

# Campus Toxic Gas Program

The Campus Toxic Gas Program specifies minimum requirements for safe storage, use, and handling of toxic gas on the UC Berkeley Campus. This program has been approved by the Laboratory Operations and Safety Committee and defines toxic gases as gases that cause significant acute health effects at low concentrations, have a National Fire Protection Association (NFPA) health rating of 3 or 4, have low occupational exposure limits, or are pyrophoric. Examples of some common toxic gases:

allene	dichlorosilane	nitric oxide
ammonia	dimethylamine	nitrogen dioxide
arsenic pentafluoride	disilane	nitrogen trifluoride
arsine	fluorine	phosgene
boron trichloride	fluorine mixtures	phosphine
boron trifluoride	germane (GeH <sub>4</sub> )	phosphorous pentafluoride
bromine pentafluoride	hydrogen bromide	phosphorous trichloride
bromine trifluoride	hydrogen chloride	phosphorous trifluoride
1,3 butadiene	hydrogen cyanide	silane (SiH <sub>4</sub> )
carbon tetrafluoride	hydrogen fluoride	silicon tetrafluoride
carbon monoxide	hydrogen selenide	stibene (SbH <sub>3</sub> )
carbonyl sulfide	hydrogen sulfide	sulfur tetrafluoride
chlorine	methyl bromide	sulfuryl fluoride
chlorine trifluoride	methyl chloride	tungsten hexafluoride
cyanogen	methyl silane	vinyl chloride
cyanogen chloride	monomethylamine	
diborane	nickel carbonyl	

The Office of Environment, Health & Safety (EH&S) assists the campus community in following this program by performing evaluations of toxic gas usage and offering technical advice on the requirements of this program. If you are planning to use a toxic gas or a mixture that contains a toxic gas and are unsure whether it is hazardous enough to be governed by the Toxic Gas Program, please contact EH&S at 642-3073. When preparing to use a toxic gas, one or more of the following requirements may apply to your laboratory:

- Exhausted cabinets or enclosures for storing toxic gas cylinders and manifolds
- Air flow monitors or alarms on exhausted enclosures
- Toxic gas sensors and alarms for the laboratory
- Gas distribution equipment that uses compatible materials and design
- Restrictive flow orifices that limit the flow rate of gas
- Documented safety procedures and training of lab personnel
- Modeling of “worst case” gas release scenario
- Secure storage

**The Laboratory Operations & Safety Committee requires that EH&S review and approve each proposed toxic gas use before the gas is obtained for that use.** EH&S will determine which of the above safety measures is required on a case-by-case basis after an



evaluation of the planned research and experimental setup. In general, more stringent precautions will be applied to large quantities, continuous flow (as opposed to batch) uses of toxic gases, and to gases with poor physiological warning properties. If you have questions about Toxic Gas Program requirements, contact EH&S at 642-3073. To read a full description of the program, go to the EH&S web site (<http://ehs.berkeley.edu>), and click the Toxic Gas Program link.

