

Additional Requirements for Toxic, Pyrophoric, and Flammable Gases

The following information is for general guidance. Consult with the Department of Environmental Health and Safety (EHS) to determine requirements for your particular usage. A code analysis may also be required.

TOXIC AND PYROPHORIC LECTURE BOTTLE CYLINDERS

Lecture Bottle cylinders of the following gases located in laboratory units shall be kept in a continuously mechanically exhausted ventilated hood or other continuously mechanically exhausted ventilated enclosure:

1. All toxic gases that have health hazard ratings of 3 or 4
2. All gases that have a health hazard rating of 2 without physiological warning properties
3. Pyrophoric Gases.

FIXED PRESSURIZED PIPING

All compressed gases listed below and distributed in fixed pressurized piping must have excess flow control devices. Flexible (non-fixed) tubing for the gases listed below is only acceptable if under 10 feet in total length. EHS may also require continuous gas monitoring and automatic shutoff valves on a case by case basis in addition to specific requirements listed in applicable sections below.

1. All gases that have health hazard ratings of 3 or 4
2. All gases that have a health hazard rating of 2 without physiological warning properties
3. Pyrophoric Gases.
4. Flammability Class 4
5. All gases that have a reactivity rating of 3 or 4

TOXIC GAS

All toxic gas cylinders (greater than lecture bottle size) with a health hazard rating of 3 or 4 and cylinders of gases that have a health hazard rating of 2 without physiological warning properties located in a laboratory unit shall comply with the following as a minimum:

1. Keep cylinders in approved continuously mechanically ventilated gas cabinets.
2. Equip with a continuous gas detection system. (Note: Gas detection may not be required where the physiological warning properties for the gas are at a level below the accepted permissible exposure level or ceiling limit of the gas.)
3. The gas detection system shall initiate a local alarm that is both visible and audible.

Any use of Toxic Gas in quantities above the UM-Dearborn Maximum Allowable Quantities (refer to EHS Compressed Gas Guideline) in any size cylinder may be required to have the following upon consultation with EHS:

1. Keep cylinders in approved continuously mechanically ventilated gas cabinets.
2. Equip with a continuous gas detection system. (Note: Gas detection may not be required where the physiological warning properties for the gas are at a level below the accepted permissible exposure level or ceiling limit of the gas.)
3. The gas detection system shall initiate a local alarm that is both visible and audible.
4. The gas detection system shall transmit a signal to a constantly attended control station.
5. Activation of the gas detection system shall automatically shut off the flow of gas related to the system being monitored.
6. The gas detection system shall detect the presence of gas at or below the OSHA permissible exposure level or ceiling limit of the gas.
7. Emergency power must be provided for the exhaust ventilation, gas detection system and alarm systems when required.
8. Treatment systems for the exhaust.
9. Sprinkler protection for gas cabinets and other protective features.

PYROPHORIC GAS

Cylinders of pyrophoric gases (greater than lecture bottle size) shall be kept in approved continuously mechanically ventilated, sprinklered gas cabinets and must be equipped with an excess flow control device.

In addition to the requirements listed above, any quantity of Pyrophoric Gas above the UM-Dearborn Maximum Allowable Quantities (refer to EHS Compressed Gas Guideline) may be also required to have the following upon consultation with your OSEH representative:

1. Equipped with a continuous gas detection system.
2. The gas detection system shall initiate a local alarm that is both visible and audible.
3. The gas detection system shall transmit a signal to a constantly attended control station.
4. Activation of the gas detection system shall automatically shut off the flow of gas related to the system being monitored.
5. The gas detection system shall detect the presence of gas at or below the Lower Explosive Limit (LEL). If the gas is also toxic, the system should detect the presence of gas at or below the OSHA permissible exposure level or ceiling limit of the gas in lieu of the LEL.
6. Emergency power must be provided for the exhaust ventilation, gas detection system and alarm systems when required.

FLAMMABLE GAS

Flammable Gas quantities above the UM-Dearborn Maximum Allowable Quantities (refer to EHS Compressed Gas Guideline) may be required to have the following:

1. Equipped with a continuous gas detection system.
2. The gas detection system shall initiate a local alarm that is both visible and audible.
3. The gas detection system shall transmit a signal to a constantly attended control station.
4. Activation of the gas detection system shall automatically shut off the flow of gas related to the system being monitored.

5. The gas detection system shall detect the presence of gas at or below the Lower Explosive Limit (LEL). If the gas is also toxic, the system should detect the presence of gas at or below the OSHA permissible exposure level or ceiling limit of the gas in lieu of the LEL.
6. Emergency power must be provided for the exhaust ventilation, gas detection system and alarm systems when required.
7. Sprinkler protection for gas cabinets and other protective features may be required.