Steel Angle, Channel and I-Section Weight per Metre

Cross-section area and weight per metre of a steel angle, channel or I-section from its dimensions, ignoring root radii, with the total weight for a length.

Method: Cross-section area from rectangles

Input parameters

Unit system: SI

Parameter	Value	Unit
Section	Angle (legs h and b, thickness t)	
Depth (or first leg)	75.000	mm
Flange width (or second leg)	75.000	mm
Web thickness (or angle thickness)	8.0000	mm
Flange thickness (channel and I only)	10.000	mm
Density	7,850.0	kg/m³
Length	6.0000	m

Calculated results

Parameter	Value	Unit
Cross-section area	11.360	cm²
Weight per metre	8.9176	kg/m
Weight of the length	53.506	kg

Notes for this case

• The section is split into rectangles: an angle is t(h + b − t); a channel is the web h·t_w plus two flanges (b − t_w)t_f; an I-section is two flanges b·t_f plus the web (h − 2t_f)t_w. Rolled sections have root and toe radii and tapered flanges that change the area by a few per cent, so use the maker's tables for exact weights and this for fabricated or non-standard sections. Weight per metre is density × area (7850 kg/m³ for steel).

Formula and method

$$A_{angle} = t(h+b-t), \quad A_{channel} = ht_w + 2(b-t_w)t_f, \quad A_I = 2bt_f + (h-2t_f)t_w, \quad w = \rho A$$

Variables

$\mathrm{section}$	Section	-
h	Depth (or first leg)	m
b	Flange width (or second leg)	m
t_w	Web thickness (or angle thickness)	m
t_f	Flange thickness (channel and I only)	m
ρ	Density	kg/m³
L	Length	m
A	Cross-section area	m²
w	Weight per metre	kg/m
m	Weight of the length	kg

Method and standards

Section weight.

Assumptions and limits

- Sharp corners; uniform thickness.

References

Cross-section area from rectangles

Report details

Report reference	FCC-SKB7-43Z4 (the same inputs always give the same reference)
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Release checks	3 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/civil/steel/structural-section-weight

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.