ACE Hardware Zimbabwe

Engineering Conversion Chart

Length, area, volume, mass, force, pressure, torque, power and temperature conversions, hardness, fractions and steel weights.

Workshop Reference Charts
acehardware.co.zw

Units

Length

From	Equals
1 inch	25.4 mm
1 foot	0.3048 m
1 yard	0.9144 m
1 mile	1.609 km
1 mm	0.03937 in
1 m	3.281 ft

Area

From	Equals
1 in^2	645.16 mm^2
1 ft^2	0.0929 m^2
1 m^2	10.764 ft^2
1 acre	0.4047 ha
1 hectare	2.471 acres

Volume

From	Equals
1 litre	1000 cm^3
1 US gallon	3.785 L
1 UK gallon	4.546 L
1 ft^3	28.317 L
1 m^3	1000 L = 35.31 ft^3

Mass

From	Equals
1 lb	0.4536 kg
1 oz	28.35 g
1 kg	2.2046 lb
1 short ton (US)	907.2 kg
1 long ton (UK)	1016 kg

Force

From	Equals
1 kgf	9.807 N
1 lbf	4.448 N
1 kN	224.8 lbf = 102 kgf
1 tonne-force	9.807 kN

Pressure

From	Equals
1 bar	100 kPa = 14.504 psi
1 psi	6.895 kPa = 0.0689 bar
1 MPa	1 N/mm^2 = 145.0 psi
1 kgf/cm^2	0.981 bar = 14.22 psi
1 atmosphere	1.013 bar

Torque

From	Equals
1 Nm	0.7376 ft-lb = 8.851 in-lb
1 ft-lb	1.356 Nm
1 in-lb	0.1130 Nm
1 kgf·m	9.807 Nm

Power & energy

From	Equals
1 kW	1.341 hp
1 hp	0.7457 kW
1 PS (metric hp)	0.7355 kW
1 kWh	3.6 MJ
1 BTU	1.055 kJ
1 kcal	4.187 kJ

Flow & speed

From	Equals
1 m^3/h	16.67 L/min
1 US gal/min	3.785 L/min
1 cfm	28.32 L/min
1 m/s	3.6 km/h = 196.9 ft/min
1 mph	1.609 km/h

Temperature and hardness

Temperature

°C	°F
-40	-40
-20	-4
-10	14
0	32
10	50
20	68
37	99
50	122
100	212
150	302
200	392
250	482
300	572
400	752
500	932
600	1112
800	1472
1000	1832
1200	2192
1500	2732

Hardness (steel, ASTM E140)

HRC	HV	HB	Tensile ≈ MPa
65	832	-	-
60	697	-	-
58	653	-	-
55	595	-	-
52	544	-	-
50	513	481	1660
48	484	456	1570
45	446	421	1450
42	412	390	1350
40	392	371	1280
38	372	353	1220
35	345	327	1130
32	318	301	1040
30	302	286	990
28	286	271	930
25	266	253	870
22	248	237	820
20	238	226	780

- `°F = °C × 1.8 + 32`
- `°C = (°F − 32) ÷ 1.8`
- `K = °C + 273.15`

> Hardness conversions are approximate and valid for carbon and alloy steels only. Brinell is not used above about HRC 50. Tensile strength ≈ 3.45 × HB is an estimate, not a test result.

Fractions to decimals and millimetres

Inch	Decimal	mm
1/64"	0.0156	0.397
1/32"	0.0312	0.794
3/64"	0.0469	1.191
1/16"	0.0625	1.587
5/64"	0.0781	1.984
3/32"	0.0938	2.381
7/64"	0.1094	2.778
1/8"	0.1250	3.175
9/64"	0.1406	3.572
5/32"	0.1562	3.969
11/64"	0.1719	4.366
3/16"	0.1875	4.762
13/64"	0.2031	5.159
7/32"	0.2188	5.556
15/64"	0.2344	5.953
1/4"	0.2500	6.350
17/64"	0.2656	6.747
9/32"	0.2812	7.144
19/64"	0.2969	7.541
5/16"	0.3125	7.938
21/64"	0.3281	8.334
11/32"	0.3438	8.731
23/64"	0.3594	9.128
3/8"	0.3750	9.525
25/64"	0.3906	9.922
13/32"	0.4062	10.319
27/64"	0.4219	10.716
7/16"	0.4375	11.112
29/64"	0.4531	11.509
15/32"	0.4688	11.906
31/64"	0.4844	12.303
1/2"	0.5000	12.700

Inch	Decimal	mm
33/64"	0.5156	13.097
17/32"	0.5312	13.494
35/64"	0.5469	13.891
9/16"	0.5625	14.287
37/64"	0.5781	14.684
19/32"	0.5938	15.081
39/64"	0.6094	15.478
5/8"	0.6250	15.875
41/64"	0.6406	16.272
21/32"	0.6562	16.669
43/64"	0.6719	17.066
11/16"	0.6875	17.462
45/64"	0.7031	17.859
23/32"	0.7188	18.256
47/64"	0.7344	18.653
3/4"	0.7500	19.050
49/64"	0.7656	19.447
25/32"	0.7812	19.844
51/64"	0.7969	20.241
13/16"	0.8125	20.637
53/64"	0.8281	21.034
27/32"	0.8438	21.431
55/64"	0.8594	21.828
7/8"	0.8750	22.225
57/64"	0.8906	22.622
29/32"	0.9062	23.019
59/64"	0.9219	23.416
15/16"	0.9375	23.812
61/64"	0.9531	24.209
31/32"	0.9688	24.606
63/64"	0.9844	25.003
1"	1.0000	25.400

Densities and steel weights

Densities

Material	Density g/cm³
Steel	7.85
Stainless steel	7.9 - 8.0
Cast iron	7.2
Aluminium	2.70
Copper	8.96
Brass	8.4 - 8.7
Lead	11.3
Titanium	4.51
Water	1.00

Steel weight formulas

- Round bar: `kg/m = 0.006165 × d²`
- Square bar: `kg/m = 0.00785 × a²`
- Flat bar: `kg/m = 0.00785 × w × t`
- Plate: `kg/m² = 7.85 × t`
- Tube: `kg/m = 0.02466 × t × (D − t)`
- All dimensions in mm, steel. Multiply by 1.01 for stainless and 0.344 for aluminium.

Guide values for general workshop use. Always follow the equipment or fastener maker's figure where one is given, and check critical work against the relevant standard.

© Ace Hardware Zimbabwe · acehardware.co.zw