Capitalised Cost of Equipment with Periodic Replacement

Capitalised cost: the first cost plus the sum to invest now so that interest pays for replacing the equipment every n years forever, net of salvage (Perry sec. 9).

Method: Perry's Chemical Engineers' Handbook; 9th ed. (McGraw-Hill, 2019); ...

Input parameters

Unit system: SI

Parameter	Value	Unit
First cost (currency)	100,000	
Replacement cost less salvage (currency)	90,000	
Interest rate per year	8.0000	%
Service life (years)	10.000	

Calculated results

Parameter	Value	Unit
Capitalised cost	177,658	
Equivalent annual replacement charge	6,212.7	

Notes for this case

- Compare alternatives with different lives by their capitalised cost: the lowest is cheapest in perpetuity.

Formula and method

$$K = C_V + \frac{C_R}{(1+i)^n - 1}$$

Variables

C_V	First cost (currency)	-
C_R	Replacement cost less salvage (currency)	-
i	Interest rate per year	-
n	Service life (years)	-
K	Capitalised cost	-
EAC	Equivalent annual replacement charge	-

Method and standards

Perry's capitalised cost.

Assumptions and limits

- Constant interest; identical replacements.

References

- Perry's Chemical Engineers' Handbook
- 9th ed. (McGraw-Hill, 2019)
- sec. 9 (capitalised cost: K = C_V + C_R/[(1 + i)ⁿ − 1])

Report details

Report reference	FCC-WZG9-ZQKA (the same inputs always give the same reference)
Generated	17 November 2026, 19:49 UTC
Calculator	Capitalised Cost of Equipment with Periodic Replacement
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/general/economics/capitalised-cost

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.