# Chemical Hygiene Plan Appendix R: Chemical Life Cycle

**What is a Hazardous Material (Chemical) that needs to be entered into the inventory?**

A hazardous material is any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant or potential hazard to human health and safety or to the environment if released.

* **The short answer is any that are hazardous**
  + The determination that a chemical product is hazardous is the responsibility of the manufacturer.
* **How do you know if it is hazardous?**
  + Check the container and the package it was shipped in:
    - Are there any hazard labels or pictograms?
    - Is there a warning statement?
  + Did it come with a Safety Data Sheet (SDS)?
    - Because some manufacturers are overly conservative, are any hazards listed in section 2 of the SDS?
  + Is it similar to other products that are in the inventory?
    - Look it up in the University’s MSDSOnline subscription.
    - Ask EH&S for help.
* **Some things are exempted from the Inventory so check against that list.**

Materials to report in the chemical inventory include, but not limited to:

|  |  |
| --- | --- |
| ***Laboratory Chemicals*** | acids, bases, solvents, mercury, metallic salts, |
| halogenated compounds, toxic substances, |
| controlled substances, pharmaceuticals |
|  |  |
| ***Compressed Gases*** | toxic/poisonous, corrosive, flammable and |
| combustible, and explosive |
|  |  |
| ***Liquids Under Pressure*** | liquid nitrogen, liquid oxygen, propane, |
| aerosols, chlorofluorocarbon refrigerants |
| (liquid/gas phases) |
|  |  |
| ***Glues, Paints and Inks*** | all adhesives except white glue, paints, spray paints, printing inks or pastes |
|
| ***Solvents and Spirits*** | degreasers, kerosene, paint thinners |
|  |  |
| ***Art Supplies*** | fixatives, gauche, tempera, solder, glazes, |
| frits, clay making materials |
|  |  |
| ***Finishes*** | varnishes, shellacs, floor waxes, lacquers |
|  |  |
| ***Photographic Materials*** | developers, reducers, stabilizers, activators, |
|  | fixers, stop bath |
|  |  |
| ***Lubricants*** | pump oil, hydraulic oil, motor oil, brake fluid, |
|  | greases |
|  |  |
| ***Fuels*** | gasoline, camping fuels, diesel fuel |
|  |  |
| ***Grounds/Landscape Materials*** | fertilizer, plant food, soda ash |
|  |  |
| ***Pesticides*** | insecticides, rodenticides, fungicides, |
| defoliants, herbicides |

**Examples of items that are not required to be in the inventory:**

* Reagent working solutions
* Test kits
* Growth media
* Dilutions made by staff
* Lab specimens
* Culture media, agar and broth
* Enzyme preparations
* Secondary containers
* Materials of biological origin except for toxins
* Printer ink cartridges and toners
* Research samples
* Food products such as table salt, sugar, food coloring etc. (ALL FOOD PRODUCTS MUST BE LABELED NOT FOR HUMAN CONSUMPTION)
* Articles such as wood, sheets of metal etc.
* Consumer products such as cleaners, cosmetics etc.
* Non University purchased products

**Ordering Hazardous Materials (Chemicals):**

There are specific guidelines that must be followed when ordering hazardous materials and chemicals. It is essential to determine how materials will be stored and used in order to avoid ordering materials that we do not have the capability of maintaining or disposing. In addition there are some chemicals that require specialized training.

Before ordering any materials (biological/radioactive/chemical):

* Search for least hazardous potions or consider substituting a hazardous chemical for something less hazardous or non-hazardous. In other words, always look for the safest alternative.
* Consider checking with other departments that use similar chemicals before placing an order to see if they have excess of the same chemical that you may be able to use.
* Only order the quantity of the substances that you are going to use. Do not order in excess or bulk if it is not needed.
* When ordering biological materials, prior approval of the order may be needed by the Biological Safety Officer and/or the Institutional Biosafety Committee.
* Radioactive materials require prior approval from the Radiation Safety Officer.
* Highly toxic Materials or those requiring special treatment (storage, containment, and disposal). Prior to order any of the following Class A carcinogens chemicals contact Environmental Health and Safety.
  + Arsenic and arsenic compounds
  + Asbestos
  + Benzene
  + Chloromethyl methyl ether
  + Chromium and chromium compounds
  + Diethylstibesterol
  + 2-Napthylamine
  + Vinyl chloride
* The following chemicals have specific OSHA regulations which include required personal protective equipment, monitoring and training. Environmental Health and Safety must be notified of their use.
  + 2-Acetylaminoflourene
  + Acrylonitrile
  + alpha-Naphthylamine
  + 4-Aminodiphenyl
  + Asbestos
  + Benzene
  + Benzidine
  + Benzine
  + beta-Naphthylamine
  + bis-Chloromethyl ether
  + 1,3-Butadiene
  + Cadmium
  + 1,2 Dibromo-3-chloropropane (DBCP)
  + 3,3’-Dichlorobenzidine (and its salts)
  + 4-Dimethylaminoazobezene
  + Thyleneime
  + Ethylene Oxide
  + Formaldehyde
  + Inorganic Arsenic
  + Lead
  + Dichloromethane
  + Methyl chloromethyl ether

**Chemical receiving:**

The following are guidelines that individual departments can use for creating their chemical receiving procedures.

Receiving packages:

When receiving packages inspect the packages to ensure there are no leaks or spills, and refuse damaged packages when necessary. Notify EHS if any chemicals have leaked or spilled through their packaging.

Packages containing chemicals should be opened in a laboratory, shop or studio. They should not be opened in offices or mailrooms.

Enter the chemical into the chemical inventory database and then deliver the container to the appropriate storage location.

Finally notify the end user that their chemical is ready to use.

**How do I keep an up to date Chemical Inventory?**

Adding Chemicals to the Inventory

It is the responsibility of the Chemical Inventory Manager to enter each chemical that is coming into the laboratory, shop, or studio into the electronic inventory.

When adding a chemical to the electronic database most if not all of the information needed will be on the product label or the Safety Data Sheet (SDS) associated with the product.

Input the following:

Chemical Information

* Product Name (on the container)
* Manufacturer – if the manufacture is not in the database it will need to be added
  + Name
  + Website
  + Phone number
* Product Number that is on the container
* Chemical Abstract System Number (CAS)
* Shelf life if there is one
* Storage State
* Density

Container Information

* Longwood Barcode Information
* Owner – the owner should be either the department, laboratory shop or studio. The only reason for a chemical to be “owned” by an individual is if it is purchased with grant money. When a chemical is “owned” by an individual and he or she separates from the University the chemical owner will revert to the department, laboratory shop or studio
* Location- if there is an optional sub-location enter that
* Container quantity (how much it holds) and units
* Container Type
* Date Acquired (date received)
* Expiration Date (if any)

Note: Non University purchased chemicals owned by faculty, staff and students do not go into the inventory, but they need to be stored in a safe manner. Student owned chemicals should be labeled with their name and contact information. When the chemicals are no longer needed the student should take them home with them. Students must always follow the Student Handbook for the rules governing what they are allowed to have in their living spaces. It is the responsibility of the professor to ensure that all SDS sheets from student chemicals are forwarded to EHS.

Container Management

Chemicals should always be stored in a safe manner. Refer to Chemical Hygiene Plan Appendix D “Chemical Storage and Incompatible Chemicals” for more information.

For the purposes of the Chemical Inventory Database individual chemical containers will be managed as either full or empty.

Peroxide Forming Compounds

Detailed information can be found in the Chemical Hygiene Plan Appendix F “Potential Peroxide Forming Chemicals”.

* Enter the Date Opened in the Container Information section
* If the container has been tested for peroxides enter that date in Last Evaluation section.

Bulk Containers

There are some occasions where bulk containers are needed. A very good example is the bins used in the Ceramics Studio for storing raw materials. Raw materials are placed in bins and the bins are periodically refilled. For the purposes of the Chemical Inventory Database the bins themselves will be considered a primary chemical container.

Here is an example on how to handle keeping track of this:

There is a bin of Calcium Carbonate-Domestic Whiting that will hold 100 pounds of product. This bin is a permanent chemical container in the Chemical Inventory Database will a barcode and will be considered always “full”. There are five 50 pound bags of Calcium Carbonate-Domestic Whiting each has their own barcode in the Chemical Inventory Database. Let’s call the barcodes of the 50 pound bags A, B, C, D, and F. When the bin needs to be refilled and bag A is poured into it then bag A would be marked empty in the Chemical Inventory Database

Empty Containers

Each Department will have to figure out what the best system is for them to keep track of empty containers so that they can be marked “Empty” in the database.

One strategy that may work is having an area dedicated in each laboratory, shop and studio for placing empty containers.

To mark containers “Empty” in the Chemical Inventory Data Base do the following:

* In the Container Information section make a note in the Container Notes block
  + For Sciences – “This container was used in an academic laboratory”
  + For Arts – “This container was used in a project”

Once the containers are marked empty they can usually be placed in the regular trash can. Of course there are always exceptions to this. Some examples are:

* Pesticide containers must be triple rinsed and the rinsate collected
* Acid and Base containers should be rinsed be for putting into the trash
* Aerosol cans must be punctured