

Poison/Toxic Gases Leak Response Guidance

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The focus of this article is to talk about leak response guidelines for toxic/poison gases. These are gases that have a Lethal Concentration 50 (LC 50) value of 5000 parts per million (ppm) or less. LC 50 is the concentration of a chemical in the air that will kill 50% of the test subjects, typically mice or rats, when administered as a single exposure. Examples of toxic gases would be arsine with an LC 50 at 20 ppm and hydrogen sulfide with an LC 50 at 712 ppm.

For potential release of highly hazardous chemicals you must comply with either 29 CFR 1910.38 and 1910.39 (*Emergency Action and Fire Prevention Plan*) or 29 CFR 1910.120 (*Hazardous Waste Operations and Emergency Response* (HAZWOPER))

If you decide to completely evacuate all employees from the danger area should there be a release of a hazardous chemical, then you may elect to comply with the requirements of 29 CFR 1910.38 and 1910.39 Emergency Action & Fire Prevention Plans. If you make this choice to completely evacuate, you should make arrangements in advance for an outside fully trained emergency response team that can respond to such a leak. Choices for such services may include:

- Local community emergency response organizations.
- Companies that specialize in HAZWOPER coverage.
- Industrial gas companies that provide emergency response services.

If you decide to have designated employees respond to and perform work to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance you must comply with all the applicable elements of 29 CFR 1910.120 *Hazardous Waste Operation and Emergency Response* and your Hazardous Material Response (HAZMAT) Team must be trained and certified to the training requirements of this standard. Keep in mind that a HAZMAT team is not a fire brigade nor is a typical fire brigade a HAZMAT team.

Only properly trained and qualified personnel having the appropriate PPE can respond to and mitigate an immediately dangerous to life or health (IDLH) situation. The Occupational Safety and Health Administration (OSHA) defines an IDLH concentration in their hazardous waste operations and emergency response regulation as follows: *An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.* At no time is it permissible to dispatch personnel to respond to an emergency situation without proper training or equipment. If on-site personnel are not properly trained and qualified with the appropriate PPE, outside trained responders may be necessary to mitigate the emergency. Sites must work closely with outside emergency response groups for effective emergency response. This should involve periodic emergency response drills, site reviews, and/or consultation.

Hazardous material responders are defined in 29 CFR 1910.120 and must meet the training requirements established in the standard under 1910.120(q).

- **First Responder Awareness** - Recognize the problem (identify and notify).
- **First Responder Operations** - Defensive skills (evacuation and protect).
- **Hazardous Materials Technician** - Offensive operations (plug, patch, control the spill and stop the leak).
- **Hazardous Materials Specialist** - Similar to technician (more specific in detail to products).
- **Incident Commander** - Person in charge of the scene (Fire Chief, Police Chief, etc.).

- **First Responder Awareness and Operations Training (8 hrs. training)**
 - Hazardous Communication
 - MSDS Training
 - Chemical Safety
 - Emergency Action Plan
 - Hazard Recognition
 - Selection & Use of PPE
 - Basic Control
 - Basic Decontamination
 - Site Security

- **Hazardous Materials Technician and Specialist Training (24 hrs. training)**

Equal to the first responder operation level plus competency in the following areas:

- Implementation of the emergency response plan.
- Classify, identify & verify hazardous substances.
- Function within Incident Command System.
- Select & use proper specialized chemical PPE.
- Know hazard & risk assessment techniques.
- Perform advance control, containment & confinement operation.
- Implement decontamination procedures.
- Understand termination procedures.

- **Specialist Training Only**

- All the above plus:
 - Act as site liaison with Federal, State & Local Authorities
 - Know the state emergency response plan.
 - Ability to develop a site safety & control plan.