Class 180 Glass Fiber Covered High-Temperature Square Copper Magnet Wire

1. Specifications

Insulation materials	Glass Fiber Film(Organic Varnish Treated)
Thermal Class	180
Conductor	Copper
Insulation thickness	Single/Heavy
Certificate	MW-52C

2. Wire Types

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

3.Dimensions

Table1 Dimensions of Square Bare Wire

AWG	Minimum	Nominal	Maximum	Nominal Corner Radius ±25%
1/0	8.171	8.252	8.334	1.00
1	7.275	7.348	7.422	1.00
2	6.477	6.543	6.609	1.00
3	5.768	5.827	5.885	1.00
4	5.138	5.189	5.240	1.00
5	4.575	4.620	4.666	1.00
6	4.074	4.115	4.155	0.80
7	3.630	3.665	3.701	0.80
8	3.231	3.264	3.297	0.80

9	2.878	2.906	2.934	0.67
10	2.563	2.588	2.614	0.67
11	2.278	2.304	2.329	0.50
12	2.027	2.052	2.078	0.50
13	1.803	1.829	1.854	0.40
14	1.603	1.628	1.654	0.40

Table2 (mm) Heavy and Quad Film-Insulated Square Magnet Wire Increase in Dimensions Due to Film Coating

Square AWG Size	Bare Wire Dimensions			Radii (±25%) Nominal	Heavy		Quadruple	
	Minimum	Nominal	Maximum		Minimum Increase	Maximum Overall	Minimum Increase	Maximum Overall
1	7.275	7.348	7.422	1.00	0.080	7.549	0.127	7.600
2	6.477	6.543	6.609	1.00	0.080	6.736	0.127	6.787
3	5.768	5.827	5.885	1.00	0.080	6.012	0.127	6.063
4	5.138	5.189	5.240	1.00	0.080	5.367	0.127	5.418
5	4.575	4.620	4.666	1.00	0.080	4.793	0.127	4.844
6	4.074	4.115	4.155	0.80	0.080	4.282	0.127	4.333
7	3.630	3.665	3.701	0.80	0.080	3.828	0.127	3.879
8	3.231	3.264	3.297	0.80	0.080	3.424	0.127	3.475
9	2.878	2.906	2.934	0.67	0.080	3.061	0.127	3.112
10	2.563	2.588	2.614	0.67	0.080	2.741	0.127	2.791
11	2.278	2.304	2.329	0.50	0.080	2.456	0.127	2.507
12	2.027	2.052	2.078	0.50	0.080	2.205	0.127	2.256
13	1.803	1.829	1.854	0.40	0.080	1.981	0.127	2.032
14	1.603	1.628	1.654	0.40	0.080	1.781	0.127	1.831

Table3 (mm) Single Glass Fiber Covered, Heavy Film-Insulated Square Copper Magnet Wire-Minimum Increase and Maximum Overall Dimensions Due to Insulation

AWG Size	Bare Wire Dimensions			Radii (±25%) Nominal	Heavy Film-Coated Single Glass Covered	
	Minimum	Nominal	Maximum		Minimum Increase	Maximum Overall
1/0	8.171	8.252	8.334	1.00	0.279	8.738
1	7.275	7.348	7.422	1.00	0.254	7.798
2	6.477	6.543	6.609	1.00	0.254	6.985
3	5.768	5.827	5.885	1.00	0.254	6.274
4	5.138	5.189	5.240	1.00	0.254	5.613
5	4.575	4.620	4.666	1.00	0.229	5.029
6	4.074	4.115	4.155	0.80	0.229	4.521
7	3.630	3.665	3.701	0.80	0.229	4.039
8	3.231	3.264	3.297	0.80	0.229	3.632
9	2.878	2.906	2.934	0.67	0.229	3.277
10	2.563	2.588	2.614	0.67	0.229	2.946
11	2.278	2.304	2.329	0.50	0.203	2.642
12	2.027	2.052	2.078	0.50	0.203	2.388
13	1.803	1.829	1.854	0.40	0.203	2.159
14	1.603	1.628	1.654	0.40	0.203	1.956

Table4 (mm) Double Glass Fiber Covered, Bare or Heavy Film-Insulated Square Copper Magnet Wire-Minimum Increase and Maximum Overall Dimensions Due to Insulation

Square AWG Size	Bare Wire Dimensions			Nominal Radii ± 25%	Bare Double Glass Covered		Heavy Film-Insulated Double Glass Covered	
	Min	Nominal	Max		Minimum Increase	Maximum Overall	Minimum Increase*	Maximum Overall
	mm	mm	mm	mm	mm	mm	mm	mm
1/0	8.176	8.252	8.329	1.00	0.330	8.788	0.406	8.915
1	7.275	7.348	7.422	1.00	0.305	7.849	0.381	7.976
2	6.477	6.543	6.609	1.00	0.305	7.036	0.381	7.163
3	5.768	5.827	5.885	1.00	0.279	6.299	0.356	6.426
4	5.138	5.189	5.240	1.00	0.279	5.639	0.356	5.766
5	4.575	4.620	4.666	1.00	0.279	5.055	0.356	5.182
6	4.074	4.115	4.155	0.80	0.279	4.547	0.356	4.674
7	3.630	3.665	3.701	0.80	0.254	4.064	0.330	4.191
8	3.231	3.264	3.297	0.80	0.254	3.658	0.330	3.785
9	2.878	2.906	2.934	0.67	0.229	3.277	0.305	3.404
10	2.563	2.588	2.614	0.67	0.229	2.946	0.305	3.073
11	2.278	2.304	2.329	0.50	0.203	2.642	0.279	2.769
12	2.027	2.052	2.078	0.50	0.203	2.388	0.279	2.515
13	1.803	1.829	1.854	0.40	0.203	2.159	0.279	2.286
14	1.603	1.628	1.654	0.40	0.203	1.956	0.279	2.083

4.General Requirements

Properties	Requirement
DIMENSIONS	Square Wire: a) Radii in accordance with **Table1** b) Thickness and width tolerances in accordance with **Table2** c) Dimensions and increase in thickness in accordance with: Single: **Table3** Double: **Table4**
ADHERENCE AND FLEXIBILITY	Single or Double with underlying film: no cracks visible in the film insulation after 20% elongation. Examine with normal vision and without removing the glass fiber covering. Double without underlying film: not less than 75 V/mil (2950 V/mm) of minimum thickness of the polyester glass fiber covering on one side
ELONGATION	Not less than 32% for a thickness of 0.049 in. (1.25 mm) and greater, or 30% for a thickness of less than 0.049 in. (1.25 mm)
SPRINGBACK	Glass fiber covered bare: not greater than 5° Glass fiber covered Heavy film-insulated: not greater than 5.5°
DIELECTRIC BREAKDOWN	Not less than 90 V/mil (3543 V/mm) of the minimum thickness of the glass fiber covering on one side plus the minimum breakdown given in **Table5** for the film-insulated wire, if applicable NOTE—The minimum thickness of the glass fiber covering is 35% of the maximum increase in dimensions calculated from: Single: Square: **Table3** Double: Square without underlying film: **Table4**

Table5 Dielectric Breakdown, Film-Insulated Square Magnet Wire

Film Insulation	Minimum Breakdown Voltage	
	Any Three of Four Values	Fourth Value
Heavy	1500	500
Quad	2500	900

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