Call for Public Comments on Proposed ERPGs for Furfural

The AIHA Guideline Foundation (AGF) Emergency Response Planning (ERP) Committee develops Emergency Response Planning Guidelines (ERPGs) for responding to potential releases of airborne substances for use in community emergency planning. ERPGs are air concentration guidelines for single exposures to agents and are intended for use as tools to assess the adequacy of accident prevention and emergency response plans, including transportation emergency planning, community emergency response plans and incident prevention and mitigation.

The ERP Committee has proposed the following values for ERPGs for Furfural. In addition to providing comments, the Committee also welcomes any additional references or resources that could be provided to them for consideration. The public comment period ends on April 11, 2016. Comments should be sent to the AGF addressed to Laurie Mutdosch (lmutdosch@aiha.org) or AIHA Guideline Foundation
3141 Fairview Park Drive, Suite 777
Falls Church, VA 22042

RECOMMENDED ERPGS FOR FURFURAL AND RATIONALES

A. ERPG-3: 50 ppm (196 mg/m³)

50 ppm of furfural 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. The 1-hr LC₅₀ in rats was 1037 ppm and the highest non-lethal level in rats was 498 ppm.⁷ The 1-hr equivalent level of 548 ppm failed to cause lethality in a 137 ppm 4-hr LC₅₀ rat study.⁸ These levels suggest an ERPG-3 level of 50 ppm. The acute lethality data support this level as well as the lack of mortality in rabbits after 60-80 exposures of 4 hr to 51 ppm.⁹

B. ERPG-2: 10 ppm (39 mg/m³)

10 ppm of furfural 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. At 10 ppm, workers with long-term exposure complained of respiratory and eye irritation.⁵ The same study reports irritation with rapid onset in sampling technicians exposed to 13.5-16 ppm, and similar symptoms were reported by the majority of nightshift workers exposed to an average concentration of 5-6 ppm.⁶ The study concluded that the irritation experienced by the employees “… (eye and upper respiratory tract irritation) is transient in nature and is not known to result in serious or permanent physical impairment.”⁷ The 10 ppm level, although irritating to eyes and upper respiratory tract, should be tolerable and protective of the ability to take protective actions. The value is well below the RD₅₀ in mice (i.e., 234 ppm or 287 ppm).⁸
C. ERPG-1: 2 ppm (8 mg/m³)

2 ppm of furfural 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. At 2 ppm, the almond- and bread-like odor of furfural—pungent at higher levels— is detectable but below the level reported to be associated with irritation. There are no data on the level at which the odor of furfural becomes objectionable.

HISTORY OF FURFURAL ERPG

First published in 1997:
ERPG-3: 100 ppm  ERPG-2: 10 ppm  ERPG-1: 2 ppm

Updated and republished in 2016:
ERPG-3: 50 ppm  ERPG-2: 10 ppm  ERPG-1: 2 ppm

REFERENCES


6. RTECS (Micromedex, Inc. [CD-ROM version], Vol. 23, exp. 1/31/1995).


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**Bhoite, P.Y. (Study Director):** SUMMARY REPORT (Preliminary Results): Repeated Dose 28-Day Dermal Toxicity Study of Furfural in Rats Followed by a 4-Week Recovery Period. JAI Research Foundation (laboratory), JRF Study Number 4700. EPA TSCA Report 8EHQ-0604-15585A submitted by Alan C. Katz (2004).

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