Stack Height from SO_2 Emission (CPCB Formula H = 14 Q^0.3)

Sulphur dioxide emission rate from fuel firing and sulphur content, and the minimum physical stack height by the Indian rule H = 14 Q^0.3 (Q in kg/h of SO_2).

Method: Environment (Protection) Rules 1986; Schedule VI; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Fuel fired at rated capacity	2,000.0	kg/h
Sulphur in the fuel, as fired	0.50000	%
Sulphur retained in the ash or by a scrubber	0	%
Load multiplier for Q (the rule takes 110 % of rated capacity)	1.1000	

Calculated results

Parameter	Value	Unit
SO_2 emission rate	21.979	kg/h
Minimum physical stack height	35.378	m

Notes for this case

- The same schedule also sets fixed stack heights by boiler size and plant rating, and the consent of your State Pollution Control Board may set more; check the current notification.

Formula and method

$$Q = \dot{m}_F S (1 - r)\, k \, \frac{M_{SO_2}}{M_S}$$

$$H = 14\, Q^{0.3} \quad (H \text{ in m},\ Q \text{ in kg/h})$$

Variables

$\dot{m}_F$	Fuel fired at rated capacity	kg/s
S	Sulphur in the fuel, as fired	-
r	Sulphur retained in the ash or by a scrubber	-
k	Load multiplier for Q (the rule takes 110 % of rated capacity)	-
Q	SO_2 emission rate	kg/s
H	Minimum physical stack height	m
M_{SO_2}, M_S	Molar masses of SO_2 and sulphur	kg/kmol

Method and standards

Each kilogram of sulphur burnt gives 64.058/32.06 kg of SO_2 (IUPAC molar masses). Retention in ash or capture by limestone or a scrubber is deducted, and the rule takes the emission at 110 % of rated capacity. The height formula is the statutory one of the Environment (Protection) Rules 1986.

Assumptions and limits

- Statutory formula; check the current notification and consent conditions.
- No credit for dispersion modelling.

References

- Environment (Protection) Rules 1986
- Schedule VI
- Part D (Government of India)

Report details

Report reference	FCC-G07K-5Y30 (the same inputs always give the same reference)
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Method last reviewed	12 November 2026
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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/emissions-stacks/stack-height-cpcb

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.