Dilution Calculator (C1V1 = C2V2)

Volume of stock solution and of water needed to make a diluted solution of a target strength (C1V1 = C2V2), such as dosing chemicals or acid for regeneration.

Method: Conservation of solute

Input parameters

Unit system: SI

Parameter	Value	Unit
Stock concentration (any unit)	33.000	
Target concentration (same unit)	4.0000	
Volume of diluted solution wanted	1,000.0	L

Calculated results

Parameter	Value	Unit
Volume of stock solution	121.21	L
Volume of water (diluent) to add	878.79	L
Dilution factor	8.2500	

Notes for this case

- Concentrations must be per volume (g/L, mol/L, % w/v). For % by mass, use mass in place of volume or correct for density. Always add acid to water, never water to acid.

Formula and method

$$C_1 V_1 = C_2 V_2 \qquad V_1 = \frac{C_2 V_2}{C_1} \qquad V_w = V_2 - V_1 \qquad DF = \frac{C_1}{C_2}$$

Variables

C_1	stock concentration	any
C_2	target concentration	same unit
V_2	final volume	m³
V_1	stock volume	m³
V_w	water to add	m³
DF	dilution factor	–

Method and standards

Mass of solute conserved on dilution; volumes taken as additive.

Assumptions and limits

- Volumes additive; concentrations per volume. For strengths given as % by mass, convert to per-volume with each solution's density, or use the acid dilution with densities calculator.

References

- Conservation of solute

Report details

Report reference	FCC-WYTW-GEB3 (the same inputs always give the same reference)
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Calculator	Dilution Calculator (C1V1 = C2V2)
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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/chemical/solutions/dilution-c1v1

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.