

University of Pittsburgh Safety Manual	EH&S Guideline Number: 04-012	
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Guidelines for Phosgene Gas Usage in Laboratories

Phosgene (CCl_2O) is a colorless, nonflammable gas with an odor like newly mown hay. Phosgene is produced commercially by chlorinating carbon monoxide. Phosgene has a health hazard rating of 4, which designates a highly toxic material. Odor is an insufficient warning of hazardous concentrations. The odor threshold is 5 times higher than the OSHA Permissible Exposure Limit (OSHA PEL). Inhalation of phosgene can cause eye and throat irritation leading to coughing or wheezing, lung swelling, breathing difficulty, severe lung damage and death. The storage and usage of phosgene requires special handling procedures:

1. Phosgene gas cylinder storage / usage
 - 1.1 International Building Codes prohibit quantities of highly toxic gases (such as phosgene) to be stored or used outside of exhausted gas cabinets or certified chemical fume hoods.
 - 1.2 Phosgene is required to be purchased in quantities smaller than 20 cubic feet or in quantities that can be easily stored and used in a gas cabinet or chemical fume hood.
 - 1.3 Phosgene gas cylinders are required to be secured with an approved chain, strap or floor bracket inside of the gas cabinet or chemical fume hood.
 - 1.4 Gas cylinders should be procured in returnable, refillable cylinders. EH&S does not recommend the usage of lecture bottles (non-refillable, non-returnable). Consult EH&S concerning vendors that supply returnable, refillable cylinders.
 - 1.5 EH&S recommends that floor level exhaust ventilation (ex. ventilation snorkel) be utilized during storage and usage of phosgene gas due to the fact that phosgene is heavier than air.

2. Phosgene storage in approved gas cabinet
 - 2.1 Phosgene is required to be stored in an approved gas cabinet or chemical fume hood that meets necessary requirements.
 - 2.2 Gas cabinet or chemical fume hood is required to be connected to building exhaust. Emergency power to operate the gas cabinet or chemical fume hood exhaust is highly recommended.
 - 2.3 If phosgene gas cylinders will be operated unattended (e.g. overnight test procedures), then gas detectors must be interconnected to the building emergency power source. The regulator should be linked to the building power source that would enable the regulator to shut the flow of gas off in the event of a power outage if the phosgene gas is run unattended.

3. Laboratory door signage
 - 3.1 Door signage should be placed outside of laboratories and storage rooms in which phosgene gas cylinders are stored and / or used. EH&S will provide all necessary door signage.
 - 3.2 Room entry requirements on the door signage should include the following:
 - 3.2.1 PHOSGENE (CCl_2O) gas storage. Highly Toxic gas.
 - 3.2.2 Entry into the laboratory is prohibited upon activation of the phosgene monitor (where applicable), except by authorized or emergency personnel.
 - 3.2.3 Entry into the laboratory is prohibited upon olfactory detection of “newly mown hay” smell or monitor detection. Personnel must immediately vacate laboratory space or building upon olfactory or monitor detection.

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- 3.2.4 Emergency responders equipped with gas detection equipment and self-contained breathing apparatus (SCBA) must conduct air quality measurements prior to entrance into the laboratory or phosgene storage site.
- 3.2.5 Upon clearance, authorized personnel are permitted to enter laboratory space or storage room to facilitate necessary repairs to equipment or gas cylinders.