



Emergency Response Planning Guidelines

from the AIHA® Guideline Foundation

Emergency Response Planning Guideline
Technical Support Documentation
Fluorosulfonic Acid

EMERGENCY RESPONSE PLANNING GUIDELINE (ERP-G) Public Comment Draft

FLUOROSULFONIC ACID (2026)

ERP-G-3: 40 mg/m³

ERP-G-2: 10 mg/m³

ERP-G-1: 2 mg/m³

ERP-G Maximum Airborne Concentration Levels



ERP-G 1 MILD

The maximum airborne concentration below which nearly all individuals could be exposed for up to one hour without experiencing more than mild, transient adverse health effects or without perceiving a clearly defined objectionable odor.



ERP-G 2 SERIOUS

The maximum airborne concentration below which nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take action.



ERP-G 3 SEVERE

The maximum airborne concentration below which nearly all individuals could be exposed for up to one hour without experiencing or developing life-threatening health effects.



**GUIDELINE
FOUNDATION**

EMERGENCY RESPONSE PLANNING GUIDELINE (ERPG)
Public Comment Draft

FLUOROSULFONIC ACID
(2026)

ERPG-3: 40 mg/m³

ERPG-2: 10 mg/m³

ERPG-1: 2 mg/m³

I. Recommended ERPGs and Supporting Rationales

ERPG-3: 40 mg/m³

The maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects is 40 mg/m³. The acute inhalation study (Arts, 2007; Rusch et al., 2008) showed that FSA was no more toxic than HF on a weight basis. Therefore 41 mg/m³ (the ERPG-3 for HF) might be considered to be an acceptable level. However, the ERPG-3 for sulfuric acid (120 mg/m³) is appreciably higher than that for HF. An exposure at 41 mg/m³ of FSA on hydrolysis would yield 40 mg/m³ of sulfuric acid. This would be below the ERPG-3 level for sulfuric acid, and may reflect the added toxicity produced by HF. Therefore, the value supported by the studies with authentic FSA support a value of 40 mg/m³ for FSA.

ERPG-2: 10 mg/m³

The maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hr without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action is 10 mg/m³. The acute inhalation study (Arts, 2007; Rusch et al., 2008) showed that FSA was no more toxic than HF on a weight basis, therefore 16 mg/m³ (the ERPG-2 for HF) could be considered to be an acceptable level. However, the ERPG-2



**GUIDELINE
FOUNDATION**



Emergency Response Planning Guidelines

from the AIHA® Guideline Foundation

Emergency Response Planning Guideline
Technical Support Documentation
Fluorosulfonic Acid

for sulfuric acid is slightly lower (10 mg/m^3). On hydrolysis, an exposure at 16 mg/m^3 of FSA would yield 15 mg/m^3 of sulfuric acid. This would be above the ERPG-2 level for sulfuric acid. Therefore, the more conservative sulfuric acid ERPG-2 of 10 mg/m^3 is recommended for FSA.

ERPG-1: 2 mg/m^3

The maximum airborne concentration below which nearly all individuals could be exposed to FSA for up to 1 hour without experiencing or developing other than mild transient health effects is 1.6 mg/m^3 . This is based on the comparison of the HF study summarized above (Valentine and Makovec, 1993; AIHA, 1997) and findings from FSA reported by Arts (2007) and by Rusch et al. (2008). There were no clinical signs during or following the exposure to 845 mg FSA/m^3 . The post-exposure breathing pattern of the rats in this exposure group was similar to the pre-exposure pattern and comparable to the controls. Thus, the effects were milder than reported for a similar exposure to HF. In that HF study, minor signs of irritation were seen. Given the similarity in the apparent irritant-based toxicities of HF and sulfuric acid, and the similarity between ERPG-1 values for these chemicals, 2 mg/m^3 is recommended as the ERPG-1 value for fluorosulfonic acid.

II. History of Fluorosulfonic Acid ERPGs

First Published in 2008: ERPG-1= 2 mg/m^3 , ERPG-2= 10 mg/m^3 , ERPG 3= 30 mg/m^3 .

Updated and republished in 2026: ERPG-1= 2 mg/m^3 , ERPG-2= 10 mg/m^3 , ERPG 3= 40 mg/m^3 .

The literature search used to develop the current document was conducted in April 2026.

III. References

American Conference of Governmental Industrial Hygienists. 1996. *Fluorides as F. Threshold Limit Values for Chemical Substances*. Cincinnati, OH: ACGIH.



**GUIDELINE
FOUNDATION**



Emergency Response Planning Guidelines

from the AIHA® Guideline Foundation

Emergency Response Planning Guideline
Technical Support Documentation
Fluorosulfonic Acid

American Conference of Governmental Industrial Hygienists. 2005. *Hydrogen fluoride. Threshold Limit Values for Chemical Substances*. Cincinnati, OH: ACGIH.

American Conference of Governmental Industrial Hygienists. 2004. *Sulfuric acid. Threshold Limit Values for Chemical Substances*. Cincinnati, OH: ACGIH.

American Industrial Hygiene Association Guideline Foundation (AIHA). 2022. *Hydrofluoric Acid, Emergency Response Planning Guideline*. Fairfax, VA: AIHA.

American Industrial Hygiene Association Guideline Foundation (AIHA). 2022. *Oleum, Sulfur Trioxide, and Sulfuric Acid, Emergency Response Planning Guideline*. Fairfax, VA: AIHA.

Arts, J.H.E. 2007. *Acute (1-hour) Inhalation Toxicity Study with Fluorosulfonic acid in Rats*. Conducted for Honeywell International. Zeist, The Netherlands: TNO Quality of Life.

Honeywell International. 2004. *Honeywell Material Safety Data Sheet: Fluorosulfonic Acid*. Morristown, NJ: Honeywell International.

OSHA. 2017. Table Z-1 Limits for Air Contaminants. Available from URL: <https://www.osha.gov/annotated-pels/table-z-1> . Last accessed July 6, 2026.

Rusch, G.M., A.M. Bowden, H. Muijser, and J.H.E. Arts. 2008. Respiratory irritation associated with inhalation of boron trifluoride and fluorosulfonic acid. *Inhalation Toxicology* 20:665-670.

Valentine, R. and G.T. Makovec. 1993. *Effects of Exposure Duration and Relative Humidity on the Acute inhalation Toxicity of Hydrogen Fluoride* (Unpublished Haskell Laboratory report). Newark, DE: E.I. du Pont de Nemours & Co., Inc., Haskell Laboratory.



**GUIDELINE
FOUNDATION**