

Ozone

May 1994

Immediately Dangerous to Life or Health Concentrations (IDLH)

<https://www.cdc.gov/niosh/idlh/10028156.html>

CAS number: 10028–15–6

NIOSH REL: 0.1 ppm (0.2 mg/m³) CEILING

Current OSHA PEL: 0.1 ppm (0.2 mg/m³) TWA

1989 OSHA PEL: 0.1 ppm (0.2 mg/m³) TWA, 0.3 ppm (0.6 mg/m³) STEL

1993-1994 ACGIH TLV: 0.1 ppm (0.2 mg/m³) CEILING

Description of substance: Colorless to blue gas with a very pungent odor.

LEL: . . Nonflammable Gas

Original (SCP) IDLH: 10 ppm

Basis for original (SCP) IDLH: The chosen IDLH is based on the statement by AIHA [1966] that pulmonary edema developed in welders who had a severe acute exposure to an estimated 9 ppm ozone plus other air pollutants [Kleinfeld et al. 1957]. Patty [1963] reported that 15 to 20 ppm is lethal to small animals within 2 hours [Wetheridge and Yaglou 1937]. AIHA [1966] also reported that on the basis of animal data, exposure at 50 ppm for 60 minutes will probably be fatal to humans [King 1963].

Existing short-term exposure guidelines: National Research Council [NRC 1984] Emergency Exposure Guidance Levels (EEGLs):

1-hour EEGL: 1 ppm

24-hour EEGL: 0.1 ppm

ACUTE TOXICITY DATA:

Lethal concentration data:

Species	Reference	LC ₅₀ (ppm)	LC _{Lo} (ppm)	Time	Adjusted 0.5-hr LC (CF)	Derived value
Mouse	Clamann & Bancroft 1957	-----	12.6	3 hr	23 ppm (1.8)	2.3 ppm
Human	Deichmann & Gerarde 1969	-----	50	30 min	50 ppm (1.0)	5.0 ppm
Rabbit	Mittler et al. 1956	-----	36	3 hr	65 ppm (1.8)	6.5 ppm
Mouse	Mittler et al. 1956	-----	21	3 hr	38 ppm (1.8)	3.8 ppm
Rat	Mittler et al. 1956	-----	21.8	3 hr	39 ppm (1.8)	3.9 ppm
G. pig	Mittler et al. 1957	-----	24.8	3 hr	45 ppm (1.8)	4.5 ppm
Rat	Stokinger 1957	-----	4.8	4 hr	10 ppm (2.0)	1.0 ppm

Other animal data: It has been reported that 15 to 20 ppm is lethal to small animals within 2 hours [Witheridge and Yaglou 1937].

Human data: Pulmonary edema developed in welders who had a severe acute exposure to an estimated 9 ppm ozone plus other air pollutants [Kleinfeld et al. 1957]. It has been reported that on the basis of animal data, exposure at 50 ppm for 60 minutes will probably be fatal to humans [King 1963].

Revised IDLH: 5 ppm
Basis for revised IDLH: The revised IDLH for ozone is 5 ppm based on acute inhalation toxicity data in humans [Deichmann and Gerarde 1969; Kleinfeld et al. 1957].

REFERENCES:

1. AIHA [1966]. Ozone. In: Hygienic guide series. Am Ind Hyg Assoc J 27:196-198.
2. Clamann HG, Bancroft RW [1957]. Physiological effects of ozone. Fed Proc 16:22 [Abstract].
3. Deichmann WB, Gerarde HW [1969]. Ozone. In: Toxicity of drugs and chemicals. New York, NY: Academic Press, Inc., pp. 446-448.
4. King ME [1963]. Toxicity of ozone. V. Factors affecting acute toxicity. Ind Med Surg 32:93-94.
5. Kleinfeld M, Giel C, Tabershaw IR [1957]. Health hazards associated with inert-gas-shielded metal arc welding. AMA Arch Ind Health 15(1):27-31.

6. Mittler S, Hedrick D, King M, Gaynor A [1956]. Toxicity of ozone. I. Acute toxicity. *Ind Med Surg* 25:301-306.
7. Mittler S, Hedrick D, Phillips L [1957]. Toxicity of ozone. II. Effect of oxygen and carbon dioxide upon acute toxicity. *Ind Med Surg* 26:63-66.
8. NRC [1984]. Emergency and continuous exposure limits for selected airborne contaminants. Vol. 1. Washington, DC: National Academy Press, Committee on Toxicology, Board on Toxicology and Environmental Health Hazards, Commission on Life Sciences, National Research Council, pp. 99-106.
9. Patty FA, ed. [1963]. Industrial hygiene and toxicology. 2nd rev. ed. Vol. II. Toxicology. New York, NY: Interscience Publishers, Inc., p. 917.
10. Stokinger HE [1957]. Evaluation of the hazards of ozone and oxides of nitrogen. *Arch Ind Health* 15:181-190.
11. Witheridge WN, Yaglou CP [1937]. Ozone in ventilation: its possibilities and limitations. *Trans Am Soc Heat Vent Eng* 45(1132):509-522.

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