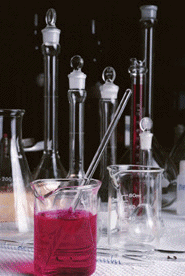
**Hazard**

**Communication**

**Program**

*Southern Connecticut State University*

*Office of Environmental Health & Safety*

*615 Fitch Street, Hamden, CT 06514*

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*Revised October 2013*

**Hazard Communication Program**

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**Section I: Introduction and Background**

In 1983, the Federal Government established the OSHA (Occupational Safety and Health Administration’s) Hazard Communication Standard, abbreviated as HCS. This standard is designed to protect employees who use hazardous materials on the job.

The HCS addresses the issues of evaluating and communicating chemical hazard information to workers. Under the (OSHA) Hazard Communication Standard, 29CFR1910.1200, employers must establish and maintain a program to evaluate and communicate the hazards of chemicals in the workplace. Elements of the Program must include safe handling procedures, and measures to be taken to protect workers from chemical hazards. The standard also addresses the labeling of chemical containers and the management of information sheets.

Hazard determination is the responsibility of the manufacturers and importers of the chemicals, who then must provide the hazard information to employers that purchase their products. You, as an employee, have a Right to Know about the hazardous materials used in your work area and the potential effects of these materials upon your health and safety.

Hazardous materials (chemical products) are everywhere. Some of these chemical products pose little danger to you, while others are very dangerous.

The first step in using chemicals safely is to recognize those materials that may be hazardous to your health or physical safety.

Chemicals can present one or more serious hazards to your health and safety. They can be:

* Reactive - may react with air, water, or itself, and may burn, explode, or release vapors
* Flammable - catch fire easily
* Explosive – explode under certain conditions
* Corrosive - burn the skin or eyes
* Toxic – poisonous

Know the ROUTES OF ENTRY chemicals can take to get into your body:

* Absorption
* Inhalation
* Ingestion
* injection

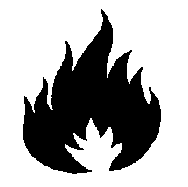
You can block these routes of entry by using good safety practices and the right Personal Protective Equipment including:

* Safety glasses or goggles
* Chemical – resistant gloves
* Protective clothing
* Respiratory protection

This written Hazard Communication Program outlines how Southern Connecticut State University (SCSU) is complying with all of the elements of the HCS. Supplementing the HCS is the University’s Chemical Hygiene Plan, which is applicable in academic laboratories where relatively small amounts of chemicals are use. Remember, before working with or handling any chemicals, be sure to read the warning label and the MSDS for safe handling and storage procedures.

**Physical Hazards**

[Physical Hazards](http://www.free-training.com/OSHA/hazcom/Phaz/Def45.htm) are one of two major classes of hazardous materials covered by the HCS. The other major hazard class is Health Hazards. To help you identify materials which are physical hazards, the symbols shown below are often used. From top to bottom the symbols stand for the following:

Flammable symbol: 

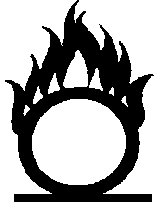
Flammables, combustibles, and pyrophorics: Do not expose these materials to sparks, flames or other heat sources. You must also not smoke or light a match or flame near them.

1. Flammables can be gases, liquids or solids. Flammables ignite easily and burn rapidly. Liquid flammables have a flashpoint under 100° F.
2. Combustibles are similar to flammables, but they do not ignite as easily. Liquid combustibles have a flash point above 100° F.
3. Pyrophoric, or spontaneous combustion materials, burst into flames "on their own" at temperatures below 130° F

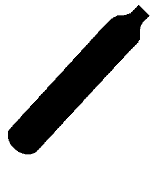
Explosive symbol: 

1. Explosive materials release a tremendous amount of energy in the form of heat, light, and expanding pressure within a very short period of time.
2. Water reactive materials react with water and may explode, or they may release a gas which is flammable.
3. Unstable reactive chemicals can react or can become self-reactive when subjected to shock, pressure or temperature.

Because materials that use the explosive symbol are often very dangerous to work with, you may need additional training or instructions from your supervisor. Always check with your supervisor before handling or using materials that use the explosive symbol.

Oxidizer symbol: 

1. Oxidizers cause other substances to burn more easily through a chemical reaction or change.
2. Organic Peroxides contain oxygen and act as powerful oxidizers.

Compressed Gas Cylinder symbol: 

Many gases such as nitrogen, oxygen, and acetylene are used in business, research, and industry. In order to transport, store and use these gases, they are "bottled" under great pressure in tanks called gas cylinders. Great care must be taken when handling gas cylinders to ensure that they are not damaged when they are moved or used. In addition, some gases also pose chemical or other hazards since many are toxic, flammable, corrosive, strong oxidizers or displace oxygen.

**Health Hazards**

Any chemicals which meet any of the following definitions, as determined by the criteria set forth in the HCS are health hazards. However, this is not intended to be an exclusive categorization scheme. The following is a brief description of the major types of health hazards.

* Corrosives - cause tissue damage and burns on contact with the skin and eyes.
* Primary Irritants - cause intense redness or swelling of the skin or eyes on contact, but with no permanent tissue damage.
* Sensitizers - cause an allergic skin or lung reaction.
* Acutely Toxic Materials - cause an adverse effect, even at a very low dose.
* Carcinogens - may cause cancer.
* Teratogens - may cause birth defects.
* Organ Specific Hazards - may cause damage to specific organ systems, such as the blood, liver, lungs, or reproductive system.

To help you identify materials which are health hazards, the following symbols are often used.

Medical symbol:  A general symbol used to identify materials which are health hazards:

Skull and Crossbones:  A symbol that is used to identify hazardous materials which are poisonous.



Corrosives symbol: Used to identify materials which are Corrosives. Corrosives cause tissue damage and burns on contact with skin or mucous membranes.

Radioactive symbol: 

Biohazard symbol:  Used to identify hazardous biological materials.

Much research has been done to establish safe exposure limits for chemical exposures.

OSHA sets enforceable permissible exposure limits (PELs) to protect workers against the health effects of exposure to hazardous substances. The PEL is the time-weighted average threshold limit a person working an 8 hour shift can be exposed to without suffering ill effects. A PEL is usually given as a time-weighted average (TWA), although some are short-term exposure limits (STEL) or ceiling limits. A TWA is the average exposure over a specified period of time, usually eight hours. This means that, for limited periods, a worker may be exposed to concentrations higher than the PEL, so long as the average concentration over eight hours remains lower.

A short-term exposure limit (STEL) is one that addresses the average exposure over a 15-30 minute period of maximum exposure during a single work shift. A ceiling limit is one that may not be exceeded for any period of time, and is applied to irritants and other materials that have immediate effects.

**Section 2: Scope**

2.1 Employees Covered

This Program covers workers employed by Southern Connecticut State University who may be exposed to hazardous chemicals under normal operating conditions or reasonably anticipated emergencies. Workers who encounter hazardous chemicals only in non-routine, isolated instances are not covered by this Program.

2.2 Academic Laboratory Exemption

This Program does not apply to academic laboratories where small quantities of chemicals are used on a non-production basis. Instead, such laboratories must follow the OSHA Laboratory Standard (29CRF1910.1450), and are covered by the Southern Connecticut State University Chemical Hygiene Plan. This plan is available in the Office of Environmental Health and Safety, 615 Fitch Street, Hamden CT, 06514 and on the University’s website. Each affected academic science laboratory has also been provided with a copy of this Plan.

2.3 Substances Covered

All substances located at Southern Connecticut State University which pose a physical or health hazard are included, except those specifically exempted by this Standard. Exempted substances include hazardous wastes, consumer products, and articles as defined by OSHA.

**Section 3: Responsibilities**

3.1 General

Responsibilities for compliance with this program are as follows:

A. The Office of Environmental Health and Safety (OEHS)

* Developing and periodically updating the written Program
* Developing and implementing training programs that comply with the requirements of the standard and also accommodating the needs of individual departments.

B. Individual Departments

* Ensuring that all employees receive Hazard Communication training prior to working with hazardous chemicals at their work site and whenever a new physical or health hazard is introduced into the work area.
* Ensuring that all applicable containers are labeled appropriately
* Keeping an updated inventory of chemicals in their work area
* Maintaining a current file of Material Safety Data Sheets for hazardous chemicals and products used in the workplace.

C. Employees

* Attending required safety training
* Reading chemical labels and Material Safety Data Sheets and following their instructions and warnings
* Asking for assistance if there are any questions or concerns that have not been answered by training, container labels, or MSDS.

3.2 Identification of Potentially Exposed Employees

Department Chairs, managers, and area supervisors are responsible for identifying employees who may be exposed to hazardous chemicals either under normal working conditions or in reasonably anticipated emergencies. Identification of these employees may be based on various criteria including job descriptions, recommendations of supervisors, or information from job hazard forms. For the purposes of this program, potentially exposed employees often include:

* Custodial, Utilities, Athletics, and Maintenance workers.
* Management and clerical personnel, and faculty in proximity to hazardous chemicals during regular work functions.
* Stockroom, shipping, and receiving personnel who handle hazardous chemicals.
* Emergency response personnel including security, police, fire, and other safety personnel.

Workers who encounter hazardous chemicals in non-routine, isolated instances only, such as office workers, mail clerks, or instructors are not covered by this Program.

**Section 4: Documents and Document Locations**

4.1 Hazard Communication Plan

A copy of this Program is located at the Office of Environmental Health and Safety (OEHS), Facilities, Operations, and Planning Building, 615 Fitch Street, Hamden, CT, and is accessible between the hours of 8:30 a.m. and 3:30 p.m., Monday through Friday. This Plan is also available on the SCSU website in the Environmental Health and Safety section.

4.2 Inventory of Hazardous Materials

1. Each department at SCSU shall perform an inventory of all materials/chemicals for which a MSDS sheet is required by OSHA. An initial inventory shall be performed immediately and updated annually by June 30th or as changes occur. The inventory shall list the materials by name (abbreviations or chemical formulae are not acceptable), manufacturer, building name and room, storage location, average amount on hand and maximum amount which may be present at any one time.
   * The same "identity" that is found on the appropriate MSDS and container label shall appear on the inventory list.
   * The inventory shall be submitted to the OEHS by way of electronic submission, to Agentist1@southernct.edu.
2. Each department shall maintain a current inventory and ensure the availability of the inventory to personnel in the department as well as to the OEHS.

1. The Environmental, Health, and Safety Officer will ensure that:

* The list of hazardous materials present in the workplace is compiled annually.
* The current inventory is distributed to the appropriate personnel and filed on an annual basis.
* Annual audits of the inventory are performed, and any changes or corrections are made.
* The inventory is readily accessible to employees, emergency responders, and applicable regulatory agencies.
* Copies of the Campus wide inventory are maintained at University Police Headquarters, each police vehicle, the Environmental, Health, and Safety Office, and Facilities Operations and Planning, Central Receiving.

**Section 5: Material Safety Data Sheets**

5.1 General Information

While labels are an effective way to display information about hazardous materials, additional information about the hazardous materials you work with are contained in what is called a [Material Safety Data Sheet](http://www.free-training.com/OSHA/hazcom/Msds/Def31.htm), or MSDS. See Appendices B and C for a glossary of MSDS terms and a sample MSDS.

A MSDS provides basic safety information about a specific chemical substance or product. Take time to read and understand the MSDS describing the hazardous materials present in your work area. While the format of an MSDS may vary, it must include certain specific safety information:

• Chemical Identity

• Section I. [Manufacturer's](http://www.ilpi.com/msds/ref/manufacturer.html) Name and Contact Information

• Section II. Hazardous Ingredients/Identity Information (>1% concentration for most

chemicals, >0.1% concentration for carcinogens)

• Section III. Physical/[Chemical](http://www.ilpi.com/msds/ref/chemical.html) Characteristics

• Section IV. Fire and Explosion Hazard Data

• Section V. Reactivity Data

• Section VI. [Health Hazard](http://www.ilpi.com/msds/ref/hazardous.html#health) Data

• Section VII. Precautions for Safe Handling and Use

• Section VIII. Control Measures

The American National Standards Institute (ANSI) approved an alternative format and published a standard, ANSI Z400.1/Z129-2010, "American National Standard for Hazardous Industrial Chemicals-Material Safety Data Sheets-Preparation."

The 16 sections of an MSDS that are prescribed by the ANSI standard are as follows:

Section 1. Chemical Product & Company Information  
Section 2. Composition/Information on Ingredients  
Section 3. Hazards Identification  
Section 4. First Aid Measures  
Section 5. Fire Fighting Measures  
Section 6. Accidental Release Measures  
Section 7. Handling and Storage  
Section 8. Exposure Controls/Personal Protection  
Section 9. Physical and Chemical Properties  
Section 10. Stability and Reactivity  
Section 11. Toxicological Information  
Section 12. Ecological Information  
Section 13. Disposal Considerations  
Section 14. Transport Information  
Section 15. Regulatory Information  
Section 16. Other Information

While this is a recommended format, it is important to note that at a minimum, the OSHA required categories must be addressed in the MSDS as these are legally enforceable.

Note: MSDS dated prior to 1986 may not have all of the required information, due to revisions in the Hazard Communication Standard made since then. Any MSDS dated on or before 1986 must be replaced.

ALWAYS CONSULT THE MSDS BEFORE STARTING TO WORK WITH ANY HAZARDOUS CHEMICAL — AND FOLLOW THE GUIDELINES!

5.2 Purchasing and Receiving Procedures

Vendors provide Material Safety Data Sheets with hazardous chemicals and products they supply, including samples. Individual departments are responsible for securing an MSDS if it is not sent by the manufacturer.

5.3 Accessibility of MSDS

A master file of MSDS for hazardous products is maintained on a database at the following locations:

* OEHS, Facilities, Operations, and Planning Building, 615 Fitch Street, Hamden, CT
* University Police Department located at 10 Wintergreen Ave. (behind Granoff Student Health Services).

MSDS are accessible to employees upon request to department supervisors or to the OEHS. They are also readily available on the internet through the chemical manufacturer or supplier.

Please note that that the MSDS must be manufacturer specific, and not generic.

Example: Clorox bleach requires an MSDS for Clorox bleach from The Clorox Company. Per the regulation, a generic MSDS for bleach would not be acceptable.

5.4 Replacement of Material Safety Data Sheets

Manufacturers and importers are required to replace out of date or modified MSDS. It is the responsibility of each department to periodically review and update its files. Responsibility for the accuracy of an MSDS rests solely with the originator of the Material Safety Data Sheet.

5.5 Creation of a Material Safety Data Sheet

In the event that SCSU needs to create an MSDS, the OEHS should be consulted for assistance. This would only be required if a University worker or student is producing a new chemical.

**Section 6: Training**

* 1. Introduction

All potentially exposed employees must be given training in the handling and safe use of chemicals. Training will be oriented toward the chemical hazards employees may be exposed to in the normal course of their work, as well as those during a foreseeable incident.

6.2 Training Materials

The Office of Environmental Health and Safety has training programs available in a variety of formats to fit the audience receiving the training.

6.3 Training Circumstances

Exposed employees must be trained under the following circumstances:

1. All workers, covered by this standard, who are exposed to hazardous materials at work.

This includes:

* New employees
* Transferred employees
* Whenever new hazards are introduced into the work area

1. Training is scheduled during regular working hours and at no expense to the employee.
2. Chemical safety training, including the elements required by this standard, is repeated on a periodic basis.

6.4 Hazard Communication Training Providers

A. Office of Environmental Health and Safety Professional Staff

B. Departmental Supervisors. All supervisors providing training to covered employees need to be trained by the Office of Environmental Health and Safety or a qualified member of their department.

**Section 7: Procurement/Purchase of chemicals**

7.1 Procurement of Chemicals

1. Each department shall develop an approved list of chemicals and materials which will be utilized. Only items which are on this listing may be purchased by the department. In developing this list, the Department Heads/Chairperson will consider the following before adding a material to the approved listing:
2. Are proper storage facilities available to store the requested amount of materials?

Look at proper segregation of chemicals, potential reactions with other materials, requirement for flammable storage lockers, proper containers, secondary containment requirements, labeling, and any other special requirements mandated by the Connecticut State Fire Code, U. S. EPA, and OSHA. Proper storage must be available to support the maximum amount of material which may be present. Materials in excess of the amount which can be properly stored will be removed from the University.

1. Safety requirements for using the materials must be evaluated, including proper safety equipment such as fume hoods, ventilation requirements, personnel protective equipment, special containers and in-process equipment.
2. Training requirements for personnel must be accomplished prior to utilization.
3. Any requirements for special programs such as medical surveillance requirements must be established and implemented prior to usage of the material.
4. Requirements for the correct storage and disposal of any wastes generated must be established prior to generating the waste.
5. Material Safety Data Sheets should be obtained and reviewed prior to product procurement to evaluate the above requirements. Again, if proper storage does not exist for the material, it may not be brought into the university or it must be removed from the University.
6. The Department Head or Chairperson shall submit a copy of the approved listing to the Environmental, Health and Safety Officer for review.

2. The Department Head or Chairperson shall review and sign all purchase orders. Signing of the purchase order indicates that the specified purchase is in compliance with the requirements of this instruction.

3. All purchase orders shall bear the statement that "Southern Connecticut State University will not accept materials without a Material Safety Data Sheet". The Material Safety Data Sheet must be received no later than at delivery of the material. If a MSDS is not on file or included with the shipment, the materials will be returned to the supplier.

1. All materials shall be received at Central Receiving at 615 Fitch Street, Hamden, CT. Direct deliveries to a department are not permitted.
2. If a material is picked up directly by open purchase, it must be taken to Central Receiving for receipt and labeling. No chemical or hazardous material may be admitted to the campus without first being taken to Central Receiving.

**Section 8: Container Labeling**

8.1 General Requirements

1. All containers of hazardous chemicals, regardless of size, must be properly labeled in accordance to the requirements of this Standard. The label and information must be in English. Warnings in foreign languages may be included in addition to those in English to assist non-English speaking employees. At a minimum, labeling requirements must include:

* A warning statement, message, or symbol
* Identity of the hazardous chemical
* Appropriate hazard warning, including both physical and health hazards
* Name and address of the chemical manufacturer, importer, or other responsible party

As you read labels, you will see key words which signal you that you should take extra care when handling a particular hazardous material. These key words include:

|  |  |  |
| --- | --- | --- |
| **CAUTION** | **MODERATE RISK** | **WARNING** |
| **DANGER** | **SERIOUS RISK** | **MAJOR RISK** |

For example, the key word "DANGER" means:

* Protective equipment and/or clothing is required before use;
* Misuse can result in immediate harm, long term effects, or death; and
* The chemical may be toxic, corrosive, or flammable.

2. Labeling is required for all portable containers that are used to transfer chemicals from one container to another or for use at another location. This will be accomplished by the person that performs the transfer.

Many organizations use labels such as those shown below: the HMIS Label and/or the NFPA Diamond. NFPA = National Fire Protection Association. The rectangular label is known as the HMIS. HMIS = Hazardous Materials Information System.

Toward the top of the label will be the chemical trade name of the hazardous material.

**HMIS LABEL**

**NFPA DIAMOND**

Each colored bar or small diamond represents a different class of hazard. The hazard classes found on labels include Health, Flammability, Reactivity, and in some cases, Special Hazards. Each hazard class uses a different color and a rating scale from 0 - 4.

The first hazard class is Health Hazards. This hazard class is colored **BLUE**. The rating scale for Health Hazards is listed below:

|  |
| --- |
| 0 - No Hazard  1 - Slight Hazard  2 - Dangerous  3 - Extreme Danger  4 - Deadly |

The second hazard class is Flammability Hazards. This hazard class is colored **RED**.

The rating scale for flammability hazards is based on the flash point of the material. The flash point is the temperature at which the material gives off enough vapors to sustain ignition.

|  |
| --- |
| 0 - Will Not Burn  1 - Ignites Above 200 Degrees Fahrenheit  2 - Ignites Below 200 Degrees Fahrenheit   3 - Ignites Below 100 Degrees Fahrenheit   4 - Ignites Below 73 Degrees Fahrenheit |

The third hazard class is the Reactivity of the material. This hazard class is colored **YELLOW.**

The rating scale for Reactivity is listed below:

|  |
| --- |
| 0 - Stable  1 - Normally Stable  2 - Unstable  3 - Explosive  4 - May Detonate |

Diamond shaped labels (NFPA) include a fourth hazard class called “Special Hazards”. This hazard class is colored **WHITE**.

These special hazards are represented by the following symbols:

|  |
| --- |
| water reactive symbol- Water Reactive  OX - Oxidizer  radioactive symbol- Radioactive  COR - Corrosive  ACD - Acid  ALK - Alkali |

3. Labeling is required for all vessels, tanks, and containers that hold a reagent, waste, and/or virgin product.

* Containers require a label that has the identity and hazard warning that corresponds with the original shipping container and the MSDS.
* The department responsible for the container will ensure the container is properly labeled.

4. SCSU will incorporate four labeling systems to comply with the above procedures.

1. Department of Transportation labels may be affixed to containers to comply with shipping requirements to meet all requirements of the Hazard Communication Standard.
2. NFPA Diamond labels may also be affixed to containers to inform employees of the level of Health, Flammability, Reactivity, and Special Hazards associated with the product.

* Product name, manufacturer, and hazards must be included when this labeling format is used.

1. HMIS labels may also be affixed to containers to inform employees of the level of Health, Flammability, Reactivity, and Special Hazards associated with the product.

* Product name, manufacturer, and hazards must be included when this labeling format is used.

1. Pre-printed Hazardous Waste labels, available at all satellite accumulation areas and the OEHS will be used per Environmental Protection Agency (EPA), and Connecticut DEEP requirements, in addition to labels required under the OSHA HAZCOM Standard.
2. All Southern Connecticut State University employees are to ensure that;

* All containers of hazardous materials, regardless of size, are properly labeled.
* The labels on containers are not removed or defaced.
* The label on any container of hazardous materials in the facility matches the identity and hazard warning on the MSDS, the shipping label as provided by the manufacturer and the facility inventory.
* The department head or supervisor is informed of any changes to the container label’s identify and/or hazard warning.

8.2 Inspection of Incoming Containers

Shipping and receiving personnel and others involved in unpacking chemicals are trained by their managers or supervisors to inspect each incoming container to insure that when it is received, each container is labeled in accordance with University's HCS regulations. OEHS must be notified of any containers that do not conform to the above requirement.

8.3 Secondary Containers

A secondary container is one that is used to transfer hazardous chemicals from a primary container for more convenient use. Secondary containers of hazardous materials must be labeled according to requirements listed in Section 8.1. However, secondary containers into which hazardous chemicals are transferred from labeled containers and which are intended for only the immediate use of the employee who performs the transfer are exempt from the labeling requirements. Once the container is left unattended, it must be properly labeled.

8.4 Placarding

The employer may use signs, place cards, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers as long as the alternative method identified the container to which it is applicable and conveys the required information.

**Section 9: Globally Harmonized System of Classification and Labeling of**

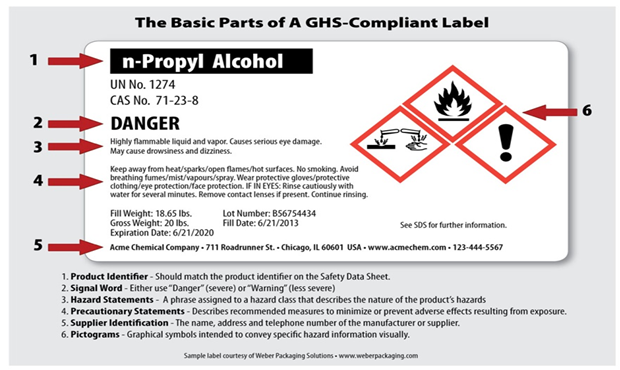
**Chemicals (GHS)**

OSHA recently incorporated the “Globally Harmonized System of Classification and Labeling of Chemicals” (GHS) into their Hazard Communication Standard (HCS). The goal of GHS is to have a uniform way to communicate chemical hazards that will be adopted and used around the world.

This system will change the way in which health and safety information is communicated by way of labels and safety data sheets.

9.1 Labels

Under the GHS, chemical manufacturers and importers will be required to provide a label that includes a product identifier, harmonized signal word, pictogram, hazard statement for each hazard class and category, and precautionary statements.



Product Identifier

* Can be (but is not limited to) the chemical name, code number or batch number.
* The manufacturer, importer or distributor can decide the appropriate product identifier.
* The same product identifier must be both on the label and in Section 1 of the SDS

Signal Words

* There are two signal words in the GHS system - Danger and Warning.
* Signal words communicate the level of hazard on both the label and the SDS.
* “Danger” is used for the more severe hazards and “Warning” is used for the less severe hazards.
* There will only be one signal word on the label no matter how many hazards a chemical may have.

Pictograms (see examples in Appendix E)

* Graphic symbols used to communicate specific information about the hazards of a chemical.
* Must consist of a red square frame set at a point, with a black hazard symbol on a white background, sufficiently wide to be clearly visible.
* Where a chemical has multiple hazards, different pictograms are used to identify the different hazards.

Hazard Statements (see examples in Appendix F)

* Standardized sentences that describe the nature of the hazard(s) of a chemical, including the degree of hazard.
* These are assigned a unique alphanumerical code which consists of one letter and three numbers as follows:
  + the letter "H" (for "hazard statement");
  + a number designating the type of hazard as follows:
  + "2" for physical hazards
  + -"3" for health hazards
  + "4" for environmental hazards
* All of the applicable hazard statements must appear on the label.

Precautionary Statements (see examples in Appendix G)

* Phrases that describe recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous product, or improper storage or handling of a hazardous product.
* These phrases cover prevention, response, storage, and disposal of products.
* Some precautionary phrases are combinations, indicated by a plus sign "+".
* There are four types of precautionary statements

1. Prevention (to minimize exposure)
2. Response (in case of spills or exposure, emergency response, and first-aid)
3. Storage
4. Disposal

* Of the four types, there are 116 individual and 33 combined Precautionary statements.

Supplier identification

* Under the GHS supplier identification would include the name, address and telephone number of the manufacturer or supplier of the substance.

9.2 Safety Data Sheets

As of June 1, 2015, all Material Safety Data Sheets (MSDS) will be called Safety Data Sheets (SDS). SDS will contain a standardized, 16 section format. (Appendix D)

* Manufacturers, importers, and distributors are required to update the SDS and send it to the chemical user if new/significant information becomes available.
* SDS versions must be cross referenced against the hazardous chemical inventory list annually, to ensure SDS’s are present for each hazardous chemical.
* The most recent version of the SDS must be made accessible to employees and/or emergency responders.

Section 10: Contractors Working In SCSU Facilities

10.1 General Information

A variety of potential environmental, health, and safety issues can arise during a renovation or construction project. These include conditions and features specific to project sites, issues associated with buildings and related infrastructure, and demolition and construction activities themselves. Early identification of these issues is critical and will help prevent accidents and exposures, releases of hazardous materials, and unnecessary complaints from area occupants and neighbors. Timely involvement will also help avert time delays and save money.

The OEHS is responsible for advising outside contractors of any chemical hazards that are known to be present in our facilities and that may be encountered by contractors working at SCSU. This is accomplished through this document, a renovation clearance program, and in some cases, through individual meetings between the contractor and the Office of Environmental Health and Safety or the SCSU representative.

Individual contractors are responsible for providing their own employees with information and training concerning the health hazards, safe handling procedures, and appropriate protective measures to be used with the hazardous substances they bring on campus. It is also the responsibility of each contractor bringing chemicals on site to provide the University with the appropriate hazard information on these substances. They are required to inform the SCSU representative and the OEHS if they will be using hazardous chemicals in a manner which could result in a potential exposure to SCSU employees working in adjacent areas.

10.2 Contractor Conduct Within Laboratory-Occupied Facilities

Contractors working in buildings housing laboratory facilities may be working in close proximity to hazardous materials. If it is necessary to enter a laboratory, the contractor's employees should step inside the door and before proceeding further, contact a laboratory worker who can identify any potential hazard(s) that the employee should be aware of, and direct them accordingly. The contractor's employees should refrain from touching anything in the laboratory during the course of their work.

10.3 Contractors Obligations

Contractors that are planning to use hazardous chemicals (sealants, oil based paints, etc.) within SCSU facilities must inform the SCSU representative and the OEHS. The contractor must specifically identify the materials to be applied and the safeguards/exposure controls to be used to protect SCSU employees working in adjacent areas. Contractors must also remove all chemical hazardous wastes generated during their operations and all "residual" waste chemical substances brought on site.

10.4 Emergency Procedures

Evacuees must leave the building immediately whenever the building fire alarm sounds and move up wind from the building staying clear of driveways, access routes, and sidewalks. No one may re-enter the building until directed to do so by the on scene commander. The contractor must always identify the shortest route from the work location out of the building and make their employees familiar with this route prior to beginning work in that area. If the contractor discovers a fire or any other emergency condition such as a hazardous gas leak, hazardous material spill, smoke, or the odor of burning, the contractor must evacuate and notify the appropriate group(s) listed below to obtain help immediately:

Fire/Security/Ambulance/ Chemical Spills (after hours)

Dial 911 or University Police at 203-392-5375

Chemical Spills

Contractors must be prepared to contain and clean up spills of the materials they bring on site. The OEHS must be notified of spills or uncontrolled releases of substances. This is done by calling 203-619-3858.

**Appendix A: Definitions**

* **“Chemical”** means any substance, or mixture of substances.
* **“Chemical manufacturer”** means an employer with a workplace where chemical(s) are produced for use or distribution.
* **“Chemical Name”** means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name that will clearly identify the chemical for the purpose of conducting a hazard classification.
* **“Classification”** means to identify the relevant data regarding the hazards of a chemical; review those data to ascertain the hazards associated with the chemical; and decide whether the chemical will be classified as hazardous according to the definition of hazardous chemical. In addition, classification for health and physical hazards includes the determination of the degree of hazard, where appropriate, by comparing the data with the criteria for health and physical hazards.
* **“Common Name”** means any designation or identification such as a code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.
* **“Container”** means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this program, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered containers.
* **“Distributor”** means a business, other than a chemical manufacturer or importer, which
* supplies hazardous chemicals to other distributors or to employers.
* **“Employee”** means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers who encounter hazardous chemicals only in non-routine, isolated instances are not covered.
* **“Employer”** means a person engaged in a business where chemicals are either used,
* distributed, or are produced for use or distribution, including a contractor or subcontractor.
* **“Exposure or exposed”** means that an employee is subjected in the course of employment to a chemical that is a physical or health hazard, and includes potential (e.g. accidental or possible) exposure. “Subjected” in terms of health hazards includes any route of entry (e.g., inhalation, ingestion, skin contact or absorption.)
* **“Foreseeable emergency”** means any potential occurrence such as, but not limited to,
* equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.
* **“Hazard Not Otherwise Classified (HNOC)”** means an adverse physical or health effect identified through evaluation of scientific evidence during the classification process that does not meet the specified criteria for the physical and health hazard classes addressed in this section. This does not extend coverage to adverse physical and health effects for which there is a hazard class addressed in this section, but the effect falls below the cut-off value/concentration limit of the hazard class or is under a GHS hazard category that has not been adopted by OSHA (e.g., acute toxicity Category 5).
* **“Hazardous chemical”** means any chemical which is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified.
* **“Health hazard”** means a chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard.
* **“Immediate Use”** means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.
* **“Importer”** means the first business with employees within the Customs Territory of the United States which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within the United States.
* **“Label”** means an appropriate group of written, printed or graphic information elements concerning a hazardous chemical that is affixed to, printed on, or attached to the immediate container of a hazardous chemical, or to the outside packaging.
* **“Mixture”** means a combination or a solution composed of two or more substances in which they do not react.
* **“Physical hazard”** means a chemical that is classified as posing one of the following hazardous effects: explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid or gas); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; or in contact with water emits flammable gas.
* **“Pictogram”** means a composition that may include a symbol plus other graphic elements, such as a border, background pattern, or color, that is intended to convey specific information about the hazards of a chemical. Eight pictograms are designated under this standard for application to a hazard category.
* **“Product identifier”** means the name or number used for a hazardous chemical on a label or in the SDS. It provides a unique means by which the user can identify the chemical. The product identifier used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the SDS.
* **“Pyrophoric gas”** means a chemical in a gaseous state that will ignite spontaneously in air at a temperature of 130 degrees F (54.4 degrees C) or below.
* **“Safety data sheet (SDS)”** means a written or printed material concerning a hazardous chemical that provides detailed information about a hazardous chemical or product.
* **“Substance”** means chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.
* **“Unclassified hazard”** means a chemical for which there is scientific evidence identified during the classification process that it may pose an adverse physical or health effect when present in a workplace under normal conditions of use or in a foreseeable emergency, but the evidence does not currently meet the specified criteria for physical or health hazard classification in this section. This does not include adverse physical and health effects for which there is a hazard class addressed in this section.
* **“Use”** means to package, handle, react, emit, extract, generate as a byproduct, or transfer.
* **“Work area”** means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.
* **“Workplace”** means an establishment, job site, or project, at one geographical location
* containing one or more work areas.

**Appendix B: Material Safety Data Sheet & Glossary of MSDS Terms**

MSDSs provide complete, detailed information about hazardous chemicals:

* Identity of the chemical—what it is, who made or distributed it
* Hazardous ingredients and exposure limits
* Chemical characteristics—how the chemical looks, smells, and acts
* Health hazards—how you can be exposed, how exposure can harm you, symptoms of exposure
* Physical hazards—fire, explosion, reaction with other substances
* Safe handling, storage, and use—how to prevent accidents
* Protective equipment—what to wear to prevent exposure
* Other safety information—proper disposal, spill response, and transportation

GLOSSARY OF MSDS TERMS

Some of the terms used in an MSDS might seem unfamiliar and technical—but you still need to know what they mean to protect yourself from chemical hazards. Make sure you understand the following terms:

Acute Health Effects—these show up soon after exposure, such as burns.

Chronic Health Effects—these show up later after exposure, or after repeated exposure.

Exposure Limits—Permissible exposure limit (PEL) and threshold limit value (TLV) establish the maximum concentration in air most workers can be exposed to without suffering adverse health effects.

Flash Point—The lowest temperature at which a chemical gives off enough vapors that the vapors can be ignited. The lower the flash point, the more flammable a chemical is.

Flammable limits—The range of concentration of vapors in the air within which the vapors are likely to ignite.

Hazardous Decomposition or Byproducts—whether the chemical will create new hazards if it breaks down or reacts with other substances.

Hazardous Polymerization—The ability of a chemical to react with itself, creating an explosion or fire hazard

Specific Gravity—Tells whether chemicals will float or sink in water. Less than 1, they float; above 1, they sink.

Stability/Instability—How well a chemical resists changes and conditions that might cause a hazardous reaction.

Vapor Pressure and Evaporation Rate—Tells how fast the chemical will put vapors into the air (evaporate). The higher the pressure, the faster it will evaporate.

Vapor Density—Tells whether vapors will rise or sink in the air. Less than 1, vapors rise; above 1, vapors sink.

Keep this handout for reference when you consult an MSDS. Remember, if you aren’t sure what something means, ask a supervisor or call the OEHS at 203-392-7073.

**APPENDIX C:** **SAMPLE MSDS FOR HYDROCHLORIC ACID**

Material Safety Data Sheet

Hydrochloric acid 32-38% solution

ACC# 11155

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| Section 1 - Chemical Product and Company Identification |

**MSDS Name:** Hydrochloric acid 32-38% solution   
**Catalog Numbers:** AC124620000, AC124620010, AC124620011, AC124620025, AC124620026, AC124620051, AC124620100, AC124620250, AC124630000, AC124630010, AC124630011, AC124630025, AC124630026, AC124630100, AC124635000, AC124635001, AC352020000, AC423790000, AC423790025, AC423790026, AC423790250, AC423795000, AC423795001, S71942, S71942MF, S74853, S74853SC, S75133, S93258, A142-212, A142P-20, A142P19, A144-212, A144-500, A144-500LB, A144-612GAL, A144C-212, A144C-212EA, A144P-20, A144P19, A144S-212, A144S-212EA, A144S-500, A144SI-212, A466-1, A466-2, A466-250, A466-2LC, A466-500, A481-212, A481-212LC, A508-212, A508-212LC, A508-4, A508-500, A508SK-212, NC9123736, NC9373124, S71942SC, S71942SCND, S71943, S71943ND, S80038, SA49, XXA481184, XXA481SK212LI   
Synonyms: Muriatic acid; Chlorohydric acid; Hydrogen chloride in aqueous solution.   
Company Identification:  
              Fisher Scientific  
              1 Reagent Lane  
              Fair Lawn, NJ 07410   
For information, call: 201-796-7100   
Emergency Number: 201-796-7100   
For CHEMTREC assistance, call: 800-424-9300   
For International CHEMTREC assistance, call: 703-527-3887

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| Section 2 - Composition, Information on Ingredients |

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| --- | --- | --- | --- |
| **CAS#** | **Chemical Name** | **Percent** | **EINECS/ELINCS** |
| 7732-18-5 | Water | 62-68 | 231-791-2 |
| 7647-01-0 | Hydrogen chloride | 32-38 | 231-595-7 |

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| Section 3 - Hazards Identification |

**EMERGENCY OVERVIEW**

Appearance: clear, colorless to pale yellow liquid.  
Danger! Causes eye and skin burns. Causes digestive and respiratory tract burns. May be fatal if inhaled or swallowed. Repeated or prolonged exposure may cause erosion of exposed teeth. Corrosive to metal.   
**Target Organs:** Respiratory system, gastrointestinal system, teeth, eyes, skin.   
  
**Potential Health Effects**   
**Eye:** May cause irreversible eye injury. Vapor or mist may cause irritation and severe burns. Contact with liquid is corrosive to the eyes and causes severe burns.   
**Skin:** Contact with liquid is corrosive and causes severe burns and ulceration. The severity of injury depends on the concentration of the solution and the duration of exposure.   
**Ingestion:** Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract.   
**Inhalation:** May be fatal if inhaled. May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract. Causes corrosive action on the mucous membranes.   
**Chronic:** Prolonged or repeated skin contact may cause dermatitis. Repeated exposure may cause erosion of teeth. Repeated exposure to low concentrations of HCl vapor or mist may cause bleeding of nose and gums. Chronic bronchitis and gastritis have also been reported.

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| Section 4 - First Aid Measures |

**Eyes:** In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid immediately.   
**Skin:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.   
**Ingestion:** If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.   
**Inhalation:** POISON material. If inhaled, get medical aid immediately. Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.   
**Notes to Physician:** Do NOT use sodium bicarbonate in an attempt to neutralize the acid.

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| Section 5 - Fire Fighting Measures |

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Not flammable, but reacts with most metals to form flammable hydrogen gas. Use water spray to keep fire-exposed containers cool. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated.   
**Extinguishing Media:** Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.   
Flash Point: Not applicable.   
Autoignition Temperature: Not applicable.   
Explosion Limits, Lower:Not available.   
Upper: Not available.   
**NFPA Rating:** (estimated) Health: 3; Flammability: 0; Instability: 1

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| Section 6 - Accidental Release Measures |

**General Information:** Use proper personal protective equipment as indicated in Section 8.   
**Spills/Leaks:** Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Isolate area and deny entry. Provide ventilation. Spill may be carefully neutralized with lime (calcium oxide, CaO). A vapor suppressing foam may be used to reduce vapors. Approach spill from upwind.

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| Section 7 - Handling and Storage |

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Contents may develop pressure upon prolonged storage. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Discard contaminated shoes. Keep away from strong bases and metals. Use caution when opening. Do not use with metal spatula or other metal items. Do not breathe vapor or mist. Use only with adequate ventilation or respiratory protection.   
**Storage:** Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Do not store in metal containers. Store away from alkalies. Separate from oxidizing materials.

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| Section 8 - Exposure Controls, Personal Protection |

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Use a corrosion-resistant ventilation system.   
**Exposure Limits**

|  |  |  |  |
| --- | --- | --- | --- |
| **Chemical Name** | **ACGIH** | **NIOSH** | **OSHA - Final PELs** |
| Water | none listed | none listed | none listed |
| Hydrogen chloride | 2 ppm Ceiling | 50 ppm IDLH | 5 ppm Ceiling; 7 mg/m3 Ceiling |

**OSHA Vacated PELs:** Water: No OSHA Vacated PELs are listed for this chemical. Hydrogen chloride: No OSHA Vacated PELs are listed for this chemical.   
**Personal Protective Equipment**   
**Eyes:** Wear chemical splash goggles and face shield.   
**Skin:** Wear appropriate gloves to prevent skin exposure.   
**Clothing:** Wear appropriate protective clothing to prevent skin exposure.   
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

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| Section 9 - Physical and Chemical Properties |

Physical State: Liquid   
Appearance: clear, colorless to pale yellow   
Odor: strong, pungent   
pH: 0.01   
Vapor Pressure: 84 mm Hg @ 20 deg C(35%)   
Vapor Density: 1.27 (air=1)   
Evaporation Rate:> 1.00 (N-butyl acetate)   
Viscosity: Not available.   
Boiling Point: 83 deg C @ 760 mmHg   
Freezing/Melting Point:-66 deg C   
Decomposition Temperature:Not available.   
Solubility: Soluble.   
Specific Gravity/Density:1.19 (38%)   
Molecular Formula:HCl.H2O   
Molecular Weight:36.46

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| Section 10 - Stability and Reactivity |

Chemical Stability: Stable under normal temperatures and pressures.   
Conditions to Avoid: Excess heat.   
Incompatibilities with Other Materials: Metals, strong oxidizing agents, strong reducing agents, bases, acetic anhydride, alcohols, amines, sulfuric acid, vinyl acetate, epoxides (e.g. butyl glycidyl ether), chlorosulfonic acid, carbides, beta-propiolactone, ethyleneimine, propylene oxide, lithium silicides, 2-aminoethanol, 1,1-difluoroethylene, magnesium boride, mercuric sulfate, aldehydes, cyanides, sulfides, phosphides.   
Hazardous Decomposition Products: Hydrogen chloride, chlorine, hydrogen gas.   
Hazardous Polymerization: Will not occur.

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| Section 11 - Toxicological Information |

RTECS#:        
CAS# 7732-18-5: ZC0110000        
CAS# 7647-01-0: MW4025000; MW4031000   
LD50/LC50:  
CAS# 7732-18-5:  
     Oral, rat: LD50 = >90 mL/kg;  
  
CAS# 7647-01-0:  
     Inhalation, mouse: LC50 = 1108 ppm/1H;  
     Inhalation, mouse: LC50 = 20487 mg/m3/5M;  
     Inhalation, mouse: LC50 = 3940 mg/m3/30M;  
     Inhalation, mouse: LC50 = 8300 mg/m3/30M;  
     Inhalation, rat: LC50 = 3124 ppm/1H;  
     Inhalation, rat: LC50 = 60938 mg/m3/5M;  
     Inhalation, rat: LC50 = 7004 mg/m3/30M;  
     Inhalation, rat: LC50 = 45000 mg/m3/5M;  
     Inhalation, rat: LC50 = 8300 mg/m3/30M;  
     Oral, rabbit: LD50 = 900 mg/kg;  
  
Inhalation LC50 (aerosol) rat: 8300mg/m3/30M; Oral LDLo Man: 2857 ug/kg; Oral LDLo Woman: 420 uL/kg; Inhalation LCLo Human: 1300 ppm/30M.   
Carcinogenicity:  
CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.  
CAS# 7647-01-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.  
  
Epidemiology: No data available.   
Teratogenicity: Female rats were exposed to 450 mg/m3 of HCl for 1 hour either prior to mating or on day 9 of pregnancy. Developmental effects were observed in the offspring. However, this exposure caused toxic effects, including mortality, in the mothers.   
Reproductive Effects: No information available.   
Mutagenicity: See actual entry in RTECS for complete information.   
Neurotoxicity: No information available.   
Other Studies:

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| Section 12 - Ecological Information |

Ecotoxicity: Fish: Bluegill/Sunfish: 3.6 mg/L; 48Hr; Lethal (unspecified)Fish: Bluegill/Sunfish: LC50; 96 Hr; pH 3.0-3.5 No data available.   
Environmental: Will exhibit extensive evaporation from soil surfaces. Upon transport through the soil, hydrochloric acid will dissolve some of the soil materials (especially those with carbonate bases) and the acid will neutralize to some degree.   
Physical: No information available.   
Other: No information available.

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| Section 13 - Disposal Considerations |

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.   
RCRA P-Series: None listed.   
RCRA U-Series: None listed.

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| Section 14 - Transport Information |

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|  | **US DOT** | **Canada TDG** |
| Shipping Name: | HYDROCHLORIC ACID | HYDROCHLORIC ACID |
| Hazard Class: | 8 | 8 |
| UN Number: | UN1789 | UN1789 |
| Packing Group: | II | II |

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| Section 15 - Regulatory Information |

US FEDERAL  
  
TSCA   
     CAS# 7732-18-5 is listed on the TSCA inventory.   
     CAS# 7647-01-0 is listed on the TSCA inventory.   
Health & Safety Reporting List  
     None of the chemicals are on the Health & Safety Reporting List.   
Chemical Test Rules  
     None of the chemicals in this product are under a Chemical Test Rule.

Section 12b  
     None of the chemicals are listed under TSCA Section 12b.   
TSCA Significant New Use Rule  
     None of the chemicals in this material have a SNUR under TSCA.   
CERCLA Hazardous Substances and corresponding RQs  
     CAS# 7647-01-0: 5000 lb final RQ; 2270 kg final RQ   
SARA Section 302 Extremely Hazardous Substances  
     CAS# 7647-01-0: 500 lb TPQ (gas only)   
SARA Codes  
     CAS # 7647-01-0: immediate.   
Section 313   
     This material contains Hydrogen chloride (CAS# 7647-01-0, 32-38%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.   
Clean Air Act:  
     CAS# 7647-01-0 is listed as a hazardous air pollutant (HAP).   
     This material does not contain any Class 1 Ozone depletors.   
     This material does not contain any Class 2 Ozone depletors.   
Clean Water Act:  
CAS# 7647-01-0 is listed as a Hazardous Substance under the CWA.   
     None of the chemicals in this product are listed as Priority Pollutants under the CWA.   
     None of the chemicals in this product are listed as Toxic Pollutants under the CWA.   
OSHA:  
     CAS# 7647-01-0 is considered highly hazardous by OSHA.   
STATE  
     CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.   
     CAS# 7647-01-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, and Massachusetts.   
  
California Prop 65  
  
California No Significant Risk Level: None of the chemicals in this product are listed.   
  
European/International Regulations  
European Labeling in Accordance with EC Directives  
Hazard Symbols:  
     C   
Risk Phrases:  
     R 34 Causes burns.   
     R 37 Irritating to respiratory system.   
  
Safety Phrases:  
     S 26 In case of contact with eyes, rinse immediately with plenty of   
     water and seek medical advice.   
     S 45 In case of accident or if you feel unwell, seek medical advice   
     immediately (show the label where possible).   
  
WGK (Water Danger/Protection)  
     CAS# 7732-18-5: No information available.   
     CAS# 7647-01-0: 1   
Canada - DSL/NDSL  
     CAS# 7732-18-5 is listed on Canada's DSL List.   
     CAS# 7647-01-0 is listed on Canada's DSL List.   
Canada - WHMIS  
This product has a WHMIS classification of E, D1A.   
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.   
Canadian Ingredient Disclosure List  
     CAS# 7647-01-0 is listed on the Canadian Ingredient Disclosure List.

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| Section 16 - Additional Information |

MSDS Creation Date: 7/06/1999   
Revision #19 Date: 6/06/2006   
The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

**Appendix D:**  **Safety Data Sheets (SDS)**

**16 Sections of a SDS**

1. Identification - Identification of the substance or mixture and of the supplier.
2. Hazard(s) Identification - includes all hazards regarding the chemical
3. Composition/Information on Ingredients - includes information on chemical ingredients; Chemical identity; Common name, synonyms, etc.; CAS number and other unique identifiers. Also includes impurities and stabilizing additives which are themselves classified and which contribute to the classification of a substance.
4. First-Aid Measures - includes important symptoms/ effects, acute, delayed; required treatment.
5. Fire-Fighting Measures - lists suitable extinguishing techniques, equipment; chemical hazards from fire.
6. Accidental Release Measures - lists emergency procedures; protective equipment; proper methods of containment and cleanup.
7. Handling and Storage - lists precautions for safe handling and storage, including incompatibilities.
8. Exposure controls/Personal Protection - lists OSHA’s Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).
9. Physical and Chemical Properties - lists the chemical’s characteristics. (appearance, odor, pH, boiling point, etc.)
10. Stability and Reactivity - lists chemical stability and possibility of hazardous reactions.
11. Toxicological Information - includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
12. Ecological information\* (non mandatory)
13. Disposal considerations\* (non-mandatory)
14. Transport information\* (non-mandatory)
15. Regulatory information\* (non-mandatory)
16. Other information, includes the date of preparation or last revision.

\*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15(29 CFR 1910.1200(g)(2)).

**Appendix E: Examples of Pictograms**

**Examples of Pictograms**



**Irritant**

**Gas Under Pressure**

**Explosive**

**Toxic**

**Oxidizer**

**Flammable**

**Appendix F: Hazard Statements**

1. H200 Unstable Explosive
2. H201 Explosive; mass explosion hazard
3. H202 Explosive; severe projection hazard
4. H203 Explosive; fire, blast or projection hazard
5. H204 Fire or projection hazard
6. H205 May mass explode in fire
7. H220 Extremely flammable gas
8. H221 Flammable gas
9. H222 Extremely flammable aerosol
10. H223 Flammable
11. H224 Extremely flammable liquid and vapor
12. H225 Highly Flammable liquid and vapor
13. H226 Flammable liquid and vapor
14. H227 Combustible liquid
15. H228 Flammable solid Flammable
16. H240 Heating may cause an explosion
17. H241 Heating may cause a fire or explosion
18. H242 Heating may cause a fire
19. H250 Catches fire spontaneously if exposed to air
20. H251 Self-heating; may catch
21. H260 In contact with water releases flammable gases which may ignite spontaneously
22. H261 In contact with water releases flammable gas
23. H270 May cause or intensify fire; oxidizer
24. H271 May cause fire or explosion; strong oxidizer
25. H272 May intensify fire; oxidizer
26. H280 Contains gas under pressure; may explode if heated
27. H281 Contains refrigerated gas; may cause cryogenic burns or injury
28. H290 May be corrosive to metals
29. H300 Fatal if swallowed Acute
30. H301 Toxic if swallowed
31. H302 Harmful if swallowed
32. H303 May be harmful if swallowed
33. H304 May be fatal if swallowed and enters airways (category 1 – Danger)
34. H305 May be fatal if swallowed and enters airways (category 2 – Warning)
35. H310 Fatal in contact with skin
36. H311 Toxic in contact with skin Acute
37. H312 Harmful in contact with skin
38. H313 May be harmful in contact with skin
39. H314 Causes severe skin burns and eye damage Skin corrosion/irritation
40. H315 Causes skin irritation Skin corrosion/irritation
41. H316 Causes mild skin irritation Skin corrosion/irritation
42. H317 May cause an allergic skin reaction
43. H318 Causes serious eye damage
44. H319 Causes serious eye irritation
45. H320 Causes eye irritation
46. H330 Fatal if inhaled
47. H331 Toxic if inhaled
48. H332 Harmful if inhaled
49. H333 May be harmful if inhaled
50. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
51. H335 May cause respiratory irritation
52. H336 May cause drowsiness or dizziness effects
53. H340 May cause genetic defects
54. H341 Suspected of causing genetic defects
55. H350 May cause cancer
56. H351 Suspected of causing cancer
57. H360 May damage fertility or the unborn child
58. H361 Suspected of damaging fertility or the unborn child
59. H362 May cause harm to breast-fed children
60. H370 Causes damage to organs
61. H371 May cause damage to organs
62. H372 Causes damage to organs through prolonged or repeated exposure
63. H373 Causes damage to organs through prolonged or repeated exposure
64. H400 Very toxic to aquatic life
65. H401 Toxic to aquatic life
66. H402 Harmful to aquatic life
67. H410 Very toxic to aquatic life with long lasting effects hazard Category 1 Warning
68. H411 Toxic to aquatic life with long lasting effects
69. H412 Harmful to aquatic life with long lasting effects
70. H413 May cause long lasting harmful effects to aquatic life
71. H420 Harms public health and the environment by destroying ozone in the upper atmosphere Hazardous

**Appendix G: Precautionary Statements**

**General Precautionary Statements**

P101: If medical advice is needed, have product container or label at hand

P102: Keep out of reach of children

P103: Read label before use

Prevention Precautionary Statements

P201: Obtain special instructions before use

P202: Do not handle until all safety precautions have been read and understood

P210: Keep away from heat/sparks/open flames/hot surfaces – No smoking

P211: Do not spray on an open flame or other ignition source

P220: Keep/Store away from clothing/…/combustible materials

P221: Take any precaution to avoid mixing with combustibles

P222: Do not allow contact with air

P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire

P230: Keep wetted with …

P231: Handle under inert gas

P232: Protect from moisture

P233: Keep container tightly closed

P234: Keep only in original container

P235: Keep cool

P240: Ground/bond container and receiving equipment

P241: Use explosion-proof electrical/ventilating/light/…/equipment

P242: Use only non-sparking tools

P243: Take precautionary measures against static discharge

P244: Keep reduction valves free from grease and oil

P250: Do not subject to grinding/shock/…/friction

P251: Pressurized container – Do not pierce or burn, even after use

P260: Do not breathe dust/fume/gas/mist/vapors/spray

P261: Avoid breathing dust/fume/gas/mist/vapors/spray

P262: Do not get in eyes, on skin, or on clothing

P263: Avoid contact during pregnancy/while nursing

P264: Wash … thoroughly after handling

P270: Do not eat, drink or smoke when using this product

P271: Use only outdoors or in a well-ventilated area

P272: Contaminated work clothing should not be allowed out of the workplace

P273: Avoid release to the environment

P280: Wear protective gloves/protective clothing/eye protection/face protection

P281: Use personal protective equipment as required

P282: Wear cold insulating gloves/face shield/eye protection

P283: Wear fire/flame resistant/retardant clothing

P284: Wear respiratory protection

P285: In case of inadequate ventilation wear respiratory protection

P231+232: Handle under inert gas. Protect from moisture

P235+410: Keep cool. Protect from sunlight

**Response Precautionary Statements**

P301: IF SWALLOWED:

P302: IF ON SKIN:

P303: IF ON SKIN (or hair):

P304: IF INHALED:

P305: IF IN EYES:

P306: IF ON CLOTHING:

P307: IF exposed:

P308: IF exposed or concerned:

P309: IF exposed or you feel unwell:

P310: Immediately call a POISON CENTER or doctor/physician

P311: Call a POISON CENTER or doctor/physician

P312: Call a POISON CENTER or doctor/physician if you feel unwell

P313: Get medical advice/attention

P314: Get Medical advice/attention if you feel unwell

P315: Get immediate medical advice/attention

P320: Specific treatment is urgent (see … on this label)

P321: Specific treatment (see … on this label)

P322: Specific measures (see … on this label)

P330: Rinse mouth

P331: Do NOT induce vomiting

P332: If skin irritation occurs:

P333: If skin irritation or a rash occurs:

P334: Immerse in cool water/wrap in wet bandages

P335: Brush off loose particles from skin

P336: Thaw frosted parts with lukewarm water. Do not rub affected areas

P337: If eye irritation persists:

P338: Remove contact lenses if present and easy to do. Continue rinsing

P340: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P341: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing

P342: If experiencing respiratory symptoms:

P350: Gently wash with soap and water

P351: Rinse cautiously with water for several minutes

P352: Wash with soap and water

P353: Rinse skin with water/shower

P360: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes

P361: Remove/Take off immediately all contaminated clothing

P362: Take off contaminated clothing and wash before reuse

P363: Wash contaminated clothing before reuse

P370: In case of fire:

P371: In case of major fire and large quantities:

P372: Explosion risk in case of fire

P373: DO NOT fight fire when fire reaches explosives

P374: Fight fire with normal precautions from a reasonable distance

P375: Fight fire remotely due to the risk of explosion

P376: Stop leak if safe to do so

P377: Leaking gas fire – do not extinguish unless leak can be stopped safely

P378: Use … for extinction

P380: Evacuate area

P381: Eliminate all ignition sources if safe to do so

P391: Collect spillage

P301+310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician

P301+312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell

P301+330+331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting

P302+334: IF ON SKIN: Immerse in cool water/wrap in wet bandages

P302+350: IF ON SKIN: Gently wash with soap and water

P302+352: IF ON SKIN: Wash with soap and water

P303+361+353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P304+312: IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell

P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P304+341: IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing

P306+360: IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes

P307+311: IF exposed: Call a POISON CENTER or doctor/physician

P308+313: IF exposed or concerned: Get medical advice/attention

P309+311: IF exposed or you feel unwell: Call a POISON CENTER or doctor/physician

P332+313: If skin irritation occurs: Get medical advice/attention

P333+313: If skin irritation or a rash occurs: Get medical advice/attention

P335+334: Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages

P337+313: If eye irritation persists get medical advice/attention

P342+311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician

P370+376: In case of fire: Stop leak if safe to do so

P370+378: In case of fire: Use … for extinction

P370+380: In case of fire: Evacuate area

P370+380+375: In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion

P371+380+375: In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion

**Storage Precautionary Statements**

P401: Store …

P402: Store in a dry place

P403: Store in a well -ventilated place

P404: Store in a closed container

P405: Store locked up

P406: Store in a corrosive resistant/… container with a resistant inner liner

P407: Maintain air gap between stacks/pallets

P410: Protect from sunlight

P411: Store at temperatures not exceeding … °C/… °F

P412: Do not expose to temperatures exceeding 50 °C/122 °F

P413: Store bulk masses greater than … kg/… lbs. at temperatures not exceeding … °C/… °F

P420: Store away from other materials

P422: Store contents under …

P402+404: Store in a dry place. Store in a closed container

P403+233: Store in a well -ventilated place. Keep container tightly closed

P403+235: Store in a well- ventilated place. Keep cool

P410+403: Protect from sunlight. Store in a well -ventilated place

P410+412: Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F

P411+235: Store at temperatures not exceeding … °C/… °F. Keep cool

**Disposal Precautionary Statements**

P501: Dispose of contents/container to …