Radiator Output at Other Water and Room Temperatures

Heat output of a radiator or convector at actual flow, return and room temperatures from its rated output at the standard temperature difference and its exponent.

Method: EN 442-2 characteristic equation Q = K_mΔT^n with the logarithmic temperature difference

Input parameters

Unit system: SI

Parameter	Value	Unit
Rated output	1,500.0	W
Rated temperature difference (EN 442: 50 K)	50.000	K
Radiator exponent	1.3000	
Flow temperature	55.000	°C
Return temperature	45.000	°C
Room temperature	20.000	°C

Calculated results

Parameter	Value	Unit
Log-mean temperature difference	29.720	K
Actual output	762.77	W
Output factor	50.852	%
Water flow	65.599	kg/h

Notes for this case

• EN 442 rating at 75/65/20 °C (ΔT = 49.8 K, nominally 50 K) and Q = Q_n(ΔT/ΔT_n)^n; n is about 1.3 for panel radiators and 1.4 for convectors. Low-temperature systems (heat pumps) need much larger radiators.

Formula and method

$$\Delta T_{ln} = \frac{t_f - t_r}{\ln \frac{t_f - t_a}{t_r - t_a}}, \quad Q = Q_n \left(\frac{\Delta T_{ln}}{\Delta T_n} \right)^n, \quad \dot{m} = \frac{Q}{c_w (t_f - t_r)}$$

Variables

Q_n	Rated output	W
ΔT_n	Rated temperature difference (EN 442: 50 K)	K
n	Radiator exponent	-
t_f	Flow temperature	K
t_r	Return temperature	K
t_a	Room temperature	K
ΔT_{ln}	Log-mean temperature difference	K
Q	Actual output	W
Q/Q_n	Output factor	-
$\dot{m}$	Water flow	kg/s
c_w	Specific heat of water, 4 186	J/(kg·K)

Method and standards

EN 442 characteristic.

Assumptions and limits

- Steady output; rated exponent.

References

- EN 442-2 characteristic equation Q = K_mΔT^n with the logarithmic temperature difference

Report details

Report reference	FCC-3JRE-G34Z (the same inputs always give the same reference)
Generated	17 November 2026, 19:45 UTC
Calculator	Radiator Output at Other Water and Room Temperatures
Method last reviewed	13 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/hvac/loads/radiator-output-temperature

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.