Second Moment of Area and Section Modulus Converter (mm⁴, cm⁴, in⁴)

Convert a second moment of area between m⁴, cm⁴, mm⁴ and in⁴, and a section modulus between m³, cm³, mm³ and in³, for steel tables and drawings.

Method: Unit definitions per NIST SP 811 and the SI Brochure (exact where defined)

Input parameters

Unit system: SI

Parameter	Value	Unit
Second moment of area (choose its unit)	1,000.0	cm⁴
Section modulus (choose its unit)	100.00	cm³

Calculated results

Parameter	Value	Unit
m⁴	1.0000e-05	m⁴
cm⁴	1,000.0	cm⁴
mm⁴	1.0000e+07	mm⁴
in⁴	24.025	in⁴
m³	1.0000e-04	m³
cm³	100.00	cm³
mm³	100,000	mm³
in³	6.1024	in³

Notes for this case

• Second moments of area scale with length to the fourth power: 1 cm⁴ = 10⁴ mm⁴ and 1 in⁴ = 41.623 cm⁴ (2.54⁴). Section moduli scale with the cube: 1 cm³ = 1,000 mm³ and 1 in³ = 16.387 cm³. Steel tables usually give I in cm⁴ and Z in cm³; design equations often need mm⁴ and mm³.

Formula and method

$$1\ \mathrm{cm}^4 = 10^4\ \mathrm{mm}^4, \quad 1\ \mathrm{in}^4 = 2.54^4\ \mathrm{cm}^4$$

Variables

I	Second moment of area (choose its unit)	m⁴
Z	Section modulus (choose its unit)	m³

Method and standards

Section units.

Assumptions and limits

- Exact factors.

References

Unit definitions per NIST SP 811 and the SI Brochure (exact where defined)

Report details

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Release checks	2 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/general/unit-conversions/section-property-converter

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.