Specific Heat Unit Converter (kJ/kg·K, kcal/kg·°C, Btu/lb·°F)

Convert specific heat capacity between J/(kg·K), kJ/(kg·K), kcal/(kg·°C) and Btu/(lb·°F), as in steam, fuel and material data.

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

Input parameters

Unit system: SI

Parameter	Value	Unit
Specific heat (choose its unit)	490.00	J/(kg·K)

Calculated results

Parameter	Value	Unit
joule per kilogram kelvin	490.00	J/(kg·K)
kilojoule per kilogram kelvin	0.49000	kJ/(kg·K)
kilocalorie per kilogram degree Celsius	0.11703	kcal/(kg·°C)
Btu per pound degree Fahrenheit	0.11703	Btu/(lb·°F)

Notes for this case

- kcal/(kg·°C) and Btu/(lb·°F) are numerically equal (both 4186.8 J/(kg·K)).

Formula and method

$$x_{\text{unit}} = \frac{x_{SI}}{f_{\text{unit}}}$$

Variables

x	Specific heat (choose its unit)	J/(kg·K)

Method and standards

Each unit's factor to the SI unit is held once in the unit registry.

Assumptions and limits

- Exact factors where the definition is exact.

References

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

Report details

Report reference	FCC-4GN2-S720 (the same inputs always give the same reference)
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Calculator	Specific Heat Unit Converter (kJ/kg·K, kcal/kg·°C, Btu/lb·°F)
Method last reviewed	12 November 2026
Software release	FireCAD Calc, release of 17 November 2026
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/specific-heat-unit-converter

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.