Sugar Syrup Preparation to a Target Brix

Sugar and water needed to make a volume of sugar syrup at a target Brix, with the syrup's specific gravity and mass, allowing for the moisture in the sugar.

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
Target Brix	65.000	%
Syrup volume wanted	1,000.0	L
Dry solids in the sugar	99.950	%

Calculated results

Parameter	Value	Unit
Specific gravity (approximate)	1.3227	
Syrup mass	1,320.3	kg
Sugar	858.63	kg
Water	461.68	kg

Notes for this case

• Brix is per cent sucrose by mass, so a syrup of mass m holds m·B of sugar solids; commercial sugar is almost dry, and its small moisture counts as water. The syrup's specific gravity comes from the common Brix–SG relation (within about 0.3 % up to 65 °Bx at 20 °C); use refractometer or density tables for exact work. Dissolve with heat for strong syrups: sucrose saturates at about 67 °Bx at 20 °C.

Formula and method

$$SG = 1 + \frac{B}{258.6 - \frac{B}{258.2}227.1}, \quad m = \rho_w V SG, \quad m_s = \frac{mB}{x_s}$$

Variables

B	Target Brix	-
V	Syrup volume wanted	m³
x_s	Dry solids in the sugar	-
SG	Specific gravity (approximate)	-
m	Syrup mass	kg
m_s	Sugar	kg
m_w	Water	kg

Method and standards

Syrup preparation.

Assumptions and limits

- Sucrose solution at 20 °C.

References

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

Report details

Report reference	FCC-J51M-P2HH (the same inputs always give the same reference)
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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/food-dairy/syrup-brix-preparation

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.