Thermal Resistance (R-Value) and U-Value Converter

Convert thermal resistance between m²·K/W, h·m²·°C/kcal and h·ft²·°F/Btu (imperial R-value), with the matching U-value in W/(m²·K) and Btu/(h·ft²·°F).

Method: U = 1/R; unit definitions per NIST SP 811

Input parameters

Unit system: SI

Parameter	Value	Unit
Thermal resistance (choose its unit)	3.3461	m²·K/W

Calculated results

Parameter	Value	Unit
m²·K/W	3.3461	m²·K/W
h·m²·°C/kcal	3.8915	h·m²·°C/kcal
h·ft²·°F/Btu (imperial R-value)	19.000	h·ft²·°F/Btu
U-value 1/R	0.29886	W/(m²·K)
U-value, Btu/(h·ft²·°F)	0.052632	Btu/(h·ft²·°F)

Formula and method

$$U = \frac{1}{R}$$

Variables

R	Thermal resistance (choose its unit)	m²·K/W
U	U-value 1/R	W/(m²·K)

Method and standards

Definitions.

Assumptions and limits

- Steady one-dimensional flow.

References

• U = 1/R; unit definitions per NIST SP 811

Report details

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Calculator	Thermal Resistance (R-Value) and U-Value Converter
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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/thermal-resistance-unit-converter

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.