

Passive Sampler for HF

Product Number SP22

Working Principle

The passive sampler reliably detects hydrogen fluoride (HF) in the air without the need for electricity. During the exposure period of 1 to 4 weeks, HF molecules diffuse into the housing and are absorbed. An integrated protective filter reduces influences such as wind, ensuring precise measurement results.



After sampling is complete, the passive sampler is analysed via ion chromatography. The analysis method is validated according to EN 13528^[1], and the laboratory is accredited under ISO/IEC 17025.

The passive sampler provides the average concentration of the pollutant over the entire measurement period. It is calculated from the collected pollutant amount, the exposure duration, and the known collection rate, reflecting the average HF exposure at the measurement site.

Additionally, the sampler only requires a protective casing, which also serves as a holder. Its simple installation allows deployment even in hard-to-reach locations. Each sampler is clearly marked with a serial number, ID, and expiration date.

Applications

Hydrogen fluoride is a colourless, irritating gas that is highly soluble in water and forms aerosols or hydrofluoric acid mists in the air. It is strongly irritating and corrosive to the respiratory system, eyes, and skin.

HF is primarily produced during industrial processes such as aluminium or fertilizer manufacturing, the production and processing of fluorine-containing chemicals, and the burning of fluorinated materials. Natural sources like volcanic eruptions or weathering processes play a secondary role.

Due to its cost-efficiency, ease of handling, and high flexibility, the passive sampler is widely used for measuring HF in the air—from industrial facilities and urban areas to monitoring campaigns in sensitive regions. Typical application areas include:

- **Monitoring industrial emissions:** Measurement and documentation from chemical plants, aluminium smelters, waste incineration plants, or fluorine production sites
- **Environmental monitoring:** Ensuring compliance with environmental regulations, supporting environmental impact assessments, and long-term measurements of HF concentrations in sensitive areas
- **Research:** Used in studies on air quality and in identifying HF sources within the air

Specifications

sampler type & dimension	badge-type (Ø 3 cm, height 2.5 cm)		
sampling time	1 – 4 weeks		
sampling rate at 20°C	20.8 ml/min		
upper working range	50 µg/m ³		
detection limit	0.5 µg/m ³ at 4 weeks or 1 µg/m ³ at two weeks exposure		
expanded uncertainty	unknown		
analysis time	approximately 45 days		
shelf life and storage conditions	12 months 4 months	prior exposure after exposure	in a sealed black plastic bag
transport conditions	sealed plastic bag		
environmental factors < 10%	wind: in the range of 0.5 – 2.2 m/s temperature: unknown relative humidity: unknown		
cross sensitivities	none known		
validation	within the accredited scope of ISO/IEC 17025 according to EN 13528 ^[1]		

References

- [1] EN 13528 1-3: Ambient air quality - Diffusive samplers for the determination of concentrations of gases and vapours; Requirements and test methods.