Should a Flammables Cabinet Be Ventilated?

Introduction

The National Fire Protection Association (NFPA) does not recommend the ventilation of flammables cabinets for the purpose of fire protection. It has never been proven that ventilation of flammables cabinets is necessary for the purpose of fire protection. It can also be argued that the ability of a flammables cabinet to protect its contents from a fire can be compromised by ventilation efforts.

Ventilation of some storage cabinets for health or safety reasons may be required by other jurisdictions. Occasionally, health officials will require the ventilation of storage cabinets containing highly toxic substances or noxious fumes. Some local fire departments will require flammable storage cabinets be ventilated. Hence, many flammables cabinets are manufactured with vent openings even though venting could adversely effect the fire integrity of the cabinet. If your flammables cabinet must be ventilated, the following procedures must be followed.

The following are proper guidelines established by the National Fire Protection Association for the ventilation of flammable chemicals.

National Fire Protection Association NFPA #30, 4-3.2

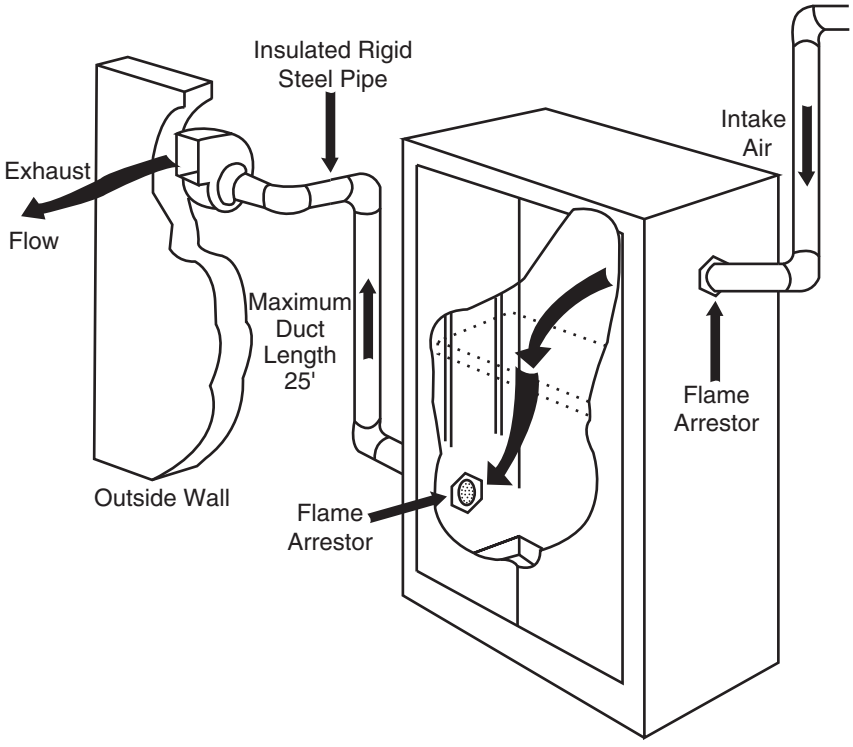
"The cabinet is not required to be vented for fire protection purposes, however, the following shall apply:

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.

How to Vent a Flammables Storage Cabinet

- Cabinet must be installed with approved flame arrestors.
- The top vent port should be utilized as the air inlet. The bottom vent port should be utilized as air exhaust.
- Insulated, seamless, rigid steel piping of appropriate diameter should connect the lower vent port to an explosion-proof or non-sparking fan which exhausts directly to the out-of-doors. Similar piping connected to the upper vent port should be used for inlet air.
- Maximum exhaust duct length of 25 feet must be observed.
- Any make-up air to the cabinet should also be arranged in a similar manner.



How could the integrity of the cabinet be compromised if the above criteria are not met? The following two examples clearly identify potential problems:

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Failure to Use a Mechanical Blower

Failure to use a non-sparking blower to "draw" the vapors out of the cabinet could result in a dangerous situation. Instead of undesirable vapors finding their way out of doors, reverse air flow could cause the vapors to exit the cabinet's top vent into your stockroom.

Use of Improper Ducting

Imagine if a cabinet vented with PVC pipe is involved in a major fire and the PVC pipe melts near the vent opening exposing the flame arrestor. While the flame arrestor effectively prevents the flame from entering the cabinets, it does not prevent vapors from rushing out of the cabinet.

Thermally induced stress will cause most glass containers to break at slightly over 210 °F. Plastic bottles will also start to soften and melt above 200 °F. When the bottles break, spilling their contents all over the floor of the cabinet, the vapors produced by the intense heat begin to rush out of the cabinet. Your cabinet becomes a virtual flame thrower!

Two other points are worth noting. It is improper to ventilate your flammables storage cabinet into a fume hood. You should avoid ventilating multiple storage cabinets through the same ventilation piping. Lastly, before purchasing any chemical storage cabinet, familiarize yourself with all local and state codes from the appropriate agencies having jurisdiction in your area.

In summary, if local jurisdictions require cabinet ventilation, you should abide by proper ventilation procedures. Venting cabinets is not required nor recommended by the National Fire Protection Association.

Reference

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

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*.