

Tinned Copper Wire and Fuse-wire

These tables are calculated and not the result of experiment. They are published as a guide only and not as an authoritative document. The fusing currents have been calculated from basic physical properties (tinned copper) and may vary in practice with different positions, air circulation etc. The fuse ratings are assumed to be half fusing current. The wire ratings are based on cable ratings of 8500A/sq in and in practice this max rating will depend on ambient temp, insulation, position and cable life expectancy. Cables can be run at higher currents and temperatures only if the insulation can stand it! This information is for experimental use only by careful and competent persons and in no circumstances should it be used for any other purpose.

No legal liability will be accepted for any consequences following from the use of this information.

Installations in buildings within the UK must follow the appropriate British Standard

AWG	SWG	Diameter mm	CSA sq mm	Fusing Current Amps	Fuse Rating Amps	Wire Rating Amps
32		0.202	0.032	7	4	0.4
	35	0.214	0.036	8	4	0.5
31	34	0.226	0.04	9	5	0.5
	33	0.250	0.049	10	5	0.6
30		0.255	0.051	10	6	0.7
	32	0.269	0.057	11	6	0.8
29	31	0.288	0.065	12	7	0.9
	30	0.315	0.078	14	7	1.0
28		0.321	0.081	15	8	1.1
	29	0.331	0.086	15	9	1.1
27		0.362	0.103	17	10	1.4
	28	0.397	0.124	20	10	1.6
26		0.404	0.128	21	10	1.7
	27	0.410	0.132	21	12	1.7
25	26	0.454	0.162	24	14	2.1
	25	0.496	0.193	28	15	2.5
24		0.517	0.21	30	17	2.8
	24	0.559	0.245	33	17	3.2
23		0.574	0.259	35	19	3.4
	23	0.613	0.295	38	21	3.9
22		0.642	0.324	41	25	4.3
	22	0.723	0.41	49	25	5.4
21		0.724	0.412	49	29	5.4
	21	0.807	0.511	58	31	6.7
20		0.841	0.556	62	34	7.3

This is a table for thinner wires. These can be useful as solder-in 'last ditch' fuses on experimental PCB's. For example, a thin soldered-in fuse in front of a shunt diode can protect a pcb from reverse polarity damaging components, whilst at the same time causing minimal energy loss. Initially, this could be a thin track on the PCB which, can be replaced by a wire if it blows.

- a useful source of thin wire for these low current fuses can be found in the braid of screened cables

- NB the fuse rating is the operational current that the fuse normally carries

dia (mm)	Dia (in)	area mm ²	fusing current A	A/sq mm	SWG	Fuse Rating A	Cable Rating A @8500A/sq in A @13.2A/mm ²
0.05	0.00	0.00	1.00	441.00	47.00	0.50	0.03
0.09	0.00	0.01	2.00	347.00	43.00	1.00	0.08
0.11	0.00	0.01	3.00	305.00	41.00	1.50	0.13
0.13	0.01	0.01	4.00	278.00	39.00	2.00	0.19
0.16	0.01	0.02	5.00	257.00	38.00	2.50	0.26
0.25	0.01	0.05	10.00	204.00	33.00	5.00	0.64
0.33	0.01	0.08	15.00	178.00	30.00	7.50	1.11
0.40	0.02	0.12	20.00	162.00	28.00	10.00	1.63

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19		0.900	0.636	68	35	8.4
	20	0.917	0.66	70	41	8.7
	19	1.017	0.813	82	42	10
18		1.026	0.826	83	49	11
17		1.151	1.04	99	54	14
	18	1.221	1.17	108	60	15
16		1.306	1.34	119	69	18
	17	1.441	1.63	138	71	21
15		1.463	1.68	141	83	22
14	16	1.627	2.08	166	99	28
13		1.830	2.63	198	99	35
	15	1.833	2.64	199	116	35
	14	2.034	3.25	232	139	43
11		2.293	4.13	278	147	54
	13	2.386	4.47	295	167	59
10		2.588	5.26	333	170	69
	12	2.620	5.39	339	197	71
9	11	2.899	6.6	395	237	87
8		3.270	8.4	473	270	110
	10	3.568	10	539	282	130