



### Weight Calculations

To calculate weight you need to know two things. The volume of the object and the density of the material being weighed.

Volume of a Round Bar =  $(\pi / 4) \times D^2 \times L$  in inches

Volume of a Round Tube per inch =  $(OD^2 \times 0.7854) - (ID^2 \times 0.7854)$

Volume of a Square or Rectangle =  $(W \times H)$  per inch

No	Material	Density Square Inch
1	Al 6061	0.0980
2	Titanium	0.1630
3	410 SS	0.2460
4	Ductile Iron	0.2550
5	Gray Iron	0.2600
6	17-4 Stainless Steel	0.2820
7	Steel/1026/1045	0.2839
8	4340/8620	0.2840
9	Stainless Steel 304	0.2890
10	Admiralty Brass	0.3080
11	660 Bearing Bronze	0.3180
12	Nickel	0.3210
13	70/30 Cu/Ni	0.3230
14	Lead	0.4100
15	Gold	0.6970

$\pi = 3.14159$  or Pi

D = Diameter in inches

L = Length in inches

OD = Outside Diameter in inches

ID = Interior Diameter in inches

W = Width in Inches

H = Height in inches

#### Other Weight Formulas

$D^2 \times 2.67 = \text{Wt/Ft}$  for Carbon Bars

Such as C1045/1050 CPO and IHC Bars

$(OD - \text{Wall}) \times \text{Wall} \times 10.68 = \text{Wt/Ft}$  for Steel Tubes

Such as St52.3/1026/A-106

### Examples

To calculate the weight per foot of a 6.000" CPO Bar 198" in length.

Volume of a Round Bar =  $(\pi / 4) \times D^2 \times L$  in inches or  $0.7854 \times 6^2 \times 198 = 5,598.33$  cu inches

$5,598.33 \times \text{density of Carbon steel } 0.2839 = 1,589.36$  pound or 96.3 lbs ft

To calculate the Weight of bronze tube 7.000"OD x 6.000" ID x 12" Length

Volume of a Round Tube per inch =  $(OD^2 \times 0.7854) - (ID^2 \times 0.7854)$

or  $(7^2 \times 0.7854) - (6^2 \times 0.7854) \times 12 = (49 \times 0.7854) - (36 \times 0.7854) \times 12$

$(38.4846) - (28.2744) \times 12 = (10.2102) \times 12 = 122.5224$  cu inches or volume

Weight = (Volume x Density) or  $(122.5224 \times 0.318) = 38.9621$  for Bearing Bronze

Standard steel would weigh 34.78 lbs and 6061 Aluminum 12.00 pounds

To calculate the weight of a rectangle 8.00" w x 2" H x 96"L

Volume of a Square or Rectangle =  $(W \times H)$  per inch or  $(8 \times 2 \times 96) = 1,536$  cu inches

To find the weight if the material grade was Ductile. Mutiply the Volume x the Density

$= 1,536 \times 0.255 = 391.68$  lbs for the piece