

Emergency Lighting Duration Calculator

Calculate emergency lighting runtime from usable battery energy, emergency load, conversion efficiency, and reserve assumptions.

Generated October 11, 2026

<https://www.elecatrix.com/lighting/emergency-lighting-duration-calculator/>

Inputs		
Input	Value	Unit
Usable battery energy	240	Wh
Emergency load	100	W
Conversion efficiency	90	%
Reserved energy	10	%
Results		
Result	Value	Unit
Usable battery energy used	240	Wh
Available emergency load energy	194.4	Wh
Emergency load used	100	W
Runtime	1.944	hours
Efficiency factor	0.9	x
Reserve factor	0.9	x
Calculation details		
Detail	Value	Unit
Calculation basis	Available emergency energy equals usable battery energy multiplied by conversion efficiency and by the fraction remaining after the entered reserve.	
Screening boundary	Duration arithmetic only; no emergency-life-safety, code-runtime, listed-equipment, transfer, charging, temperature, inspection, or approval result is made.	
Formulas		

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$\text{efficiency factor} = \text{conversion efficiency percent} / 100$

$\text{reserve factor} = 1 - \text{reserve percent} / 100$

$\text{available energy Wh} = \text{usable battery energy Wh} \times \text{efficiency factor} \times \text{reserve factor}$

$\text{estimated duration hours} = \text{available energy Wh} / \text{emergency load W}$

Warnings and limitations

This emergency-lighting duration estimate uses entered energy, load, efficiency, and reserve assumptions. It is not an emergency-life-safety, code-compliance, listed-equipment, or inspection approval.