

Toxic & Highly Toxic Gases Inspection

INTRODUCTION

The Toxic Gas Program is written to ensure safe and regulated use of toxic gases, highly toxic and pyrophoric gases. Encompassing all regulations pertinent to toxic gases, the corresponding inspection is a mandatory compliance guide to all users of toxic gases on the UC Irvine campus. It is revised whenever significant changes in policy or regulations take place and otherwise reviewed on an annual basis. Communicating all revisions to affected lab personnel is the responsibility of the principal investigator or laboratory manager. The program also describes responsibilities of toxic gas users and EH&S and detailed specific requirements for required engineering controls.

Toxic gas inspections are performed on an annual basis the office of Environmental Health & Safety.

Cited Regulations:

- California Fire Code, Chapter 60

DEFINITIONS

Exhausted Enclosures – locally ventilated gas cabinets and fume hoods.

LC50- The average concentration of a chemical or mixture in air as a gas, vapour, mist, fume or dust capable of killing 1/2 of the test animals exposed by inhalation under specific conditions, often expressed in ppm or mg/m3.

Highly Toxic Gas – The California Fire Code class for a gas that has a median lethal concentration (LC50) between 0 and 200 parts per million (ppm) by volume in air when administered by continuous inhalation for one hour or less to albino rats, each weighing between 200 and 300 grams.

Toxic Gas – The California Fire Code class for a gas that has a median lethal concentration (LC50) between 201 and 2,000 ppm by volume in air when administered by continuous inhalation for one hour or less to albino rats, weighing between 200- 300 g.

Pyrophoric Gas – A gas that, upon contact with air or oxygen, will ignite spontaneously at or below a temperature of 54.5 degrees C (130 degrees F).

For any questions or clarification please refer to the Toxic Gas Program at: ehs.uci.edu/programs or contact EH&S at 949.824-6200.

Date of Inspection:

Follow-up Date:

EH&S Surveyor:

Dept.	
Building:	Room Number:

Principal Investigator Name:

Principal Investigator Phone/Email:

Lab Representative(s):

Lab Representative Phone/ Email(s):

GAS INVENTORY

<u>Name:</u>	<u>Concentration:</u>	<u>Class:</u>
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Class:
T: Toxic
HT: Highly Toxic
Pyr: Pyrophoric

Fire Prevention-Hazardous Materials

Toxic & Highly Toxic Gases

1. TRAINING RECORDS	Status	Comments
1.1 All users have been trained on the TG Program and signed		
1.2 EH&S Toxic Gas training documented or in Progress		
1.3 EH&S Compressed Gas training is documented or in Progress		
1.4 All users been trained on the process SOPs specific to each gas.		
1.5 Are there written emergency response procedures for accidental releases of each present toxic gas?		
1.6 All non-users have been trained on emergency response in case of accidental release		
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2. EXHAUSTED ENCLOSURES		
2.1 Are all gas cabinets and fume hoods labeled?		
2.2 Are there any toxic gases with no exhausted enclosures? No Yes, Detail.		
2.3 Airflow rates are at a minimum of 200 fpm with a minimum of 150 fpm at any point. Include a value for every exhausted enclosure.		
2.4 Continuously reading ventilation airflow monitor present on every enclosure? Yes No, List deficiencies		
2.5 Automatic sprinkler system		
2.6 Gas cabinets have 3 cylinders or less.		
2.7 TSS or other Sticker is current showing inspection date.		
2.8 Highly Toxic or Pyrophoric: Rooms are sprinklered.		
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3. TREATMENT SYSTEM		
3.1 Discharge is being reduced to ½ IDLH of the gas, Gas/IDLH _____ Responsibility of EHS/HVAC.		
3.2 Is treatment system being bypassed? If yes, are the following present? <input type="checkbox"/> Valve outlet plugs <input type="checkbox"/> Hand-wheel operated valves are prevented from movement Moveable containment vessels are present and capable of handling a worst case release.		
3.3 Emissions significant enough to require emissions controls device? Describe current controls.		
3.4 More than one type of gas to one enclosure?		

N/A- Not Applicable ✓ - Compliance **R**-Requiring Correction

Fire Prevention-Hazardous Materials

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3.5 Piping compatible with exhaust toxic gas?

4. MONITORING SYSTEM

Detectors & Alarms

4.1 Alarms inside exhausted enclosures are detecting at IDLH level

4.2 Alarms are in at least one outside breathing location and are detecting at ½ PEL level

4.3 Are alarms being calibrated everywhere at the recommended frequency?

4.4 Automatic shut-off at the source is triggered following detection by the monitoring system

4.5 Automatic shut-off is bypassed? If yes, is

◇ Gas operation less than 15 psi

◇ Operation is constantly attended

Supply has accessible emergency shut-off valve

4.6 Is emergency power source provided for:

◇ Exhaust ventilation

◇ Treatment system

◇ Gas detections

◇ Emergency alarms

5. CONTACT PRECAUTIONS

5.1 All connections compatible AND welded?

5.2 Flow restrictors used when needed?

5.3 All regulators, valves and lines are constructed of compatible material

6. STORAGE AND HANDLING

6.1 Oxidizing gases are kept at least 20 feet away from flammable gases or by non-combustible 30 min rated firewall?

6.2 Safety Data Sheets are affixed next to the lab's main exit

6.3 All lecture cylinders are double restrained.

6.4 How are valve fittings of lecture cylinders being used/stored?

6.5 Toxic Oxidizers are not near combustible sources

Fire Prevention-Hazardous Materials

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6.6 Flammables next to heat, ignition or electrical sources?		
6.7 Corrosives stored less than 6 months or recertified?		
7. PROCESSES		Detail Deficiency / Other Notes:
7.1 Other enclosures are constructed of compatible material		
7.2 All gas lines whether main supply or process are labeled with the direction of flow		
7.3 All process equipment and associated lines are seismically secured to non-combustible		
7.4 Are designated areas defined?		
7.5 Other Issues:		

Other Comments/Solutions/Notes: