

Should Chemical Storage Cabinets Be Ventilated?



Should teachers ventilate their chemical storage cabinets? This question has been asked many times. This question will be answered along with the proper installation of a ventilation system.

Should a Chemical Storage Cabinet Be Ventilated?

Proper room ventilation with adequate air exchanges will eliminate most unsafe chemical vapors. The only time a chemical storage cabinet should be ventilated is if the ventilation in the laboratory or chemical stores area is inadequate, or if state or local law requires cabinet ventilation.

Venting a chemical storage cabinet is not necessary for fire protection. In fact, a vented cabinet could compromise the ability of the cabinet to protect its contents from a fire. Studies show that the interior temperature of a cabinet may increase dramatically when the cabinet is subjected to an external fire. In this situation, vapor from the hazardous chemicals in the cabinet may be released. If the integrity of the chemical storage cabinet is compromised because of the ventilation system, these hazardous fumes will escape from the cabinet and a very dangerous and devastating situation may occur. Therefore, it is recommended that storage cabinets, including acid storage and flammables storage cabinets, not be ventilated (see NFPA #30, 4-3.2).

Ventilation Guidelines for Chemical Storage Cabinets

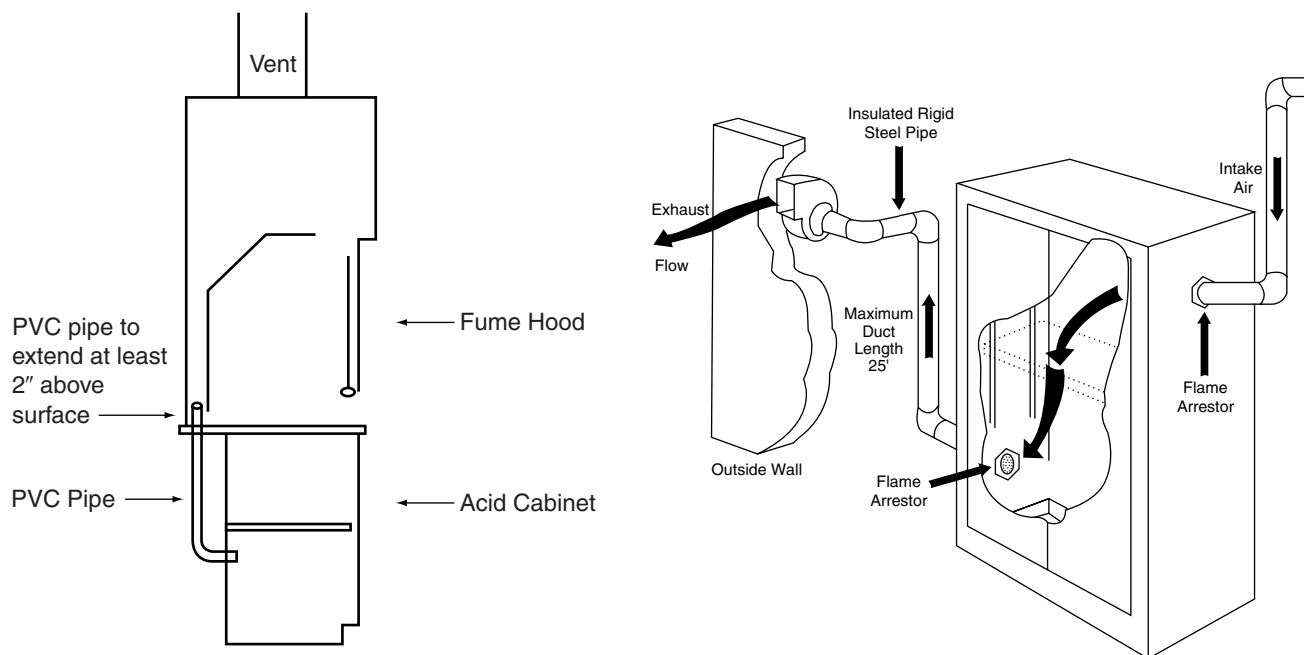
It is recognized that some state and local jurisdictions may require storage cabinets to be vented. Some users may desire ventilation if the cabinet contains highly toxic or noxious materials. Chemical storage cabinets should be vented from the lower vent opening with make-up (in-take) air supplied to the upper vent opening. Mechanical exhaust ventilation is preferred and should comply with NFPA 91, *Standard for the Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying*.

Vent openings are sometimes provided in chemical storage cabinets by manufacturers. It should be understood that venting the cabinet may defeat its fire integrity. If it is not necessary or required that the cabinet be vented, then the vent openings should be kept tightly capped with the metal bungs provided for that purpose.

If the cabinet must be vented, the ventilation system should be installed so as not to reduce the fire protection capabilities of the chemical storage cabinet during a fire. Means of accomplishing this may include thermally actuated dampers on the vent openings or proper insulation of the vent piping system. Manifolding the vents of multiple storage cabinets should be avoided. These procedures should be followed:

- Remove both metal bungs and replace with flash arrestor screens (normally provided with cabinets). The top openings will serve as the fresh air inlet.
- Connect the bottom opening to an exhaust fan by a substantial metal tubing having an inside diameter no smaller than the vent. The tubing should be rigid steel.
- The fan should have a nonsparking fan blade and nonsparking shroud. It should exhaust directly to outside.
- The total run of exhaust duct should not exceed 25 feet.

If corrosive fumes from your acid cabinet are a problem, the acid storage cabinet may be connected to the duct work of the fume hood. Standard 1–2" PVC pipe can be used and flame arrestors are not necessary. Keep the air flow to a bare minimum and eliminate as much of the horizontal run of the duct piping as possible. This will reduce condensation and precipitation of the acid vapors. Try not to use a dedicated exhaust blower just for the cabinet. Connecting your acid cabinet into your existing fume hood exhaust will dilute the concentration of the acid fumes and will not harm the fume hood's exhaust system since it is designed to handle corrosive vapors.



Safe Installation: If required to ventilate your chemical storage cabinet, the above drawing illustrates the proper venting technique recommended by NFPA.

Ventilation Guidelines for Flammable Chemical By Storage

Flinn Scientific and the National Fire Protection Association does not recommend that flammable chemical storage cabinets be ventilated. If they must be ventilated, the NFPA Standard #30, 4-3.2 must be followed.

National Fire Protection Association NFPA #30, 4-3.2

“The cabinet is not required to be vented for fire protection purposes, however, the following shall apply:

- If the cabinet is vented for whatever reasons, the cabinet shall be vented outdoors in such a manner that will not compromise the specified performance of the cabinet, as acceptable to the authority having jurisdiction.
- If the cabinet is not vented, the vent openings shall be sealed with the bungs supplied with the cabinet or with bungs specified by the manufacturer of the cabinet.

Flinn Scientific carries a complete line of high quality SciMatCo chemical storage cabinets. Please refer to the Safety Storage Cabinet section of the *Flinn Scientific Catalog/Reference Manual*.

Reference

National Fire Protection Association, “Flammable and Combustible Liquids Code Handbook.” NFPA No. 30—1990. National Fire Protection Association, Quincy, MA 02269.