# Wire and Cable Metric Calculations

## Dimensions

### *Length*

mils x 0.0254 = mm (millimeters)
inches x 25.4 = mm
feet x 0.3048 = m (meters)
miles x 1.609344 = km (kilometers)

### *Area*

circular mils x 0.0005067 = $mm^2$ (square millimeters)
sq. in x 645.16 = $mm^2$
sq. ft. x 0.092903 = $m^2$ (square meters)
sq. yd. x 0.836127 = $m^2$
sq. mi. x 2.58999 = $km^2$ (square kilometers)

### *Volume*

cu. in. x 16.387 = $cm^3$ (cubic centimeters)
cu. ft. x 0.028317 = $m^3$ (cubic meters)
gallons x 4.54609 = L (liters)
U.S. gal. x 3.7854 = L (liters)

## Mass

pounds x 0.45359 = kg (kilograms)
tons (2000 lb) x 0.907185 = t (metric tones)

### *Mass per unit length*

lb/1000 ft. x 1.48816 = kg/km (kilograms per kilometer)
lb/mi x 0.28185 = kg/km

### *Solid wire weight*

$mm^2$ x 8.89 = kg/km (for copper)
$mm^2$ x 2.70 = kg/km (for aluminum)
$mm^2$ x 7.83 = kg/km (for steel)

### Temperature Conversion

**℉ to ℃:** ℃ = (℉ minus 32) x $^5/_9$

**℃ to ℉:** ℉ = (℃ x $^9/_5$) plus 32

## Force or Tension

pounds (force) x 4.448 = N (newtons)
mass (in kg) x 9.8066 = N (weight at or near sea level)

### *Force per unit area*

(stress, pressure, tensile strength, etc.)

$lbf/in^2$ = (psi) x 6.895 = kPa (kilopascals)

$lbf/in^2$ x 0.006895 = MPa (megapascals)

$N/mm^2$ = MPa

### *Note*

Kilopascals are used generally for fluid pressures. Megapascals are used generally for stresses in materials, i.e. for tensile stress, modulus of elasticity, etc.

## SI Prefixes

| Multiplying factor | | Prefix | Symbol |
|---|---|---|---|
| 1 000 000 000 000 | = $10^{12}$ | tera | T |
| 1 000 000 000 | = $10^{9}$ | giga | G |
| 1 000 000 | = $10^{6}$ | mega | M |
| 1 000 | = $10^{3}$ | kilo | k |
| 100 | = $10^{2}$ | hecto | h |
| 10 | = $0^{1}$ | deca | da |
| 0.1 | = $10^{-1}$ | deci | d |
| 0.01 | = $10^{-2}$ | centi | c |
| 0.001 | = $10^{-3}$ | milli | m |
| 0.000 001 | = $10^{-6}$ | micro | µ |
| 0.000 000 001 | = $10^{-9}$ | nano | n |
| 0.000 000 000 001 | = $10^{-12}$ | pico | p |
| 0.000 000 000 000 001 | = $10^{-15}$ | femto | f |
| 0.000 000 000 000 000 001 | = $10^{-18}$ | atto | a |