

## MAQ Compliance Strategies

MAQ Compliance can be achieved in a number of ways. The most common solutions are outlined below. Often, a combination of approaches is ideal for chemical owners. The MAQ Taskforce Report also includes a comprehensive Toolbox of Solutions in Appendix C, which can complement these approaches.

### Reduction in Chemical Inventory

The most common method for achieving MAQ Compliance is to remove unwanted or older chemicals. When chemical inventories are regularly updated and reviewed, this can be streamlined by identifying containers that are expired, damaged, or rarely used. Consider disposing of duplicate chemicals to maintain a smaller number of chemicals on hand. Transition to purchasing smaller container sizes more frequently rather than stockpiling bulk quantities. See Waste Removal and Disposal.

### Storing Materials in Approved Storage

Most hazardous materials qualify for a storage “bonus” when the containers in that hazard class are stored within approved storage cabinets. MAQs can be doubled for many hazardous materials when they are stored within approved storage. Appropriate storage is dependent on the material. The CFM can provide materials specific guidance.

### Educating Stakeholders

It is critical to educate all stakeholders affected by chemical storage on the importance of MAQ compliance. Construction design choices, laboratory location, building attributes, researcher’s experimental design, laboratory protocols, housekeeping, and procurement can have impacts on MAQ compliance.

Education or training can include:

- MAQ resources website
- online training, general and designed for target audiences
- seminars
- town halls
- guidance documents on how to view chemical inventories (RSS Chemicals)
- implementation of administrative controls, include project design guidelines
- lab safety inspections
- webinars

### Administrative Controls

EH&S and Departments should consider laboratory close-outs, retirements, normal turnover of lab researchers (post-docs, graduate students moving on), and other transitions as opportunities to dispose of chemicals, samples, and obsolete equipment. Locations should

develop a laboratory closure or checkout process when researchers depart the lab. This should include disposal of chemicals and laboratory clean-outs.

When certain hazard classes are near (within 80% of MAQ) or have exceeded MAQs recently for a particular control area or laboratory suite, researchers should be notified of which chemicals of concern are nearing non-compliance. EH&S and CFMs may flag new orders of such chemicals to prevent MAQ overages.

### Utilizing Stockrooms

Some campus departments or locations maintain a central stockroom which contains commonly used chemicals. Chemical users can consider maintaining smaller quantities of chemicals within labs, using them up completely (and disposing of), and ordering from the stockroom when needed. Departments or locations can consider developing a Re-Use facility that maintains a fairly broad selection of specialty chemicals which can be accessed by multiple researchers.

### Moving chemicals to a different location

For labs that occupy different rooms or buildings, consider moving higher hazard chemicals to alternate control areas with greater capacity. In general, MAQ limits are more generous on the ground floor and most restrictive on upper floors. Consider sharing or borrowing less commonly used chemicals from collaborator labs. RSS Chemicals also has a share chemical function.

### Replacing chemicals with less hazardous chemicals

Certain chemical families have very restrictive MAQs. When possible, replace high hazard chemicals with lower hazard chemicals. For example, some metal powders are considered pyrophoric solids (MAQ = 4 pounds). Alternate vendors may sell the same metal powder, possibly less finely divided, which is a flammable solid (MAQ = 125 pounds) rather than a pyrophoric solid.

### Reviewing chemical purchase orders

Certain chemical hazard categories may be flagged by EH&S prior to ordering. This will enable real time review of chemical inventories to determine if certain chemicals will trigger an MAQ overage. For labs that maintain accurate inventories and dispose of items (delete them from their chemical inventory) prior to ordering new materials, "replacement" chemicals will be unlikely to contribute to MAQ problems.

### Waste Removal and Disposal

Hazardous waste stored in a building contributes to the MAQ limits. Researchers should be encouraged to frequently review their chemical inventories for accuracy and to identify unnecessary chemicals. Excessive storage of identical containers or large volume containers is discouraged. Older chemicals may no longer maintain purity or become unstable. Lab close-outs or departure of researchers should instigate chemical disposal.

Consider waste amnesty days for departments. Encourage annual "spring cleaning" for labs to review and dispose of unwanted chemicals.

## New Construction

Buildings or rooms can be designed to safely store unlimited quantities of hazardous materials. Preliminary discussions for new buildings and building renovations should include the Campus Fire Marshal, designers, project managers, building managers, facilities, EH&S staff, and researchers who may occupy the space. Initial planning and collaboration with all stakeholders must include consultation with the UC Laboratory Safety Design Manual. This collaboration may entail departments describing their current and future needs for chemical storage. Designers can provide options for different configurations supporting chemical storage. Campus Fire Marshals can help everyone understand the consequences of different design choices on chemical storage. Project managers can facilitate these conversations and make sure all stakeholders can evaluate tradeoffs in different design choices. Ultimately, the planned use of the building should inform the building design. A higher upfront cost for a well-designed lab building will best support future research and save money in the long term by minimizing the need for constant building upgrades and retrofits.

Construction of dedicated High Hazard (Group H occupancy) support buildings or rooms may also significantly impact the ability to satisfy MAQ requirements by providing departments or locations where large quantities of chemicals can safely be stored. These could exist in many forms, such as:

- A single room on the floor a Chemistry building, shared by multiple researchers or a single lab, for unlimited storage of certain classes of chemicals
- A stockroom supporting an entire building or department containing commonly used chemicals. Users in individual labs would only keep small quantities in the lab at any one time, relying on the replenishment from the stockroom when needed
- A hazardous materials storage building which supports a location. This could contain hazardous waste storage or act as a receiving location for incoming chemical orders.

## Existing Building Renovations

Buildings or rooms can be designed to safely store unlimited quantities of hazardous materials. High Hazard (Group H) occupancies should be considered in certain circumstances. Other construction improvements that can increase chemical quantities can include: adding full automatic fire sprinklers throughout a building (doubles MAQs for most hazardous materials), constructing additional control areas in a portion of a building, converting rooms or buildings to Group L (Laboratory) Occupancies. In addition, adding gas cabinets can double storage quantities for many hazardous gases. Installing gas cabinets involves connection with the hazardous exhaust system to achieve minimal ventilation rates and typically includes installation of a fire sprinkler within the cabinet.

## Inventory Management Practices

More examples of solutions to MAQ Compliance can be found in the Toolbox of Solutions, Appendix C of the MAQ Task Force Report.

EH&S and the CFM can send MAQ reports to Departments, broken down by building, hazard class, and chemical owner. This will allow Departmental leaders (Deans, Department Chairs) to

notify chemical owners (PIs) of MAQ problems. It can also inform leadership of problematic buildings that may benefit from renovations.

With appropriate resources, locations can increase the frequency of MAQ reviews for all campus buildings. Inspections and Audits by EH&S and the CFM will highlight problematic areas and assure that MAQ compliance is being maintained.