

# Class 180 Polyester Glass Fiber Covered High-Temperature Round Copper Magnet Wire

## 1. Specifications

Insulation materials	Polyester Glass Fiber Film(Organic Varnish Treated)
Thermal Class	180
Conductor	Copper
Insulation thickness	Single/Heavy
Certificate	MW-51C



## 2. Wire Types

- Class 180 Polyester Glass Fiber Covered High-Temperature Organic Varnish Treated Bare Round Copper Magnet Wire
- Class 180 Polyester Glass Fiber Covered High-Temperature Organic Varnish Treated Film-Insulated Round Copper Magnet Wire
- Class 180 Polyester Glass Fiber Covered Bare Round Copper Magnet Wire
- Class 180 Polyester Glass Fiber Covered Film-Insulated Round Copper Magnet Wire
- Class 180 Polyester Glass Fiber Covered High-Temperature Round Copper Magnet Wire

## 3. Dimensions

**Table1** (mm) Dimensions for Single Polyester Glass Fiber Covered Round Bare Single Film-Coated and Heavy Film-Coated Wire

AWG Size	Bare Wire Diameter			Minimum Increase, Single Polyester Glass Fiber Covering	Maximum Overall Diameter, Single Polyester Glass Fiber Covered			AWG Size
	Minimum	Nominal	Maximum		Bare	Single Film	Heavy Film	
4/0	11.567	11.684	11.801	0.102	11.928	–	–	4/0
3/0	10.300	10.404	10.508	0.102	10.635	–	–	3/0
2/0	9.174	9.266	9.357	0.102	9.484	–	–	2/0
1/0	8.171	8.252	8.334	0.102	8.461	–	–	1/0
1	7.275	7.348	7.422	0.102	7.549	–	–	1
2	6.477	6.543	6.609	0.102	6.736	–	–	2
3	5.768	5.827	5.885	0.102	6.012	–	–	3
4	5.138	5.189	5.240	0.102	5.392	–	5.481	4
5	4.575	4.620	4.666	0.102	4.818	–	4.907	5
6	4.074	4.115	4.155	0.102	4.308	–	4.397	6



7	3.630	3.665	3.701	0.102	3.853	-	3.940	7
8	3.231	3.264	3.297	0.102	3.449	-	3.536	8
9	2.878	2.906	2.934	0.102	3.086	-	3.172	9
10	2.563	2.588	2.614	0.089	2.741	-	2.822	10
11	2.281	2.304	2.327	0.089	2.454	-	2.535	11
12	2.032	2.052	2.073	0.089	2.200	-	2.278	12
13	1.811	1.829	1.847	0.089	1.974	-	2.050	13
14	1.613	1.628	1.643	0.089	1.770	1.819	1.859	14
15	1.435	1.450	1.466	0.089	1.593	1.639	1.674	15
16	1.278	1.290	1.303	0.089	1.430	1.476	1.511	16
17	1.138	1.151	1.163	0.089	1.290	1.334	1.367	17
18	1.013	1.024	1.034	0.089	1.161	1.204	1.237	18
19	0.902	0.912	0.922	0.089	1.049	1.090	1.120	19
20	0.805	0.813	0.820	0.089	0.947	0.988	1.019	20
21	0.716	0.724	0.731	0.089	0.859	0.897	0.925	21
22	0.635	0.643	0.650	0.089	0.777	0.813	0.841	22
23	0.569	0.574	0.579	0.089	0.706	0.744	0.770	23
24	0.505	0.511	0.516	0.064	0.643	0.678	0.704	24
25	0.450	0.455	0.460	0.064	0.587	0.620	0.643	25
26	0.399	0.404	0.409	0.064	0.536	0.566	0.589	26
27	0.358	0.361	0.363	0.064	0.490	0.523	0.544	27
28	0.318	0.320	0.323	0.064	0.450	0.483	0.500	28
29	0.284	0.287	0.290	0.064	0.417	0.447	0.465	29
30	0.251	0.254	0.257	0.064	0.384	0.411	0.429	30

**Table2** (mm) Dimensions for Double Polyester Glass Fiber Covered Round Bare Single Film-Coated and Heavy Film-Coated Wire

AWG Size	Bare Wire Diameter			Minimum Increase, Double Polyester Glass Fiber Covering	Maximum Overall Diameter, Double Polyester Glass Fiber Covered			AWG Size
	Minimum	Nominal	Maximum		Bare	Single Film	Heavy Film	
4/0	11.567	11.684	11.801	0.152	12.029	-	-	4/0
3/0	10.300	10.404	10.508	0.152	10.737	-	-	3/0
2/0	9.174	9.266	9.357	0.152	9.586	-	-	2/0
1/0	8.171	8.252	8.334	0.152	8.562	-	-	1/0
1	7.275	7.348	7.422	0.152	7.650	-	-	1
2	6.477	6.543	6.609	0.152	6.838	-	-	2
3	5.768	5.827	5.885	0.152	6.114	-	-	3
4	5.138	5.189	5.240	0.152	5.469	-	5.558	4
5	4.575	4.620	4.666	0.152	4.895	-	4.983	5
6	4.074	4.115	4.155	0.152	4.384	-	4.473	6
7	3.630	3.665	3.701	0.152	3.929	-	4.016	7



8	3.231	3.264	3.297	0.152	3.526	–	3.612	8
9	2.878	2.906	2.934	0.152	3.162	–	3.249	9
10	2.563	2.588	2.614	0.140	2.817	–	2.898	10
11	2.281	2.304	2.327	0.140	2.530	–	2.611	11
12	2.032	2.052	2.073	0.140	2.276	–	2.355	12
13	1.811	1.829	1.847	0.140	2.050	–	2.126	13
14	1.613	1.628	1.643	0.140	1.847	1.895	1.935	14
15	1.435	1.450	1.466	0.140	1.669	1.712	1.750	15
16	1.278	1.290	1.303	0.140	1.506	1.552	1.558	16
17	1.138	1.151	1.163	0.140	1.367	1.410	1.443	17
18	1.013	1.024	1.034	0.140	1.237	1.280	1.313	18
19	0.902	0.912	0.922	0.140	1.125	1.166	1.196	19
20	0.805	0.813	0.820	0.140	1.024	1.064	1.095	20
21	0.716	0.724	0.731	0.140	0.935	0.973	1.001	21
22	0.635	0.643	0.650	0.140	0.853	0.889	0.917	22
23	0.569	0.574	0.579	0.140	0.782	0.820	0.846	23
24	0.505	0.511	0.516	0.114	0.681	0.716	0.742	24
25	0.450	0.455	0.460	0.114	0.625	0.658	0.681	25
26	0.399	0.404	0.409	0.114	0.574	0.605	0.627	26
27	0.358	0.361	0.363	0.114	0.528	0.561	0.582	27
28	0.318	0.320	0.323	0.114	0.488	0.521	0.538	28
29	0.284	0.287	0.290	0.114	0.455	0.485	0.503	29
30	0.251	0.254	0.257	0.114	0.422	0.450	0.467	30

#### 4. General Requirements

Properties	Requirement
DIMENSIONS	Single 4-30 AWG in accordance with <b>Table1</b> Double 4-30 AWG in accordance with <b>Table2</b>
ADHERENCE AND FLEXIBILITY	Covering shall not open sufficiently to expose the bare or film-insulated wire after bending on mandrel sizes as <b>Table3</b>
ELONGATION	Not less than the values in <b>Table4</b>
SPRINGBACK	4-13 AWG polyester glass fiber covered bare: not greater than 5° 4-13 AWG polyester glass fiber covered film-insulated: not greater than 5.5°
DIELECTRIC BREAKDOWN	Not less than the value in the <b>Table5</b> *For polyester glass fiber covered wire having underlying film insulation, add the minimum breakdown voltage given in Part 3 for the film-insulated wire.

**Table3**

AWG Size	Mandrel Diameter
4-9.5	10d
10-30	5d

**Table4** Minimum Dielectric Breakdown Voltage—Twisted Pair Method

AWG Size	Single Build or Type 1		Heavy Build or Type 2		Triple Build or Type 3		Quad Build		
	Standard	Polyamide Topcoat	Standard	Polyamide Topcoat	Standard	Polyamide Topcoat	Standard	Polyamide Topcoat	MW 16-C Quad
8	3740*	—	7000*	—	—	—	—	—	—
8.5	3740*	—	6800*	—	—	—	—	—	—
9	3740*	—	6800*	—	—	—	—	—	—
9.5	3740*	—	6800*	—	—	—	—	—	—
10	3740	—	6800	6120	—	—	—	—	—
10.5	3740	—	6600	5940	—	—	—	—	—
11	3740	—	6600	5940	—	—	—	—	—
11.5	3520	—	6600	5940	—	—	—	—	—
12	3520	—	6400	5760	—	—	—	—	—
12.5	3520	—	6400	5760	—	—	—	—	—
13	3520	—	6400	5760	—	—	—	—	—
13.5	3520	—	6400	5760	—	—	—	—	—
14	3520	3170	6330	5690	8450	7600	11000	9900	8840
14.5	3470	3130	6240	5620	8340	7510	10860	9770	8750
15	3430	3090	6160	5550	8230	7410	10720	9650	8660
15.5	3380	3050	6080	5470	8120	7310	10580	9520	8560
16	3340	3010	6000	5400	8020	7220	10440	9400	8470
16.5	3300	2970	5930	5330	7910	7120	10310	9280	8280
17	3250	2930	5850	5260	7810	7030	10170	9150	8290
17.5	3210	2890	5770	5200	7710	6940	10040	9040	8190
18	3170	2850	5700	5130	7610	6850	9910	8920	8100
18.5	3130	2820	5620	5060	7510	6760	9780	8800	8010
19	3090	2780	5550	4990	7410	6670	9650	8690	7920
19.5	3050	2740	5480	4930	7320	6580	9530	8570	7820
20	3010	2710	5410	4870	7220	6500	9400	8460	7730
20.5	2970	2670	5340	4800	7130	6410	9280	8350	7640
21	2930	2640	5270	4740	7030	6330	9160	8240	7550
21.5	2890	2600	5200	4680	6940	6250	9040	8140	7450
22	2850	2570	5130	4620	6850	6170	8920	8030	7360
22.5	2820	2540	5060	4560	6760	6090	8810	7930	7270

23	2780	2500	5000	4500	6670	6010	8690	7820	7180
23.5	2740	2470	4930	4440	6590	5930	8580	7720	7080
24	2710	2440	4870	4380	6500	5850	8470	7620	6990
24.5	2670	2410	4810	4320	6420	5780	8360	7520	6900
25	2640	2370	4740	4270	6330	5700	8250	7420	6810
25.5	2600	2340	4680	4210	6250	5630	8140	7330	6710
26	2570	2310	4620	4160	6170	5550	8040	7230	6620
26.5	2540	2280	4560	4100	6090	5480	7930	7140	6530
27	2500	2250	4500	4050	6010	5410	7830	7040	6440
27.5	2470	2220	4440	4000	5930	5340	7730	6950	6340
28	2440	2200	4380	3950	5860	5270	7630	6860	6250
28.5	2410	2170	4330	3890	5780	5200	7530	6770	6160
29	2380	2140	4270	3840	5700	5130	7430	6690	6070
29.5	2380	2140	4220	3800	5640	5080	7340	6600	5970
30	2380	2140	4220	3800	5640	5080	7340	6600	5880
31	2040	1840	3900	3510	5080	4570	6770	6100	—
32	2040	1840	3570	3210	4800	4320	6210	5590	—
33	1700	1530	3250	2920	4230	3810	5640	5080	—
34	1700	1530	2920	2630	3950	3560	5360	4830	—
35	1360	1220	2920	2630	3670	3300	4800	4320	—
36	1360	1220	2600	2340	3390	3050	4520	4060	—
37	1360	1220	2270	2050	3100	2790	3950	3560	—

**Table5**

AWG Size	Mandrel Diameter		Minimum Breakdown, Volts*	
	Inches	mm	Single	Double
4-9.5	—	—	150	270
10-23.5	1.00	25.4	360	540
24-30	0.25	6.3	225	400

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