Stanford University

What Researchers Need To Do In Preparation for Operations Involving Exempt Quantities of Toxic Gas

I. PURPOSE:

This document is designed to assist researchers by identifying steps they need to complete in order to ensure that their labs are ready to support exempt quantities of toxic gas.

The tasks outlined below must be addressed as early as possible ***before placing the order for the toxic gas*** in order to facilitate your research schedule.

II. ACTION ITEMS FOR RESEARCHERS:

1) Determine if the material is exempt from Santa Clara County's Toxic Gas Ordinance (TGO):
   - Consult Stanford University's Regulated Toxic Gas Table to determine classification (i.e., Class I, II, III, or "Not Regulated") available at: http://www.stanford.edu/dept/EHS/prod/researchlab/lab/tgo/tgodata.html
     - *Certain gases are regulated based on their toxicity; a material that has a median Lethal Concentration (LC 50) in air less than 5000 parts per million by volume of gas or vapor is regulated. The TGO describes gases by classes, with Class I being the most toxic.*
     - *There are constraints on the quantities of hazardous materials in a building per Control Area. EH&S evaluates the chemical inventory with the researcher to ensure that the aggregate quantity of hazardous materials within a Control Area of a building is not exceeded.*

   - A regulated toxic gas is exempt from most of the provisions of the TGO if:

     The material has an aggregate quantity of less than 2 lbs in a control area,

     And

     The quantity in a single vessel does not exceed:
     - 1 pound; or
     - A concentration below the Permissible Exposure Limit (PEL) http://www.dir.ca.gov/Title8/5155table_ac1.html

     Note: All materials, whether regulated by the TGO or not, must meet Fire and all other hazardous materials handling policies and regulations.

2) Prepare Standard Operating Procedure (SOP) for the proposed experiment using guidance available at: http://chemtoolkit.stanford.edu/TemplateSOP, along with a simple sketch. Additionally, for toxic gas operations indicate:

a) gas type/concentration/volume stored in cylinder - temperatures/pressures expected at various points in the process
b) apparatus safety features (RFO size, excess flow valves, shutoff valves, etc.)
c) piping material/size/anchorage/route to be used from cylinder to point-of-use
d) dedicated exhaust used for tool (e.g., certified fume exhaust, gas cabinet, special purpose hood/enclosure)
e) details regarding cylinder installation (e.g., how it will be secured)

f) leak check procedures for piping systems prior to opening gas valve and when receiving cylinder(s)
g) information regarding monitoring systems and alarms in place
h) description of any other collateral hazards (e.g., lasers, electrical)

3) Consult with EH&S (723-0448) and your departmental building manager to see if your facility can safely support the use of exempt quantity toxic gases.

EH&S support includes:

✓ Review if acquisition of new toxic gas will exceed Control Area limit. ✓ Review for code impacts (i.e., Fire, Building, Mechanical, and Electrical). ✓ Review if area has adequate sprinkler coverage (required regardless of quantities of Class I Regulated Materials).	✓ Review engineering controls used to treat process exhaust work. [NOTE: Dilution of gas to ½ IDLH not needed under exempt TGO and UBC quantities.] ✓ Review general lab safety precautions. ✓ Advise on Restricted Flow Orifice (RFO) selection process. Contact vendor for information on RFO availability for specific gas system in use.

Departmental Building Manager will assist to:

✓ Coordinate obtaining ventilation information for space (e.g., confirmation of 6 air changes/hour in lab, system exhaust flow rates).	✓ Coordinate installation of special purpose hood or upgrade existing system per EH&S.

4) Obtain written prior approval from your Principle Investigator before ordering the gas. Per SU's Chemical Hygiene Plan, toxic gases are considered "Restricted Chemicals." See http://chemtoolkit.stanford.edu/RestrictedChem

5) When review process is completed and the laboratory is ready to support the toxic gas, place the toxic gas order.

6) Update your chemical inventory.