

The AC resistance of copper wire is greater than the DC resistance due to "skin effect" (the concentration of current on the wire surface rather than through the entire wire area).

The table shows RAC/RDC for various wire sizes and frequencies. The bold highlighted ratios show the largest wire that can be used at each frequency, without exceeding a 5% increase over DC resistance.

AWG SIZE	FREQUENCY (RAC / RDC RATIO)										
	10 KHz	15 KHz	20 KHz	30 KHz	40 KHz	50 KHz	60 KHz	70 KHz	80 KHz	100 KHz	150 KHz
10	1.247	1.453	1.647	1.970	2.236	2.461	2.667	2.858	3.036	----	----
11	1.167	1.325	1.487	1.779	2.018	2.224	2.408	2.577	2.734	3.023	----
12	1.110	1.224	1.352	1.604	1.822	2.010	2.176	2.326	2.466	2.723	----
13	1.072	1.151	1.247	1.452	1.646	1.818	1.969	2.106	2.231	2.460	2.947
14	1.046	1.100	1.167	1.325	1.487	1.640	1.779	1.904	2.018	2.224	2.657
15	1.030	1.065	1.110	1.224	1.352	1.481	1.604	1.718	1.823	2.010	2.398
16	1.019	1.041	1.071	1.150	1.245	1.347	1.449	1.548	1.642	1.813	2.165
17	1.012	1.026	1.046	1.099	1.167	1.243	1.324	1.406	1.486	1.639	1.961
18	1.007	1.017	1.029	1.064	1.109	1.163	1.223	1.286	1.350	1.478	1.767
19	1.005	1.011	1.019	1.041	1.071	1.108	1.150	1.196	1.244	1.346	1.595
20	1.003	1.007	1.012	1.026	1.046	1.071	1.099	1.132	1.167	1.243	1.446
21	1.002	1.004	1.007	1.017	1.029	1.045	1.064	1.085	1.109	1.163	1.317
22	1.001	1.003	1.005	1.010	1.018	1.029	1.041	1.055	1.070	1.107	1.217
23	1.001	1.002	1.003	1.007	1.012	1.018	1.026	1.035	1.046	1.070	1.148
24	1.001	1.001	1.002	1.004	1.007	1.012	1.016	1.022	1.029	1.045	1.096
25	1.000	1.001	1.001	1.003	1.005	1.007	1.010	1.014	1.018	1.029	1.062
26	1.000	1.000	1.001	1.002	1.003	1.005	1.007	1.009	1.012	1.018	1.040

If a wire larger than the highlighted wire is needed, use multiple strands of smaller wire, twisted in a bundle. The resistance doubles for each 3 wire sizes smaller.

Example: One #12 AWG = Two # 15 AWG
 Four #18 AWG

At 20 KHz, use 4 strands of #18 AWG, twisted in a bundle, instead of one #12 AWG. RAC/RDC of the bundle is equal to 1.029, which is acceptable