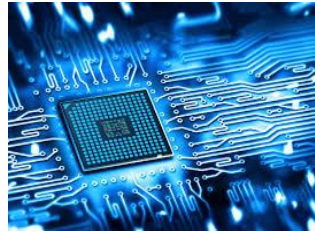


CABLE CONDUCTOR SPECIFICATION

TDS-043 Issue 01



This Technical data sheet cross refers the standards used to identify wire size and associated conductor resistance. The cable conductor size is critical when transporting power between hardware – for example 70 / 100 Volt line loudspeaker circuits which could be seriously degraded if an incorrectly sized cable is installed. In the past Standard Wire Gauge SWG was prevalent in the UK and American Wire Gauge was used in North America.

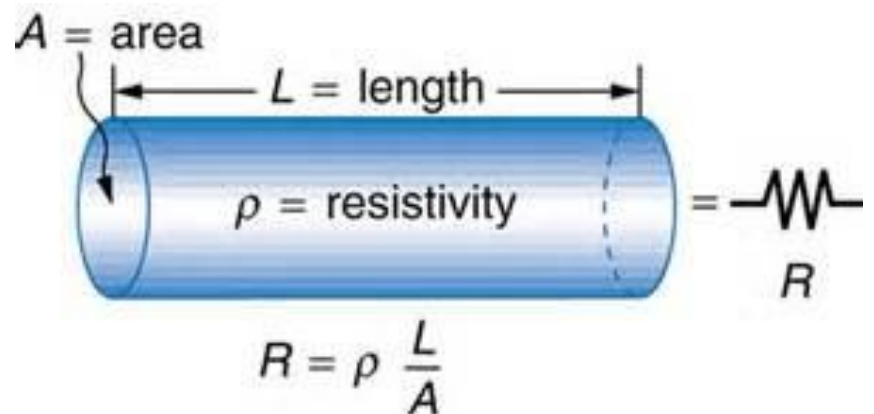
Ziztel have standardized on the use of Metric measurement of cable conductors by cross sectional area CSA mm².

FIELD CABLE CONDUCTOR SIZING

Cable conductors are allocated size according to standards; there are several differing wire standards world which are incompatible with each other. The purpose of this technical document is to provide a simple cross reference between the two most common wire measurement standards AWG and Metric cable conductor size versus associated resistance.

SWG and AWG

SWG was derived from the British *Standard Wire Gauge*, eventually dropping the 'British' part. In comparison, AWG - *American Wire Gauge* - originates from North America, which is composed of the USA and Canada. For the most part SWG wire is larger than an AWG wire of the same gauge. For example, with an AWG gauge value of 1 AWG, an SWG gauge conductor in comparison has a diameter of 0.3 inches while the AWG wire has a diameter of 0.2893 inches. Another difference is the resolution; SWG has 50 steps, resulting in a thinnest wire diameter of 0.001 inches. AWG has only 40 steps and the smallest wire diameter is 0.003 inches. The size of the wire selected is critical not only because it adds to the mechanical strength of the wire, but because it directly correlates to the amount of current that can be carried. A wire that is too narrow for the current that needs to be passed will heat up due to volt drop in the conductor and could present a fire hazard.



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Although both SWG and AWG were once widely used to size electrical wires, SWG has gradually disappeared in favor of the metric standard. (Despite that, SWG is still used in other industries that do not actually deal with electrical wires, example guitar wires still use the SWG size standards).

The following table provides comparison of AWG versus Metric cross sectional area CSA versus Resistance

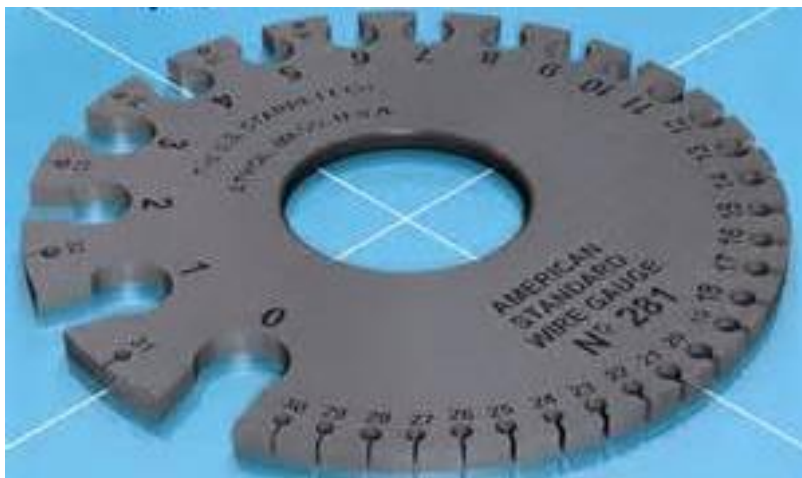
AWG value	Diameter [inch]	Diameter [mm]	cross section [mm ²]	Copper resistance [ohm/km]	common metric equivalent [mm ²]	Notes
1	0.2893	7.348	42.4	0.406		
2	0.2576	6.543	33.6	0.512		Standard US/Canada internal power installation wire 125A
3	0.2294	5.826	26.6	0.646		Standard US/Canada internal power installation wire 100A
4	0.2043	5.189	21.2	0.815		Standard US/Canada internal power installation wire 85A
5	0.1819	4.621	16.8	1.028		
6	0.1620	4.115	13.3	1.296		
7	0.1443	3.665	10.5	1.634		
8	0.1285	3.264	8.37	2.061		Standard US/Canada internal power installation wire 50A
9	0.1144	2.906	6.63	2.599	6.0	Standard European internal power installation wire 30A
10	0.1019	2.588	5.26	3.277		Standard US/Canada internal power installation wire 30A
11	0.0907	2.305	4.17	4.132	4.0	
12	0.0808	2.053	3.31	5.211		Loudspeaker / Flashing beacon circuits Standard US/Canada internal power installation wire 20A
13	0.0720	1.828	2.62	6.571	2.5	Loudspeaker / Flashing beacon circuits Standard European internal power installation wire 16A
14	0.0641	1.628	2.08	8.286		Standard US/Canada internal power installation wire 15A

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15	0.0571	1.450	1.65	10.45	1.5	Loudspeaker / Flashing beacon circuits PAGA access units, Intercom stations Standard European internal power installation wire 10A/16A
16	0.0508	1.291	1.31	13.17		
17	0.0453	1.150	1.04	16.61	1.0	PAGA access units, Intercom stations Loudspeaker / Flashing beacon circuits
18	0.0403	1.024	0.823	20.95	0.75	PAGA access units, Intercom stations Page Party handsets
19	0.0359	0.912	0.653	26.42		
20	0.0320	0.812	0.518	33.31	0.5	PAGA access units, Intercom stations Page Party handsets
21	0.0285	0.723	0.410	42.00		
22	0.0253	0.644	0.326	52.96		
23	0.0226	0.573	0.258	66.79		
24	0.0201	0.511	0.205	84.22	0.25	Telephony Page Party handsets
25	0.0179	0.455	0.162	106.2		
26	0.0159	0.405	0.129	133.9	0.14	Ethernet, telephony Page Party handsets
27	0.0142	0.361	0.102	168.9		
28	0.0126	0.321	0.0810	212.9	0.09	
29	0.0113	0.286	0.0642	268.5		
30	0.0100	0.255	0.0509	338.6		
31	0.00893	0.227	0.0404	426.9		
32	0.00795	0.202	0.0320	538.3		



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