Juice Concentrate Reconstitution to Single Strength

Water to add to a fruit juice concentrate to bring it to single-strength Brix, the single-strength juice mass and volume, and the concentration fold.

Method: Common Brix (Plato)–specific gravity relation SG = 1 + B/(258.6 − 227.1B/258.2); approximate

Input parameters

Unit system: SI

Parameter	Value	Unit
Concentrate mass	100.00	kg
Concentrate Brix	65.000	%
Single-strength Brix	11.500	%

Calculated results

Parameter	Value	Unit
Water to add	465.22	kg
Single-strength juice	565.22	kg
Single-strength juice volume	541.19	L
Fold (by mass)	5.6522	
Fold (by volume)	7.1454	

Notes for this case

• Soluble solids are conserved when water is added, so the single-strength mass is m_c·B_c/B_s. Juice standards fix a minimum single-strength Brix for each fruit (orange about 11.2–11.8 °Bx). The fold by volume is larger than the Brix ratio because the concentrate is much denser; trade is often by volume fold. Use the corrected (acid-adjusted) Brix where the standard requires it.

Formula and method

$$m_s = m_c \frac{B_c}{B_s}, \quad m_w = m_s - m_c$$

Variables

m_c	Concentrate mass	kg
B_c	Concentrate Brix	-
B_s	Single-strength Brix	-
m_w	Water to add	kg
m_s	Single-strength juice	kg
V_s	Single-strength juice volume	m³
F	Fold (by mass)	-
F_V	Fold (by volume)	-

Method and standards

Reconstitution.

Assumptions and limits

- Soluble solids conserved.

References

Common Brix (Plato)–specific gravity relation SG = 1 + B/(258.6 − 227.1B/258.2), approximate

Report details

Report reference	FCC-WXWM-RYVT (the same inputs always give the same reference)
Generated	23 November 2026, 18:00 UTC
Calculator	Juice Concentrate Reconstitution to Single Strength
Method last reviewed	17 November 2026
Software release	FireCAD Calc, release of 22 November 2026
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/food-dairy/juice-concentrate-reconstitution

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.