Distillery Energy KPIs: Steam, Power and Fuel per kL

Specific steam (kg/L), power (kWh/kL) and fuel (t/kL) of a distillery from daily steam, power and fuel use and the alcohol produced.

Method: Definitions (specific consumption = daily use ÷ daily production)

Input parameters

Unit system: SI

Parameter	Value	Unit
Steam used	280.00	t/d
Power used	1,041.7	kW
Fuel burnt	60.000	t/d
Alcohol produced (absolute)	100.00	kL/d

Calculated results

Parameter	Value	Unit
Steam per litre	2.8000	kg/L
Power per kL	250.00	kWh/m³
Fuel per kL	0.60000	kg/L

Formula and method

$$s = \frac{\dot{m}_s}{\dot{V}_e}, \quad e = \frac{\dot{E}}{\dot{V}_e}, \quad f = \frac{\dot{m}_f}{\dot{V}_e}$$

Variables

$\dot{m}_s$	Steam used	kg/s
$\dot{E}$	Power used	W
$\dot{m}_f$	Fuel burnt	kg/s
$\dot{V}_e$	Alcohol produced (absolute)	m³/s
s	Steam per litre	kg/m³
e	Power per kL	J/m³
f	Fuel per kL	kg/m³

Method and standards

Definitions.

Assumptions and limits

- Same period for all.
- Fuel is by mass with no calorific value or moisture basis, and steam by mass with no pressure or enthalpy basis; the KPIs compare only plants with the same fuel and steam conditions.

References

- Definitions (specific consumption = daily use ÷ daily production)

Report details

Report reference	FCC-A5QX-B60X (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/ethanol/distillery-energy-kpi

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.