

# How to Safely Store Hazardous Materials



# Choosing a Safety Cabinet that's Justrite!



Safety storage cabinets serve several critical functions. First and foremost, cabinets provide for the safe containment of hazardous chemicals which helps protect both personnel and property from devastating fires. Different sizes of cabinets can be positioned in the work area near points of use, saving costly trips to a central storage room. Locking mechanisms help ensure hazardous chemicals are being used only by properly trained, authorized personnel. Lastly, safety cabinets provide the perfect means to maintain a good housekeeping program. They help identify, organize, and segregate dangerous liquids.

With such a wide selection available in today's marketplace, how do you select the safety storage cabinet best suited for your application? Begin by asking yourself some basic questions such as:

- 1 What chemicals will I be storing? And what are the hazardous characteristics of these chemicals? Are they flammable? Combustible? Corrosive? Toxic?
- 2 Do federal regulations apply? What about state or local regulations? Do industry standards or model codes offer guidance?
- 3 How much of each chemical is needed in any given work area per day or per shift? Do I need any special features to fulfill my specific needs? Do construction details make a difference in ease of use, product longevity and actual performance under fire conditions?

## 1. Chemical Characteristics

### Identify and inventory all chemicals in your workplace.

Review the MSDS (Material Safety Data Sheet) for each to determine characteristics and recommended storage practices. To avoid generating toxic gases and to prevent fires and explosions, it is important to segregate incompatible chemicals. Chemical labeling and training is covered under regulations and the Right-to-Know Act. In addition to compatibility issues amongst the chemicals, it's also important to know chemical compatibility as it relates to the construction material of the cabinet itself.

Using color and labeling in your cabinet storage practices can also help identify different types of chemicals. This can provide an easy means for employees to organize and segregate different liquids used in their operations. It also helps fire department personnel recognize hazards when responding to fire situations. While regulatory codes do not mandate the specific color of safety cabinets, industry has customarily observed the following:

- Yellow for flammable liquids
- Red for combustible liquids
- Blue for corrosive liquids
- Green for pesticides/insecticides
- White or gray for outdoor storage conditions or other miscellaneous such as hazardous waste materials.



Often times laboratory settings employ the use of neutral color cabinets (whites, grays and beiges) to match countertops and work surfaces.



## 2. Regulatory Requirements

If liquids used in your process exhibit any of the above characteristics, federal OSHA regulations and state and local codes should be consulted.

### Flammables/Combustibles

If the chemical is flammable or combustible, OSHA 1910.106 applies. Your state and local codes, in all probability, are based on either the National Fire Protection Association Code (NFPA 30) and/or the Uniform Fire Code (UFC 79).

Section 4-3 of the 2000 edition of NFPA covers the design, construction, and capacity of storage cabinets.

#### 4.3.3

(a) Storage cabinets that are designed and constructed to limit the internal temperature at the center of the cabinet and 1 in. (25 mm) from the top of the cabinet to not more than 325° F (162.8° C), when subjected to a 10-minute fire test that simulates the fire exposure of the standard time-temperature curve specified in NFPA 251, Standard Methods of Tests of Fire Endurance of Building Construction and Materials, shall be acceptable. All joints and seams shall remain tight and the door shall remain securely closed during the fire test.





In addition to passing the fire test, NFPA further requires specific cabinet construction. Whereas both metal and wood construction are acceptable, the most popular choice in industry is metal.

(b) Metal storage cabinets that are constructed in the following manner shall be acceptable. The bottom, top, door, and sides of the cabinet shall be at least No. 18 gauge sheet steel and shall be double walled, with 1 1/2-in. (3.8 mm) air space. Joints shall be riveted, welded, or made tight by some equally effective means. The door shall be provided with a three-point latch arrangement and the door sill shall be raised at least 2 in. (50 mm) above the bottom of the cabinet to retain spilled liquid within the cabinet.

#### 4.3.5

Storage cabinets shall be marked in conspicuous lettering: "FLAMMABLE - KEEP FIRE AWAY."

One notable distinction in the Uniform Fire Code is the requirement that all flammable and combustible liquid cabinets shall be self-closing.

In addition to making sure cabinets meet applicable codes, it's important to look for safety storage cabinets which carry independent third party certification, such as Factory Mutual (FM Approved) or Underwriter's Laboratories (UL Listed). Codes vary internationally. For example, Canada's National Fire Code mandates the cabinets carry the ULC listing.

## Non-flammable Acids/Corrosives

While NFPA does not mandate requirements for the storage of non-flammable acids and corrosives, these chemicals should be properly stored for maximum safety. Corrosion resistant cabinets vary in materials from steel coated with chemically resistant powder paint, to laminated wood, to molded polyethylene.

The metal cabinets coated with a chemical resistant finish are satisfactory for frequently used acids such as Hydrochloric Acid and Phosphoric Acid. For highly corrosive acids and caustics such as Nitrics, Dichlorics, and Phenols, the laminated or molded cabinetry is preferred.

These are examples of making the right cabinet choice based upon it's compatibility with cabinet construction material.



## 3. Capacity and Convenience

**Identify how much chemical capacity is needed for both existing as well as future needs.**

How does the volume of chemical stored affect cabinet selection? First, there are applicable codes relating to flammables and combustibles and NFPA 30 addresses the issue as follows:

4.3.1 Not more than 120 gal (454 L) of Class I, Class II, and Class IIIA liquids shall be stored in a storage cabinet. Of this 120 gallon total, not more than 60 gallons (227 L) shall be Class I and Class II liquids.

4.3.2 Not more than three storage cabinets shall be located in any one fire area. (The code goes on to indicate two exceptions).

5.5.4.1 The aggregate of the sum of all incidental operations in each single fire area shall not exceed the sum of the following:

- a) 25 gal (95 L) of Class IA liquids in containers;
- b) 120 gal (454 L) of Class IB, Class IC, Class II or Class III liquids in containers
- c) Two portable tanks each not exceeding 660 gal (2498 L) of Class IB, Class IC, Class II, or Class IIIA liquids
- d) 20 portable tanks each not exceeding 660 gal (2498 L) of Class IIIB liquids.

*Exception: Where quantities of liquid in excess of the above limits are needed to supply an incidental operation for one continuous 24-hour period, that greater quantity shall be allowed.*





## Within the parameters of the code, what size and style of cabinet is most practical?

Code compliant cabinets are available in sizes ranging from 4 gallons (15 liters) to 120 gallons (454 liters). Does your work area lend itself to using a standard floor style with leveling feet, or would cabinets that slide under a bench or counter or fume hood be more convenient? Perhaps stacking 'piggy-back' cabinets is your best option. When the liquids are stored in small bottles or other vessels of limited capacity, consider using a wall mounted cabinet.

However, when managing 30 gallon (114 liter) or 55 gallon (208 liter) drums, single or double drum cabinets should be your choice. They're available for either vertical or horizontal drum placement for easy storage or dispensing.

## Aside from design and construction details mandated by code, are there other factors to be considered when making a cabinet selection?

Absolutely yes. Although all cabinets may look alike, their manner of construction and other features make a difference when it comes to durability and ease of use. Units that incorporate welding (versus all poprivets) tend to hold squareness and rigidity better resulting in a longer life. Cabinets with concealed self-closing mechanisms provide full access to top shelf space, unlike those with exposed mechanisms which restrict space.

Door styles vary from single to double door, as well as from manual closing to self-closing to sliding door closure. Those states following the UFC must use self-closing doors. Whereas they are slightly more expensive, they provide an added measure of safety and often times users will choose self-closing over manual for that reason alone. Regarding door operation, those which self-latch make a big difference in daily use. A self-latching feature makes door closing easy with no need to pull down the handle to lock in place. This user-friendly feature encourages complete closure of doors by employees, and with no need to manually rotate the handle to engage the 3-point latch, you can be assured the cabinet will perform under fire conditions.

Shelving within the cabinet can also make a difference when it comes to convenience and durability. Shelves with simple built-in troughs help catch incidental leaks, making cleanup easier. Ribbing provides extra strength and rigidity and the ability to interlock onto internal cabinet tabs can help prevent bothersome "shelf slippage." Welded shelf hangers spaced at 2-1/4" increments give flexibility in storing various container sizes... and no flimsy brackets to lose!

The actual finish on a cabinet can also prolong its life. A powder paint finish not only looks terrific, it's better than baked on enamel when it comes to chemical and corrosion resistance.

Other factors to consider might include whether seismic adapters would be beneficial for earthquake prone areas, or whether venting is required per local jurisdictions.

Special applications might require the addition of 'pass-thru valves' which allow for virtually 'hands-free' liquid transfer. Other circumstances might dictate the need for outdoor storage of hazardous materials, most often found where storage capacity ranges from two to eight 55-gallon drums of liquid.



## More Storage Solutions



- **GuardMaster™** Security Cabinet for optimum protection of valuables
- **Justrite®** Cylinder Lockers for LPG and compressed gases
- **Centura™** Safety Cabinets for under-counter and fume hood applications

## An informed choice is always the best choice.

After evaluating three major areas relative to **chemical characteristics, regulatory requirements, and capacity and convenience factors**, you can be assured of making the cabinet selection that meets both your individual needs, as well as federal requirements. You can also rest easier knowing you have minimized the problems and risk associated with the use of hazardous chemicals in the workplace.



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