in China National Standard, which is different from the specifications in IEC and the foreign standard. Generally the sheath color is black, for the compensation wire, precision grade is grey, high-temperature grade is yellow, intrinsically safe cable is blue. The sheath color can be any different color according to the needs. The sheath mark should include the manufacturer's name, type and specification, the number of meter, also can be marked according to the customer's requirements.

Characteristics and Application Sites of Cables with Different Armours

Characteristics and application / Armor type	Characteristics		Application								
	Resist transverse stress	Resist longitudinal stress	Bury	Cable channel	Tube	Tunnel	Bridge	Aerial	Silo	Under water	Indoor
Steel tapes wrapped armor	G	P	●	●							
Steel wire winding armor	G	E	●	●	●	●			●	●	●
Steel wire braided armor	P	E – G			●	●		●	●	●	●
Steel tapes interlocked armor	E	F	●	●							
A1 or A1 alloy tapes interlocked armor	E – G	F	●	●							
A1 tube	E – G	G	●	●							
A1 tube + 2-layer steel tapes wrapped armor	E	F	●	●							
No armor	F - P	F - P			●	●	●	●			●

E – OK G – Good F— Normal P –Badness
● Apply Blank – unapply Spase shall be other comment

Code and Meaning

Item	Meaning
Flame – Retardant characteristic	Non-flame –retardant can be omitted
	Common flame- retardant (commonly means Class C flame –retardant)
	Zero halogen, low smoke flame- Retardant (commonly means - Class C flame-retardant)
	Halogen-free low smoke flame- Retardant (commonly means Class B or upwards flame retardant)
Series code	Computer instrumental cable
Insulation Material	(YJ)PE or flame – retardant PE (YJ-XLPE)
	PP
	Flouro-plastic
	Silicon rubber
	Halogen-free low smoke flame-retardant
Sheathed Material	Climate-corrosion resist ance PE or flame- retardant PE
	PVC, flame-retardant PVC or low halogen, low smoke flame retardant PVC
	Flouro-plastic
	Halogen-free low smoke flame-retardant
	Silicon rubber
Shield Material	Cu wire braid
	Tinned copper braid
	Copper-mylar laminate or Cu tape
	Aluminum –mylar laminate tape
Armour Material	Interlocked steel tapes armour, PVC sheath
	Interlocked steel tapes armour, PE sheath
	2-layer steel tapes wrapped armour, PVC sheath
	2- layer steel tapes wrapped armour, PE sheath
	Steel wire armour, PVC sheath
	Steel wire armour, PE sheath
	Steel wire braid armor, PVC sheath
	Steel wire braid armor, PE sheath
	Interlocked A1 tape or A1 alloy tape armour, PVC sheath