Boiler Load Factor and Capacity Utilisation

Average load, load factor, capacity utilisation and running share of a boiler from the steam generated in a period, the running hours and the rated capacity.

Method: Plant performance definitions (load factor, capacity utilisation, running share)

Input parameters

Unit system: SI

Parameter	Value	Unit
Steam generated in the period	200.00	t
Length of the period	24.000	h
Rated capacity (MCR)	10,000	kg/h
Running hours in the period	22.000	h

Calculated results

Parameter	Value	Unit
Load factor (average load while running ÷ MCR)	90.909	%
Capacity utilisation over the whole period	83.333	%
Running share of the period	91.667	%
Average steam flow while running	9,090.9	kg/h

Formula and method

$$\bar{\dot{m}} = \frac{S}{t_r} \qquad LF = \frac{\bar{\dot{m}}}{\dot{m}_{MCR}} \qquad CUF = \frac{S}{\dot{m}_{MCR}\, t_p} \qquad A = \frac{t_r}{t_p}$$

Variables

S	steam generated in the period	kg
t_p	length of the period	s
$\dot{m}_{MCR}$	rated capacity (maximum continuous rating)	kg/s
t_r	running hours	s
LF	load factor	–
CUF	capacity utilisation	–
A	running share of the period	–
$\bar{\dot{m}}$	average steam flow while running	kg/s

Method and standards

Standard plant performance definitions; note that $CUF = LF \cdot A$.

Assumptions and limits

- Steam totals and hours from the same period; the rating is the current MCR.
- A is the share of the period the boiler ran, not its availability: a boiler that was available but held on standby counts as not running.

References

- Plant performance definitions (load factor, capacity utilisation, running share)

Report details

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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/boiler-load-factor

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.