Heat Transfer Coefficient and Conductivity Converter

Convert a heat transfer coefficient between W/(m²·K), kcal/(h·m²·°C) and Btu/(h·ft²·°F), and a thermal conductivity between W/(m·K), kcal/(h·m·°C) and Btu/(h·ft·°F).

Method: NIST SP 811 (2008); Appendix B conversion factors

Input parameters

Unit system: SI

Parameter	Value	Unit
Heat transfer coefficient (choose its unit)	50.000	W/(m²·K)
Thermal conductivity (choose its unit)	0.040000	W/(m·K)

Calculated results

Parameter	Value	Unit
Coefficient in W/(m²·K)	50.000	W/(m²·K)
Coefficient in kcal/(h·m²·°C)	42.992	kcal/(h·m²·°C)
Coefficient in Btu/(h·ft²·°F)	8.8055	Btu/(h·ft²·°F)
Conductivity in W/(m·K)	0.040000	W/(m·K)
Conductivity in kcal/(h·m·°C)	0.034394	kcal/(h·m·°C)
Conductivity in Btu/(h·ft·°F)	0.023112	Btu/(h·ft·°F)

Notes for this case

- 1 kcal/(h·m²·°C) = 1.163 W/(m²·K) and 1 kcal/(h·m·°C) = 1.163 W/(m·K) exactly; the Btu units use the International Table Btu.

Formula and method

$$1\ \mathrm{kcal/(h{\cdot}m^2{\cdot}{^\circ}C)} = 1.163\ \mathrm{W/(m^2{\cdot}K)}, \quad 1\ \mathrm{Btu/(h{\cdot}ft^2{\cdot}{^\circ}F)} = 5.678\,26\ \mathrm{W/(m^2{\cdot}K)}$$

Variables

h	Heat transfer coefficient (choose its unit)	W/(m²·K)
k	Thermal conductivity (choose its unit)	W/(m·K)

Method and standards

Factors built from the exact kilocalorie, Btu, foot and degree definitions.

Assumptions and limits

- Units only.

References

- NIST SP 811 (2008)
- Appendix B conversion factors

Report details

Report reference	FCC-XJE0-3RKQ (the same inputs always give the same reference)
Generated	17 November 2026, 19:48 UTC
Calculator	Heat Transfer Coefficient and Conductivity Converter
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/heat-transfer-unit-converter

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.