Weight of Plate, Flat, Round, Square and Hex Bar and Tube

Cross-section area, weight per metre and total weight of steel or any metal plate, flat bar, round, square or hexagon bar or round tube from its dimensions.

Method: Section geometry × density

Input parameters

Unit system: SI

Parameter	Value	Unit
Shape	Plate or flat bar (width × thickness)	
Width, diameter, side, across flats or outside diameter	1,500.0	mm
Thickness or wall (plate, flat, tube)	12.000	mm
Length	6.0000	m
Number of pieces	1.0000	
Density of the metal Carbon steel about 7 850; stainless about 7 900–8 000; aluminium about 2 700 kg/m³.	7,850.0	kg/m³

Calculated results

Parameter	Value	Unit
Cross-section area	18,000	mm²
Weight per metre	141.30	kg/m
Weight of one piece	847.80	kg
Total weight	847.80	kg

Notes for this case

- Nominal dimensions; rolling tolerances and corner radii change the real weight by a few per cent.

Formula and method

$$A = ab\ \text{(plate)},\ \frac{\pi}{4}a^2\ \text{(round)},\ a^2\ \text{(square)},\ \frac{\sqrt{3}}{2}a^2\ \text{(hex)},\ \pi(a-b)b\ \text{(tube)}$$

$$m' = A\rho, \quad m = m'L, \quad m_{tot} = Nm$$

Variables

shape	shape	-
a	width, diameter, side, across flats or outside diameter	m
b	thickness or wall	m
L	length	m
N	number of pieces	-
ρ	density	kg/m³
A	cross-section area	m²
m'	weight per metre	kg/m
m	weight of one piece	kg
m_{tot}	total weight	kg

Method and standards

Weight is section area times density times length; the hexagon area across flats a is (√3/2) a².

Assumptions and limits

- Nominal dimensions; tolerances and corner radii ignored.

References

- Section geometry × density

Report details

Report reference	FCC-ZX51-HTR8 (the same inputs always give the same reference)
Generated	17 November 2026, 19:44 UTC
Calculator	Weight of Plate, Flat, Round, Square and Hex Bar and Tube
Method last reviewed	12 November 2026
Software release	FireCAD Calc, release of 17 November 2026
Release checks	4 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/materials/properties/plate-bar-weight

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.