

BioRAFT ChemTracker Module User's Guide

Prepared by BioRAFT Professional Services and University of Pennsylvania EHRs

Log-in to ChemTracker with your Pennkey at
<https://penn.bioraft.com>

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BioRAFT ChemTracker Module Introduction

The BioRAFT ChemTracker module provides a method for tracking chemical inventory with connection to a central database.

All inventory records entered prior to Summer 2019 were migrated into ChemTracker from the CISProLive Chemical Inventory Program.

Contact the Chemical Inventory Team

EHRM Chemical Inventory Team
cheminv@ehrs.upenn.edu

EHRM Customer Service Links:

General Information about Penn's Chemical Inventory Program:

<https://ehrs.upenn.edu/health-safety/lab-safety/chemical-inventory-program>

Barcode Sticker Requests (Free):

<https://ehrs.upenn.edu/health-safety/health-safety-forms/warning-sign-and-label-request-form>

Problem Container Form (For chemicals not found in database):

<https://ehrs.upenn.edu/policies-resources/chemical-inventory-problem-container-request-form>

Request Changes to BioRAFT Lab Locations (Spaces)

<https://ehrs.upenn.edu/request-changes-bioraft-lab-locations-spaces>

Chemical Inventory Tip Sheets:

See Resources for ChemTracker Users

<https://ehrs.upenn.edu/health-safety/lab-safety/chemical-inventory-program/resources-chemtracker-users>

Request Search of Chemical Inventories on Campus (Borrow/surplus chemicals):

<https://ehrs.upenn.edu/health-safety/health-safety-forms/chemical-surplus-or-borrow-request>

What Must Be Tracked in the Inventory?

Hazardous Chemicals

You must track inventory of any research chemicals that are **physical, environmental, or health hazards**. This includes all solvents and other flammables, reactive substances, corrosives, irritants, toxics, etc.

Examples of the new GHS hazard pictograms and the older CHIP hazard pictograms are shown below.

If a manufacturer has labeled a chemical container with one or more of these symbols, the chemical must be tracked in your inventory.



Older chemical containers may not be labeled according to current standards. Some containers that do not have these hazard pictures are still hazardous and must be tracked in your inventory. If you're not sure, contact cheminv@ehrs.upenn.edu to ask!



For information about what these pictograms mean, see the chemical's SDS, or https://www.osha.gov/Publications/HazComm_QuickCard_Pictogram.html

Tracking Hazardous Gases

ALL HAZARDOUS GASES must be tracked in your inventory.

See Appendix A for information about cylinder sizes.

Hazardous Gases Include any gas that is:

- Flammable
- Corrosive
- Toxic
- Oxidizing



Common examples of hazardous gases include:

Ammonia	Fluorine
Boron trichloride	Hydrogen (> 5%)
Carbon monoxide	Hydrogen fluoride
Chlorine	Methane
Dichlorosilane	Nitric oxide

Oxygen (>20 %)
Propane
Silane
Sulfur dioxide

Inert (non-hazardous) gases do not need to be tracked.

Examples of inert gases include:



Argon
Carbon dioxide
Nitrogen
Helium

Exempt Chemicals

Below are some examples of containers that **do not** need to be tracked in the inventory system:

- Chemicals in small quantity that are sold as part of a **kit**
- **Stock solutions** and other mixtures of chemicals that were prepared in your lab and/or transferred into a new container (such as **wash bottles** of solvents)
- **Household products** such as Clorox, Windex, baking soda, paints, etc.
- Products with **no chemical hazards**, such as:

Growth media	Amino acids	Glass beads, sand, etc.
Agar/Agarose	Sodium chloride	Glucose, sucrose, starch, etc.



These are just a few examples. If you're not sure whether a material is hazardous, check if the container has a hazard warning on the label. If you are still unsure, inquire at cheminv@ehrs.upenn.edu.

Remember: You are welcome to track non-hazardous materials in your inventory. Contact EHRS or use the [Problem Container Form](#) on the EHRS website if you cannot find the product in ChemTracker.

Viewing Your Chemical Inventory

All containers

From the BioRAFT homepage, expand the left side menu to view information relevant to your lab.

Click the “**ChemTracker**” tab to view your lab’s chemical inventory.

This page displays every chemical container in your lab’s inventory.

You can search for a specific record by clicking in **Container ID** and scanning or typing a barcode number.

The screenshot displays the ChemTracker interface for viewing chemical containers. The top navigation bar includes tabs for View, Edit, ChemTracker (highlighted), Dashboard, and Members. Below the navigation bar, there is a search bar and a sidebar menu with options like Research Management, Inspections, Passante Lab, Biologicals, ChemTracker, Add Inventory, Bulk Edit, Chemical Containers, Group Inventories, Totals, Reports, Research Tools, and My Account. The main content area is titled "Passante Lab Chemical Containers" and shows "Showing 1-25 of 32 results". A filter form is present with various input fields and dropdown menus. Below the filter form is a text input field for "Container IDs" and a "Submit" button. At the bottom, a table lists chemical containers with columns for Chemical Name, CAS #, State, Amount, Units, Location, Container ID, Edit, Remove, Bench, and Shelf. The table shows two entries: Acetone 99% and Acetonitrile.

Chemical Name	CAS #	State	Amount	Units	Location	Container ID	Edit	Remove	Bench	Shelf
Acetone 99%	67-64-1	Liquid	4	l	Annenberg Center - 001	23456789	Edit	Remove	FLSC1	
Acetonitrile	75-05-8	Liquid	100	ml	Annenberg Center - 001	C-20000077	Edit	Remove		

Notice that you can scroll back and forth to view more headings for your list of containers.

You can view a subset of your containers by using the filters at the top of the ChemTracker page, and you can sort the results by clicking on any heading title that is underlined.



<u>Chemical Name</u> ▲	<u>CAS #</u>	<u>State</u>	<u>Amount</u>	<u>Units</u>	<u>Location</u>	<u>Container ID</u>	Edit	Remove	<u>Bench</u>	<u>Shelf</u>
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<u>Location</u>	<u>Container ID</u>	Edit	Remove	<u>Bench</u>	<u>Shelf</u>	<u>Specific Location Note</u>	<u>Date Last Changed</u>	<u>Submission Date</u>	<u>Date Received</u>	<u>Expiration Date</u>
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<u>Location</u>	<u>Date Last Changed</u>	<u>Submission Date</u>	<u>Date Received</u>	<u>Expiration Date</u>	<u>Manufacturer</u>	<u>Product Name</u>	<u>Product Number</u>	<u>Container Status</u>	<u>Notes</u>
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Searching for Chemicals Outside of Your Lab

You will be able to see all chemical containers within **your lab's** inventory. You will not be able to search for chemicals in other labs' inventories.

The EHRS Chemical Inventory Team can help you locate chemicals in our EHRS Surplus Inventory or in other labs across campus.

Use the webform on the EHRS website to submit your search request. Remember that all chemical sharing is voluntary and requires the permission of the lab that owns the chemical as well as the approval of the PI for the lab that wishes to borrow or adopt the chemical.

Search "[Chemical Surplus or Borrow Request](#)" on the EHRS website or use the URL below to locate this webform:

<https://ehrs.upenn.edu/health-safety/health-safety-forms/chemical-surplus-or-borrow-request>

Totals

Click on the **“Totals” link** to view the aggregate amount of each chemical in your lab’s inventory.

Notice that the total number of containers of each chemical is shown on the right side.

Tip: The **“Display Units” dropdown** allows you to change the units for the table (i.e., display in grams).

The screenshot shows the 'Passante Lab Chemical Totals' page. The 'Totals' link in the header is circled in red. The 'Display units' dropdown in the filters section is circled in blue. The table below lists various chemicals with their CAS numbers, states, amounts, units, and total containers.

Chemical Name	CAS #	State	Amount	Units	Total Containers
Acetone	67-64-1	Liquid	4.00	L	1
Acetonitrile	75-05-8	Liquid	4.10	L	2
Chloroform	67-66-3	Liquid	12.00	L	3
Ethyl alcohol	64-17-5	Liquid	1.89	L	4
Ethyl ether	60-29-7	Liquid	20.00	L	2
Formaldehyde buffered aqueous solution, 3-20 wt. % in H2O		Liquid	0.19	L	1
Formaldehyde, 37% solution with 10-15% methanol		Liquid	4.00	L	1
Formic acid	64-18-6	Liquid	2.00	L	4
Hexaethylene glycol monodecyl ether	5168-89-8	Liquid	0.95	L	1
Hydrazine, anhydrous	302-01-2	Liquid	39.60	L	4
Hydrofluoric acid aqueous solution, 71-75%	7664-39-3	Liquid	16.00	L	4
Microposit 1400 series photoresist		Liquid	0.47	L	1
Mixture of Nitric acid (90%) and Hydrofluoric acid (10%)		Liquid	4.00	L	1
Water	7732-18-5	Liquid	113.27	L	1

Add New Inventory

Chemical Look-Up

To add new inventory, click **“Add Inventory”** from the ChemTracker page.

Select your **search criteria** (Chemical Name, CAS Number, or Product Name or Number)

<p>CAS Number <u>Best for</u> Pure substances (not mixtures, solutions, or specialty products)</p> <p><u>Tip</u> Requires hyphens</p>	<p>Product Number <u>Best for</u> Mixtures, solutions, or specialty products</p> <p><u>Tip</u> May or may not require punctuation (e.g. hyphens and commas), try both ways if needed</p>	<p>Chemical Name <u>Best for</u> When CAS or Product number is not available or is not found</p> <p><u>Tip</u> As you continue to type, the list of options in the dropdown menu will change; keep an eye out for your chemical in the list as you type</p>
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Start typing the chemical name, CAS number or Product Number of the chemical you are adding. A list of options will appear based on your search. If there are no results, see the section of this manual regarding *chemicals not found in database*.

The screenshot shows the 'Add Chemicals to Passante Lab' form. At the top, there are navigation tabs: View, Edit, ChemTracker, Dashboard, and Members. Below these is a breadcrumb trail: ChemTracker > Add Inventory > Totals > Bulk Edit > Find Other Chemicals. The 'Add Inventory' link is circled in red. The main form area is titled 'Add Chemicals to Passante Lab' and has a sub-header 'Look Up Chemical Name or CAS Number'. It contains several input fields: 'Chemical: *' with a dropdown arrow, 'Location (space):' with a dropdown arrow and a 'Reset' button, 'Amount:', 'Units:', 'Container Count:', 'Container Status: *', and 'Unique Container ID:'. There are also checkboxes for 'Controlled Substance?' and 'Additional Details'.

Select the chemical from the dropdown list.

Then select the room number (from the **“Location (space)” dropdown**) to specify where this container will be stored.

If the space you are looking for is not listed, please use the Request Changes to BioRAFT Lab Locations Webform to have it added:

<https://ehrs.upenn.edu/request-changes-bioraft-lab-locations-spaces>

Note: Specific-location information (bench, cabinet, FLSC, refrigerator, etc) is added later. See [Adding Additional Details](#) for more information.

Chemicals Not Found in Database

If the database does not have the chemical you are searching for, the dropdown will show “None of the above.”

Add Chemicals to Passante Lab

Look Up Chemical Name or CAS Number

Chemical: *

None of the above
--None of the above--

Chemical Name CAS Number Product Name or Number

Start typing the chemical name to find the chemical in the database.

Select “—none of the above—” only after you have searched by name, CAS Number, and Product number, and you still do not see the correct chemical on the list.

When you choose “—none of the above—”, ChemTracker **may suggest unlinked chemical records that match your search**. If one of these looks correct, select it and continue adding your container to your inventory.

Add Chemicals to Passante Lab

Look Up Chemical Name or CAS Number

Chemical: *

ChemTracker

Chemical Name CAS Number Product Name or Number

Start typing the chemical name to find the chemical in the database.

The following are results manually entered by users and not verified in the database. Adding a chemical not matched to the database has consequences for accuracy of regulatory reports.

ChemTracker Example Unlinked Chemical (Solid)
 --None of the above--

Cancel Continue

Submit Add Another

If you still do not see a match, the EHRS Chemical Inventory Team will create a chemical record for you. Submit your request through the [Problem Container Form](#) on the EHRS website.

Specifying Amount

Amount:
5

Units:
✓ -- Select --
g
kg
ml
L
CC
CUB FT
CYLINDER, LARGE
CYLINDER, MEDIUM
CYLINDER, SMALL
Fl Oz
gals
lbs
mg
ng
Oz
PT
QT
Ton
μg
μl
UNIT

Quantity Added	CAS
XIN	93384

Ethanol, denatured (70+%)

The size of the container must be specified.

Enter the amount, then select the units from the dropdown.

When adding a gas to your inventory, you must add the amount as a specific volume.

Do NOT use the unit designations *cylinder large*, *cylinder medium*, *cylinder small*.

Consult [Appendix A](#) in this manual for common gas cylinder volumes. If you do not see your cylinder in Appendix A, contact the [Chemical Inventory Team](#) to ask what amount and unit to use.



Container Status

Attention! As of August 2019, the ability to view other labs' inventory records has been disabled. No containers will be visible to other labs regardless of the container status.

Normal

This is the default container status. This designation means that other lab groups will be able to view that your lab has this chemical and the container location; **you are NOT required to share the chemical with another lab.**

Hidden

By designating a container "Hidden," the container will not appear in other lab's inventory searches.

Surplus

Designating a container "Surplus" denotes that it is available for anyone to use.

Unique Container ID (Barcode Number)

All containers of hazardous materials are required to be labeled with EHRS-provided barcode labels.

To request additional quantities of barcode labels, use the form on the EHRS website:

[Warning Sign and Label Request Form.](#)

(Inventory Barcode requests are at the bottom of the form)

Click in the “**Unique Container ID**” field and type or scan a **barcode** from the provided labels.

If this field is left blank, the system auto-generates a unique ID number, which will not correspond to the barcode label on the container and will make it difficult to identify the container in the future. If you notice this has occurred, you can edit the barcode number after the container is created.

Container Count: 

1 

Container Status: * 

Normal 

Unique Container ID:

Hint: If you have more than 1 identical container, select the appropriate “**Container Count**”. You will only need to scan 1 EHRS-provided barcode. The system will automatically generate the correct number of sequential “**Container IDs**.”

Look out for this!

Some barcode scanners are programmed to immediately “enter” after they scan. If yours does this, your container will be automatically submitted to the inventory when you scan the barcode. You’ll know this happens if the screen jumps to the “Chemical Inventory Recently Added” table at the bottom of the page.

If you still want to add additional details such as location specifics, expiration dates, or notes, just click the “**edit**” link and continue editing the container record.

If you do not need to enter additional details, your container entry is complete.



Chemical Inventory Recently Added

Chemical Name	CAS #	State	Amount	Location	Container ID	Edit	Remove
Acetone 99%	67-64-1	Liquid	4 l	Annenberg Center - 001	23456789	Edit	Remove

Adding Additional Details

Assigning location within room

More detailed location information (refrigerators, benches, shelves, etc.) can be added in the “Additional Details” section.

The “Bench” location field is only *required* for Flammable Liquids Storage Cabinets (FLSCs) and for Acid Cabinets (ACs) in the high-rise biomedical buildings:

Stellar-Chance
John Morgan

Anat-Chem
CRB

Johnson
Smilow

BRB

In all other locations, this field is optional.

If you *want* to specify sub-locations take note:

All additional location information should be added to the “Bench” section.

Adding location information to the other fields will lead to difficulties in searching for inventory by location.

Look out for this!

The “Bench” field is free-form text; therefore, if the name of a location is entered differently for the same location, it will create a new sub-location name.

There is no alert to tell you whether you are entering a new sub-location name, and no option to select from existing sub-locations within the room.

Inconsistencies in sub-location names can lead to difficulties in locating containers and in EHRS reporting.

To help avoid errors, common sub-location names have been standardized by EHRS. Use these abbreviations for chemical storage cabinets

Additional Details

Bench:
FLSC

Shelf:

Specific Location Note:

Manufacturer:

Product Name:

Product Number:

Date Received:
2019-05-28
Format: 2019-05-28

Expiration Date:
Format: 2019-05-28

Purchase Order:

Notes:

Controlled Substance?

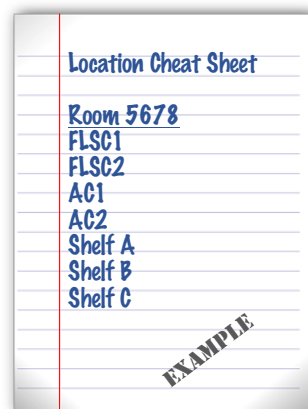
Flammable Cabinet → FLSC

Acid Cabinet → AC

Base Cabinet → BC

Tip: If your lab has multiple chemical storage cabinets of the same type or any sub-location names that are more specific or complex, you should create a “cheat sheet” for lab members to reference when entering container information.

Don't forget to label your cabinets and shelves with the names, too!



Disposing of Chemical Inventory

Disposing of a Single Container

Select “ChemTracker” and enter the Container ID to find the chemical of interest and click Submit.

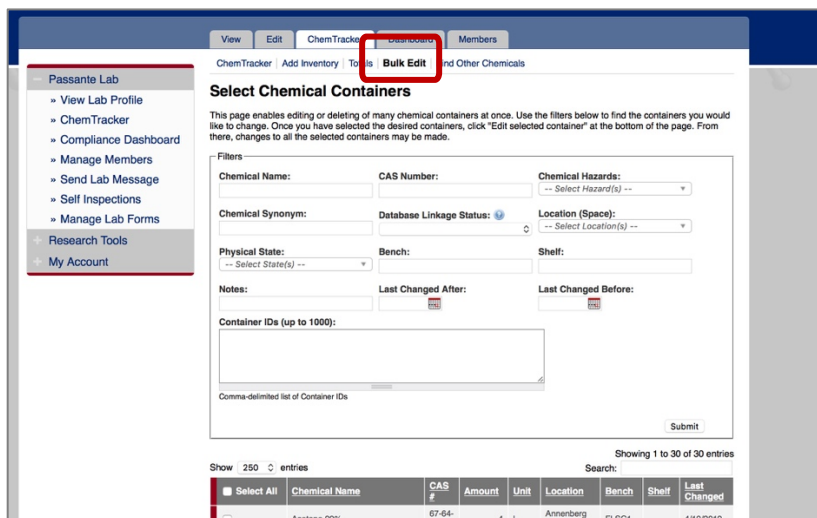
Then click “Remove”, and click “yes” to confirm.

The screenshot shows the ChemTracker web application interface. At the top, there are navigation tabs: View, Edit, ChemTracker, Dashboard, and Members. The 'ChemTracker' tab is circled in red. Below the tabs, the page title is 'Passante Lab Chemical Containers' and it shows 'Showing 1-17 of 17 results'. There is a 'Filters' section with various input fields for Chemical Name, CAS Number, Chemical Hazards, Chemical Synonym, Database Linkage Status, Physical State, Location (Space), Bench, Shelf, and Specific Location Note. Below the filters is a 'Container IDs' input field, which is circled in red. Below the input field is a 'Submit' button. At the bottom, there is a table with columns: Chemical Name, CAS #, State, Amount, Units, Location, Container ID, Edit, Remove, Bench, and Shelf. The 'Remove' button in the table is circled in orange.

Chemical Name	CAS #	State	Amount	Units	Location	Container ID	Edit	Remove	Bench	Shelf
Acetone 99%	67-64-1	Liquid	4	l	Annenberg Center - 001	23456789	Edit	Remove	FLSC1	
Acetonitrile	75-05-8	Liquid	100	ml	Annenberg Center - 002	C-20000077	Edit	Remove		
Acetonitrile	75-05-8	Liquid	4	l	Annenberg Center - 001	C-20000003	Edit	Remove		

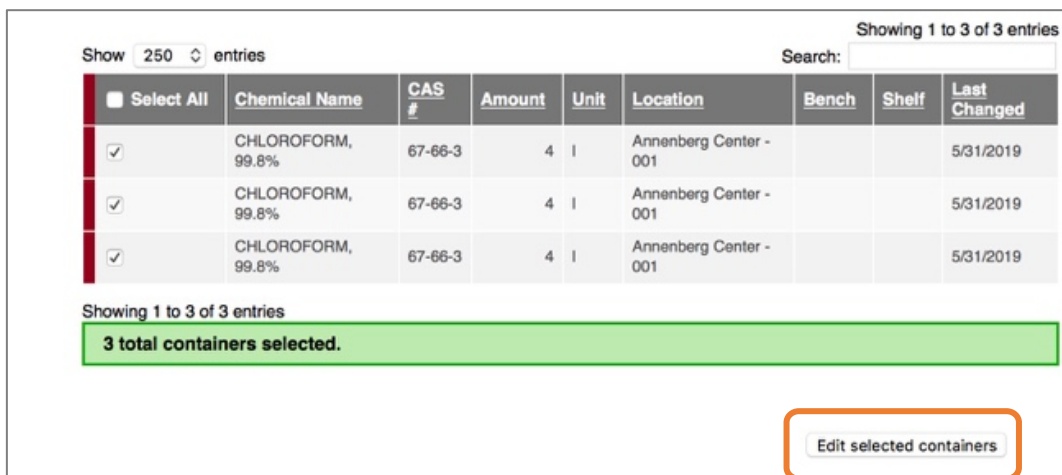
Disposing of Multiple Containers (and Bulk Edit)

The bulk edit function is valuable for editing or deleting many records all together. Click **“Bulk Edit”** from your lab’s ChemTracker menu.



You can scan multiple barcodes into the container ID box (one per line) or use the filters to search for the containers you want to remove or edit.

Select the containers of interest or choose “select all”, then click **“Edit selected containers”** in the bottom right corner. From there, indicate the changes you would like to make.



To **dispose** of the containers, click “**Delete all selected**”.

The screenshot displays the 'Edit All Selected Containers' page in the ChemTracker system. The page header includes navigation tabs for 'View', 'Edit', 'ChemTracker', 'Dashboard', and 'Members'. Below the header, there are links for 'ChemTracker', 'Add Inventory', 'Totals', 'Bulk Edit', and 'Find Other Chemicals'. A sidebar on the left lists various lab management options. The main content area features a green banner indicating that 3 containers are selected. Below the banner, a warning message states that changes will be applied to all selected containers and that data will be overwritten. The form includes fields for 'Chemical' (with a search box), 'Location (space)', 'Amount', 'Units', 'Bench', 'Shelf', 'Specific Location Note', 'Expiration Date', and 'Notes'. At the bottom, there are three buttons: 'Cancel', 'Apply changes', and 'Delete all selected', with the latter highlighted by a red box.

Once a container is disposed, the barcode is also disposed and cannot be used again.

Bulk edits to **Location (space)**, **Amounts**, **Units** and **Bench** can also be made in **Bulk Edit**.

Once the changes are complete, click “Apply changes” and follow the prompts to complete.

Any changes made here will be applied to all the containers and overwrite existing data for those containers (such as replacing the existing notes). These changes cannot be bulk undone.

If a field is left blank on the edit page, the existing information in that field will be preserved for all records being edited.

Managing High-Turnover Containers (not available in all buildings)

THIS METHOD MAY NOT BE USED FOR FLAMMABLE LIQUIDS IN HIGH-RISE BIOMEDICAL LABORATORY BUILDINGS. Those buildings are required to track individual containers of all flammable liquids!

Some labs have a high turnover of certain commodity chemicals, especially solvents. If you keep a stock of these chemicals—and the quantity is consistent—you may wish to have a *representative* inventory of those containers.






Example: At any time, you have a maximum of five 4-liter bottles of acetone in your flammable liquids storage cabinet. You empty these at a rate of 1 bottle every week or two, and you don't want to keep entering them into ChemTracker and then marking them as disposed.




Rather than adding each container to your inventory as you receive it and removing when empty:

- EHRS would create five *representative* containers in your ChemTracker inventory. (Starting with the letters “HT”)
- The information and high-turnover barcodes would be on a *sheet of paper* instead of on the bottles.
- The paper is attached to the cabinet where the bottles are stored.

Example:

Material	Package information	Size	Barcode
Acetone [67-64-1]	Sigma-Adrich Chromsolv for HPLC >99.9%	4 Liter	
Acetone [67-64-1]	Sigma-Adrich Chromsolv for HPLC >99.9%	4 Liter	
Acetone [67-64-1]	Sigma-Adrich Chromsolv for HPLC >99.9%	4 Liter	
Acetone [67-64-1]	Sigma-Adrich Chromsolv for HPLC >99.9%	4 Liter	
Acetone [67-64-1]	Sigma-Adrich Chromsolv for HPLC >99.9%	4 Liter	


Five unique barcode labels

Contact the Chemical Inventory Team (cheminv@ehrs.upenn.edu) to create container records for these materials.

Include the following information when contacting the Chemical Inventory Team about High-Turnover containers:

1. The name of the material
2. The volume/amount of *a single container*
3. The number of containers of the above stated size
4. Any additional label information you would like included (for example: grade, vendor, etc)
5. The location where these materials will be stored.

Contact EHRS if you need us to make any changes to your high-turnover inventory.

High-turnover inventories will be checked by Inventory Team members periodically to ensure accuracy.

Appendix A: Gas Cylinders

Reference the following table to enter the volumes (in liters) or weights of your hazardous gases.

Gas	Cylinder Description	Cylinder Size	Amount	Units
Oxygen Gas (greater than 21%)		Cylinder size 10	340	L
Oxygen Gas (greater than 21%)		Cylinder Size E	660	L
Oxygen Gas (greater than 21%)	7 inch x 33 inch	Cylinder Size 80	2407	L
Oxygen Gas (greater than 21%)	9 inch x 51 inch	Cylinder Size 200	7107	L
Oxygen Gas (greater than 21%)	9 inch x 55 inch	Cylinder size 300	9543	L
Hydrogen Gas (greater than 5%)	7 inch x 19 inch	Cylinder Size 35	878	L
Hydrogen Gas (greater than 5%)	7 inch x 33 inch	Cylinder Size 80	2095	L
Hydrogen Gas (greater than 5%)	9 inch x 51 inch	Cylinder Size 200	5578	L
Hydrogen Gas (greater than 5%)	9 inch x 55 inch	Cylinder Size 300	7391	L
Carbon Monoxide		Cylinder Size 150A	400	L
Carbon Monoxide	6 inch x 23 inch	Cylinder Size 10	850	L
Carbon Monoxide	7 inch x 33 inch	Cylinder Size 80	2000	L
Carbon Monoxide	9 inch x 51 inch	Cylinder Size 200	5100	L
Carbon Monoxide	9 inch x 55 inch	Cylinder size 300	6800	L
Methane	7 inch x 19 inch	Cylinder Size 35	1132	L
Methane	7 inch x 33 inch	Cylinder Size 80	2831	L
Methane	9 inch x 51 inch	Cylinder Size 200	7400	L
Methane	9 inch x 55 inch	Cylinder size 300	10100	L
Nitric Oxide		Cylinder Size 35	226	L
Ammonia		lecture bottle	283	L
Ammonia	9 inch x 51 inch	Cylinder Size 200	5578	L
Propane Gas	Single use Fatboy tank with standard torch fitting		16.92	oz
Propane Gas	Liquefied Gas		100	G
Propane Gas	Liquefied Gas		300	G

If you do not see the specifications for the gas cylinder you are trying to enter, contact the Chemical Inventory Team, cheminv@ehrs.upenn.edu.