

### 2.2 COATINGS

There are three materials commonly used for coating a copper conductor: tin, silver and nickel.

Tin is the most common and is used for improved corrosion resistance, solderability and to reduce friction between strands in flexible cables.

Silver-plated conductors are used in high-temperature environments (150°C–200°C). It is also used for high-frequency applications where silver's high conductivity (better than copper) and the "skin effect" work together to reduce attenuation at high frequencies.

Nickel coatings are used for conductors that operate between 200°C and 450°C. At these high temperatures, copper oxidizes rapidly if not nickel plated. One drawback of nickel is its poor solderability and higher electrical resistance.

### 2.3 TENSILE STRENGTH OF COPPER WIRE

Table 2.3—Tensile Strength of Copper Wire

Size	Soft or Annealed	Medium Hard Drawn	Hard Drawn
(AWG)	Max. Breaking Load (lb.)	Min. Breaking Load (lb.)	Min. Breaking Load (lb.)
4/0	6,000	6,970	8,140
3/0	4,750	5,660	6,720
2/0	3,765	4,600	5,530
1/0	2,985	3,730	4,520
1	2,435	3,020	3,690
2	1,930	2,450	3,010
3	1,535	1,990	2,440
4	1,215	1,580	1,970
6	765	1,010	1,280
8	480	645	825
10	315	410	530
12	200	262	335
14	125	167	215
16	78.5	106	135
18	49.5	67.6	85.5
20	31.0	43.2	54.2
22	19.4	27.3	34.1
24	12.7	17.5	21.7
26	7.94	11.1	13.7
28	4.99	7.02	8.64
30	3.14	4.48	5.47
32	2.01	2.90	3.53
34	1.25	1.82	2.20
36	0.79	1.16	1.40