Sulphitation: SO_2 Dose and Sulphur Burnt

SO_2 needed per hour from the juice flow and dose, the sulphur burnt to make it (S + O_2 → SO_2) and sulphur per tonne of cane.

Method: Stoichiometry S + O_2 → SO_2 with IUPAC atomic masses

Input parameters

Unit system: SI

Parameter	Value	Unit
Juice flow	250.00	m^3/h
SO_2 dose on juice	1,000.0	mg/L
Crushing rate	250.00	t/h

Calculated results

Parameter	Value	Unit
SO_2 needed	250.00	kg/h
Sulphur burnt (theoretical, complete burning)	125.12	kg/h
Sulphur per tonne cane	0.50048	kg/t

Notes for this case

- Burner efficiency below 100 % (sublimed sulphur) raises the sulphur actually used.

Formula and method

$$\dot{m}_{SO_2} = \dot{V}_j c, \quad \dot{m}_S = \dot{m}_{SO_2} \frac{M_S}{M_S + 2M_O}$$

Variables

$\dot{V}_j$	Juice flow	m^3/s
c	SO_2 dose on juice	kg/m^3
C	Crushing rate	kg/s
$\dot{m}_{SO_2}$	SO_2 needed	kg/s
$\dot{m}_S$	Sulphur burnt (theoretical, complete burning)	kg/s
s	Sulphur per tonne cane	kg/kg

Method and standards

Stoichiometry.

Assumptions and limits

- Complete combustion: the sulphur is the theoretical minimum; sublimed or unburnt sulphur raises the real use.
- Juice flow and crushing rate are separate inputs; they are not checked against each other (juice % cane).

References

- Stoichiometry S + O_2 → SO_2 with IUPAC atomic masses

Report details

Report reference	FCC-G61W-YXP4 (the same inputs always give the same reference)
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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/sugar-ethanol/clarification/sulphitation-so2-dose

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.