



# COPPER FLAT

MEASUREMENT MATRIX  
 (IMPERIAL AND METRIC SYSTEMS)

## FLAT BAR MEASUREMENTS IN INCHES

| Width  | Thickness (inches) |       |       |       |       |       |       |       |       |       |       |        |       |
|--------|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|
|        | 1/16"              | 3/32" | 1/8"  | 3/16" | 1/4"  | 5/16" | 3/8"  | 1/2"  | 5/8"  | 3/4"  | 1"    | 1 1/2" | 2"    |
| kg/m   |                    |       |       |       |       |       |       |       |       |       |       |        |       |
| 1/4"   |                    | 0.135 | 0.177 | 0.261 | 0.356 |       |       |       |       |       |       |        |       |
| 5/16"  | 0.112              |       |       |       | 0.448 |       |       |       |       |       |       |        |       |
| 3/8"   | 0.135              | 0.202 | 0.266 | 0.406 | 0.532 | 0.675 | 0.817 |       |       |       |       |        |       |
| 1/2"   | 0.177              | 0.266 | 0.356 | 0.532 | 0.712 |       | 1.064 | 1.44  |       |       |       |        |       |
| 5/8"   | 0.224              | 0.335 | 0.452 | 0.677 | 0.903 |       | 1.356 | 1.79  | 2.26  |       |       |        |       |
| 3/4"   | 0.266              | 0.404 | 0.541 | 0.812 | 1.08  |       | 1.62  | 2.16  | 2.7   | 3.27  |       |        |       |
| 1"     | 0.358              | 0.532 | 0.722 | 1.08  | 1.44  | 1.8   | 2.16  | 2.89  | 3.6   | 4.32  | 5.76  |        |       |
| 1 1/4" |                    |       | 0.885 | 1.352 | 1.8   | 2.23  | 2.7   | 3.61  | 4.43  | 5.44  | 7.22  |        |       |
| 1 1/2" | 0.541              | 0.81  | 1.08  | 1.62  | 2.17  | 2.69  | 3.25  | 4.33  | 5.44  | 6.5   | 8.56  | 12.66  |       |
| 1 3/4" | 0.631              |       | 1.26  | 1.9   | 2.53  | 3.15  | 3.79  | 5.05  |       | 7.59  |       |        |       |
| 2"     |                    | 1.07  | 1.44  | 2.16  | 2.89  | 3.61  | 4.33  | 5.77  | 7.23  | 8.67  | 11.58 | 17.52  | 23.16 |
| 2 1/4" |                    |       | 1.63  | 2.43  | 3.59  | 4.06  | 4.87  | 6.5   |       | 10.77 | 13    |        |       |
| 2 1/2" |                    |       | 1.798 | 2.71  | 3.61  | 4.46  | 5.41  | 7.18  | 8.99  | 10.83 | 14.4  | 21.7   | 28.8  |
| 2 3/4" |                    |       |       | 2.976 | 3.966 | 4.93  | 5.95  | 7.93  | 9.9   |       |       |        |       |
| 3"     |                    |       | 2.165 | 3.25  | 4.33  | 5.4   | 6.5   | 8.66  | 10.83 | 12.96 | 17.26 | 25.42  | 34.5  |
| 3 1/4" |                    |       |       | 3.51  | 4.69  |       | 7.03  |       |       |       | 18.76 |        |       |
| 3 1/2" |                    |       |       |       | 5.05  | 6.26  | 7.59  | 10.07 | 12.56 | 12.96 | 15.15 |        |       |
| 4"     |                    |       | 2.88  | 4.33  | 5.77  | 7.22  | 8.66  | 11.55 | 14.37 | 17.2  | 23    | 34.64  | 46.33 |
| 4 1/2" |                    |       | 3.25  |       | 6.49  |       | 9.74  | 12.99 | 16.27 | 19.48 | 26    |        |       |
| 5"     |                    |       |       |       | 7.22  | 9     | 10.83 | 14.44 | 17.98 |       |       |        |       |
| 5 1/2" |                    |       |       |       | 7.94  |       |       |       |       |       |       |        |       |
| 6"     |                    |       | 4.3   | 6.5   | 8.66  |       | 12.99 | 17.32 | 21.62 | 25.98 | 34.64 | 51.84  | 63.3  |
| 8"     |                    |       |       |       | 11.51 |       |       | 23.1  |       | 34.65 | 46.2  |        |       |

## FLAT BAR MEASUREMENTS (mm)

| Width | Thickness (mm) |   |   |   |    |    |    |
|-------|----------------|---|---|---|----|----|----|
|       | 3              | 5 | 6 | 8 | 10 | 15 | 20 |
| kg/m  |                |   |   |   |    |    |    |
| 15    | x              | x |   |   | x  |    |    |
| 20    |                | x | x |   | x  |    |    |
| 25    |                | x | x |   |    |    |    |
| 30    |                | x |   |   | x  |    |    |
| 40    | x              | x | x | x | x  |    |    |
| 50    |                | x |   |   | x  |    |    |
| 60    |                | x |   |   | x  | x  |    |
| 80    |                | x |   |   | x  |    |    |
| 100   |                | x |   |   | x  |    |    |
| 120   |                |   |   |   | x  |    |    |
| 130   |                |   |   |   | x  |    |    |
| 150   |                |   |   |   | x  |    | x  |

## ROUND BAR MEASUREMENTS (mm)

|   | Inches " |        | mm       |        | Theoretical weight Kg |
|---|----------|--------|----------|--------|-----------------------|
|   | Diameter | Length | Diameter | Length |                       |
|   | 1/4"     | 3660   | 6,35     | 3660   | 1,03                  |
|   | 3/8"     | 3660   | 9,52     | 3660   | 2,32                  |
|   | 7/16"    | 3660   | 11,11    | 3660   | 3,16                  |
|   | 1/2"     | 3660   | 12,70    | 3660   | 4,13                  |
|   | 5/8"     | 3660   | 15,87    | 3660   | 6,45                  |
|   | 1"       | 3660   | 25,40    | 3660   | 16,53                 |
| 1 | 1/8"     | 3660   | 28,58    | 3660   | 20,93                 |
| 1 | 1/4"     | 3660   | 31,75    | 3660   | 25,83                 |
| 1 | 1/2"     | 3660   | 38,10    | 3660   | 37,19                 |
| 1 | 3/4"     | 3660   | 44,45    | 3660   | 50,62                 |
|   | 2"       | 3660   | 50,80    | 3660   | 66,12                 |
|   |          |        | 60,00    | 3660   | 92,23                 |
| 2 | 3/8"     | 3660   | 60,32    | 3660   | 93,22                 |
| 2 | 1/2"     | 3660   | 63,50    | 3660   | 103,31                |
|   | 3"       | 3660   | 76,20    | 3660   | 148,76                |
| 3 | 3/16"    | 3660   | 80,96    | 3660   | 167,93                |
| 3 | 1/2"     | 3660   | 88,90    | 3660   | 202,48                |
|   | 4"       | 3660   | 101,60   | 3660   | 264,46                |
|   |          |        | 130,00   | 3660   | 432,98                |

\*Square and hexagonal bars (on request)

## TABLE OF STANDARDS (EQUIVALENCE)

| EN       |           | DIN      |           | ASTM   | AFNOR | BS   | JIS   | SN     |
|----------|-----------|----------|-----------|--------|-------|------|-------|--------|
| SYMBOLIC | NUMERICAL | SYMBOLIC | NUMERICAL |        |       |      |       |        |
| Cu-ETP   | CW004A    | E-Cu58   | 20065     | C11000 | CuA1  | C101 | C1100 | Cu-ETP |

AMPERAGE

Ambient temperature 35°C | Final temperature of bars 65°C | Conductivity 56 M/Ωmm<sup>2</sup>(ρ= 0.0178Ωmm<sup>2</sup>/m)


| Width<br>x<br>Thickness | Alternating current up to 60 Hz |      |      |      |             |      |      |      | Direct and alternating current 16 2/3 Hz |      |      |      |             |      |      |      | Static characteristics |                 |       |                          |                 |        |
|-------------------------|---------------------------------|------|------|------|-------------|------|------|------|--|------|------|------|-------------|------|------|------|------------------------|-----------------|-------|--------------------------|-----------------|--------|
|                         | Painted                         |      |      |      | Glossed     |      |      |      | Painted                                  |      |      |      | Glossed     |      |      |      | $x \sqrt{1-x}$         |                 |       | $y \sqrt{\frac{1-y}{F}}$ |                 |        |
|                         | No. of bars                     |      |      |      | No. of bars |      |      |      | No. of bars                              |      |      |      | No. of bars |      |      |      | Jx                     | Wx              | lx    | Jx                       | Wx              | lx     |
|                         | 1                               | 2    | 3    | 4    | 1           | 2    | 3    | 4    | 1  | 2    | 3    | 4    | 1           | 2    | 3    | 4    | cm <sup>4</sup>        | cm <sup>3</sup> | cm    | cm <sup>4</sup>          | cm <sup>3</sup> | cm     |
| 12 x 2                  | 123                             | 202  | 228  |      | 108         | 182  | 216  |      | 123                                      | 202  | 233  |      | 108         | 182  | 220  |      | 0,0288                 | 0,048           | 0,346 | 0,0008                   | 0,008           | 0,0577 |
| 15 x 2                  | 148                             | 240  | 261  |      | 128         | 212  | 247  |      | 148                                      | 240  | 267  |      | 128         | 212  | 252  |      | 0,0563                 | 0,075           | 0,433 | 0,001                    | 0,01            | 0,0577 |
| 15 x 3                  | 187                             | 316  | 381  |      | 162         | 282  | 361  |      | 187                                      | 316  | 387  |      | 162         | 282  | 365  |      | 0,0844                 | 0,113           | 0,433 | 0,00338                  | 0,0225          | 0,0866 |
| 20 x 2                  | 189                             | 302  | 313  |      | 162         | 264  | 298  |      | 189                                      | 302  | 321  |      | 162         | 266  | 303  |      | 0,133                  | 0,133           | 0,577 | 0,00133                  | 0,0133          | 0,0577 |
| 20 x 3                  | 237                             | 394  | 454  |      | 204         | 348  | 431  |      | 237                                      | 394  | 463  |      | 204         | 348  | 437  |      | 0,2                    | 0,2             | 0,577 | 0,0045                   | 0,03            | 0,0866 |
| 20 x 5                  | 319                             | 560  | 728  |      | 274         | 500  | 690  |      | 320                                      | 562  | 729  |      | 274         | 502  | 687  |      | 0,333                  | 0,333           | 0,577 | 0,0208                   | 0,0833          | 0,144  |
| 20 x 10                 | 497                             | 924  | 1320 |      | 427         | 825  | 1180 |      | 499                                      | 932  | 1300 |      | 428         | 832  | 1210 |      | 0,667                  | 0,667           | 0,577 | 0,167                    | 0,333           | 0,289  |
| 25 x 3                  | 287                             | 470  | 525  |      | 245         | 412  | 498  |      | 287                                      | 470  | 536  |      | 245         | 414  | 506  |      | 0,391                  | 0,313           | 0,722 | 0,00563                  | 0,0375          | 0,0866 |
| 25 x 5                  | 384                             | 662  | 869  |      | 327         | 586  | 795  |      | 384                                      | 664  | 841  |      | 327         | 590  | 794  |      | 0,651                  | 0,521           | 0,722 | 0,026                    | 0,104           | 0,144  |
| 30 x 3                  | 337                             | 544  | 593  |      | 285         | 476  | 564  |      | 337                                      | 546  | 608  |      | 286         | 478  | 575  |      | 0,675                  | 0,45            | 0,866 | 0,00675                  | 0,045           | 0,0866 |
| 30 x 5                  | 447                             | 760  | 944  |      | 379         | 672  | 896  |      | 448                                      | 766  | 950  |      | 380         | 676  | 897  |      | 1,13                   | 0,75            | 0,866 | 0,0313                   | 0,125           | 0,144  |
| 30 x 10                 | 676                             | 1200 | 1670 |      | 573         | 1060 | 1480 |      | 683                                      | 1230 | 1630 |      | 579         | 1080 | 1520 |      | 2,25                   | 1,5             | 0,866 | 0,25                     | 0,5             | 0,289  |
| 40 x 3                  | 435                             | 692  | 725  |      | 366         | 600  | 690  |      | 436                                      | 696  | 748  |      | 367         | 604  | 708  |      | 1,6                    | 0,8             | 1,15  | 0,009                    | 0,06            | 0,0866 |
| 40 x 5                  | 573                             | 952  | 1140 |      | 482         | 836  | 1090 |      | 576                                      | 966  | 1160 |      | 484         | 848  | 1100 |      | 2,67                   | 1,33            | 1,15  | 0,0417                   | 0,167           | 0,144  |
| 40 x 10                 | 850                             | 1470 | 2000 | 2580 | 715         | 1290 | 1770 | 2280 | 865                                      | 1530 | 2000 |      | 728         | 1350 | 1880 |      | 5,33                   | 2,67            | 1,15  | 0,333                    | 0,667           | 0,289  |
| 50 x 5                  | 697                             | 1140 | 1330 | 2010 | 583         | 994  | 1260 | 1920 | 703                                      | 1170 | 1370 |      | 588         | 1020 | 1300 |      | 5,21                   | 2,08            | 1,44  | 0,0521                   | 0,208           | 0,144  |
| 50 x 10                 | 1020                            | 1720 | 2320 | 2950 | 852         | 1510 | 2040 | 2600 | 1050                                     | 1830 | 2360 |      | 875         | 1610 | 2220 |      | 10,4                   | 4,17            | 1,44  | 0,417                    | 0,833           | 0,289  |
| 60 x 5                  | 826                             | 1330 | 1510 | 2310 | 688         | 1150 | 1440 | 2210 | 836                                      | 1370 | 1580 | 2060 | 696         | 1190 | 1500 | 1970 | 9                      | 3               | 1,73  | 0,0625                   | 0,25            | 0,144  |
| 60 x 10                 | 1180                            | 1960 | 2610 | 3290 | 985         | 1720 | 2300 | 2900 | 1230                                     | 2130 | 2720 | 3580 | 1020        | 1870 | 2570 | 3390 | 18                     | 6               | 1,73  | 0,5                      | 1               | 0,289  |
| 80 x 5                  | 1070                            | 1680 | 1830 | 2830 | 885         | 1450 | 1750 | 2720 | 1090                                     | 1770 | 1990 | 2570 | 902         | 1530 | 1890 | 2460 | 21,3                   | 5,33            | 2,31  | 0,0833                   | 0,333           | 0,144  |
| 80 x 10                 | 1500                            | 2410 | 3170 | 3930 | 1240        | 2110 | 2790 | 3450 | 1590                                     | 2730 | 3420 | 4490 | 1310        | 2380 | 3240 | 4280 | 42,7                   | 10,7            | 2,31  | 0,667                    | 1,33            | 0,289  |
| 100 x 5                 | 1300                            | 2010 | 2150 | 3300 | 1080        | 1730 | 2050 | 3190 | 1340                                     | 2160 | 2380 | 3080 | 1110        | 1810 | 2270 | 2960 | 41,7                   | 8,33            | 2,89  | 0,104                    | 0,417           | 0,144  |
| 100 x 10                | 1810                            | 2850 | 3720 | 4530 | 1490        | 2480 | 3260 | 3980 | 1940                                     | 3310 | 4100 | 5310 | 1600        | 2890 | 3900 | 5150 | 83,3                   | 16,7            | 2,89  | 0,833                    | 1,67            | 0,289  |
| 120 x 10                | 2110                            | 3280 | 4270 | 5130 | 1740        | 2860 | 3740 | 4500 | 2300                                     | 3900 | 4780 | 6260 | 1890        | 3390 | 4560 | 6010 | 144                    | 24              | 3,46  | 1                        | 2               | 0,289  |
| 160 x 10                | 2700                            | 4130 | 5360 | 6320 | 2220        | 3590 | 4680 | 5530 | 3010                                     | 5060 | 6130 | 8010 | 2470        | 4400 | 5860 | 7110 | 341                    | 42,7            | 4,62  | 1,33                     | 2,67            | 0,289  |
| 200 x 10                | 3290                            | 4970 | 6430 | 7490 | 2690        | 4310 | 5610 | 6540 | 3720                                     | 6220 | 7460 | 9730 | 3040        | 5390 | 7150 | 9390 | 667                    | 66,7            | 5,77  | 1,67                     | 3,33            | 0,289  |

When there are several bars in parallel, the distance between the bars is taken in the same way as the thickness. For alternating current, the net distance between the phases is taken as > 0.8 the distance between phase axes. \* Minimum distance.


FORMATS (TINNED, ROLLED, STANDARD LENGTH, ETC.)

Standard length: 3.66 metres (Mexico), 4 metres and 5 metres (Europe and UK)


**Formats available**




Tinned flat bar



CCA flat bar (extrusion of copper in aluminium)

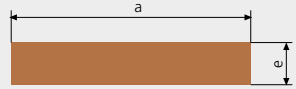


Round and square copper bar

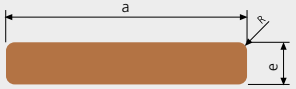


Appearance: Flat, Rolled and Wrapped

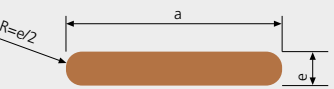
**TYPE OF EDGE**



Sharp edge



Rounded edge



Semicircular edge

At Bronmetal we supply high quality silver-finish copper flat bars in line with the most relevant international standards.

**Silver-finish flat bars:**  
Tinning microns: 0.3 - 0.7 µm

**Tinned flat bars:**  
Tinning microns: 5 µm

**Uses of silver-finish and/or tinned flat bars:**  
Electrical components exposed to corrosive atmospheres, thanks to the protective properties provided by the layer of tin.

We can supply both formats in a roll or in lengths, adapting to your needs.

\*Other coverings on request.

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