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## Alloy 400 Precision Resistance

|  |  |                    |
|--|--|--------------------|
| <b>ASTM:</b> B164  | <b>DIN:</b> 17753  | <b>UNS:</b> N04400 |
| <b>Ω/cir. mil. ft.:</b> 310  | <b>Weight/Density:</b> .318 lbs/in <sup>2</sup> (8.8 g/cm <sup>3</sup> ) |                    |
| <b>Chemical Composition %:</b> Ni 63%, C .05% max, Cu 28-34%, Fe 1-2%, Mn 1.25%, S .01%, Si .5%, Al .3%    |  |                    |
| <b>Coeff. of Lin. Expansion, X 10<sup>-6</sup>:</b> 15.5 (200°C), 16.0 (400°C), 16.6 (600°C), 17.4 (800°C) |  |                    |
| <b>Conductivity:</b> 21 w/mK   | <b>Specific Heat:</b> .103 cal./gm @ 20°C                                |                    |
| <b>Temp. Coeff. of Resistance:</b> .00010  | <b>Specific Gravity:</b> 8.84  |                    |
| <b>Melting Point:</b> ~1,350°C (~2,462°F)  | <b>Elongation:</b> 15-30%  |                    |
| <b>Max Operating Temp:</b> ~550°C (~1,022°F)   | <b>Yield Point:</b> 25,000-45,000 PSI                                    |                    |
| <b>Soft Tensile:</b> 65,000-85,000 PSI   |  |                    |

| Diameter |         |       | Resistance @<br>68° F/20° C<br>Ω/ft | Sq. in./Ω<br>68°F | Weight<br>Lb./1000 ft | Ω/lb.      | Ft/Lb.  | Cross<br>sectional<br>area (in <sup>2</sup> ) |
|----------|---------|-------|-------------------------------------|-------------------|-----------------------|------------|---------|---|
| B&S      | Inches  | Mm    |                                     |                   |                       |            |         |   |
| 13       | 0.072   | 1.83  | 0.060                               | 45.39             | 15.5                  | 3.85       | 64.39   | 0.00407                                       |
| 14       | 0.064   | 1.63  | 0.076                               | 31.88             | 12.3                  | 6.16       | 81.38   | 0.00322                                       |
| 15       | 0.057   | 1.45  | 0.095                               | 22.52             | 9.77                  | 9.77       | 102.4   | 0.00256                                       |
| 16       | 0.051   | 1.29  | 0.119                               | 16.13             | 7.75                  | 15.39      | 129.1   | 0.00203                                       |
| 17       | 0.045   | 1.15  | 0.153                               | 11.08             | 6.14                  | 24.92      | 162.8   | 0.00161                                       |
| 18       | 0.04    | 1.02  | 0.194                               | 7.783             | 4.81                  | 40.30      | 208.0   | 0.00126                                       |
| 19       | 0.036   | 0.912 | 0.239                               | 5.674             | 3.89                  | 61.45      | 256.9   | 0.00102                                       |
| 20       | 0.032   | 0.812 | 0.303                               | 3.985             | 3.07                  | 98.67      | 325.9   | 0.000804                                      |
| 21       | 0.0285  | 0.723 | 0.382                               | 2.815             | 2.43                  | 156.8      | 410.7   | 0.000638                                      |
| 22       | 0.0253  | 0.644 | 0.484                               | 1.969             | 1.93                  | 250.3      | 516.9   | 0.000507                                      |
| 23       | 0.0226  | 0.573 | 0.607                               | 1.404             | 1.53                  | 396.6      | 653.5   | 0.000401                                      |
| 24       | 0.0201  | 0.51  | 0.767                               | 0.988             | 1.20                  | 640.4      | 834.6   | 0.000314                                      |
| 25       | 0.0179  | 0.455 | 0.968                               | 0.697             | 0.969                 | 998.2      | 1,032   | 0.000254                                      |
| 26       | 0.0159  | 0.405 | 1.226                               | 0.489             | 0.759                 | 1,615      | 1,317   | 0.000199                                      |
| 27       | 0.0142  | 0.361 | 1.537                               | 0.348             | 0.603                 | 2,550      | 1,659   | 0.000158                                      |
| 28       | 0.0126  | 0.321 | 1.953                               | 0.243             | 0.477                 | 4,094      | 2,096   | 0.000125                                      |
| 29       | 0.0113  | 0.286 | 2.428                               | 0.175             | 0.382                 | 6,362      | 2,621   | 0.000100                                      |
| 30       | 0.01    | 0.255 | 3.100                               | 0.122             | 0.300                 | 10,349     | 3,338   | 0.0000785                                     |
| 31       | 0.0089  | 0.227 | 3.914                               | 0.086             | 0.239                 | 16,383     | 4,186   | 0.0000626                                     |
| 32       | 0.008   | 0.202 | 4.844                               | 0.062             | 0.189                 | 25,591     | 5,283   | 0.0000496                                     |
| 33       | 0.0071  | 0.18  | 6.150                               | 0.044             | 0.150                 | 40,902     | 6,651   | 0.0000394                                     |
| 34       | 0.0063  | 0.16  | 7.811                               | 0.030             | 0.119                 | 65,602     | 8,399   | 0.0000312                                     |
| 35       | 0.0056  | 0.143 | 9.885                               | 0.021             | 0.0943                | 104,877    | 10,609  | 0.0000247                                     |
| 36       | 0.005   | 0.127 | 12.40                               | 0.0152            | 0.0748                | 165,790    | 13,370  | 0.0000196                                     |
| 37       | 0.0045  | 0.113 | 15.31                               | 0.0111            | 0.0580                | 263,928    | 17,240  | 0.0000152                                     |
| 38       | 0.004   | 0.101 | 19.38                               | 0.0078            | 0.0481                | 402,961    | 20,798  | 0.0000126                                     |
| 39       | 0.0035  | 0.09  | 25.31                               | 0.0052            | 0.0374                | 677,383    | 26,768  | 0.00000979                                    |
| 40       | 0.0031  | 0.08  | 32.26                               | 0.0036            | 0.0297                | 1,085,157  | 33,640  | 0.00000779                                    |
| 41       | 0.00275 | 0.07  | 40.99                               | 0.0025            | 0.0235                | 1,743,842  | 42,541  | 0.00000616                                    |
| 42       | 0.0025  | 0.063 | 49.60                               | 0.00190           | 0.0186                | 2,668,974  | 53,810  | 0.00000487                                    |
| 43       | 0.00225 | 0.057 | 61.23                               | 0.00139           | 0.0145                | 4,222,841  | 68,962  | 0.00000380                                    |
| 44       | 0.0020  | 0.051 | 77.50                               | 0.00097           | 0.0120                | 6,467,906  | 83,457  | 0.00000314                                    |
| 45       | 0.00175 | 0.044 | 101.22                              | 0.00065           | 0.0093                | 10,916,187 | 107,841 | 0.00000243                                    |
| 46       | 0.0015  | 0.038 | 137.78                              | 0.00041           | 0.0077                | 17,962,830 | 130,375 | 0.00000201                                    |
| 47       | 0.0014  | 0.036 | 158.16                              | 0.00033           | 0.0059                | 26,913,894 | 170,165 | 0.00000154                                    |
| 48       | 0.0013  | 0.033 | 183.43                              | 0.00027           | 0.0046                | 39,726,587 | 216,574 | 0.00000121                                    |