

 <b>CnC Tech</b> Industrial Cable and Connector Technology			
<b>Standard name</b>	MW28C		
<b>Standard number</b>	<b>CX14061701</b>		
<b>Date of publish</b>	<b>06/17/2014</b>		
<b>Date of Revision</b>			
<b>Approved</b>			
<b>Publish</b>	<b>Approval</b>	<b>Examination</b>	<b>Issue</b>
	万永红	刘明胜	黄平

## Revision form

TYPE: MW28C

CODE: CX14061701

DATE	REVISION ITEM
2014.06.17	New publishing

## 1. Scope

This Standard specifies thermal class 155°C MW28C enameled copper wires to be used in windings and wirings of electric machines and apparatus, electric Communication equipment, electronic equipment and electrical instruments.

## 2. Classes and Symbols

The wires are classified according to the conductor and thickness of film, and the classes and symbols be as Table 1.

Table 1

Class	Symbol
Class Heavy film polyurethane enameled copper wire	MW28C HY
Class Single film polyurethane enameled copper wire	MW28C SL

## 3. Thermal Class

TI: 155°C

## 4. Characteristics

The characteristics of the wires shall comply with Table 2, when tested in accordance with 6.

Table 2

Test items	Characteristics		Test Method			
			Test requirements		Clause	
Dimensions	Comply with Attached Table4		—		6	
Pinhole	Heavy Class	Single Class	L=5M			
	3Max	5Max				
Flexibility	The coating shall show no crack on the conductor		AWG Size	Elongation	Mandrel Winding	6 3
			14~20	20%	3d	
			21~30	15%	1d	
			31~44	20% (Or to its breaking point, Whichever is less)	3d	
Adhesion	No cracks visible in the film such as to expose the conductor		—		6	
Abrasion	Comply with Attached Table		—		6	
Breakdown Voltage	Comply with Attached Table4		—		6	
Cut through	Not cut through at 170°C, 2min		—		6	

Continuous Table 2

Test items	Characteristics	Test Methods			Clause Used
		Test requirements			
Heat shock resistance	No cracks visible in the film such as to expose the conductor	AWG Size	Elongation	Mandrel Winding	6.8
		14~30	20%	3d	
		31~44	20% (Or to its breaking point, whichever is less)	3d	
		The specimen shall be heated to $175\pm 5^{\circ}\text{C}$ in 3d for half an hour			
Solvent resistance	No bubbles or blisters visible in the film, with nail or 2H, film shall not be peeled off to expose the conductor	Pencil method			6.9
Solder-ability	To be soldered uniformly without dross	AWG Size	Solder Temperature $^{\circ}\text{C}$	Soakage Time	6.10
		14~19	430 $^{\circ}\text{C}$	10S	
		20~23	430 $^{\circ}\text{C}$	8S	
		24~29	360 $^{\circ}\text{C}$	6S	
		30~36	360 $^{\circ}\text{C}$	5S	
		37~44	360 $^{\circ}\text{C}$	4S	
Conductor Resistance	Comply with Attached Table4	—			6.11
Elongation	Comply with Attached Table4	—			6.12



## 5. Conductor, Insulating Film and Appearance

### 5.1 Conductor

The conductor for class-2 shall be copper wire specified in JISC 3103-Annealed Copper Wires for Windings of Electric Machines.

### 5.2 Insulating Film

The insulating film of the wire shall be made by baking polyurethane and over coated with polyamide insulating varnish for enameled wires on the conductor uniformly. The film shall be harmless to the conductor and shall have sufficient durability.

### 5.3 Appearance

No scratches, to be smooth surface and uniform luster and hue, not sticky, not to be readily scratched off by fingernail Testing Methods. The wire shall be wind the bobbin, no cracks and dirt visible on appearance.

## 6. Test methods

### 6.1 Dimensions

This shall comply with 3.2.1.1 of NEMA.MW-1000

### 6.2 Pinhole

This shall comply with 6.1 of JISC 3003

### 6.3 Flexibility

This shall comply with 3.3.1.1 of NEMA.MW-1000

### 6.4 Adhesion

This shall comply with 3.3.1.1 of NEMA.MW-1000

### 6.5 Resistance to abrasion

This shall comply with 3.59.1.1 of NEMA.MW-1000

### 6.6 Breakdown Voltage

This shall comply with 3.8.1.1.2 of NEMA.MW-1000

### 6.7 Resistance to out through

This shall comply with 3.50.1.1 of NEMA.MW-1000



#### 6.8 Heat shock resistance

This shall comply with 3.51.1 of NEMA.MW-1000

#### 6.9 Solvent resistance

This shall comply with 3.51.1.1 of NEMA.MW1000

#### 6.10 Solder-ability

This shall comply with 3.13.1.1 of NEMA.MW1000

#### 6.11 Conductor resistance

This shall comply with NEMA.MW1000

#### 6.12 Elongation

This shall comply with 3.4.1.1 of NEMA.MW1000

### 7. Inspection

Inspection shall be made on the following items by the testing methods of 7

- (1) Appearance
- (2) Dimensions
- (3) Pinhole
- (4) Flexibility
- (5) Adhesion
- (6) Resistance to abrasion
- (7) Breakdown voltage
- (8) Cut through
- (9) Heat shock resistance
- (10) Solvent resistance
- (11) Solder ability
- (12) Conductor resistance
- (13) Elongation

### 8. Packing and Net Weight per coil

#### 8.1 Packing

The wire shall be wound, without slackness or tangle, on a bobbin of suitable size according to the conductor diameter (comply with table 3).



## 8.2 Net Weight per Coil

The net weight per coil shall comply with Table3.

Table 3

Conductor diameter (mm)	Bobbin type	Net weight Per coil (kg)
0.160~0.051 (34#~44#)	PT-4	4+2.0 -3.0
0.361~0.180 (27#~33#)	PT-10	10+2.0 -4.8
0.511~0.404 (24#~26#)	PT-15	15+6.0 -5.0
1.628~0.574 (14#~23#)	PT-25	25+8 -3





## 9. Designation of Product

The product shall be designated by the class and conductor diameter, or by the symbol and conductor diameter.

Example: (1) Class Heavy MW28C enameled copper wire 0.160(AWG34#) mm color of nature or MW28C HY AWG34#

(2) Class Heavy MW28C enameled copper wire 0.160(AWG34#) mm color of red or MW28C HY AWG34#R

## 10. Marking

The bobbin or container shall be marked at a suitable place with the following items:

- (1) Class or symbol
- (2) Conductor diameter (3) Manufacturing Number (4) Net weight
- (5) Year and month of manufacturing

## 11. Magnet Wire Test Report

Test report is must when make lot.

## 12. Keep method and valid time

### 12.1 Keep method

- (1) Pulling down is not allowed
- (2) Beware of collision and fall
- (3) Put the goods in dry environment, wet degree: 40%~75%

### 12.2 Valid time

Valid for two years

### 13. Manufactory

EVERSHINE HARDWARE PRODUCTS Co., Ltd FOR CNC TECH, LLC

**Table 4 MW-28C SL**

AWG Size	Diameter (mm)	Conductor Tolerance (mm)	Minimum Film thickness (mm)	Maximum Overall Diam. (mm)	Minimum Dielectric Breakdown Voltage (v)	Minimum Elongation (%)	Maximum Conductor Resistance 20°C (Ω/KM)	Unit weight in meters (m/kg)
10#	2.588	+0.021/-0.025	0.043	2.660	-	35	3.342	21.4
11#	2.304	+0.018/-0.023	0.043	2.373	-	35	4.219	27.0
12#	2.052	+0.017/-0.020	0.041	2.117	-	34	5.316	34.0
13#	1.829	+0.014/-0.018	0.041	1.892	-	34	6.693	42.8
14#	1.628	+0.015/-0.015	0.041	1.692	3170	33	8.437	54.0
15#	1.450	+0.016/-0.015	0.038	1.509	3090	33	10.66	68.1
16#	1.250	+0.013/-0.012	0.036	1.330	3010	33	14.30	86.1
17#	1.160	+0.012/-0.013	0.036	1.240	2930	31	16.60	108.1
18#	1.000	+0.010/-0.011	0.033	1.070	2850	32	22.40	136.6
19#	0.900	+0.010/-0.010	0.030	0.960	2780	31	27.50	172.2
20#	0.800	+0.007/-0.008	0.030	0.860	2710	30	34.80	216.7
21#	0.720	+0.008/-0.008	0.028	0.780	2640	30	43.00	273.2
22#	0.640	+0.007/-0.008	0.028	0.690	2570	29	54.5	346.4
23#	0.570	+0.005/-0.005	0.025	0.620	2500	29	68.70	434.7
24#	0.510	+0.005/-0.006	0.025	0.560	2440	28	85.90	548.5
25#	0.440	+0.005/-0.005	0.023	0.490	2370	28	115.0	691.8
26#	0.410	+0.005/-0.005	0.023	0.450	2310	27	133.0	877.5
27#	0.350	+0.002/-0.003	0.020	0.390	2250	27	182.0	1099.0
28#	0.330	+0.003/-0.002	0.020	0.370	2200	26	205.0	1398.6
29#	0.290	+0.003/-0.003	0.018	0.330	2140	26	265.0	1738.8
30#	0.250	+0.003/-0.003	0.018	0.275	2140	25	357.0	2219.9
31#	0.230	+0.003/-0.002	0.015	0.255	1840	24	422.0	2804.1
32#	0.210	+0.003/-0.002	0.013	0.235	1840	24	506.4	3475.5
33#	0.180	+0.003/-0.002	0.013	0.200	1530	23	689.0	4420.4
34#	0.160	+0.003/-0.003	0.013	0.180	1530	22	872.0	5594.6
35#	0.140	+0.003/-0.002	0.010	0.160	1220	21	1137	7102.8
36#	0.130	+0.003/-0.003	0.010	0.150	1220	20	1322	8879.8
37#	0.120	+0.003/-0.002	0.008	0.140	1220	20	1551	11020.4
38#	0.100	+0.002/-0.003	0.008	0.120	450	19	2237	13766.0
39#	0.090	+0.002/-0.003	0.005	0.105	450	18	2758	18081.2
40#	0.080	+0.002/-0.003	0.005	0.095	375	17	3487	22948.5
41#	0.070	+0.003/-0.002	0.005	0.085	375	17	4556	28411.3
42#	0.060	+0.002/-0.003	0.005	0.075	350	16	6198	34966.2
43#	0.056	+0.002/-0.003	0.005	0.066	300	15	7815	45670.1
44#	0.051	+0.002/-0.003	0.005	0.061	275	14	9529	55064.0
45#	0.0447	+0.003/-0.003	0.0051	0.0559	250	11	11495	71679.2
46#	0.0399	+0.003/-0.003	0.0051	0.0508	225	10	16122	89962.7

