

Passive Sampler for SO₂

Product Number SP10

Working Principle

The passive sampler enables the measurement of sulfur dioxide concentration in the air in two steps. First, it independently collects the pollutant at the measurement site without the need for an energy source. Then, the collected amount of pollutant is analyzed in our laboratory.



The sampler operates on the principle of passive diffusion: SO₂ molecules enter the housing and are absorbed by the absorbing medium (potassium carbonate). Sampling is autonomous and takes place over a period of 1 to 4 weeks. A protective filter reduces environmental influences such as wind, allowing for precise measurement.

We conduct the analysis by ion chromatography, validated according to EN 13528 and carried out in our Swiss laboratory accredited to ISO 17025. The average sulfur dioxide concentration is calculated based on the amount of pollutant, exposure time, and sampling rate.

Only a protective shelter, which also serves as a holder, is required at the measurement site. The straightforward installation allows for use even in remote locations. Each sampler is uniquely identified by batch number, ID, and expiration date.

Applications

Thanks to its cost-efficiency, ease of use, and high flexibility, the passive sampler has numerous applications in air quality monitoring:

- **Regulatory air quality monitoring** with indicative measurements in accordance with the EU Directive [1]. The SO₂ passive sampler serves as a tool to monitor the annual mean limit of 20 µg/m³, which will be effective from 2030. It can also be used to comply with the critical level for the protection of vegetation and natural ecosystems.
- **Determining the spatial distribution of SO₂** [2], for example, in immission monitoring networks, to support urban development projects, traffic management measures, or to verify implemented reduction measures.
- **Studies on the effects of pollutants** on humans and the environment.
- **Indoor air quality monitoring** in spaces such as laboratories, warehouses, or production facilities.
- **Monitoring of industrial processes** or the perimeter of an industrial site, e.g., in the petrochemical industry.

Specifications

sampler type & dimensions	Badge-Typ (Ø 3 cm, height 2.5 cm)		
sampling time	1 – 4 weeks		
sampling rate at 20°C	11.9 ml/min		
upper working range	90 µg/m ³		
detection limit	0.5 µg/m ³ at 4 weeks or 1 µg/m ³ at 2 weeks exposure		
expanded uncertainty	23.8 % at 20 µg/m ³ ; indirect approach according to GUM		
analysis time	approximately 10 – 15 days		
shelf life and storage conditions	12 months before exposure	store in a sealed plastic bag at room temperature, protected from sunlight	
	3 months after exposure		
transport conditions	in a sealed plastic bag		
environmental factors < 10%	wind: in the range of 0.5 – 2.2 m/s	temperature: in the range of 5 – 25 °C	
	relative humidity: unknown		
cross sensitivities	none known		
validation	within the accredited scope of ISO/IEC 17025 according to EN 13528		

References

- [1] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe, <https://eur-lex.europa.eu/eli/dir/2008/50/oj> & revision: <https://data.consilium.europa.eu/doc/document/PE-88-2024-INIT/en/pdf>
- [2] Hient et al., Impact of urban expansion on the air pollution landscape: A case study of Hanoi, Vietnam; Science of the Total Environment, 702, 2020, 134635; <https://doi.org/10.1016/j.scitotenv.2019.134635>