

USEFUL FORMULAE & MASS CONVERSION FACTORS

USEFUL FORMULAE	
Useful formulae for the calculation of coiled sheet density and the calculation of mass per unit area or per unit length, are given below. The formulae assume an alloy density of $2.71 \times 10^3 \text{ kg/m}^3$ (Mass Conversion Factor - 1,000). The calculated result should be multiplied by the appropriate Mass Conversion Factor (see Table below) when the formulae are applied to alloys of other density.	
Coiled Sheet	Sections
Coil density (kg per mm of width)	Mass per metre (kg)
$= 2.13 (D + d) (D - d) \div 1,000,000$	$= 2.71 A \div 1,000$
Sheet	Tube
Mass per square metre (kg)	Mass per metre (kg)
$= 2.71 t$	$= 8.51 t (D - t) \div 1,000$
Circles	Round Bar and Wire
Mass per square metre (kg)	Mass per metre (kg)
$= 2.13 D \times D \div 1,000,000$	$= 2.13 D \times D \div 1,000$
Where	
D = outside diameter (mm) d = inside diameter (mm) t = thickness (mm) A = cross-sectional area (mm ²)	

MASS CONVERSION FACTOR

ALLOY	DENSITY (kg/m ³ x 10 ³)	MASS CONVERSION FACTOR
1050 / 1150	2.70	0.996
1350	2.70	0.996
1100 / 1200	2.71	1.000
2024	2.77	1.022
3003 / 3005	2.73	1.007
3203	2.73	1.007
3004	2.72	1.004
5005	2.70	0.996
5050A	2.69	0.993
5052 / 5252	2.68	0.989
5251	2.69	0.993
5154A	2.66	0.982
5454	2.68	0.989
5457	2.70	0.996
5083 / 5086	2.66	0.982
6060 / 6061	2.70	0.996
8011	2.71	1.000

CONVERSION MADE EASY - this example, the mass conversion is 2.7, Alloy 5005.

Sheet / Plate Calculations - Length (in metres) x Width (in metres) x Thickness (in mm) x Mass Conversion.

Typical Example - 2400 x 1200 x 3mm 5005**2.4 Length x 1.2 Width x 3mm Thickness x 2.7 Mass Conversion = 23.32kgs.**