Distillation Steam per Litre and Boiler Steam for a KLPD

Specific steam in kg per litre of alcohol from measured steam and alcohol, and the steam a plant of given capacity needs at that rate.

Method: Definition s = ṁ_s/V̇_a (kg per litre = t/kL)

Input parameters

Unit system: SI

Parameter	Value	Unit
Steam to distillation (measured)	10.000	t/h
Alcohol produced (absolute, measured)	100.00	kL/d
Planned capacity	150.00	kL/d

Calculated results

Parameter	Value	Unit
Specific steam	2.4000	kg/L
Steam for the planned capacity	15.000	t/h

Notes for this case

- Multi-pressure distillation runs near 2–2.5 kg/L; atmospheric plants use more. Track the trend.

Formula and method

$$s = \frac{\dot{m}_s}{\dot{V}_a}, \quad \dot{m}_p = s\dot{V}_p$$

Variables

$\dot{m}_s$	Steam to distillation (measured)	kg/s
$\dot{V}_a$	Alcohol produced (absolute, measured)	m³/s
$\dot{V}_p$	Planned capacity	m³/s
S	Specific steam	kg/m³
$\dot{m}_p$	Steam for the planned capacity	kg/s

Method and standards

Definitions.

Assumptions and limits

- Steady operation.
- Steam is counted by mass with no pressure or enthalpy basis: compare plants and scale to a new capacity only at the same steam conditions. Scaling assumes the planned plant has the same specific steam.

References

- Definition s = ṁ_s/V̇_a (kg per litre = t/kL)

Report details

Report reference	FCC-Z1WE-HTGZ (the same inputs always give the same reference)
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Software release	FireCAD Calc, release of 17 November 2026
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/ethanol-distillation/distillation-steam-per-litre

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.