

**Chemical Use in Non-Laboratory Areas
Self-Audit Checklist**

Building _____ Room _____ Supervisor _____ Date _____

Audit Performed by _____

	Y	N	NA	COMMENTS
A. General Work Environment				
1. Work areas illuminated				
2. Storage of combustible materials minimized				
3. Trash removed promptly				
4. Aisles and passageways kept clear				
5. Wet surfaces covered with non-slip material				
6. Heavy items stored on lower shelves				
7. Means available to reach items stored above shoulder level				
8. Storage at least 18 inches below sprinkler head				
9. Storage at least 24 inches below ceiling				
10. Exits				
a. illuminated signs working				
b. Paths free from obstruction				
c. Alternate exits available				
d. Fire doors not blocked or wedged open				
e. Doors not locked				
11. Pits and floor openings covered or guarded				

Key to Chemical Use in Non-Lab Areas Checklist

A. General Work Environment

1. Depending upon the tasks involved, adequate lighting should be provided.
2. Minimize storage of materials that would add fuel to a burning fire. Examples would include paper goods, plastic containers, materials stored in boxes, empty containers.
3. A Building Services' responsibility, trash should be removed at least daily.
4. Self explanatory
5. Self explanatory
6. Self explanatory
7. A warehouse ladder, step stool, or some other appropriate means should be provide where items are stored above shoulder level.
8. Per NJ Uniform Fire Code, storage must be at least 18 inches below sprinkler heads.
9. Per NJ Uniform Fire Code, in any area with no sprinkler system, storage must be at least 24 inches below the ceiling.
10. Items (a) through (d) - Self explanatory.
Item (e) - Exit doors, including those which open directly from lab spaces into stairwells, must not be locked during normal business hours. Security measures are allowed after hours, with the approval of the local fire official.
11. Any floor opening or pit deeper than 4 feet must be covered or guarded (i.e., barricades, railing, etc.) to prevent falls.

	Y	N	NA	COMMENTS
B. Emergency Planning				
Facilities				
1. Fire extinguishers mounted near doorway				
2. Fire extinguishers unobstructed				
3. Fire extinguisher fully charged				
4. Fire extinguisher tamper indicator in place				
5. Eyewash and safety showers available in close proximity and unobstructed				
6. Fire alarm pull stations unobstructed				
7. Emergency lights functional				
Inspections				
8. Fire extinguisher inspected				
9. Eyewash and safety shower inspected				
Procedures				
10. Spill control plan completed				
11. Spill control materials available and adequate to cover anticipated spills				
C. Required Information/Postings				
Information				
1. Written Emergency Action Plan				
2. Material Safety Data Sheets Readily accessible				
3. Written Hazard Communication Program available				
4. Written Respiratory Protection Program available				

B. Emergency Planning

Key to Chemical Use in Non-Lab Areas Checklist

1. Self explanatory
2. Self explanatory
3. Some types of fire extinguishers have pressure gauges. Check these to insure extinguisher is fully charged. Fire extinguishers without pressure gauges can only be checked by trained personnel in Building Services.
4. If fire extinguisher tamper indicator is not in place, contact Building Services.
5. Self explanatory
6. Self explanatory
7. Press the self-test button on unit's power supply.
8. Fire extinguishers should be inspected monthly by Building Services with the results recorded on an attached inspection card.
1. Eyewash and safety showers should be inspected at least twice yearly and the result should be recorded on an attached inspection card.
2. Pre-planning is essential to handling a chemical spill. A written Spill Control Plan should be available, considering the amounts and types of chemicals used or stored in the area. General procedures and a guide to developing Spill Control Plans are available through EHS.
3. Employees working with chemicals should have access to spill control materials appropriate to the type and amount of chemicals used or stored in the lab. Some departments have spill control materials available in a central location. Pails, bags, and vermiculite are available through EHS. Recommended spill control materials are listed on the EHS web page, under Emergency Procedures, Chemical Spills (<http://www.princeton.edu/~ehs>).

C. Required Information/Postings

1. Every department must have an Emergency Action Plan which details emergency reporting procedures, escape routes, and employee assembly and accountability procedures. A model program is available through EHS.
2. Material Safety Data Sheets (MSDSs) must be obtained and retained by department for every hazardous chemical used or stored. See the written departmental Hazard Communication Program for location and procedures for MSDSs. The EHS web page has pointers to several sources of MSDSs (<http://www.princeton.edu/~ehs>). MSDSs also may be available through EHS.
3. Departments where chemicals are used in non-laboratory settings must have a written Hazard Communication Program, which includes an inventory of hazardous materials used or stored by the department, procedures for maintenance and procurement of MSDSs, labeling requirements, training requirements, contractor requirements, and non-routine tasks requirements. A model written program is available through EHS.
4. If respirators, including self-contained breathing apparatus, are used, the department must have a written Respiratory Protection Program, which details the procedure for respirator selection, medical assessment of respirator user health, training, proper fitting, respirator inspection and maintenance, and recordkeeping. A model written program is available through EHS.

	Y	N	NA	COMMENTS
1. Documentation of Personal Protective Equipment Hazard Assessment and training				
Postings				
6. Emergency Information Posters accurate and current				
7. OSHA poster				
8. Telephones posted with 911 sticker				
9. Building Evacuation Routes posted				
10. Fire Code Permits posted (when required)				
D. Personal Protective Equipment				
1. Eye and face protection available where needed				
a. Goggles and face shields for corrosives				
b. Industrial safety glasses for flying particles				
2. Areas requiring the use of eye protection posted				
3. Open toe shoes prohibited in areas where corrosives are used				
4. Respirator users:				
a. Appropriate respirator/appropriate cartridge used				
b. User(s) enrolled in respiratory protection program				
E. Chemical Storage				
Facilities				
1. Shelving adequate for loads imposed				
2. Refrigeration units for chemical storage labeled <i>No Food</i>				
3. Refrigeration units for food labeled <i>Food Only</i>				

Required Information/Postings (continued)

Key to Chemical Use in Non-Lab Areas Checklist

5. Departments must complete a hazard assessment to determine which types of personal protective equipment (e.g. eye and face protection, gloves, etc.) should be used. Workers must receive adequate training on personal protective equipment selection and use. Documentation of the hazard assessment and training must be maintained. Sample forms are available through EHS
6. Information regarding emergency contact people and specific chemical hazards must be posted at the principal entrance to each area where chemicals are stored or used, for use by emergency response personnel. Emergency Information Posters and instructions for their completion are available through EHS.
7. Commonly known as “the OSHA poster”, a poster entitled *Job Safety & Health Protection* must be conspicuously placed where notices to employees are customarily posted. Copies are available through EHS.
8. Self explanatory.
9. Posting of evacuation routes is recommended as part of the Emergency Action Plan.
10. A copy of the fire code permit must be posted per the local fire official's instructions received with the permit.

D. Personal Protective Equipment

1. Refer to the department's Personal Protective Equipment Hazard Assessment to determine what type of eye protection should be used.

2. Where eye protection is necessary, *Eye Protection Required* signs should be posted at the entrance to the area.
3. Self explanatory.
4. There are several types of respirators and respirator cartridges and filters. The proper combination of respirator type and cartridge or filter is necessary for protection from the anticipated concentration of the hazardous material. University policy indicates that all respirator use on campus must be reviewed by an Industrial Hygienist from EHS and that all respirator users are enrolled in the Respiratory Protection Program (which includes annual training and fit-testing and medical surveillance).

E. Chemical Storage

1. Generally, light-duty shelving should not be used. Shelving units should be securely anchored to the wall.
2. To avoid potential contamination, food should not be stored in refrigerators or freezers designated for chemical storage.
3. To avoid potential contamination, chemicals should not be stored in refrigerators designated for food storage.

	Y	N	NA	COMMENTS
1. Chemical storage cabinets properly labeled				
Containers				
5. Containers clearly labeled with chemical name(s) and CAS numbers				
6. Containers kept closed except during transfers				
7. Containers compatible with the chemical				
Procedures				
8. Chemicals segregated to avoid incompatibilities				
9. Large/heavy containers stored on lower shelves				
10. Corrosives not stored above eye level				
11. Storage quantities minimized				
12. Secondary containers used during transport of more than 1 pint of hazardous chemicals				
13. Materials with shelf lives dated and disposed of per supplier's recommendations				
14. Fire code permits obtained				
F. Flammable Liquids				
1. Used in well-ventilated area				
2. Stored in flammable liquid storage cabinet for more than 10 gallons per room				
3. Flammables separated from strong oxidizers				
4. Class ABC or BC fire extinguisher provided				
5. Flammable liquids not stored near ignition sources				

Key to Chemical Use in Non-Lab Areas Checklist

Chemical Storage (continued)

4. Labeling of cabinets by chemical class (e.g. flammable liquids, acids, oxidizers) is essential if chemical storage is to be segregated to avoid incompatibilities, and to identify storage areas for emergency response personnel.
5. Chemical containers must be clearly labeled with at least chemical name(s) and Chemical Abstract Service (CAS) number(s). The manufacturer's label is best, as it usually contains a great deal of information about health and physical hazards. When a chemical is transferred from the original container, the new container must be labeled, as possible. Small containers may use other means of identification, such as a code or number system referenced to the user's lab notebook.
6. In order to avoid spillage or release of vapors, containers should be closed except when transferring.
7. Some chemicals may degrade certain container materials. For example, hydrofluoric is incompatible with glass. Inorganic hydroxides are best stored in polyethylene containers. Some organic solvents will soften plastic.
8. Chemicals which may react violently or emit hazardous fumes when mixed should not be stored near each other. Examples include oxidizers and flammables, acids and bases.
9. Self explanatory.
10. Corrosive materials can cause severe tissue damage and are particularly injurious to the eye. Storage of corrosive below eye level helps to minimize this risk.
11. Quantities of chemicals in storage should be consistent with the short-term needs of the lab. Excessive storage should be avoided.

12. When transporting chemicals between rooms or buildings, secondary containers, such as bottle carriers, should be used. In the event the container is dropped, bumped or otherwise breaks, the contents would be contained in the bottle carrier, avoiding a spill. Bottle carriers are available in many stockrooms.
13. Some chemicals, such as ethers or other peroxide-formers, have recommended storage time limits. Chemicals stored beyond their limit date may form explosive peroxides, which may detonate when removing a cap, agitating, dropping, scraping, etc. Upon arrival, these containers should be marked with the date placed in storage and an expiration date based on manufacturer's recommendations. Many manufacturers include an expiration date on the product label.
14. Storage and use of certain quantities of several classes of chemicals trigger the need to obtain fire code permits from the local fire official. Information on fire code permits is available from EHS.

F. Flammable Liquids

1. Self explanatory.
2. If the total quantity of all flammable liquids stored in the room exceeds 10 gallons, a flammables storage cabinet must be used. No more than three flammables storage cabinets may be used in one room.
3. Chemical storage should be segregated to avoid incompatibilities. The storage of flammable liquids with strong oxidizers creates a fire hazard and should be avoided.
4. Designation that includes "B" class is appropriate for flammable liquids.
5. Self-explanatory.

	Y	N	NA	COMMENTS
G. Compressed Gases				
1. Used in well ventilated area				
2. Storage quantities minimized				
3. Secured from tipping in use				
4. Regulators compatible with gas cylinder				
5. Cylinder carts used for transport				
6. Protective valve caps in place				
7. Empty or unused gas cylinders promptly returned to supplier				
H. Waste Disposal				
1. Containers kept sealed except during transfer				
2. Containers labeled with the words <i>Hazardous Waste</i>				
3. Constituents of the waste described on the container label				
4. Storage limited to < 1 quart of acutely hazardous waste				
5. Glass chemical containers recycled per established procedures				
6. Separate disposal containers available for broken glass				
7. Containers compatible with waste				
I. Training/Awareness				
Training				
1. Workers have attended Hazard Communication Training				
2. Workers have attended Emergency Action Plan Training				
3. Workers have attended an orientation				

Key to Chemical Use in Non-Lab Areas Checklist

G. Compressed Gases

1. Self explanatory
2. As with the storage of all chemicals, quantities of compressed gas cylinders on-hand should be consistent with the short-term needs of the lab.
3. Compressed gas cylinders must be safely secured in an upright position while in storage or use. Information on the various ways to secure cylinders is available from EHS.
4. Regulators are designed for use with specific gases, within prescribed pressure ranges. Cylinder valve outlets and inlet connectors on regulators are designed to minimize the chances of using the wrong regulator. If the connections do not readily fit together, the wrong regulator is being used.
5. Large compressed gas cylinders are heavy and difficult to move. A cylinder cart makes the job of transporting cylinders easier and more secure.
6. Cylinders without attached regulators should have valve caps in place.
7. Disposal of abandoned cylinders is difficult and costly.

H. Waste Disposal

1. Except during transfers, N.J. Dept. of Environmental Protection regulations require that all waste containers be sealed.
2. Self-explanatory - per NJ Department of Environmental Protection standards.
3. Containers must list contents and approximate percentage composition. Standard chemical nomenclature (common or IUPAC) should be used. Symbols or structural formulas should be avoided.
4. No more than one quart of "acutely hazardous waste" (as listed by the N.J. Department of Environmental Protection) can be stored within a

lab work area. A list of acutely hazardous chemicals may be found on the EHS Web Page (<http://www.princeton.edu/~ehs>) under *Chemical Waste Procedures*.

5. To promote recycling and to reduce waste disposal costs, a procedure for disposing of empty glass chemical containers has been established. Details are available from Building Services or on the EHS Web Page (<http://www.princeton.edu/~ehs>), under *Hazardous Waste*.
6. Broken glassware should be placed in a cardboard *Glass Waste* receptacle. It should not be recycled or disposed of in regular trash containers.
7. Chemical containers should be constructed of materials that will not be affected by the substances that are stored in them. Hydrofluoric acid will etch glass. Acids corrode many metals and some organics will soften plastics.

I. Training/Awareness

1. All employees who with chemicals must attend Hazard Communication Training offered by EHS.
2. All employees within a department or building must receive training by the department on the Emergency Action Plan. This includes contacting Public Safety at 911 for emergencies such as fire or injury and what to do in the event of a fire alarm (evacuation routes, where your group is to congregate, accounting for all building occupants, etc.) See the written departmental Emergency Action Plan for information.
3. All employees should receive an orientation to the work area and chemicals used, including, as a minimum, where the written Hazard Communication Program is kept, how to use chemicals and equipment, how and when to use personal protective equipment, where emergency equipment, such as eye washes and safety showers are, who to contact in an emergency, where MSDSs are kept, spill control procedures, emergency procedures and incident reporting.

	Y	N	NA	COMMENTS
1. Workers have had training beyond EHS training				
2. Training (EHS and departmental) is documented				
Awareness: Do workers know				
1. what to do in the event of an emergency, such as fire, injury, including evacuation routes				
2. how to clean up chemical spills				
3. the Safety Manager for the department				
4. what an MSDS is and where to find them				
5. what type of personal protective equipment to use and when to use it				
6. what to do with chemical waste				

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Key to Chemical Use in Non-Lab Areas Checklist

Training/Awareness (continued)

1. The Hazard Communication Training conducted by EHS is general in nature and does not cover specific chemicals or procedures. Additional training must be provided by departmental personnel.
2. All training, including departmental training and that given by EHS, must be documented. Such records must be kept at least until the employee leaves Princeton University.

Awareness Questions

These questions may be asked of a representative number employees to help assess their level of understanding of health and safety issues. Based on their answers to these questions, additional training may be warranted. EHS may assist the department in developing such training.

1. Emergency response information should be covered in the departmental Emergency Action Plan training, including evacuation routes, calling 911, and assembly points.
2. Employees working with chemicals should know where spill control materials are stored and how to use them. Basic information about cleaning up chemical spills is covered in Hazard Communication training. EHS offers a more extensive training program for departments or groups upon request.
3. Self-explanatory.
4. An overview of the type of information available in MSDSs is given during Hazard Communication training. Departments must explain where to find MSDSs and the protocol for obtaining and maintaining MSDSs within the department.
5. General information about the use of personal protective equipment is discussed in Hazard Communication Training. Specific information about what particular personal protective equipment must be used for specific chemicals or processes must be given by the department.
6. Chemical waste procedures are reviewed in Hazard Communication training. Specific departmental procedures must be explained by the department.