

## Diffusive Sampler for Hydrogen sulphide

Hydrogen sulphide is an odorant, which in pure form has an odour detection threshold of 0.2-2.0  $\mu\text{g}/\text{m}^3$ . Its characteristic smell of rotten eggs appears at concentrations 3-4 times higher than the odour threshold.

The main sources of  $\text{H}_2\text{S}$  to the atmosphere are geothermal and biogenic.

The anthropogenic sources are:

- Petroleum refineries
- Fish processing industry
- Waste treatment plants
- Catalysators of motor vehicles

Typical concentrations are found in the environment

Location	Mean values	Maximal values
Pulp mills Finland	100 $\mu\text{g}/\text{m}^3$	540 $\mu\text{g}/\text{m}^3$
City of Frankfurt	1.3 $\mu\text{g}/\text{m}^3$	
Pulp mill New Zealand	0.7 $\mu\text{g}/\text{m}^3$	1.8 $\mu\text{g}/\text{m}^3$
Geothermal sites		80 $\mu\text{g}/\text{m}^3$
Museum London [1]	0.05 $\mu\text{g}/\text{m}^3$	0.06 $\mu\text{g}/\text{m}^3$

The passive sampler for hydrogen sulphide is based on the principle of the diffusion of  $\text{H}_2\text{S}$  molecules onto an absorbing medium, in this case Cadmium sulphate. The passive samplers are composed of a polypropylene housing with an opening of 20 mm diameter. To reduce wind disturbance a glass fibre membrane is attached, supported by a wire net.



Protective shelter for  $\text{H}_2\text{S}$  sampler

Protective shelter for  $\text{H}_2\text{S}$  sampler in combination with other samplers protect the sampler from weather influences, as well as minimising wind disturbance, a specially developed suspension device is recommended.

Hydrogen sulphide causes odour nuisance at concentrations far below those that cause health hazards. On the basis of the scientific literature, it is not possible to state a specific concentration of hydrogen sulphide at which odour nuisance starts to appear.

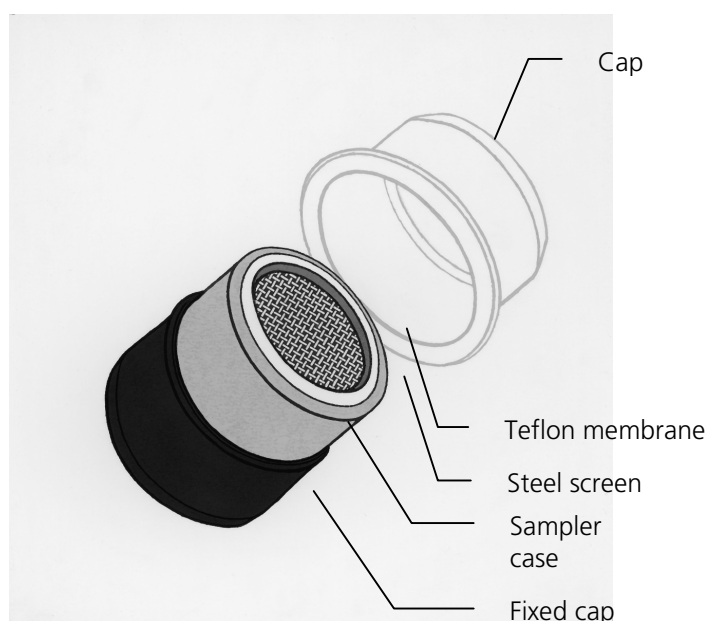
There are no limit values for hydrogen sulphide for ambient air.

Odour detection threshold 0.2 – 2.0  $\mu\text{g}/\text{m}^3$

Guideline value WHO 24 hours [2] 7  $\mu\text{g}/\text{m}^3$

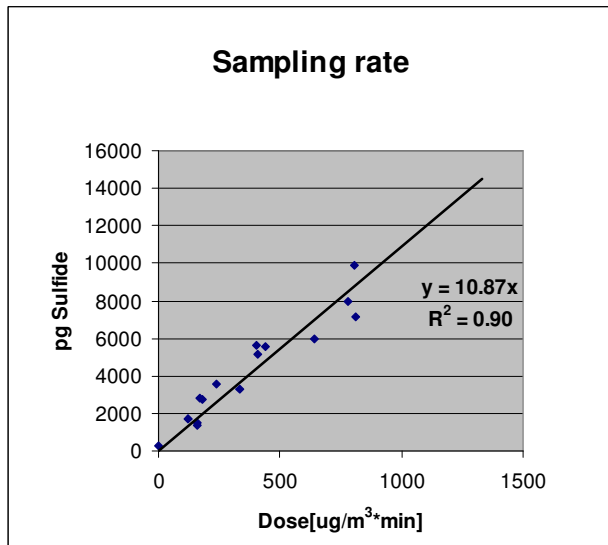
Threshold effects exposure limit [3] 0.9  $\mu\text{g}/\text{m}^3$

Workplace level 15  $\text{mg}/\text{m}^3$

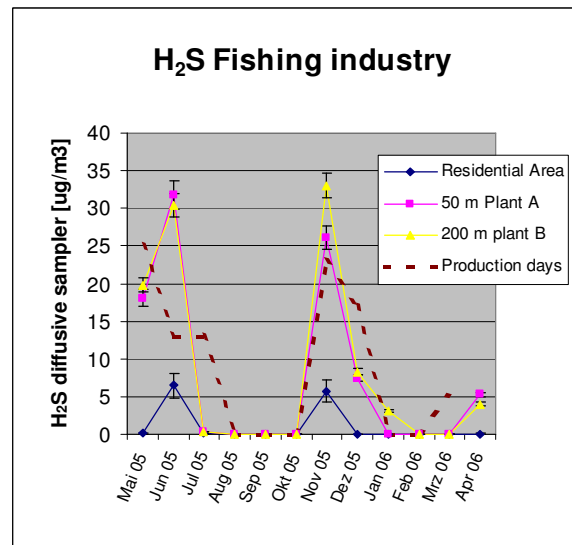


Membrane sampler for Hydrogen sulphide

## Specifications



Determination of sampling rate under various laboratory conditions such as concentration range, humidity and exposure time



H<sub>2</sub>S measurements in the vicinity of fish processing plants over a time period. The ambient concentrations follows more or less the production rate in a plausible way

Sampling rate	10.9 ml/min at 20°C
Working range	1 – 50 µg/m <sup>3</sup>
Sampling time	2 – 4 weeks
Detection limit	0.1 µg/m <sup>3</sup> for sampling periods of one month
External influences:	<div> <div>wind speed</div> <div>influence of wind speed &lt; 10% up to 10 m/sec</div> </div> <div> <div>temperature</div> <div>&lt; 0.2 m/sec starvation</div> </div> <div> <div>humidity</div> <div>no influence between 10 to 30°C</div> <div>no influence between 20 to 80%</div> </div>
Storage	<div>before use: 12 months</div> <div>after exposure: 3 months</div>
Cross sensitivity	Specific method
Expanded uncertainty*	18.9 % at levels of 5 to 30 µg/m <sup>3</sup>

\*according to GUM; subject to change without notice

revised 5.1.2012

## References

[1] D. Shouter: A passive sampler for Hydrogen sulphide, Environmental Monitoring Assessment 38: 11-23, 1995.

[2] WHO Regional Office for Europe, Copenhagen, Denmark, 2000

[3] Threshold effects exposure limit, Massachusetts county

**passam ag**

Männedorf/Switzerland  
passam@passam.ch

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