



CHEMICAL HYGIENE PROGRAM CHEMICAL HYGIENE PLAN

January 3, 2024



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CHEMICAL HYGIENE PROGRAM

PURPOSE

The purpose of Alexandria Technical and Community College's (ATCC's) Chemical Hygiene Program is to minimize exposures, injuries, illnesses, and incidents to protect employees and students at ATCC from the risk of health hazards associated with hazardous chemicals in its campus laboratories. ATCC's Chemical Hygiene Program uses policies, procedures, and written programs to meet the requirements of the Occupational Health and Safety (OSHA) Laboratory Standard specified in 29CFR1910.1450.

ANNUAL REVIEW

ATCC's Chemical Hygiene Program is reviewed at a minimum at least annually and updated as necessary whenever changes in processes, chemicals, practices, policies, personnel, or equipment are implemented.

The annual review is completed by the chemical hygiene officer and/or the campus safety coordinator, with input from the Dean of Academic Affairs, science faculty, and lab techs/assistants. (Safety Committee) Its requirements are followed in all laboratories.

REGULATORY STANDARD

The OSHA standard for Occupational Exposure to Hazardous Chemicals in Laboratories Title 29 Code of Federal Regulations (CFR) Part 1910.1450, "Occupational Exposure to Hazardous Chemicals in Laboratories," often referred to as the Laboratory standard, specifies the requirements of a Chemical Hygiene Program to protect laboratory workers from harm due to hazardous chemicals. The standard's intent is to ensure that laboratory personnel are aware of the hazards of chemicals in their work area, and that appropriate work practices and procedures are implemented to promote the safe handling of chemicals from ordering to disposal. The ability to accurately identify and assess laboratory hazards is taught and encouraged through training and ongoing organizational support. A crucial component of this training is to nurture basic attitudes and habits of prudent behavior so that safety is a valued and inseparable part of all laboratory activities throughout a laboratory worker's career.

RESPONSIBILITIES

The following individuals are responsible for chemical hygiene, but are not limited to, the following:

President of Alexandria Technical and Community College

1. Ultimate responsibility for chemical hygiene within ATCC.
2. Provides necessary staffing and resources for maintaining an effective Chemical Hygiene Plan.

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3. Supports a broad-based laboratory safety/Chemical Hygiene Plan that will protect laboratory users from health effects associated with hazardous chemicals, and physical or biological hazards.
4. Ensures that employees assigned laboratory safety responsibilities are provided adequate time and recognition to carry out their responsibilities.
5. Promotes the importance of safety in all laboratory activities.

Director of Facilities and Security

1. Responsible for the maintenance of the campus facilities and laboratories.
2. Assists with the proper disposal of all generated hazardous waste.

Dean of Academic Affairs

1. Ensures that the Chemical Hygiene Officer has the authority to act to instruct/direct campus employees to implement the Chemical Hygiene Plan.
2. Is responsible for supporting safety in laboratories and helps to provide the resources as needed to ensure the safety of faculty, staff, and students.
3. Ensures timely actions are taken to address safety concerns in laboratories and to protect personnel and facilities.
4. Ensures the science departments remain in compliance with all applicable codes, regulations, and system/ATCC safety policies.
5. Provides budgetary arrangements to ensure the health and safety of departmental personnel, students, and visitors in the laboratories.
6. Assigns the Chemical Hygiene Officer's responsibilities to a qualified individual.
7. Assists the Chemical Hygiene Officer in selecting qualified individuals to serve on the Safety Committee.
8. Ensures that employees assigned laboratory safety responsibilities are provided adequate time and recognition to carry out their responsibilities.
9. Ensures that adequate time and resources are provided for proper training of all laboratory users.

Campus Safety Director/Administrator/Coordinator

1. Coordinates with the Facilities Director, Dean of Academic Affairs, Chemical Hygiene Officer, and faculty in promoting safety throughout the facility and in all laboratories.
2. Responsible for the safety of the institution by ensuring regulatory compliance and making appropriate recommendations to ALL personnel.
3. Ensures that there is a written and implemented Chemical Hygiene Plan (CHP) for the facility.
4. Acts as or ensures the appointment of a Chemical Hygiene Officer.
5. Ensures that the CHP is reviewed annually and updates are made as needed.

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6. Ensures that inspection, personnel training, and inventory records are kept and located in a central location and available for regulatory inspection.
7. Coordinates the proper disposal of all generated hazardous waste.
8. Participates on the Safety Committee.

Chemical Hygiene Officer

1. Ensures that the Chemical Hygiene Officers' Supervisor has given the necessary authority to act to instruct/direct the campus employees to implement the Chemical Hygiene Program.
2. Responsible for implementing and documenting appropriate safety policies and procedures in accordance with the Chemical Hygiene Plan.
3. Works with the Campus Safety Director/Administrator/Coordinator, faculty, and other employees to develop and implement appropriate chemical hygiene policies and procedures.
4. Monitors procurement, use, storage, and disposal of chemicals used in the lab.
5. Ensures all laboratory inspections (e.g. eyewash, etc.) are conducted and documented.
6. Assists laboratory supervisors in developing and maintaining adequate facilities.
7. Responsible for determining potential exposure to chemicals.
8. Seeks ways to improve the chemical hygiene program.
9. Ensures that chemical waste is managed properly.
10. Ensures that the SDS is available for all chemicals used in the laboratory.

Department Chairperson

1. Has overall responsibility for ensuring that all work performed within their departments complies with applicable health safety, including personnel engaged in laboratory operations.
2. Provides assistance to faculty and staff engaged in the laboratory use of hazardous chemicals.
3. Provides the chemical hygiene officer (CHO) with the support necessary to implement and maintain the CHP.
4. After receipt of the laboratory inspection report from the CHO, meets with laboratory supervisors to discuss cited issues and to ensure timely actions to protect trained laboratory personnel and facilities and to ensure that the department remains in compliance with all applicable federal, state, campus, and departmental codes and regulations.

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Campus Safety Committee

1. Reviews accident reports in timely manner and makes appropriate recommendations to the department chairperson regarding proposed changes in the laboratory procedures.
2. Monitors and advises on policies, procedures, equipment, and work practices to protect laboratory users from health hazards.
3. Conducts periodic laboratory inspections to identify any issues that may result in non-compliance with any applicable federal, state, system, campus, or departmental rules or regulations.

Faculty/Laboratory Supervisor

1. Ensures that laboratory personnel comply with the CHP.
2. Ensures personal protective equipment (PPE) is available and meets the requirements of the chemical's Safety Data Sheet.
3. Follows all pertinent safety rules when working in the laboratory to set an example.
4. Collaborates with the Safety Director/Administrator/Coordinator, CHO and others to identify effective means to implement CHP in the laboratory.
5. Assumes responsibility for all students and visitors to ensure all provisions of the laboratory rules are followed.
6. Maintains and implements safe laboratory practices.
7. Monitors the facilities and the chemical fume hoods to ensure that they are maintained and function properly.
8. Conducts hazard analysis and reviews applicable Safety Data Sheets before assigning work activities to other laboratory personnel.
9. Ensures regular, formal chemical hygiene and housekeeping inspections, including routine inspections of emergency equipment.

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Alexandria Technical and Community College's (ATCC's) Chemical Hygiene Plan (CHP) is a written program that sets forth the procedures, equipment, personal protective equipment and work practices to minimize exposures, injuries, illnesses and incidents to protect employees and students at ATCC from the risk of health hazards associated with hazardous chemicals in its campus laboratories. ATCC's CHP uses policies, procedures and written programs to meet the requirements of the Occupational Health and Safety (OSHA) Laboratory Standard specified in 29CFR1910.1450.

ATCC's Chemical Hygiene Plan applies to the safe handling, use, and storage of hazardous materials and includes standard practices to be followed when laboratory work involves the use of hazardous chemicals. When working with hazardous materials, it is essential to know about their physical properties and their potential health effects. These can be obtained by review of Safety Data Sheets, which are accessible on ATCC's website through MSDS Online at www.alextech.edu.

A copy of CFR 1910.1450 and its appendices are included in the binder with the Chemical Hygiene Plan, which is located in ATCC's Safety Department.

DEFINITIONS

A list of definitions is provided below. A more comprehensive list can be found in the OSHA Standard CFR1910.1450.

Chemical Hygiene Officer: An employee designated by the employer, who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan.

Chemical Hygiene Plan: A written program developed and implemented by an employer which sets forth procedures, personal protective equipment, and work practices that are capable of protecting employees from health hazards presented by hazardous chemicals used in ATCC campus laboratories.

Chemicals: Refers to hazardous substances, samples, and hazardous wastes.

Corrosive: A chemical that has a pH greater than 12 or less than 2. Corrosive chemicals will irritate or burn the skin, eyes and respiratory tract. Severe exposure can cause permanent damage.

Flammable Liquids: Liquids which produce flammable vapors which are both a fire and explosion hazard. It is important to understand that it is the vapor, not the liquid that can burn. The Flash Point is the temperature at which enough vapor is given off to form an ignitable mixture with air. Chemicals with a flash point of less than 100 degrees F are classified as flammable.

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Hazardous Chemical: Any chemical that is classified as a health hazard or simple asphyxiate in accordance with the hazard communication standard 1910.1200.

Laboratory: A facility where the “laboratory use of hazardous chemicals” occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

Reactive Chemicals: Any chemical that is inherently unstable and susceptible to rapid decomposition, as well as chemicals that act alone or with other substances in a violent uncontrolled manner liberating heat, toxic gases, or leading to an explosion. Reaction rates almost always increase rapidly as the temperature increases. If the heat evolved in a reaction is not dissipated, the reaction rate can increase until an explosion results.

Toxic chemicals: Any chemical that is poisonous or destructive to the body’s internal systems. The toxicity of a chemical is the degree of injury or illness that can be caused by it. Primary entry of these chemicals into the body is by inhalation, skin absorption, or ingestion.

INDIVIDUAL CHEMICAL HYGIENE RESPONSIBILITIES

Specific responsibilities for carrying out this program are identified by position below.

Chemical Hygiene Officer:

- Reviews and evaluates the Chemical Hygiene Plan annually for effectiveness.
- Ensures that any changes or additions to the program or program related documents are reviewed prior to implementation.
- Researches replacements for chemicals with high chronic toxicity and evaluates them prior to use.

ATCC Safety Coordinator:

- Ensures annual review, evaluation, and necessary updates to the Chemical Hygiene Plan.
- Ensures that employee training records and non-medical related program required records are maintained.
- Ensures annual eyewash and fume hood testing is completed.
- Ensures that weekly eyewash inspections are conducted.
- Evaluates and reviews the Chemical Hygiene Plan for effectiveness.
- Ensures that weekly hazardous waste storage area inspections are completed.

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Administration, Deans, Directors:

- Supports the overall Chemical Hygiene Plan.
- Provides resources for equipment to protect employees when using hazardous laboratory chemicals.

Human Resources Department:

- Maintains medical records based on regulatory requirements.
- Provides access to records based on regulatory requirements.

Department Heads, Supervisors, Laboratory Instructors:

- Ensures that Safety Data Sheets are available for all hazardous chemicals and that they are available for employees.
- Ensures that new equipment (fume hoods, eyewashes, etc.) is assessed prior to use.
- Provides appropriate personal protective equipment and makes it available to employees and students.
- Supervises staff to ensure that the Chemical Hygiene Plan is followed.
- Oversees employee and student use of and training on Laboratory Protective Equipment.
- Evaluates and reviews the Chemical Hygiene Plan for effectiveness.

Employees:

- Complies with ATCC's Chemical Hygiene Plan.
- Learns about the physical and chemical hazards associated with their respective laboratory and follows safe work practices.
- Learns the signs and symptoms associated with hazardous chemicals used in their respective laboratory.
- Wears personal protective equipment necessary to perform tasks safely.
- Completes required training sessions.

LABORATORY STANDARD OPERATING PROCEDURES

ATCC's Chemical Hygiene Plan identifies techniques for the safe handling, use, and storage of hazardous materials and includes standard practices to be followed when laboratory work involves the use of hazardous chemicals. When working with hazardous materials, it is essential to know about their physical properties and their potential health effects. These can be obtained by review of Safety Data Sheets.

Be prepared for hazardous material emergencies and know what action to take in the event of an emergency. Know the location of safety equipment including the emergency shower, eyewash, fire extinguisher and fire alarm pull station. Be certain that necessary supplies are

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available for handling small spills of hazardous materials. General guidelines for the safe use of hazardous chemicals are listed below.

General Safety Guidelines for the Proper Handling, Use and Storage of Chemicals:

1. Use common sense when working with or around any area where chemicals are being used or stored.
2. Limit access to areas where chemicals are used or stored by posting signs and ensuring doors are locked when areas are unattended.
3. If possible, do not work alone when working with hazardous chemicals.
4. Know the location of safety equipment such as an emergency shower, emergency eyewash, fire extinguisher, and fire alarm pull station.
5. Review Safety Data Sheets (SDS).
6. Labels on incoming chemicals should not be defaced or removed. All containers must be properly labeled with their identity and a hazard warning.
7. Only the minimum amount of hazardous chemicals should be kept at workstations.
8. Use chemicals in a laboratory hood when necessary.
9. Do not store chemicals in laboratory hoods.
10. Store all chemicals and samples in appropriate closed containers.
11. Store chemicals and samples in their proper place such as in an acid or flammable cabinet.
12. Chemicals are segregated for storage and returned accordingly.
13. Use appropriate personal protective equipment when working with hazardous chemicals.
14. Chemicals should be kept off desks and out of non-laboratory areas.
15. General paperwork and food products should be kept away from chemical use areas.
16. Spilled chemicals should be cleaned up immediately and disposed of properly.
17. No eating or drinking is allowed where chemicals are being used or stored.
18. Smelling of chemicals is discouraged or done only when absolutely necessary and only by wafting a small amount of vapor toward the nose.
19. Cover all open cuts and sores before working with chemicals.
20. Wash hands after working with chemicals.
21. Rinse all equipment before leaving it for final cleaning.

General Safety Guidelines for the Proper Handling, Use and Storage of Acids and Bases:

1. Always add acids or bases to water (A to W). *Never add water to acids or bases.*
2. Acids are poured slowly to avoid splashing or super heating.
3. In case of an emergency when working with corrosive chemicals, make sure that there is a source of water and functioning eyewash in the area.

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4. Flush acid or base containers with water after becoming empty.
5. Wipe surface areas after using acids or bases and dispose of wipes properly.

General Safety Guidelines for the Proper Handling, Use and Storage of Flammable Liquids:

1. Open flames and smoking are prohibited in all areas where flammable liquids are stored, handled or used.
2. Avoid prolonged or repeated skin contact.
3. Use only non-sparking electrical equipment.
4. Only store flammable liquids in tightly closed containers.
5. Store flammables in a designated flammable storage room or cabinet.

General Safety Guidelines for the Proper Handling, Use and Storage of Toxic Materials:

1. Protect the hands and forearms to avoid contact of toxic materials with the skin as indicated per chemical information.
2. Use and store these substances only in designated restricted access areas.
3. Procedures involving volatile toxic substances and those involving solid or liquid toxic substances that may result in the generation of aerosols should be conducted in a hood.
4. Wash hands thoroughly after working with toxic materials.
5. Dispose of contaminated clothing or shoes properly.

Research for replacement of chemicals with high chronic toxicity. Approval for usage is by the Chemical Hygiene Officer.

General Safety Guidelines for the Proper Handling, Use and Storage of Reactive Chemicals:

Highly reactive chemicals include those that are inherently unstable and susceptible to rapid decomposition as well as chemicals that can react alone under certain conditions. Other reactive chemicals react in a violent uncontrolled manner and liberate heat, toxic gases, or lead to an explosion.

Water Reactive react violently with water and often produce flammable hydrogen gas that can ignite when mixed with air. Examples include alkali metals, organometallic compounds, and some hydrides. Others give off large amounts of heat when mixed with water resulting in a violent reaction if heat produced is not dissipated.

Pyrophoric materials ignite spontaneously when exposed to oxygen and or moisture in air or at below 130° F. These must be stored under water, mineral oil, or an inert dry atmosphere depending on the substance. Examples include phosphorous, titanium, dichloride, tributyl aluminum, sodium, and lithium hydride.

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An Explosive is a substance or mixture of substances that when initiated by heat, light, friction, impact, or detonation undergoes a rapid chemical reaction giving off large volumes of hot gases. Fire typically accompanies an explosion.

Oxidizing Agents, in addition to their corrosive properties, present fire and explosion hazards on contact with organic compounds and other oxidizable substances.

A common class of compounds found in the laboratory is peroxides. Peroxides have unusual stability problems, being both fuels and oxidizers in one, making them the most hazardous substances normally handled in laboratories. All organic peroxides are flammable.

General Safety Guidelines for the Proper Handling of Peroxides:

1. The quantity of peroxide dispensed should be limited to the minimum amount required. Unused peroxides should not be returned to the container.
2. Spills should be cleaned up immediately.
3. The sensitivity of most peroxides to shock and heat can be reduced by dilution with inert solvents, such as aliphatic hydrocarbons.
4. Solutions of peroxides in volatile solvents should not be used under conditions in which the solvent might be vaporized because this may increase the peroxide concentration of the solution.
5. Open flames and other sources of heat are not permitted near peroxides.

General Safety Guidelines for the Proper Storage of Incompatible Chemicals:

Certain chemicals should not be stored with, or cannot be safely mixed, with other chemicals due to severe reactions or result in a toxic product. In the event of unexpected breakage or fire, the storage of incompatible chemicals could be fatal to staff, fire fighters, and other emergency responders.

Always consult a current Safety Data Sheet (SDS) to ensure that the storage of incompatible chemicals together is prevented. Accidental contact of incompatible chemicals can result in:

1. Generation of Heat (Example: acids & bases)
2. Violent Reactions (Example: acrolein & acids or other catalyst)
3. Formation of Toxic Vapors or Gases (Example: cyanide salt & acid)
4. Formation of a Flammable Gas (Example: alkali metal & water)
5. Fire or Explosion (Example: perchloric acid & acetic anhydride)

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General Safety Guidelines for the Proper Handling, Use, and Storage of Compressed Gas Cylinders:

1. Be extremely careful when handling compressed gas cylinders. Do not drop, jar or expose them to temperature extremes.
2. Except when in use, the valve cap or valve protection device must always be in place.
3. Be sure all cylinder valves are closed before moving them, when work is finished, and when the cylinder is empty.
4. Never use the valve or valve cap to lift or move cylinders.
5. Contents must be properly marked on all cylinders.

PERSONAL PROTECTIVE EQUIPMENT

Proper protective equipment (PPE) is provided, used, and maintained in a sanitary and reliable condition where there is a chemical hazard that may cause illness or injury to the employee or student. Safety Data Sheets (SDS) provide information on the PPE recommended for use with specific chemicals. General recommendations for PPE use is as follows:

1. **Splash-proof goggles** should be the primary choice for eye protection. They provide superior protection against dust, flying objects, spray, mist, and splash hazards.
2. **Safety glasses with side shields** may be used against dust and flying objects and should be worn under face shields when worn to protect the head from potential hazards.
3. **Gloves** should be worn when handling unknown samples.
 - a. Chemical-resistant gloves must be worn when working with corrosives. If there is a splash potential when working with corrosives, chemical goggles and/or a face shield and additional protective clothing should be worn, depending on the extent of possible exposure.
 - b. Wear chemical-resistant gloves to prevent prolonged or repeated skin contact when working with solvents. If there is a splash potential, chemical goggles and/or a face shield should be worn.
 - c. Chemical resistant gloves should be worn if chemicals can be absorbed through the skin. If there is a splash potential, chemical goggles and/or a face shield should be worn.
4. **Respirators:** ATCC campus laboratories have been evaluated and the use of respiratory protection in its laboratories is not necessary.

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LABORATORY PROTECTIVE EQUIPMENT INFORMATION

Laboratory Fume Hoods

Laboratory Fume Hoods have been installed to control exposure to airborne contaminants and are volume-checked annually and the proper sash height is indicated for optimum hood performance. Most fume hoods are not intended to be used with the sash fully open. The following guidelines should be followed:

1. The sash should be set at a level where the operator is shielded from some degree from explosions or violent actions which could occur.
2. Only apparatus and chemicals essential to the specific procedure should be placed in the hood.
3. Hoods used for experimental work should not be used for chemical storage.
4. Hoods used for chemical storage should be dedicated for chemical storage only.

Eyewashes/Showers

Eyewashes are required by regulation wherever corrosive materials are present. This includes all ATCC laboratories. Annual and weekly eyewash inspections are conducted to ensure proper operation.

Refrigerators for Sample Storage

Refrigerators used for the storage of chemical or biological samples are labeled to ensure that food is not stored in them.

MEDICAL CONSULTATIONS AND EVALUATIONS

ATCC provides its employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, for the following circumstances:

1. Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed, the employee is provided the opportunity to have an appropriate medical exam. The employee is to contact the Chemical Hygiene Officer or the ATCC Safety coordinator.
2. Where exposure monitoring reveals an exposure routinely above the action level, or in the absence of an action level above the Permissible Exposure Limit (PEL), for an OSHA-regulated substance for which there are exposure monitoring and medical surveillance requirements. Medical Surveillance will be established for the affected employee as identified in the particular OSHA standard (Medical Surveillance & Exposure Requirements as per 29CFR1910.1001 through 29CFR1910.1052).

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3. Whenever an event takes place in the work area such as a spill, leak, explosion, or other occurrence resulting in the likelihood of a hazardous chemical exposure, the affected employee(s) is provided an opportunity for a medical consultation. This consultation is for the purpose of determining the need for a medical examination. An appropriate medical examination is provided as necessary.

All medical examinations and consultations are performed by or under the direct supervision of a licensed physician, and are provided at no cost to the employee without loss of pay, and at a reasonable time and place.

The following information will be provided to the physician by the affected employee, the Chemical Hygiene Officer, or the ATCC Safety coordinator:

1. The identity of the hazardous chemical to which the employee may have been exposed.
2. A description of the conditions under which the exposure occurred.
3. A description of the signs and symptoms of exposure that the employee is experiencing, if any.

A written opinion will be provided from the examining physician to the ATCC Human Resources Department which includes,

1. Any recommendation for further follow-up.
2. The results of the examination and any associated tests
3. Any medical condition, which may be revealed in the course of the examination, which may place the employee at increased risk as a result of the exposure to a hazardous chemical.
4. A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.

The written opinion will not include any findings or diagnoses which are not related to an occupational exposure.

Annual lab work will be provided to ATCC employees who come in contact or are at high risk for exposure to lead.

CHEMICAL MANAGEMENT

ATCC requires that labels on incoming containers of hazardous chemicals are not removed or defaced and Safety Data Sheets are received, maintained, and accessible to laboratory employees.

The following procedures have been developed for chemical substances produced in the laboratory:

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1. For known composition for chemical substances produced, appropriate training is provided. If a SDS is available, it is available to employees.
2. For unknown composition for chemical substances produced, the substance is assumed to be hazardous and procedures identified within the CHP are used.
3. For production of chemical substances for someone outside the laboratory, the Hazard Communication Standard 29CFR1910.1200 is complied with including the preparation of SDS and labeling requirements.

Chemical Procurement

1. Information on proper handling, storage, and disposal must be known to those who will be involved before a hazardous chemical is received.
2. Only containers with adequate identifying labels will be accepted.
3. Lab 407 Prep Room will be used for receiving all chemical shipments.
4. Shipments with breakage or leakage will be refused.
5. Only the minimum amount of the chemical needed to perform the planned work is ordered.
6. Highly hazardous chemicals must be reviewed and approved by CHO prior to purchase.
7. Proper protective equipment and handling and storage procedures must be in place before receiving a shipment.
8. SDS must be available to all employees on MSDSOnline in MyATCC at www.alextech.edu for every chemical on the campus.
9. For unknown composition for chemical substances produced, the substance is assumed to be hazardous and procedures identified within the CHP are used.
10. For production of chemical substances for someone outside the laboratory, the Hazard Communication Standard 29CFR1910.1200 is complied with including the preparation of SDS and labeling requirements.

Chemical Storage

1. Chemicals must be separated and stored according to hazard category and compatibility.
2. SDS and label information must be followed for storage requirements.
3. Existing labels on incoming containers of chemicals and other materials are maintained.
4. Labels on containers used for storing hazardous chemicals must include the chemical identification and appropriate hazard warnings.
5. The contents of all secondary chemical containers and transfer vessels, including, but not limited to, beakers, flasks, reaction vessels, and process equipment, in use longer than one lab session must be properly identified with the identity of the hazardous chemical and the hazards present.

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6. All container lids or caps must be secured and tightly closed.
7. Chemical shipments must be dated upon receipt and stock rotated.
8. Peroxide formers must be dated upon receipt, again dated upon opening, and stored away from heat and light with tightfitting, nonmetal lids. Once open they must be periodically tested for peroxides (i.e. peroxide test strips.)
9. Open shelves used for chemical storage must be secured to the wall and contain 3/4-inch lips. Secondary containment devices must be used as necessary.
10. SDS must be consulted to keep incompatibles separate during transport, storage, use, and disposal.
11. Oxidizers, reducing agents, and fuels must be stored separately to prevent contact in the event of an accident.
12. Fume hoods must not be used for storage of chemicals, unless they are part of the experiment being conducted in the fume hood at that time. The exception is storage in a fume hood, which is specifically designed for that storage, and where experimental procedures are not carried out. Chemicals should not be stored on the floor, in areas of egress, on the benchtop, or in areas near heat or in direct sunlight.
13. Hallways must not be used as storage areas for chemicals.
14. Laboratory-grade, flammable-rated refrigerators and freezers must be used to store sealed chemical containers of flammable liquids that require cool storage. These refrigerators and freezers must be labeled "Flammable Liquids Only" "Do not store food or beverages".
15. Highly hazardous chemicals must be stored in a well-ventilated and secure area designated for that purpose.
16. Flammable chemicals must be stored in a spark-free environment and in approved flammable-liquid containers and storage cabinets. Grounding and bonding must be used to prevent static charge buildups when dispensing solvents from large metal containers.
17. Chemical storage and handling rooms must be controlled-access areas. They must have proper ventilation, appropriate signage, diked floors and fire suppression systems.

Chemical Handling

1. A risk assessment must be conducted prior to beginning work with any hazardous chemical for the first time. The assessment must be done by knowledgeable staff such as the chemical hygiene officer, campus safety coordinator, science department administration, science faculty and lab techs/assistants. (Safety Committee)
2. All SDS and label information must be read before using a chemical for the first time.
3. Trained laboratory users must ensure that proper engineering controls such as chemical fume hoods are working properly and PPE are in place. This assessment

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must be done by knowledgeable staff such as the chemical hygiene officer, campus safety coordinator, science department administration, science faculty and lab techs/assistants. (Safety Committee)

4. Inspect glassware for chips or cracks before using for chemical handling or storage.
5. A checkout process must be in place for highly hazardous chemicals,

Chemical Inventory

1. A qualitative chemical inventory must be done of all hazardous chemicals used.

Transporting Chemicals

1. Secondary containment devices must be used when transporting chemicals.
2. Ensure the container lids or caps are secured and tightly closed.
3. High-traffic areas should be avoided while transporting chemicals.

Transferring Chemicals

1. Use adequate ventilation (such as a fume hood) when transferring even a small amount of a highly hazardous chemical.
2. While drum storage is not appropriate for laboratories, chemical stockrooms may purchase drum quantities of hazardous chemicals used in high volumes. Ground and bond metal drums and receiving vessel when transferring flammable liquids from a drum to prevent static charge buildup. Drums must be placed on a spill pallet that is designed to contain 10% of the total volume of the chemicals or 100% of the largest container whichever is greater or be stored in a spill containment area designed to control hazardous chemical spills.
3. Transfer and storage of flammable chemicals should not be in an area where a spill of liquid could block an exit from the room. Exit routes must be free of obstructions and available for immediate use at all times.
4. If chemicals from commercial sources are repackaged into transfer vessels for storage and not as a secondary container, the new containers must be labeled with all essential information as shown on the original container.

CHEMICAL WASTE MANAGEMENT

Chemical wastes are managed utilizing the following hierarchy of practices.

Waste Management Plan

1. Prudence must be used in ordering new chemicals. This will ensure that excess chemical will not be subject to disposal as hazardous waste. Chemical waste generation is minimized by reducing the scale of operations, reducing its formation

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during operations, and, if possible, substituting less hazardous chemicals for a particular operation.

2. Only the amount of material necessary for an experiment should be purchased, and, if possible, materials should be reused.
3. If waste generation cannot be prevented or minimized, ATCC should consider recycling chemicals that can be safely recovered.
4. Disposal of hazardous wastes and chemicals in laboratory sinks is not permitted without prior approval by the CHO. Proper waste disposal methods include incineration, treatment, neutralization, processed through the University of MN's Chemical Safety Day Program and/or dilution for sewerage purposes, and lastly, land disposal. The campus Safety coordinator and/or CHO must be consulted in determining which disposal methods are appropriate for different types of waste.
5. Secondary containment devices must be used when transporting chemicals.
6. Ensure the container lids or caps are secured and tightly closed.
7. High-traffic areas should be avoided while transporting chemicals.

Collection and Storage of Waste

1. Chemical waste should be accumulated at or near the point of generation, under the control of laboratory supervisors. Chemical waste will be collected in compliance with satellite accumulation requirements. Satellite accumulation (SA) is a waste management method that allows for the slow accumulation of waste over an extended period of time. The container must be labeled with the following information: "Satellite Accumulation" "Hazardous Waste", "Start Date (date when the first drop of waste was added)" and a general description of the waste (i.e. Sulfuric Acid solution, etc.). If multiple waste streams are to be accumulated in this area, each container must be labeled separately as listed above. This area must be included in the weekly hazardous waste inspection whenever waste is in storage. Once the container is full, remove the satellite accumulation label and replace it with a Hazardous Waste shipping label. Once the container is full or no longer needed, the waste disposal timeline will be based on the campus hazardous waste generator designation. Each waste type must be stored in a compatible container pending transfer or disposal.
2. Incompatible waste types must be kept separated to ensure that heat generation, gas evolution, or another reaction does not occur.
3. Waste container storage areas must be designated, and these areas included on the weekly hazardous waste inspection checklist whenever waste is in storage.
4. Waste containers are stored in a designated location that does not interfere with normal laboratory operations. Ventilated storage and secondary containment may be appropriate for certain waste types.

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5. Waste containers must be clearly labeled and kept sealed when not being actively filled. Labels must include the accumulation start date and hazard warnings as appropriate.
6. Non-explosive electrical systems, grounding and bonding between floors and containers, and non-sparking conductive floors and containers must be used in the central waste accumulation area to minimize fire and explosion hazards from flammable waste. Fire suppression systems, specialized ventilation systems, and dikes must be installed in the central waste accumulation area.
7. Waste management workers are to be trained in proper waste handling procedures as well as contingency planning and emergency response. Trained laboratory users most familiar with the waste are actively involved in waste management decisions to ensure that the waste is managed safely and efficiently. Engineering controls are implemented as necessary, and personal protective equipment must be worn by workers involved in waste management.

INSPECTION PROGRAM

Maintenance and regular inspection of laboratory equipment are essential parts of this laboratory safety program. Management participates in the development and review of this laboratory safety program. This ensures that the laboratory is a safe facility, adequate procedures are implemented and followed and that employees are well trained in safe operations. This laboratory safety program includes routine evaluations, self-audits, program audits, peer inspections, EHS inspections and inspections by external entities.

Elements of an Inspection

1. Inspectors must use a checklist to ensure that all compliance issues are covered. A camera may be used to document inspection issues that require correction.
2. Conversations with laboratory personnel should be encouraged during the inspection, as critical information will be shared. This dialogue provides inspectors an outreach opportunity to educate the employees.
3. All issues resolved during the inspection must be documented.
4. An inspection report containing all findings and recommendations must be available for management and lab personnel.
5. Management must conduct a follow-up inspection in a timely manner. It must be ensured that all identified non-compliant items in the inspection report are rectified.

TRAINING

All employees covered under this program will receive training on the ATCC Chemical Hygiene Plan and OSHA standard 29 CFR 1910.1450 and its appendices.

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Employees will be provided training to ensure that they are apprised of the hazards of chemicals present in their work area. Such training will be provided at the time of an employee's assignment to a work area where hazardous chemicals are present, and prior to assignments involving new exposure situations.

In addition, the training will include:

1. Location of the Chemical Hygiene Plan and 29 CFR 1910.1450 and its appendices.
2. The signs and symptoms associated with exposures to hazardous chemicals being used in the laboratory
3. Information on OSHA permissible exposure limits (PELs) where they exist, and other recommended exposure limits.
4. Methods and observations that may be used to detect the presence or release of a hazardous chemical.
5. The physical and health hazards of chemicals in the work area.
6. The measures employees can take to protect themselves from these hazards.
7. The location of program information and training materials.

Training Records

Records of training are documented and retained for a minimum of 3 years. Training documentation includes:

1. Date and location of training
2. Names of employees attending and their signatures
3. Name and title of the person conducting the training
4. Brief summary of material covered

Medical records will be maintained based on regulatory requirements.

PROGRAM REVIEW

Annual reviews of ATCC's Chemical Hygiene Plan are conducted. Any changes or additions to the program or program-related documents recommended by ATCC's Chemical Hygiene Officers are documented.