

Should chemical storage cabinets be ventilated?

Proper room ventilation with adequate air exchanges will eliminate most unsafe chemical vapors. The only time you may want to ventilate a chemical storage cabinet is if the ventilation in the laboratory or chemical stores area is inadequate or you are required to provide cabinet ventilation because of state or local law.

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. During a fire, 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.

At the right and below are the proper guidelines established by the National Fire Protection Association for the ventilation of flammable chemicals.

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:

- (a) 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.
- (b) 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.

A-4-3.2 Venting of storage cabinets has not been demonstrated to be necessary for fire protection purposes. Additionally, venting a cabinet could compromise the ability of the cabinet to adequately protect its contents from involvement in a fire since cabinets are not generally tested with any venting. Therefore, venting of storage cabinets is not recommended.”

What is the proper method for ventilating a chemical storage cabinet?

It is recognized that some state and local jurisdictions may require storage cabinets to be vented. Safety cabinets should be vented from the lower vent opening with make-up air supplied to the upper vent opening. Mechanical exhaust ventilation is preferred and should comply with NFPA 91-199 Standard for Exhaust Systems for Air Conveying Vapors, Gasses, Mist, and Non-Combustible Solids.

In such cases, the ventilation system should be installed so as not to reduce the fire protection capabilities of the safety 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. Any make-up air to the cabinet should also be arranged in a similar manner. Remember, the intent of a flammables storage cabinet is to keep the contents of the cabinet away from the fire. The ductwork of the cabinet should have the same intent.

National Fire Protection Association NFPA #30, 4-3.2

“Vent openings are often provided by manufacturers because some jurisdictions mandate that the cabinet be vented to prevent vapor accumulation in the cabinet and because some users desire this feature if the cabinet will be used for toxic or noxious materials. 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, then 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 non-sparking fan blade and non-sparking shroud. It should exhaust directly outside.
- The total run of exhaust duct should not exceed 25 feet.

