Flash Steam Recovery Saving per Year

Flash steam recovered from hot condensate or blowdown in a flash vessel, the heat it carries and its value per year at your cost of steam (IAPWS-IF97).

Method: IAPWS-IF97

Input parameters

Unit system: SI

Parameter	Value	Unit
Condensate pressure before the trap	10.000	bar g
Flash vessel pressure	1.0000	bar g
Condensate flow	5,000.0	kg/h
Share of the flash steam actually used	90.000	%
Operating hours per year	8,000.0	h
Cost of steam per tonne (your currency)	2,500.0	

Calculated results

Parameter	Value	Unit
Flash fraction	12.534	%
Flash steam used	564.02	kg/h
Latent heat recovered	344.83	kW
Steam recovered per year	4,512.1	t
Value per year (your currency)	1.1280e+07	

Notes for this case

- The value assumes each tonne of flash steam used replaces a tonne of boiler steam at the same cost; it is a little high where the flash steam is at lower pressure than the steam it replaces.

Formula and method

$$x = \frac{h_{f1} - h_{f2}}{h_{fg2}} \qquad \dot{m}_{fs} = \dot{m}_c \, x \, u \qquad \dot{Q} = \dot{m}_{fs} \, h_{fg2} \qquad m_y = \dot{m}_{fs} \, t_y \qquad V_y = \frac{m_y}{1000\ \mathrm{kg/t}} \, c_s$$

Variables

p_1	condensate pressure (absolute in SI; shown and entered as gauge, bar g)	Pa
p_2	flash vessel pressure (absolute in SI; shown and entered as gauge)	Pa
$\dot{m}_c$	condensate flow	kg/s
u	share used	–
t_y	hours per year	s
c_s	cost of steam per tonne	currency
x	flash fraction	–
$\dot{m}_{fs}$	flash steam used	kg/s
$\dot{Q}$	latent heat recovered	W
m_y	steam per year	kg
V_y	value per year	currency
h_{f1}, h_{f2}, h_{fg2}	IF97 enthalpies	J/kg

Method and standards

Isenthalpic flashing of saturated liquid, IAPWS-IF97 enthalpies.

Assumptions and limits

- Saturated condensate at p_1; no subcooling.
- Pressures are shown as gauge and converted with the standard atmosphere (101.325 kPa); at altitude the gauge reading differs slightly.
- Each tonne of flash steam is valued as a tonne of boiler steam; where it replaces higher-pressure steam the value is a little high.

References

- IAPWS-IF97

Report details

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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/steam/flash-steam-recovery-saving

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.