

Title: RSS Chemical Inventory User Guide

Prepared by: Charles Dal Castel

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1 About RSS Chemical Inventory System

RSS Chemical Inventory System is a cloud-based chemical inventory management tool developed with a researcher-centric approach. It allows easy tracking and maintenance of containers using a barcoding system. Chemical and safety information, such as hazard codes and first aid, are automatically populated. RSS Chemicals includes a web application that works in sync with the complimentary mobile app.

2 Getting Started

- 2.1 To access the system, visit <https://app.riskandsafety.com>.
- 2.2 Enter your WATIAM email credentials.
- 2.3 Once logged in you will be taken to the RSS homepage.
- 2.4 To access your lab's inventory, select the lab under the "Workspace" section.
- 2.5 You will be taken to the lab's inventory homepage.

3 Adding Inventory Managers (For PIs and Lab Managers)

- 3.1 Select your initials located on the top right corner. Select "Profile".
- 3.2 Beneath "Group Memberships", select the group that is associated with the inventory where you wish to add an Inventory Manager.
- 3.3 Select "Members" in the right-hand menu.
- 3.4 Select the user's name you wish to promote to Inventory Manager.
- 3.5 Beneath "Document and Inventory Access", select the box next to Inventory Manager.
- 3.6 Select **Save**.

4 Adding Locations (Lab Room #)

- 4.1 Select your initials located on the top right corner. Select "Profile".
- 4.2 Beneath "Group Memberships", select your group.
- 4.3 Select "Locations" in the right-hand menu.
- 4.4 Select the round + button in the lower right corner.
- 4.5 Search and select the building name and room name of the new location.
- 4.6 Select **Save**.

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5 Adding Sublocations (Storage Locations in a Lab)

Sublocations are required before any containers can be added in.

- 5.1 Select **Inventory Summary** on your lab's inventory homepage.
- 5.2 Beneath "Sublocations", select **Manage Sublocations**.
- 5.3 Select the round + button in the lower right corner.
- 5.4 Select the **Room** from the drop-down menu.
- 5.5 Add the Sublocation Name (e.g. Flammables Cabinet, Corrosives Cabinet, or Fridge).
- 5.6 Temperature and Pressure default to Ambient and can be edited as needed.
- 5.7 Mark the sublocation as private to prevent sharing of all containers stored within that sublocation.
- 5.8 Select the appropriate hazard pictograms associated with the chemicals stored in the sublocation.
- 5.9 Select **Save**.

6 Adding a Chemical

Before affixing a barcode/RFID tag to a container, make sure the surface is smooth and clean.

Do not cover the original label with a barcode.

Please contact checoop@uwaterloo.ca for barcodes/RFID tags.

- 6.1 Select **Add to Inventory** on your lab's inventory homepage.
- 6.2 Search by chemical name, CAS number, or product ID, then select a chemical from the results.
 - a) If you are unable to find the chemical you are searching for, select the three-dot menu in the upper right corner, and select **Add Commercial Substance**. This will allow you to add a chemical family not found in our system.
 - b) If the chemical you are looking for is synthesized or no longer commercially available, please use the **Add Novel Compound** to enter it. This does not add the chemical to the Chemical Library.
- 6.3 To the right of **Containers** section, select the round + button.
- 6.4 Confirm the number of containers and enter: Container Size, Units, Physical State, Container Type, and Location.
- 6.5 You can type the barcode label manually or go back to the mobile version to scan. Alternatively, a barcode scanner is available in the Analytical Lab. Please contact checoop@uwaterloo.ca for assistance.
- 6.6 Once all required fields have been entered, select **Save**.

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7 Creating a Custom Chemical Name (For Pls and Inventory Managers)

- 7.1 Select **Search Chemicals** from your lab's inventory homepage.
- 7.2 Choose the chemical.
- 7.3 Select the three-dot menu in the top right corner.
- 7.4 Select **Custom Chemical Name**.
- 7.5 Choose from the synonyms list or type a name into the **Create custom name line**.
- 7.6 Select Save.

8 Removing a Chemical

- 8.1 Select **Search Chemicals** from your lab's inventory homepage
- 8.2 Choose the chemical you want to remove from the list.
- 8.3 In the **Containers** section, click on the three-dot menu beside the container you want to remove, then select **Remove**.
- 8.4 Select **Delete** and **Confirm**.
- 8.5 Dispose the container/chemical following the Hazardous Waste Disposal procedures.

9 Tracking and Testing Peroxide-Forming Compounds.

Peroxide-forming compounds (PFCs) are chemicals that can gradually form shock-sensitive and potentially explosive peroxides, particularly when exposed to air, light, or heat during storage. To minimize this risk, PFCs should be stored in sealed, airtight, light-resistant containers and, whenever possible, kept in their original manufacturer's packaging. If a compound has been purified to remove inhibitors, an appropriate inhibitor must be reintroduced before storage, and the addition should be documented. Where practical, oxygen exposure should be minimized through oxygen-exclusion techniques, such as purging containers with an inert gas.

The RSS Chemical Inventory System can be used to identify, track, and manage peroxide-forming compounds throughout their lifecycle. For inventory management purposes, peroxide-forming compounds are classified into four groups:

- **Class A (Severe Peroxide Hazard):** Form explosive levels of peroxides during storage without any concentration or opening.
 - Examples: Butadiene (liquid), potassium metal, sodium amide, tetrafluoroethylene (liquid), vinylidene chloride.
 - Action: Test liquids for peroxide formation before using, and discard when peroxides are present. Dispose of the chemicals 3 months after opening or 12 months after receiving if unopened.
- **Class B (Concentration Hazard):** Form dangerous peroxides only when the solvent is evaporated, distilled, or concentrated.

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- Examples: Cyclohexene, diethyl ether, isopropanol, tetrahydrofuran (THF).
- Action: Always test for peroxide formation before distillation or evaporation. **Do not concentrate solutions that may contain peroxides.** Test for peroxide formation every 12 months after opening. Dispose of the chemical if peroxides are above 25ppm.
- **Class C (Self-polymerization):** Highly reactive monomers that can undergo a runaway, explosive polymerization triggered by internal peroxide accumulation.
 - Examples: Acrylic acid, butadiene (gas), ethyl acrylate, styrene, vinyl chloride.
 - Action: Test liquids for peroxide formation before using. Test for peroxide formation every 12 months after opening. Dispose of the chemical if peroxides are above 25ppm. Uninhibited Class C chemicals or should be disposed 24h after opening.
- **Class D (Potential Peroxide Formers):** Chemicals that do not fit within Classes A–C, but require special handling as they may form peroxides.
 - Examples: Allyl ether, tert-butyl methyl ether, tetrahydropyran.
 - Action: Always test for peroxide formation before distillation or evaporation. Test for peroxide formation every 12 months after opening. Dispose of the chemical if peroxides are above 25ppm.

Note: Class A, B, C, and D, are also referred to as Class 1, 2, 3, and Unclassified.

9.1 Adding Peroxide Forming Compounds to your Chemical Inventory

- a) Upon receiving a peroxide forming compound, label the container with the received date, opened date, and expiration date or next testing date as determined by its classification (see above). Peroxide testing labels are available in the Analytical Lab or the Safety Office.
- b) Add the container to the inventory following the instruction in Section 6, **including the expiration date**. Determine the expiration date based on its classification above. For example, a Class A compound should be assigned an expiration date one year after the date received or 3 months after opening, while a Class B or C compound should be assigned an expiration date one year after the date received.

9.2 Tracking Peroxide Forming Compounds in your inventory using RSS

- a) Use the Advanced Search function to identify all peroxide-forming chemicals in your inventory.
- b) Select **Search Chemicals** from your lab's inventory homepage.
- c) Select the drop-down menu on the right of the Search by **cas #, name, formula, GHS or container barcode** search bar to access the advanced search option.
- d) Select the drop-down menu on the right of the **Classification** field and check the items **Peroxide Former (UW)** –

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Group 1, 2, 3, and Unclassified to show the list of Chemicals which are peroxide formers.

- e) Select a chemical from the list. In the **Containers** section, click on the three-dot menu beside the container you want to check, then select **Edit**.
- f) Ensure the expiration date at the bottom is filled according to item 9.1 for all the containers of peroxide forming compounds and that all containers are labelled and dated. Containers expired and those that need to be tested will be flagged in the Inventory Summary (see Section 10.1).

Note: Peroxide forming compounds are classified by RSS based on CAS numbers listed on the SDS and in some instances, such as in proprietary formulated chemical products (Commercial Substances), there are false positives (e.g. aqueous potassium calibration standard lists the CAS number for potassium metal). If you have false positive compound flagged by the RSS Chemical Inventory, contact the Safety Office to determine if it can be exempted from testing.

9.3 Inspecting and Testing Peroxide Forming Compounds

- a) Peroxide forming chemicals must be visually inspected before handling or opening. Check for signs of discoloration, crystal formation (around the cap or suspended in the liquid), visible precipitate, liquid stratification, or oily viscous layers, as these signs indicate an elevated explosion risk.
- b) **Do NOT open or test containers of unknown origin or age, or those that have evidence of peroxide formation.** Contact the Safety Office for assistance.
- c) Peroxide testing strips are available in the Analytical Lab, Chem Stores, or from distributors of laboratory supplies. Follow the manufacturer's instructions for using the strips/kits to ensure adequate colorimetric detection.
- d) Record the peroxide concentration and test date on the container and update the container information in RSS according to item 9.1, with a new expire date based on the Class and adding the result in the comments section.

10 Inventory Summary (For PIs and Inventory Managers)

The Inventory Summary section allows PIs and Inventory Managers to perform administrative functions to the inventory and can be accessed only on the desktop version.

10.1 Inventory Overview

- Provides a count of Total Chemicals and Total Containers in your lab.
- **View container issues (e.g. Peroxide forming compounds, expired containers, etc.)**
- Count of containers currently barcoded.
- Count of containers missing barcodes.

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10.2 Inventory Access & Permissions

- View and modify inventory member's permissions to access different functionalities within your Chemical inventory.

10.3 Certification

- Certify your inventory as accurate after an inventory reconciliation. See **item 11** below for details.

Note: Inventory Certification is required annually.

10.4 Import & Reconcile

- Reconcile your inventory with FID barcodes.
- Reconcile your inventory by sublocation with QR barcodes.
- Import containers in bulk.
- Export inventory into a spreadsheet.

10.5 Missing Rooms

- View rooms that are not associated with the inventory but have containers added to them.

10.6 View Activity

- Review the most recent 100 actions taken in the inventory.
- If a container was accidentally deleted, it can be restored here.

11 Reconciliation (For Pls and Inventory Managers)

Reconciliation is the process of auditing your physical inventory to ensure it matches your online inventory in RSS Chemical Inventory System. This process happens once per year. Reconciliation requires the use of barcodes and a separate scanner, which are available in the Analytical Lab. Please contact Checoop@uwaterloo.ca for assistance.

Note: Only Inventory Owners, Inventory Managers, and Chem Admins can perform reconciliations.

11.1 Scanning

- g) Pair the barcode scanner with a computer or laptop

Option 1: Use the provided wireless dongle.

Option 2: Connect wirelessly via Bluetooth through the computer's Bluetooth settings.

- h) Open a blank Excel spreadsheet and click on the cell A1.

- i) Use the scanner to scan a chemical container's barcode. The scanned barcode will automatically populate the selected cell then move the cursor to the next cell after each scan.

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- j) Scan all containers in the room(s).

Note: If a chemical container has no barcode, set it aside. After scanning all the other containers in the room(s), add barcodes to the untagged containers, then update the inventory (see **item 6**) and Excel document accordingly.

- k) Save the Excel document on the computer.

11.2 Upload to RSS

- l) Visit <https://app.riskandsafety.com>.
- m) Enter your WATIAM email credentials.
- n) Once logged in you will be taken to the RSS homepage.
- o) To access your lab's inventory, select the lab under the "Workspace" section.
- p) Select **Inventory Summary** on your lab's inventory homepage.
- q) Select Reconcile your inventory.
- r) Use the dropdown to choose what rooms have barcodes included in this scan.
 - a) If you are reconciling your whole inventory, select all rooms.
 - b) If you are reconciling only part of your inventory, choose the rooms from which you scanned barcodes.
- s) Select **Upload Scan** or drag and drop your Excel file into the area.
- t) The system will parse your file and compare what you scanned to what is in your online inventory. The results are:
 - a) **Location Match** – Barcode tags found in expected location. The goal of this process is to have all containers be a Location Match.
 - b) **Location Mismatch** - Barcode tags scanned in different location than expected, usually a different room than what was selected in the scan.
 - c) **Unscanned** - Barcode tags not scanned, usually because they were disposed of but not taken out of the online inventory.
 - d) **New** - New Barcode tags not associated with a current inventory item, usually because they were not added into the online inventory.
 - e) **Accounted For** - Barcode tags not relevant to the reconciliation of this inventory, usually tags from another inventory found mixed with your own.
- u) Choose Finish Uploading when you have selected all scan files.

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11.3 Reconcile

- v) Download the Reconciliation Report by selecting the button in the lower right of the page.
- w) Take action: Use the reconciliation report to find container(s) that need to be reconciled.
 - a) “**Location mismatches**” are containers that must be physically moved into the correct room, or edited to reflect the correct building/room/sublocation.
 - b) “**Unscanned**” must be confirmed they are not present before removing from your inventory. If they are not present, remove them from the inventory.
 - c) “**New**” must be confirmed before adding into your inventory. Find the container with this barcode and add it to the inventory (see **item 6**). Use the Excel document and the Reconciliation report to help identify its location by checking nearby containers.
 - d) “**Accounted For**” must be investigated and confirmed not owned by your inventory (borrowed chemicals).
- x) When all actions have been completed, choose **Finish Reconciliation**.
- y) Certify your inventory as accurate. See item 10.3.

12 Installing the RSS Chemical Inventory Mobile Application

RSS Chemicals includes a web application that works in sync with the complimentary mobile app, where you can add and remove chemicals using your mobile device.

For iOS users	For Android Users
1. Navigate to the App Store 2. Search for RSS Chemicals 3. Select Get 4. Launch the application 5. Select Allow 6. Enter your email address for your organization 7. Log in with your credentials	1. Navigate to the Google Play Store 2. Search for RSS Chemicals 3. Select Install 4. Launch the application 5. Enter your email address for your organization 6. Log in with your credentials

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13 Adding a Chemical (Mobile)

- 13.1 Log into the RSS Chemicals app on your Apple or Android mobile device.
- 13.2 Choose the **Inventory** tab on the bottom.
- 13.3 Select your lab's Inventory from the drop-down menu at the top of the screen.
- 13.4 Select the **Chemical Database** tab on the top left.
- 13.5 Search for the chemical to add by Name, CAS Number, or Product number and select it.
- 13.6 Select **Add Container**.
 - a) When using barcodes, attach the barcode onto the container securely. Choose the **barcode** icon and line the square QR code onto the camera's red line.
 - b) Choose a **Location** where this container will be stored.
 - c) Enter the additional required fields: Container Size, Units, and Container Type. You can also enter in the Substance and choose a product from a specific vendor, if applicable.
 - d) All other fields are optional.
- 13.7 When complete, select **Add to Inventory**.
- 13.8 You can add another container of the same chemical by selecting the **Add Container** button at the bottom of the page, or by selecting the back icon in the upper left and searching for a new chemical.