

ENVIRONMENTAL HEALTH & SAFETY

UNIVERSITY *of* WASHINGTON

# UNIVERSITY OF WASHINGTON CHEMICAL HAZARD COMMUNICATION (HAZCOM) PROGRAM MANUAL

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# ENVIRONMENTAL HEALTH & SAFETY

UNIVERSITY *of* WASHINGTON

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## INTRODUCTION

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[Washington Administrative Code WAC 296-901](#) Hazard Communication addresses classifying the potential hazards of chemicals and communicating information concerning hazards and appropriate protective measures to employees. The University of Washington Hazard Communication (HazCom) Program complies with this mandate in [Administrative Policy Statement \(APS. 12.5, Chemical Hazard Communication Program\)](#) and this guidance manual. The main components of this guidance manual are:

- Identifying hazardous chemicals and maintaining an inventory in the UW MyChem database system
- Providing access to and making use of Safety Data Sheets (SDSs) and labels to provide hazard information
- Informing and training employees about chemical hazards and how to work with chemicals in a safe manner
- Maintaining documentation

This document is the official written UW HazCom Program and the UW Environmental Health & Safety department (EH&S) is responsible for its development and implementation.

## SCOPE

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The HazCom Program applies to all University employees, students and visitors at all University locations including the Seattle, Bothell, and Tacoma campuses, medical centers, all other University-owned property, University-leased space, and field locations under the control of University operations and staff where chemicals are used, transported, stored or manufactured.

The HazCom Program does not apply to individuals who work in research, educational and clinical laboratories, as these individuals refer to the UW Laboratory Safety Manual for hazard communication and laboratory chemical use requirements. These laboratories are defined as places using relatively small quantities of hazardous substances, using multiple procedures or chemicals on a small scale where one person can easily handle the volume of the chemical in use (WAC 296-828 Hazardous Chemicals in Laboratories). The following types of laboratories are not exempt from HazCom and are specifically regulated under the HazCom Program:

- Anatomy and pathology laboratories where formaldehyde is the predominant chemical in use (Note that the Formaldehyde Standard is also applicable)
- Quality control laboratories for a production process
- Pharmacy operations

- Small or large scale production laboratories with a potential commercial basis

The HazCom Program requires supervisors and principal investigators to train their employees on the hazards of the chemicals used in their workplace in compliance with this written UW Chemical Hazard Communication Program Manual.

## RESPONSIBILITIES

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The HazCom Program describes the responsibilities of department managers, supervisors, principal investigators (PIs), employees, students, contractors, visitors, and EH&S. Protection from hazards provided by the program is meant to be consistent, whether in a specific chemical use area, applicable laboratory, workplaces such as shops, custodial and maintenance services, transportation facilities, and art and ceramics studios.

### Department managers, supervisors and PIs are responsible for:

- Assessing department chemicals and use
- Ensuring chemicals are in compatible containers and stored properly
- Ensuring a chemical inventory is entered into the online [MyChem](#) chemical inventory system and that SDSs are attached for each chemical in the inventory
- Ensuring staff have ready access to SDSs in the work area, either through the online MyChem system and printed copies as needed
- Reviewing the inventory and hazards of each chemical with employees
- Determining proper engineering and/or administrative controls, work practices and personal protective equipment (PPE) to implement when employees work with specific chemicals
- Ensuring proper labeling of all original and secondary chemical containers, storage cabinets and work areas as needed
- Developing SDS and labels for any chemical that is manufactured and distributed by UW personnel
- Ensuring employees and affected individuals receive HazCom training, and work area chemical specific training to supplement it, such as chemical locations, potential hazards, and location of SDSs
- Conducting job hazard analysis (JHA) and/or developing standard operating procedure (SOP) for processes and chemical use and ensuring that it describes the hazards and safeguards
- Providing PPE for employees and other individuals, where applicable
- Retraining employees and other individuals when new chemicals or procedures are introduced to the work area
- Informing contractors of chemicals and potential hazards they may encounter in their work

- Informing contractors that they must provide UW with chemical information and SDS about chemicals they are bringing onsite to complete their work
- Reporting any accidents or injuries using the [Online Accident Reporting System \(OARS\)](#)
- Asking EH&S for help if needed

### Employees, students are responsible for:

- Reviewing safety data sheets (SDSs) for the chemicals you use and identifying the potential hazards
- Taking the EH&S general Hazard Communication training course and obtaining chemical-specific training from your supervisor
- Knowing how to use the online [MyChem](#) chemical database system and how to access the chemical inventories and SDSs for chemical-specific hazard information
- Following standard operating procedures (SOPs) and/or a job hazard analysis (JHA) developed for operations in your work area that describe hazards and safeguards
- Following safe use practices when working with chemicals, including engineering controls, administrative controls, good work practices, and use of proper personal protective equipment (PPE) as required
- Helping your supervisor ensure all chemical containers are labeled
- Knowing emergency procedures in case of a chemical spill
- Asking questions if you are unsure about any procedures or chemical hazards
- Reporting any accidents or injuries immediately to your supervisor; reporting to EH&S using the [Online Accident Reporting System \(OARS\)](#)

### EH&S is responsible for:

- Maintaining the HazCom program, auditing it annually and updating it as needed
- Maintaining the online MyChem chemical inventory system and centralized library of safety data sheets
- Providing advice on chemical assessments, assisting in the development of standard operating procedures and/or job hazard analyses that describe hazards and safeguards, safe use practices when working with chemicals, and personal protective equipment selection and use
- Providing basic HazCom training; advising on area-specific HazCom training
- Conducting air and other monitoring for workplace chemicals to determine potential for exposures, advising on corrective actions when concentrations exceed regulated limits, and maintaining exposure records

### Contractors, visitors are responsible for:

- Providing UW with chemical information and safety data sheets about chemicals they are bringing onsite to complete their work

- Asking about chemicals and potential hazards they may encounter in the work area where they will work or visit
- Following proper procedures of the work area and wearing personal protective equipment as needed

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## IDENTIFYING HAZARDOUS CHEMICALS

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University departments are required to inform employees, visitors and contractors (where applicable) of chemical hazards if a chemical itself is hazardous or if it can release a hazardous component during normal use or accidental discharge. Chemicals include both pure and mixed forms of solids, liquids, gases and liquids stored in gas cylinders, and substances that may be released during a procedure or work task. The table below shows different ways of identifying when a chemical must be included in the HazCom program.

## Actions Needed when Identifying Hazardous Chemicals

Situation	Examples	Your Actions
A container holds a hazardous chemical or product known to have hazards	<ul style="list-style-type: none"> <li>• Bottle of acetone</li> <li>• Compressed gas cylinder</li> <li>• Lead brick</li> </ul>	<ul style="list-style-type: none"> <li>• Check label, SDS, and other reference materials and determine the hazards</li> <li>• Add to MyChem inventory</li> <li>• Keep labels in good condition</li> <li>• Train employees</li> </ul>
Personnel mix chemicals together and keep for future	<ul style="list-style-type: none"> <li>• Dilution of a concentrated acid</li> <li>• Solvent mixture poured into process reservoir</li> </ul>	<ul style="list-style-type: none"> <li>• Check labels, SDS, and other reference materials and determine the hazards</li> <li>• Address hazards/controls in SOPs or JHAs</li> <li>• Label container</li> <li>• Train employees</li> </ul>
A procedure generates potentially hazardous contaminants from “non-hazardous” materials	<ul style="list-style-type: none"> <li>• Melting glassware</li> <li>• Disturbing guano during a field trip to a cave</li> <li>• Cutting nylon rope or plastics with a “hot knife”</li> <li>• Handling animals in research causing release of allergens</li> <li>• Sanding or cutting lumber that could create hazardous sawdust levels</li> <li>• Doing work on building walls that may contain asbestos</li> <li>• 3D printing</li> </ul>	<ul style="list-style-type: none"> <li>• Recognize the hazard</li> <li>• Address hazards/controls in SOPs or JHAs</li> <li>• Train employees</li> </ul>
Exempt materials	<ul style="list-style-type: none"> <li>• Cosmetics, food, food additives, beverages, liquor, tobacco, or tobacco products for human consumption</li> <li>• Drugs as pills or tablets in final form and ready to administer (including any in first aid kits)</li> <li>• Biological materials with no chemical hazards</li> <li>• Sealed radioactive sources</li> </ul>	<ul style="list-style-type: none"> <li>• Check that materials are indeed exempt (no other actions needed for those materials)</li> </ul>
Consumer products used in small quantities and no more frequently than typical consumer use*	<ul style="list-style-type: none"> <li>• Spray furniture polish used to clean your office’s desktops</li> <li>• Marker pens used on white boards, or to highlight dates on a chemical container label</li> <li>• Copier/printer toner cartridge replacement</li> </ul>	<ul style="list-style-type: none"> <li>• Check that materials are indeed consumer products used as a typical consumer may use them (no other actions needed for those materials.*</li> </ul>
Consumer products used in large quantities or more frequently than typical consumer use	<ul style="list-style-type: none"> <li>• Glass cleaner used throughout a shift</li> <li>• Several cans of aerosol spray paint used each day</li> </ul>	<ul style="list-style-type: none"> <li>• Identify that use requires HazCom</li> <li>• Address hazards/controls in SOPs or JHAs</li> <li>• Add to MyChem inventory</li> <li>• Keep labels in good condition</li> <li>• Train employees</li> </ul>

\*If small amounts of consumer products are the only materials used by the employees, you must inform them about the HazCom program in general.

## TRACKING HAZARDOUS CHEMICALS

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University departments are required to enter and maintain a hazardous chemical list/inventory in MyChem, the UW online chemical inventory and SDS management system. The inventoried chemicals and their associated SDSs are used by UW employees and EH&S to comply with local, state, and federal regulations. Supervisors or Principal Investigators are required to update MyChem inventories as work processes or chemical use changes. Review inventories annually even if work processes and chemical usage has not changed. For more details refer to [MyChem](#) on the EH&S website.

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## HANDLING SAFETY DATA SHEETS (SDSs)

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All employees must have ready access to the SDS for each hazardous chemical they may use or be exposed to. It is important that employees can access the SDSs at all times while working with chemicals. It is also important to maintain access to SDSs for new products introduced to the workplace.

SDSs are generated by chemical manufacturers in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), which replaces the older documents called Material Safety Data Sheets (MSDSs). SDSs provide information on the health and physical hazards of chemicals found in the workplace. See [Appendix C](#) for more information about the GHS system.

EH&S maintains the online MyChem inventory of chemicals and helps ensure SDSs are accessible to all employees. Employees can access SDSs at any time in [MyChem](#) using their UW NetID or through their chemical inventory. Supervisors can provide inventory access accounts to their employees or have a choice about keeping paper copies of SDSs and the chemical inventory. View the EH&S website for more information about MyChem access accounts.

In case of emergencies on the Seattle campus, SDSs are available by calling EH&S at 206.543.0467 during normal business hours (Monday through Friday, from 8:00 a.m. to 5:00 p.m.); or during non-business hours, by calling UW Police Department at 206.685.UWPD (8973) to reach EH&S staff on call. At other UW locations, local procedures should be followed. Medical providers recommend that employees have a copy of the appropriate SDSs when talking to or visiting the emergency room following a hazardous chemical exposure.

Supervisors should ensure the MyChem inventory, SDS, and any optional paper copy systems are updated annually or whenever chemicals are added or removed from the area. Supervisors should ensure newly acquired SDSs in chemical shipments are electronically attached to their chemical inventories. Doing so, notifies EH&S that a new or updated SDS is available for review and inclusion in the SDS library, which is accessed by all MyChem users.

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## CONTAINER LABELING

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### Newly-Received Chemicals

Chemical containers must have a label that meets the following requirements, be legible and in English, when received from the manufacturer or they must be rejected and returned to the manufacturer:

- Product identifier
- Signal word
- Hazard statement(s)
- Pictogram(s)
- Precautionary statement(s)
- Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

### Workplace Labeling of Containers

If a container label becomes illegible during use or if a hazardous chemical is transferred from its original container to a second container, the container must have affixed to it an extra copy of the original container label, or a legible hand-written label that includes the required information, or a generic label (available from various vendors) either pre-printed or filled in with the required information.

Exemption: If the chemical is put into a second container that will be under the direct control of the individual who transferred it and all of it will be consumed during the same shift, then the second container does not need to be labeled.

At a minimum, a secondary chemical container label must identify:

- Chemical or product name
- Words, symbols, pictures, or a combination thereof, which provide at least general information regarding the chemical's physical and health hazards

The user may include other information on the label such as the date the chemical was received, the date a container was opened (if the chemical could degrade or react over time), the amount of chemical still remaining in the container, the initials of the person who prepared the chemical, or any other information useful for safe and efficient use.

### Labeling Substances Prepared In-House

Reagents, stock solutions, and bulk quantities of chemicals mixed for in-house use need to be labeled with the chemical name and its hazards unless the container will be emptied during the user's work shift.



## Department of Homeland Security “Chemicals of Interest”

If a specified “Chemical of Interest” per US Department of Homeland Security is procured (listed below), a “do not ship” label as shown on the right must be attached to the container to remind workers of special requirements. Laboratories can print their own labels or obtain labels from EH&S by calling 206.616.0585.

This chemical is federally regulated and **cannot** be shipped without prior EH&S notification. Contact EH&S at 206-685-0585 for details.

### “Chemicals of Interest” that must be labeled are:

Chemical	CAS	Chemical	CAS
Acetone cyanohydrin, stabilized	75-86-5	Magnesium phosphide	12057-74-8
Aluminum phosphide	20859-73-8	Methyldichlorosilane	75-54-7
Boron tribromide	10294-33-4	Phosphorus oxychloride	10025-87-3
Bromine pentafluoride	7789-30-2	Phosphorus pentasulfide	1314-80-3
Bromine trifluoride	7787-71-5	Phosphorus trichloride	7719-12-2
Calcium phosphide	1305-99-3	Potassium phosphide	20770-41-6
Chlorine dioxide	10049-04-4	Sodium phosphide	12058-85-4
Chloroacetyl chloride	79-04-9	Strontium phosphide	12504-16-4
Chlorosulfonic acid	7790-94-5	Sulfuryl chloride	7791-25-5
Lithium amide	7782-89-0	Titanium tetrachloride	7550-45-0
Lithium nitride	26134-62-3	Trichlorosilane	10025-78-2

If you possess any of the listed chemicals the substance cannot be shipped in any amount without prior EH&S notification by calling 206.616.0585.

## National Fire Protection Association (NFPA) Labels/Signs

Fire departments use the NFPA 704 labeling system to convey general information about the hazards of chemicals to emergency responders in the case of a fire or spill inside of a room. This system rates a chemical’s hazards, on a scale of 0-4 with 4 being the most hazardous (opposite of the GHS). This labeling system can be used in addition to the GHS label requirements, but is not a substitute for proper secondary labeling which should include the name of the substance, signal word, and hazards.

The Seattle Fire Department requires room signs on all new or renovated laboratories and other areas where hazardous chemicals are used or stored. See the following information for an explanation of the codes used on NFPA 704 signs.



Hazard:	Fire Hazard	Health Hazard	Reactivity
Color:	Red	Blue	Yellow
Location:	Top Quadrant	Left Quadrant	Right Quadrant
Rating	Description of Numeric Rating		
4	Flash Point <73°F, Boiling Point <100°F	Deadly	May Detonate
3	Flash Point <73°F and Boiling Point ≥100°F, or Flash Point 73°F - 100°F	Extreme danger	Shock and heat may detonate
2	Flash Point >100°F and ≤200°F	Hazardous	Violent chemical change
1	Flash Point ≥200°F	Slightly hazardous	Unstable if heated
0	Will not burn	Normal material	Stable

The bottom diamond segment is white, with any specific hazard codes printed in it. These specific hazards include:

Specific Hazards	
OX	oxidizers
ACID	acids
ALK	alkali materials
COR	corrosive materials
<del>W</del>	use no water

Contact EH&S at 206.543.0465 for more information and signs.

## DOCUMENTING SAFE PROCEDURES

Departments must assess and document procedures for the safe use of hazardous chemicals in the workplace. In general, document the required procedures for safe use of hazardous chemicals and required personal protective equipment using a Job Hazard Analysis (JHA) or a Standard Operating Procedure (SOP).

Departments must ensure an assessment is made for chemical hazards when performing new or unusual, non-routine tasks. Basic requirements for evaluating chemical hazards and selecting protective measures are the same no matter where the employee works. However, different regulations require somewhat different formats for documenting the assessment. Work situations that may need to be assessed fall into three main categories:

- Routine tasks
- New or infrequently performed tasks
- Re-assessment after an accident or incident

If chemical protective gloves, goggles, or clothing are necessary to provide protection, PPE use must be documented as a certification for PPE. Refer to the following PPE guides:

PPE Guides
<a href="#">Guidelines for Personal Protective Equipment (PPE)</a>
<a href="#">Laboratory PPE Hazard Assessment Guide</a>
<a href="#">Shop PPE Hazard Assessment Guide</a>

### Assessing Routine Tasks

Assess the tasks thoroughly by involving experienced and knowledgeable employees who perform the task most frequently. Actual steps include:

- Select the task to be performed
- Break the task down into steps
- Identify the hazards in each step. For chemical hazards, assess whether a less hazardous chemical or if a lesser amount of the chemical can be used to accomplish the task.
- Identify the controls (safeguards); safety equipment, procedures, training and PPE used. Determine additional safety measures required to reduce the risks from the different hazards to an acceptable level
- Describe spill cleanup procedures and waste disposal procedures
- Identify any authorizations needed prior to conducting the task
- Document as a JHA (see blank template and example JHA form in [Appendix B](#)) or an SOP if applicable

## Assessing New or Infrequently Performed Tasks

University employees may be required to perform hazardous new or non-routine tasks such as a confined space entry, a major repair or maintenance task, or scaling-up a new chemical process involving chemical hazards. Prior to starting work on such projects, supervisors or PIs in individual departments or organizational units will:

- Provide information and training about the proposed work
- Specify and define the unusual tasks and the steps to complete the work
- Assess the potential hazards and how the work was done previously
- Assess whether the hazards may result in risks and devise methods to minimize the risks to an acceptable level or use a less hazardous chemical
- Document the potential hazards and the required controls (safeguards) to reduce the risks from the different hazards in the JHA or SOP

## Re-assessing Tasks after an Accident or Incident

All accidents and incidents should be reported in the [Online Accident Reporting System \(OARS\)](#). It is important to analyze the cause of the accident versus just providing the chain of events. Try to identify and document changes in tasks, equipment, training, etc. that will reduce the chances of a similar accident or incident in the future. Update the JHA or SOP accordingly.

Contact EH&S at 206.543.7388 for additional advice on conducting an accident investigation.

## HAZCOM TRAINING

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### Who Must Receive HazCom Training

All employees in the HazCom Program must take the online HazCom training provided by EH&S. Even employees who must walk through areas that store or use chemicals need this training. Students, visitors, and volunteers participating in a formal worker program in applicable areas should receive HazCom training.

Staff working in research, educational, and clinical laboratories are required to take the EH&S lab specific training course **Managing Laboratory Chemicals**.

Office workers exempt from HazCom should review the [HazCom for Office Products Focus Sheet](#). If an office worker is required to work with large quantities of consumer products at a frequency or duration that is atypical for the average consumer, then HazCom training is necessary.

In the guides below, EH&S has identified a series of recommended or required safety courses for various types of UW personnel whether they work in a lab, shop, or other location.

Safety Training Guide	Personnel
<a href="#">General Safety Training Matrix</a>	General guide for all UW employees
<a href="#">Safety Training for Laboratory Personnel</a>	Laboratory personnel
<a href="#">Safety Training for Shop Personnel</a>	Shop personnel

For more information on EH&S classes and to register for a class go to the [EH&S website](#).

## What needs to be Covered in the Training

Employees must understand the hazards of chemicals they work with and know the controls to use to protect themselves from exposures. All employees need to understand how to interpret chemical labels and SDS information. This may include online and classroom courses, and specific work area training.

The following resources may help in area specific training:

- [Appendix A](#) contains a detailed list of hazard categories
- [Appendix C](#) contains details on the Globally Harmonized System of Classification and Labelling of Chemical Substances (GHS)

Chemical manufacturers and distributors are required to use the GHS system of standardized signal words, pictograms, hazard statements, and precautionary statements on their chemical labels and SDSs to provide safety information.

After the initial training is complete, more training is required when new chemicals or processes are brought into the work area. Periodic re-training in HazCom is not required, unless employees are not following procedures.

## Training Documentation

HazCom training records and all other training records must be maintained by the supervisor. These records should include who was trained, the date of training, and the subjects covered.



Training records should not be kept in personnel files, as they need to be easily and quickly retrievable for all active employees in case of a Washington State Labor and Industries (L&I) inspection. Training records should be kept as long as an individual employee is working in that job, and may be retained longer if the employee may return to that job.

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## PROVIDING SDS AND LABEL FOR A UW- SYNTHESIZED CHEMICAL

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If synthesizing a hazardous chemical and providing it to other labs outside the UW system, or if transporting a synthesized chemical over public streets, departments and supervisors must generate a GHS compliant SDS and label before shipping or transporting the chemical. There is no *de minimus* quantity or researcher exemption in this requirement. Although some scientific data may not be available, the person producing the chemical has the most relevant information about the chemical and its hazards, and that information needs to go to the recipient. Detailed information on the classification of chemicals can be found in the OSHA document [Hazard Communication, Classification Guidance for Manufacturers, Importers, and Employers](#). Employees can contact EH&S for assistance or guidance in producing SDSs and labels.

If the synthesized chemical will be put into commerce there are additional specific labeling requirements beyond the scope of this HazCom guidance manual. These requirements include:

- Pesticides (as defined in the Federal Insecticide, Fungicide and Rodenticide Act - 7 USC 136 et seq. and regulations issued by the EPA)
- Toxic chemicals and mixtures (as defined in the Toxic Substances Control Act - 136 USC 2601 et seq. and requirements issued by the EPA)
- Foods, food additives, color additives, drugs, cosmetics, or medical/veterinary devices or products including materials intended as ingredients (such as flavors or fragrances) (as defined in the Federal Food, Drug, and Cosmetic Act - 21 USC 301 et seq. or the Virus-Serum Toxin Act of 1913 - 21 USC 151 et seq. and regulations issued by the Food and Drug Administration or the Department of Agriculture)
- Distilled spirits (beverage alcohols, wine or malt beverage for nonindustrial use (as defined in the Federal Alcohol Administration Act - 27 USC 201 et seq. and regulations issued by the Bureau of Alcohol, Tobacco, and Firearms)
- Consumer products or hazardous substances (as defined in the Consumer Product Safety Act - 15 USC 2051 et seq. and the Federal Hazardous Substance Act - 15 USC 1261 et seq. and regulations issued by the Consumer Product Safety Commission)
- Agricultural or vegetable seeds treated with pesticides (as defined in the Federal Seed Act - 7 USC 1551 et seq. and requirements issued by the Department of Agriculture)

For advice completing this requirement, contact EH&S at 206.543.7262.

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## CONTRACTORS AND HAZCOM

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Contractors may be hired to do repairs and maintenance work on equipment or facilities, including construction, plumbing, electrical, painting, instrument calibrations, spill cleanup, and custodial services. Contractors include service vendors that may also be retained to maintain, calibrate, test and repair all types of equipment and instrumentation. UW employees are required to inform contractors about the hazardous materials used in their work place. In addition, contractors are required to inform UW employees of hazardous materials they plan to use.

### Inform Contractors of UW Hazardous Materials

If you hire an outside contractor or have a contractor come to a UW site, the site supervisor or project manager needs to inform the contractor of chemical hazard information in the work area. This includes providing:

- Information on the University's system for labeling of chemicals and piping systems that convey hazardous materials
- Information on the potential hazards to chemicals in the area or workplace
- How to access SDSs for chemicals that may be encountered

Whenever possible, stop UW activities that could expose contractors before they arrive.

If the contractor work may disturb building materials (floors, walls, windows), the supervisor or project manager must determine and inform the contractor of the presence of any regulated building materials (asbestos, lead, polychlorinated biphenyls, etc.). The supervisor should contact the Regulated Materials Management Office at [asbestos@uw.edu](mailto:asbestos@uw.edu) or 206.685.3357 to determine if the work will disturb any regulated building materials.

### Contractors Must Inform UW of Their Hazardous Chemicals

The contractor is required to inform UW of any hazardous chemicals they will bring onto University sites that may result in potential exposures to UW employees, students or the community. The contractor will be knowledgeable and compliant with HazCom regulations and will provide the following information:

- A list of chemicals they will bring on site
- How the chemicals will be labeled, used, stored, transported and what quantities used
- SDS for each chemical

The supervisor or UW project manager shall review the information, inform and train employees as needed, and consult with EH&S at 206.543.7262 if the chemical(s) present special hazards that could potentially result in significant risk.

There is no exemption from this HazCom requirement based on the value or duration of the project or service, or whether or not there is a contract.

See the [Contractors and HazCom Focus Sheet](#) for additional help communicating the HazCom requirements to contractors and vendors before any work is scheduled.

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# APPENDICES

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## Appendix A – HazCom Training Categories

### Categories of Chemical Hazards

1. Toxic Hazards
  - a. Toxic to the body as a whole
  - b. Toxic to specific organs or body systems
  - c. Irritants
  - d. Allergens / Sensitizers
  - e. Asphyxiants
  - f. Carcinogens
  - g. Reproductive / Developmental toxicants
  - h. Chemicals of unknown toxicity, such as nanoparticles
2. Corrosive Hazards
3. Flammable Hazards
  - a. Flammable liquids / Vapor hazards
  - b. Flammable gases
  - c. Flammable solids
  - d. Combustible dusts
  - e. Oxygen-enriched atmospheres
  - f. Combustible materials that may feed a fire once it starts
4. Reactive and Explosive Hazards
  - a. Incompatible chemicals
  - b. Compounds that generate toxic gases
  - c. Oxidizers
  - d. Chemicals that can polymerize
  - e. Pyrophorics
  - f. Water reactive chemicals
  - g. Explosives
    - Nitrated compounds
    - Peroxides
    - Other explosives
    - Dusts
  - h. Explosive boiling

### Categories of Physical Hazards

1. Extreme Pressures (Note: many authorities include explosive hazards here)

- a. Compressed gases
- b. High pressure reactions / Warming contained cryogenics / Heating contained liquids
- c. Diving operations / Over pressurizations
- d. Vacuum operations
2. Extreme Temperatures
  - a. Cold stress
  - b. Cryogenic operations / Handling frozen materials
  - c. Heat stress
  - d. Kiln, Oven or Autoclave operations / Handling hot materials
  - e. Heat produced by chemical reactions
3. Workplace Conditions
  - a. Cuts
  - b. Slips, trips, falls
  - c. Working at heights (on ladders, manlifts, tall structures, etc.
  - d. Lifting
  - e. Ergonomic / Repetitive stresses
  - f. Noise
  - g. Vibration
  - h. Electrical hazards
  - i. Equipment that moves / rotates / can fall from heights onto people / etc.
  - j. Confined spaces (entering wells / spaces through hatches, etc.
  - k. Working in cold room / environmental chamber with no outside air supply
  - l. Lockout/Tagout concerns when equipment must be maintained while energized
  - m. Workplace stress / Individual medical conditions / Violence issues
  - n. Facility conditions (Asbestos, Lead, Poor water quality, etc.

## **Radiological Hazards**

Refer to training requirements in the [Radiation Safety Program](#)

## **Biological Hazards**

Refer to training requirements in the [Biological Safety Program](#)


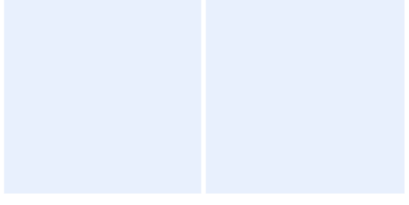

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## Appendix B – Job Hazard Analysis Form: Blank Template and Example

Note: The template shown below is a copy of the Word document [Job Hazard Analysis Template](#) that is a fillable form that can be completed electronically.

Enter information electronically in shaded areas, name Word document file, and save to device.  
Or print document to enter information manually.

## Job Hazard Analysis

<b>University of Washington:</b> <a href="#">Choose or type a location.</a>		<b>Department:</b> <a href="#">Click to enter text.</a>	
<b>Activity or Process:</b> <a href="#">Click to enter text.</a>		<b>Building/Room:</b> <a href="#">Click to enter text.</a>	
<b>Job Title:</b> <a href="#">Click to enter text.</a>		<b>Supervisor:</b> <a href="#">Click to enter text.</a>	
<b>Prepared By:</b> <a href="#">Click to enter text.</a>		<b>Date:</b> <a href="#">Click to enter a date.</a>	
<i>This document is the certification of hazard assessment for PPE for the workplace.</i>			
TASKS/STEPS	HAZARDS	CONTROLS (SAFEGUARDS)	PHOTO
1 <a href="#">Click to add first task/step.</a>	<ul style="list-style-type: none"> <li><a href="#">Click to add a hazard.</a></li> <li><a href="#">Click to add a hazard.</a></li> <li><a href="#">Click to add a hazard.</a></li> <li><a href="#">Click to add a hazard.</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> </ul>	
2 <a href="#">Click to add second task/step.</a>	<ul style="list-style-type: none"> <li><a href="#">Click to add a hazard.</a></li> <li><a href="#">Click to add a hazard.</a></li> <li><a href="#">Click to add a hazard.</a></li> <li><a href="#">Click to add a hazard.</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> </ul>	
3 <a href="#">Click to add third task/step.</a>	<ul style="list-style-type: none"> <li><a href="#">Click to add a hazard.</a></li> <li><a href="#">Click to add a hazard.</a></li> <li><a href="#">Click to add a hazard.</a></li> <li><a href="#">Click to add a hazard.</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> <li><a href="#">Click to add a control.</a></li> </ul>	








Enter information electronically in shaded areas, name Word document file, and save to device.  
Or print document to enter information manually.

<p>4 Click to add fourth task/step.</p>	<ul style="list-style-type: none"> <li>Click to add a hazard.</li> <li>Click to add a hazard.</li> <li>Click to add a hazard.</li> <li>Click to add a hazard.</li> </ul>	<ul style="list-style-type: none"> <li>Click to add a control.</li> <li>Click to add a control.</li> <li>Click to add a control.</li> <li>Click to add a control.</li> <li>Click to add a control.</li> <li>Click to add a control.</li> <li>Click to add a control.</li> </ul>		
<p>5 Click to add fifth task/step.</p>	<ul style="list-style-type: none"> <li>Click to add a hazard.</li> <li>Click to add a hazard.</li> <li>Click to add a hazard.</li> <li>Click to add a hazard.</li> </ul>	<ul style="list-style-type: none"> <li>Click to add a control.</li> <li>Click to add a control.</li> <li>Click to add a control.</li> <li>Click to add a control.</li> <li>Click to add a control.</li> <li>Click to add a control.</li> <li>Click to add a control.</li> </ul>		
<p><b>Required Training</b></p>		<p><b>Required PPE</b></p>		
<p>Click to add required training. Click to add required training. Click to add required training. Click to add required training.</p>		<p>Click to add eye and face protection. Click to add head protection. Click to add body (foot, leg, hand, or arm) protection. Click to add hearing protection. Click to add respiratory protection.</p>		
<p><i>I have read and understand the contents of the job hazard analysis and the controls required to mitigate the risks from the identified hazards</i></p>				
<p><b>Name</b></p>			<p><b>Date</b></p>	
<p>Click to enter text.</p>			<p>Click to enter a date.</p>	
<p>Click to enter text.</p>			<p>Click to enter a date.</p>	
<p>Click to enter text.</p>			<p>Click to enter a date.</p>	
<p>Click to enter text.</p>			<p>Click to enter a date.</p>	
<p>Click to enter text.</p>			<p>Click to enter a date.</p>	
<p>Click to enter text.</p>			<p>Click to enter a date.</p>	

## Example

### JOB HAZARD ANALYSIS

<b>University of Washington</b>		<b>Department:</b> Art	
<b>Activity or Process:</b> Painting/Sketching		<b>Building/Room:</b> Art/221	
<b>Job Title:</b> Student		<b>Supervisor:</b> Jane Doe	
<b>Prepared By:</b> John Smith		<b>Date:</b> 1/8/2018	
<b><i>This document is the certification of hazard assessment for PPE for the workplace.</i></b>			
<b>TASKS/STEPS</b>	<b>HAZARDS</b>	<b>CONTROLS (SAFEGUARDS)</b>	<b>PHOTO</b>
Painting	<ul style="list-style-type: none"> <li>• Paints and thinners may contain solvents e.g., alcohols, petroleum distillates, xylene, methyl ethyl ketone and are flammable, volatile and toxic. Exposure can occur through inhalation and skin.</li> <li>• Pigments in paints could contain toxic metals and other compounds (formaldehyde, phenol, caseins, and ammonia) which can cause respiratory irritation, sensitization and allergic reactions.</li> <li>• Epoxy paints contain resins, hardeners, and diglycidyl ether. Diglycidyl ether is highly toxic by inhalation, ingestion, and skin/eye contact. It may cause a number of health effects including dermal burns, severe eye, skin, and respiratory tract irritation, and skin sensitization.</li> <li>• Some paints and thinners may be flammable.</li> </ul>	<ul style="list-style-type: none"> <li>• Review the SDS for hazardous components</li> <li>• Use premixed and/or water based paints if possible.</li> <li>• Use formaldehyde and Lead-free products.</li> <li>• Wear protective clothing and prevent contact with skin</li> <li>• Practice good hygiene, remove paint with baby oil, soap and water.</li> <li>• Work in a well ventilated area.</li> </ul>	

<p><b>Paint Spaying / Air Brush</b></p>	<ul style="list-style-type: none"> <li>• Paints can be water-based or solvent based posing same hazards as above.</li> <li>• Spraying generates mist, fine particles and may be suspended in air for up to several hours. Spray-paint with solvent based paints and propellants in aerosol cans can contain propane or butane that are flammable and can result in flammable-air concentration that is ignitable.</li> </ul>	<ul style="list-style-type: none"> <li>• Use water-based airbrushing paints and inks rather than solvent-based</li> <li>• Never spray solvent-based materials in or near the building except in designated spray booths</li> <li>• Keep spray booth clear of combustible materials</li> <li>• Remove all ignition sources from spray booth area.</li> <li>• Ensure all spray gun equipment is grounded.</li> <li>• Wear protective clothing, gloves, safety goggles, and face shield</li> <li>• Wear respirator as needed</li> </ul>	
<p><b>Drawing</b></p>	<ul style="list-style-type: none"> <li>• Chalk, charcoal, pens, inks, markers, pencils can contain metals, solvents, and other hazardous materials are toxic via inhalation, ingestion or skin contact.</li> <li>• Fixatives may contain solvents and may cause upper respiratory irritation, CNS effects if inhaled.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't blow off excess pastel or charcoal dust.</li> <li>• Wet wipe or mop dusty surfaces.</li> <li>• Wear a dust mask or N95 respirator if necessary</li> <li>• Use fixatives in well ventilated location or spray booth</li> <li>• Practice good hygiene, remove paint with baby oil, soap and water.</li> </ul>	
<p><b>Required Training</b></p>		<p><b>Required PPE</b></p>	
<p>Hazard Communication Respiratory Protection Electrical Safety Fire Extinguisher</p>		<p><u>Gloves</u> Recommended: Powder Free Nitrile</p>  <p><u>Eye/Face Protection</u></p>  <hr/> <p>Safety glasses Goggles Face shields</p>	

Respiratory Protection



N95 Particulate  
Half-face tight fitting with particulate  
and/or solvent vapor cartridges

***I have read and understand the contents of the job hazard analysis and the controls required to mitigate the risks from the identified hazards***

Name	Date

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## Appendix C – GHS Training Information

The Globally Harmonized System of Classification and Labelling of Chemical Substances (GHS) system uses standardized signal words, pictograms, hazard statements, and precautionary statements on their labels and SDSs to provide safety information.

The major hazard classes and categories and their related signal words and pictograms are:

Hazard Class	Category Identifier(s)	Signal Word	Pictogram(s)
Acute Toxicity	1, 2, 3	Danger	Skull/Crossbones
	4	Warning	Exclamation Mark
Skin Corrosion	1A, 1B, 1C	Danger	Corrosion
Skin Irritation	2	Warning	Exclamation Mark
Eye Damage	1	Danger	Corrosion
Eye Irritation	2A	Warning	Exclamation Mark
	2B	Warning	None
Respiratory Sensitization	1A, 1B	Danger	Health Hazard
Skin Sensitization	1A, 1B	Warning	Exclamation Mark
Germ Cell Mutagen	1A, 1B	Danger	Health Hazard
	2	Warning	
Carcinogen	1A, 1B	Danger	Health Hazard
	2	Warning	
Reproductive Toxicity	1A, 1B	Danger	Health Hazard
	2	Warning	
Specific Target Organ Toxicity, Single Exposure	1	Danger	Health Hazard
	2	Warning	Health Hazard
	3	Warning	Exclamation Mark
Specific Target Organ Toxicity, Repeated or Prolonged Exposures	1	Danger	Health Hazard
	2	Warning	
Aspiration Hazard	1	Danger	Health Hazard
Explosives	Unstable, 1.1, 1.2, 1.3	Danger	Exploding Bomb
	1.4	Warning	Exploding Bomb
	1.5	Danger	None
	1.6	None	None
Flammable Gases	1	Danger	Flame
	2	Warning	None
Flammable Aerosols	1	Danger	Flame
	2	Warning	
Oxidizing Gases	1	Danger	Flame over Circle
Gases under Pressure	"Compressed", "Liquified", "Refrigerated liquefied", "Dissolved"	Warning	Gas Cylinder

Flammable Liquid	1, 2	Danger	Flame
	3	Warning	Flame
	4	Warning	None
Flammable Solid	1	Danger	Flame
	2	Warning	
Self-Reactive Chemical	A	Danger	Exploding Bomb
	B	Danger	Exploding Bomb, Flame
	C, D	Danger	Flame
	E, F	Warning	Flame
Pyrophoric Liquid	1	Danger	Flame
Pyrophoric Solid	1	Danger	Flame
Self-Heating Chemical	1	Danger	Flame
	2	Warning	
Chemicals which Emit Flammable Gases when in Contact with Water	1, 2	Danger	Flame
	3	Warning	
Oxidizing Liquid	1, 2	Danger	Flame over Circle
	3	Warning	
Oxidizing Solid	1, 2	Danger	Flame over Circle
	3	Warning	
Organic Peroxide	A	Danger	Exploding Bomb
	B	Danger	Exploding Bomb, Flame
	C, D	Danger	Flame
	E, F	Warning	Flame
Corrosive to Metal	1	Warning	Corrosion
Unclassified <sup>1</sup>	N/A	None	None

<sup>1</sup> "Unclassified" means hazards that have not had a methodology developed yet for classifying severity, e.g., combustible dusts and asphyxiant gases.

GHS pictograms are:



**Corrosion**



**Exploding Bomb**



**Flame**



**Flame over Circle**



**Gas Cylinder**



**Health Hazard**



**Skull/Crossbones**



**Exclamation Mark**

If these labels and Safety Data Sheets are provided on chemicals in your work area, everyone using the chemical must receive training as to the pictogram meanings. For example, all workers should realize that a product labeled with a "Flame" (flammable) pictogram should not be stored in the same cabinet as a product labeled with a "Flame over Circle" (oxidizer) pictogram.

Personnel should also be trained to understand the hazard statements and to obey the precautionary statements. For example, the hazard statement for an acutely toxic gas in category “1” is: “Fatal if inhaled.” An example of one of the many precautionary statements for an acutely toxic gas is “If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.”

## Appendix D – Chemical Safety Training Log

Chemical Safety Training Log			
PI/Supervisor:			
Department:			
Documentation should include formal and informal safety discussions, including any internal meetings when the agenda includes any safety discussions. Log discussions on Personal Protective Equipment, ventilation systems, glove box requirements, specific chemical hazards, SDS access, chemical storage plans, etc.			
Date	Trainer	Trainees	Description of Safety Training
<i>Example: 1/21/17</i>	<i>Roberta Rosen</i>	<i>Tim Hansen, John Peil</i>	<i>Following the HF SOP (1/5/16), use of PPE and First aid</i>
<i>Example: 2/12/17</i>	<i>Dr. Jones</i>	<i>Jerry Marshall, Roberta Rosen, April Shen</i>	<i>Emergency Response – Simulated HF Splash in Eye, Use of Eyewash</i>

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