Biogas H_2S Load and Scrubber Media Consumption

Hydrogen sulphide and sulphur removed per day from the biogas flow and H_2S content, and the scrubber media used at its sulphur capacity.

Method: Ideal gas at 0 °C; 1 atm (molar volume, CODATA); IUPAC atomic masses

Input parameters

Unit system: SI

Parameter	Value	Unit
Biogas	36,000	Nm³/d
H_2S in biogas (by volume)	2.0000	%
Removal	95.000	%
Media capacity (kg S per kg media)	0.25000	kg/kg

Calculated results

Parameter	Value	Unit
H_2S removed	1,039.9	kg/d
Sulphur removed	978.36	kg/d
Media consumed	3,913.5	kg/d

Notes for this case

- Spent wash biogas often carries 1–3 % H_2S from sulphate: size the scrubber on measured gas.

Formula and method

$$\dot{n} = \frac{\dot{V}_b y_{H_2S} \eta}{V_m}, \quad \dot{m}_S = \dot{n} M_S, \quad \dot{m}_m = \frac{\dot{m}_S}{q_S}$$

Variables

$\dot{V}_b$	Biogas	Nm³/s
y_{H_2S}	H_2S in biogas (by volume)	-
η	Removal	-
q_S	Media capacity (kg S per kg media)	kg/kg
$\dot{m}_{H_2S}$	H_2S removed	kg/s
$\dot{m}_S$	Sulphur removed	kg/s
$\dot{m}_m$	Media consumed	kg/s

Method and standards

Stoichiometry.

Assumptions and limits

- Ideal gas.

References

- Ideal gas at 0 °C
- 1 atm (molar volume, CODATA); IUPAC atomic masses

Report details

Report reference	FCC-5GAQ-FJ1F (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/spent-wash-zld/biogas-h2s-removal

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.