

HSM Wire International, Inc.

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Ultra Fine Copper Wire Sizes AWG 42.5 - 58 Chart (Inches)

Technical Details = inches for Copper Magnet Wire. All tolerances based on NEMA MW 1000. Based upon copper conductivity of 100% I.A.C.S. Actual values may be up to 102% I.A.C.S. The following information is intended for a guideline only, actual result may vary; please consider all data before implementing into any project.

AWG	Bare Copper					
	Diameter (Inches)			Resistance* (ohms/1,000ft)		
	MIN	NOM	MAX	MIN	NOM	MAX
42.5	.0023	.0024	.0025	1,659	1,800	1,960
43	.0021	.0022	.0024	1,960	2,142	2,351
43.5	.0020	.0021	.0022	2,142	2,351	2,592
44	.0019	.0020	.0021	2,351	2,592	2,872
44.5	.0018	.0019	.0020	2,592	2,872	3,200
45	.0017	.00176	.00183	3,080	3,348	3,616
46	.0015	.0016	.00164	3,870	4,207	4,544
47	.0014	.0014	.00146	4,868	5,291	5,714
48	.0012	.0012	.00129	6,205	6,745	7,285
49	.0011	.0011	.00116	7,744	8,417	9,090
50	.0010	.0010	.00103	9,734	10,580	11,430
51	.0009	.0009	.00092	12,320	13,390	14,460
52	.0008	.0008	.00081	15,690	17,050	18,410
53	.0007	.0007	.00073	19,480	21,170	22,860
54	.0006	.0006	.00065	24,820	26,980	29,140
55	.0005	.00055	.00057	31,540	34,280	37,020
56	.00047	.0005	.00051	39,730	43,190	46,650
57	.0004	.00042	.00045	49,735	54,060	58,385
58	.00036	.00039	.00040	62,570	68,011	73,452

AWG	Single Build				Heavy Build			
	Min. Increase (in)	Overall Diameter (inches)			Min. Increase (in)	Overall Diameter (inches)		
		MIN	NOM	MAX		MIN	NOM	MAX
42.5	.00020	.0025	.0026	.0028	.0004	.0027	.0029	.0031
43	.00020	.0023	.0024	.0026	.0004	.0025	.0027	.0029
43.5	.00010	.0021	.0023	.0025	.0004	.0024	.0026	.0028
44	.00010	.0020	.0022	.0024	.0004	.0023	.0025	.0027
44.5	.00010	.0019	.0021	.0023	.0004	.0022	.0024	.0026
45	.00010	.00179	.00192	.0021	.0003	.00199	.00215	.0023
46	.00010	.00161	.00173	.0019	.0003	.00181	.00196	.0021
47	.00010	.00145	.00158	.0017	.0003	.00165	.00178	.0019
48	.00010	.00129	.00140	.0015	.0002	.00139	.00155	.0017
49	.00010	.00117	.00124	.0013	.0002	.00127	.00139	.0015
50	.00010	.00105	.00113	.0012	.0002	.00115	.00128	.0014
51	.00010	.00095	.00103	.0011	.0002	.00105	.00117	.00129
52	.00010	.00085	.00093	.0010	.0001	.00095	.00105	.00115
53	.00005	.00072	.00079	.0009	.0001	.0008	.00092	.00103
54	.00005	.00065	.00070	.0008	.0001	.00073	.00084	.00095
55	.00005	.00058	.00064	.0007	.0001	.00066	.00077	.00087
56	.00005	.00052	.00059	.00065	.0001	.0006	.00071	.00081
57	.00004	.00046	.00051	.00056	-	-	-	-
58	.00004	.00041	.00046	.00051	-	-	-	-

AWG	Area Sq. mm NOM	Single Build					Recommended Winding Tensions (grams)	Typical Elongation %
		Lbs/1000ft	ft/lb	ohms/lb	wires/sq. in	ohms/cu. in		
		NOM	NOM	NOM	NOM	NOM		
42.5	5.75	.0180	55,635	100,172	147,928	22,195	30	23
43	4.84	.0151	66,092	141,169	176,611	31,536	26	22
43.5	4.41	.0138	71,462	170,408	189,035	37,046	24	21
44	4.00	.0125	79,798	206,897	206,897	44,641	22	21
44.5	3.61	.0113	88,308	253,696	253,696	54,287	19	20
45	3.10	.00965	103,608	-	271,441	75,683	17	20
46	2.47	.00768	130,200	-	334,084	117,138	14	20
47	1.96	.00604	165,200	-	400,689	176,621	11	19
48	1.54	.00487	205,300	-	509,769	286,777	9	18
49	1.23	.00385	259,700	-	649,636	456,176	7	17
50	.980	.00308	324,700	-	783,225	690,474	5	16
51	.775	.00246	406,500	-	942,841	1,051,779	4	16
52	.608	.00196	510,200	-	1,155,625	1,642,711	3	14
23	.490	.00153	653,600	-	1,602,756	2,826,737	2.5	12
54	.384	.00121	826,400	-	2,042,041	4,588,435	2	11
55	.303	.00097	1,032,000	-	2,439,844	6,974,283	1.5	10
56	.240	.00078	1,283,700	-	2,837,025	10,339,461	1	9
57	.192	.00061	1,636,700	-	4,000,000	-	0.8	8
58	.152	.00049	2,040,800	-	4,726,276	-	0.6	7