



Emergency Response Planning Guidelines

from the AIHA® Guideline Foundation

Emergency Response Planning Guideline
Technical Support Documentation
Acetic Anhydride

EMERGENCY RESPONSE PLANNING GUIDELINE (ERP) Public Comment Draft

ACETIC ANHYDRIDE (2026)

ERP-3: 100 ppm (420 mg/m³)

ERP-2: 15 ppm (63 mg/m³)

ERP-1: 2 ppm (8.2 mg/m³)

ERP™ Maximum Airborne Concentration Levels



ERP 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 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 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.



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ERPG-2: 15 ppm (63 mg/m³)
ERPG-1: 2 ppm (8.2 mg/m³)

I. Recommended ERPGs and Supporting Rationales

ERPG-3: 100 ppm (420 mg/m³)

100 ppm of acetic anhydride is 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. No human deaths following exposure to acetic anhydride have been reported. Therefore, this value is based on a subacute inhalation study in rats of acetic anhydride at concentrations of 0, 25, 100, or 400 ppm, 6 hours/day, 5 days/week for 2 weeks. (Hoechst Celanese Corporation, 1988) Only one exposure at 400 ppm was performed due to two mortalities (out of 6) within 24 hours of exposure at 400 ppm. This value is used as the basis of deriving the ERPG-3. This ERPG-3 value is also supported by the absence of any deaths in rats following a 4 hour exposure to 1000 ppm. (Carpenter et al., 1949)

ERPG-2: 15 ppm (63 mg/m³)

15 ppm of acetic anhydride is 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 adverse health effects or symptoms that could impair an individual's ability to take protective action. This value is recommended on the basis of acute respiratory effects observed in rat inhalation studies at 25 ppm. (Hoechst Celanese Corporation, 1988) This ERPG-2 level is based on 2 subacute



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inhalation studies where rats were exposed to a range of concentrations: 0, 25, 100, 400 ppm (Hoechst Celanese Corporation, 1988) or 0, 0.98, 4.96, 20 ppm (Hoechst Celanese Corporation, 1996). Noisy respiration (indicative of mild effects on the respiratory tract) with accompanying hyperplasia and/or ulceration in the nasal passages, larynx, trachea, and lungs as well as half closed eyes were observed in one study at 25 ppm exposure. (Hoechst Celanese Corporation, 1988) The same effects were observed at 20 ppm in the other study. (Hoechst Celanese Corporation, 1996) All changes regressed in this study during the recovery period, indicating the effects were reversible. While the severity is difficult to ascertain, these observations can be interpreted as mucous membrane irritation in the eye and upper respiratory tract. This ERPG-2 value is also supported by odor threshold data that indicates an irritating concentration at 5 ppm. (Ruth, 1986)

ERPG-1: 2 ppm (8.2 mg/m³)

2 ppm of acetic anhydride is the maximum airborne concentration below which nearly all individuals could be exposed for up to one hour without experiencing or developing effects other than mild transient health effects or without perceiving a clearly defined objectionable odor. This value is based on the range of odor detection threshold ranging from 0.12 to 0.35 ppm. (Ruth, 1986)(AIHA, 2013) The “Level of distinct Odor Awareness (LOA)” was estimated to be 1.92 ppm, which was below the irritation threshold of 4.8 ppm. Based on the LOA methodology, an ERPG-1 value was established at 2 ppm. (Ruijten et al., 2009)

II. History of Acetic Anhydride ERPGs

First Published in 2008: ERPG-1=0.5 ppm, ERPG-2=15 ppm, ERPG 3=100 ppm.

Updated and republished in 2026: ERPG-1=2 ppm, ERPG-2=15 ppm, ERPG 3=100 ppm.

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



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