Slurry Density and Concentration (Cw ↔ Cv)

Slurry density and solids concentration by volume from concentration by weight and the solid and liquid densities, with the solids flow for a slurry flow.

Method: Mixture density 1/ρ_m = C_w/ρ_s + (1 − C_w)/ρ_l

Input parameters

Unit system: SI

Parameter	Value	Unit
Solids density	2,200.0	kg/m³
Liquid density	1,000.0	kg/m³
Solids concentration by weight	40.000	%
Slurry flow	100.00	m³/h

Calculated results

Parameter	Value	Unit
Solids concentration by volume	23.256	%
Slurry density	1,279.1	kg/m³
Solids flow	51.163	t/h

Formula and method

$$\frac{1}{\rho_m} = \frac{C_w}{\rho_s} + \frac{1 - C_w}{\rho_l}, \quad C_v = C_w \frac{\rho_m}{\rho_s}$$

Variables

ρ_s	Solids density	kg/m³
ρ_l	Liquid density	kg/m³
C_w	Solids concentration by weight	-
$\dot{V}$	Slurry flow	m³/s
C_v	Solids concentration by volume	-
ρ_m	Slurry density	kg/m³
$\dot{m}_s$	Solids flow	kg/s

Method and standards

Mass and volume balance.

Assumptions and limits

- No air in the slurry.

References

- Mixture density 1/ρ_m = C_w/ρ_s + (1 − C_w)/ρ_l

Report details

Report reference	FCC-SMHE-Y5RH (the same inputs always give the same reference)
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Calculator	Slurry Density and Concentration (Cw ↔ Cv)
Method last reviewed	12 November 2026
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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/chemical/solutions/slurry-density-concentration

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.