Boiler Horsepower to Steam Output

Steam generation of a boiler from its boiler horsepower (33,475 Btu/h each), steam pressure, feedwater temperature and blowdown, by Ganapathy's energy balance.

Method: Ganapathy; Steam Plant Calculations Manual; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Boiler horsepower	500.00	
Saturated steam pressure (absolute)	10.600	bar
Feedwater temperature	110.00	°C
Blowdown as a share of steam	5.0000	%

Calculated results

Parameter	Value	Unit
Heat output	4,905.3	kW
Steam generated	7,567.4	kg/h
Blowdown	378.37	kg/h

Notes for this case

- One boiler horsepower is 33,475 Btu/h (9.81 kW), equal to 34.5 lb/h evaporated from and at 212 °F.

Formula and method

$$W = \frac{BHP \times 33\,475\ \text{Btu/h}}{(h_g - h_{fw}) + BD\,(h_f - h_{fw})}$$

Variables

BHP	Boiler horsepower	-
p	Saturated steam pressure (absolute)	Pa
T_{fw}	Feedwater temperature	K
BD	Blowdown as a share of steam	-
Q	Heat output	W
W	Steam generated	kg/s
W_{BD}	Blowdown	kg/s
h_g, h_f, h_{fw}	Enthalpies of saturated steam, saturated water and feedwater	J/kg

Method and standards

Ganapathy's energy balance with IF97 enthalpies.

Assumptions and limits

- Saturated steam; heat losses within the rating.
- Feedwater enthalpy is taken as saturated liquid at the feedwater temperature, not compressed liquid at boiler pressure; the difference is well under 0.5 % at shell-boiler pressures.

References

- Ganapathy
- Steam Plant Calculations Manual
- 2nd ed. (Marcel Dekker, 1993)
- Q1.08 (steam output of a boiler from its horsepower)
- Steam and water enthalpies from IAPWS-IF97

Report details

Report reference	FCC-P4JG-M6H6 (the same inputs always give the same reference)
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Calculator	Boiler Horsepower to Steam Output
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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/boilers-power-plant/boilers/boiler-horsepower-steam-output

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.