Slab-on-Grade Floor Heat Loss (Perimeter Method)

Design heat loss of a slab-on-grade floor from its exposed perimeter and perimeter heat-loss factor, and the annual heating energy from the heating degree-days.

Method: Perimeter heat-loss method

Input parameters

Unit system: SI

Parameter	Value	Unit
Perimeter heat-loss factor (W per m per K)	0.85000	W/(m·K)
Exposed slab perimeter	44.000	m
Indoor design temperature	21.000	°C
Outdoor design temperature	-10.000	°C
Heating degree-days (K·d)	2,800.0	
Heating system efficiency	90.000	%

Calculated results

Parameter	Value	Unit
Design heat loss	1,159.4	W
Annual heat loss through the slab	2,513.3	kWh
Annual heating input	2,792.5	kWh

Notes for this case

• Heat from a slab on grade flows mainly out through the edge, so loss is proportional to the exposed perimeter: Q = F_pP(T_i − T_o). F_p depends on the edge insulation and construction (roughly 0.3–0.5 W/m·K with good edge insulation, 1–1.5 W/m·K uninsulated); take it from the design guide for your construction. Annual loss uses the degree-days; ground temperature lag makes this a simplified estimate.

Formula and method

$$Q = F_p P (T_i - T_o), \quad E = F_p P \cdot HDD \cdot 24\ \mathrm{h}$$

Variables

F_p	Perimeter heat-loss factor (W per m per K)	W/(m·K)
P	Exposed slab perimeter	m
T_i	Indoor design temperature	K
T_o	Outdoor design temperature	K
HDD	Heating degree-days (K·d)	-
η	Heating system efficiency	-
Q	Design heat loss	W
E	Annual heat loss through the slab	J
E_f	Annual heating input	J

Method and standards

Slab heat loss.

Assumptions and limits

- Perimeter factor from the design guide; steady state.

References

Perimeter heat-loss method

Report details

Report reference	FCC-M7MC-1R7Y (the same inputs always give the same reference)
Generated	23 November 2026, 17:51 UTC
Calculator	Slab-on-Grade Floor Heat Loss (Perimeter Method)
Method last reviewed	17 November 2026
Software release	FireCAD Calc, release of 22 November 2026
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/hvac/loads/slab-on-grade-heat-loss

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.