Specific Fuel Consumption per Tonne of Steam

Fuel per tonne of steam and evaporation ratio from daily or monthly fuel and steam totals, with the boiler efficiency they imply (IAPWS-IF97).

Method: IAPWS R7-97(2012) IF97; input–output definitions

Input parameters

Unit system: SI

Parameter	Value	Unit
Fuel burned in the period	33.000	t
Steam generated in the period	200.00	t
Gross calorific value of the fuel, as fired	18,600	kJ/kg
Steam pressure (absolute)	10.500	bar
Steam condition	Dry saturated	
Steam temperature (superheated only)	250.00	°C
Feedwater temperature	105.00	°C

Calculated results

Parameter	Value	Unit
Fuel per tonne of steam	165.00	kg/t
Evaporation ratio (steam per kg fuel)	6.0606	kg/kg
Implied boiler efficiency (on GCV, blowdown not counted)	76.183	%

Formula and method

$$SFC = \frac{m_f}{m_s} \qquad ER = \frac{m_s}{m_f} \qquad \eta = \frac{m_s\,(h_s - h_{fw})}{m_f \cdot GCV}$$

Variables

m_f	fuel burned in the period	kg
m_s	steam generated in the period	kg
GCV	gross calorific value as fired	J/kg
p	steam pressure, absolute	Pa
state	saturated or superheated steam	–
T_s	steam temperature (superheated)	K
T_{fw}	feedwater temperature	K
SFC	fuel per unit of steam	kg/kg
ER	evaporation ratio	kg/kg
η	implied efficiency on GCV	–
$h_s\$, \$h_{fw}$	steam and feedwater enthalpy (IF97)	J/kg

Method and standards

Input–output totals over a period; steam and feedwater enthalpies from FireCAD's IAPWS-IF97.

Assumptions and limits

- Totals over the same period; blowdown not counted in the steam, so the implied efficiency is slightly below a direct-method figure that counts it.
- Warnings appear for an implied efficiency above 95 % or below 50 %.

References

- IAPWS R7-97(2012) IF97
- input–output definitions

Report details

Report reference	FCC-9XNF-KKHS (the same inputs always give the same reference)
Generated	17 November 2026, 19:49 UTC
Calculator	Specific Fuel Consumption per Tonne of Steam
Method last reviewed	11 November 2026
Software release	FireCAD Calc, release of 17 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/boilers-power-plant/plant-performance/specific-fuel-consumption-steam

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.