

## Summary of US Acronyms for Ethylene Oxide Exposure Standards

**Action Level (OSHA) :** for EtO is 0.5 ppm, calculated as an 8-hour time-weighted average

**ERPG:** The American Industrial Hygiene Association (AIHA) has recommended Emergency Response Planning Guidelines (ERPGs). AIHA has recommended an ERPG-3 of 500 ppm, which is "the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing life threatening health effects".

The ERPG-2 of 50 ppm is "the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing serious health effects or symptoms that could impair an individual's ability to take protective action".

There is no specified ERPG-1, the "maximum concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing other than mild, transient effects or without perceiving a clearly defined objectionable odor".

**Excursion Limit:** for EtO is 5 ppm, as averaged over a sampling period of 15 minutes

**IDHL:** The IDLH concentration for EO is 800 ppm. Carcinogenic effects of this compound were not considered in determining the IDLH value. The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory protection equipment. In the event of failure of respiratory protective equipment every effort should be made to exit immediately.

**NIOSH IDLH** -- National Institute of Occupational Safety and Health's immediately dangerous to life or health concentration; NIOSH recommended exposure limit to ensure that a worker can escape from an exposure condition that is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from the environment.

**NIOSH REL**--NIOSH's recommended exposure limit; NIOSH-recommended exposure limit for an 8- or 10-h time-weighted-average exposure and/or ceiling.

**OSHA PEL**--Occupational Safety and Health Administration's permissible exposure limit expressed as a time-weighted average; the concentration of a substance to which most workers can be exposed without adverse effect averaged over a normal 8-h workday or a 40-h workweek.

LEL: Lower Explosive Limit, EO = 3%, 30,000ppm

UEL: Upper Explosive Limit, EO = 100%

PEL: OSHA's Permissible Exposure Limits, or PELs, are the following:

- 1 ppm in air as an 8 hour time weighted average (TWA) concentration
- 5 ppm 15 minute excursion limit (EL)

REL: The NIOSH recommended exposure limits (**RELs**) are time-weighted average (**TWA**) concentrations for up to a 10-hour workday during a 40-hour workweek. A short-term exposure limit (**STEL**) is a 15-minute TWA exposure that should not be exceeded at any time during a workday. Same as OSHA PEL.

- **TLV = Threshold Limit Value.** (TLV is a trademark of the American Conference of Governmental Industrial Hygienists) ACGIH TLV's are essentially the same as OSHA's "PEL's" (Permissible Exposure Limits), There are three categories of TLV's:
  1. **TLV-TWA: (Time Weighted Average).** This refers to the concentration for an 8-hour work day and 40-hour work week, to which most workers may presumably be exposed on a daily basis without adverse effect.
  2. **TLV-STEL: (Short Term Exposure Limit).** This refers to the concentration to which workers can be exposed to CONTINUOUSLY for a "SHORT" period of time, without suffering from irritation, chronic or irreversible tissue damage, narcosis to the degree to cause impaired self rescue or accidental injury. All this is provided that the daily TLV-TWA has not been exceeded. The STEL is further defined as a 15 minute TWA exposure which should not be exceeded any time during the work day, even if the 8-hour TWA is within the TLV-TWA. Exposures above the TLV-TWA up to the STEL should not occur more than four times a day. There should be at least one hour between such successive exposures.
  3. **TLV-C (Ceiling).** This is the concentration which should not be exceeded during ANY part of the working day.

**TWA (8-hour time-weighted average) for EtO is 1 ppm.**