Blending Two Spirits to a Target Strength

Volumes of a strong and a weak spirit (or water) to make a blend of target strength and volume by the absolute-alcohol balance, ignoring contraction.

Method: Absolute alcohol balance $V_1 s_1 + V_2 s_2 = V_t\ s_t$ (volume contraction neglected)

Input parameters

Unit system: SI

Parameter	Value	Unit
Strong spirit strength (% vol at 20 °C)	94.400	%
Weak spirit strength (% vol at 20 °C; 0 for water)	0	%
Target strength (% vol at 20 °C)	42.800	%
Blend volume wanted (at 20 °C)	1,000.0	L

Calculated results

Parameter	Value	Unit
Strong spirit	453.39	L
Weak spirit or water	546.61	L
Absolute alcohol in the blend	428.00	L

Notes for this case

- Mixing contracts the volume by up to a few per cent: blend slightly long and adjust with a hydrometer reading.

Formula and method

$$V_1 = V_t \frac{s_t - s_2}{s_1 - s_2}, \quad V_2 = V_t - V_1$$

Variables

s_1	Strong spirit strength (% vol at 20 °C)	-
s_2	Weak spirit strength (% vol at 20 °C; 0 for water)	-
s_t	Target strength (% vol at 20 °C)	-
V_t	Blend volume wanted (at 20 °C)	m³
V_1	Strong spirit	m³
V_2	Weak spirit or water	m³
AL	Absolute alcohol in the blend	m³

Method and standards

Alcohol balance.

Assumptions and limits

- No contraction: the blend comes out a few per cent short of V_t near 40–60 % vol and slightly above the target strength. The spirit blending with contraction calculator corrects for it.
- Strengths and volumes at 20 °C.

References

- Absolute alcohol balance $V_1 s_1 + V_2 s_2 = V_t\ s_t$ (volume contraction neglected)

Report details

Report reference	FCC-TWQ2-K4FW (the same inputs always give the same reference)
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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/sugar-ethanol/alcoholometry/spirit-blending-two-strengths

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.