



# Aerosol Storage Requires Forethought And Planning

A single pallet load of flammable aerosols in a storage area represents a potentially catastrophic loss.

## The Hazard

Flammable aerosols are more hazardous than most flammable liquids because aerosol containers rupture explosively when exposed to sufficient heat. Exploding containers become projectiles spraying burning liquids over a wide area causing multiple fires that will severely hamper manual fire fighters and virtually guarantee fire spread over large areas. Consequently, this hazard supports a critical need for providing "special" fire protection and controls in those areas where aerosol containers are stored.

## Defining the Hazard

The special protection required will vary depending upon: 1) the type or classification of products, 2) quantity of storage, and 3) storage arrangement. Aerosol products are classified as Level 1, Level 2 or Level 3, with Level 1 being the least hazardous and Level 3 the most hazardous. These classifications are defined in the NFPA 30B Code. The flammability of the base product (not the propellant) is the major factor influencing the classification.

Level 1 aerosols are typically water-base products with a maximum of 25 percent flammable base products. Examples of Level 1 aerosols may include shaving cream, spray starch, window cleaners, alkaline oven cleaners, rug shampoos, some air fresheners and some insecticides.

Level 1 aerosols, being water-based products, do not pose any unusual fire hazard. In fact, the water base may even possibly help extinguish a fire. Consequently, they can be treated as ordinary combustible materials from a fire protection standpoint.

Level 2 aerosols are typically alcohol-base products with either 25 percent to 100 percent water miscible (e.g., acetone, ethyl alcohol and propyl alcohol) flammable base product or 25 percent to 50 percent non-water miscible (e.g., toluene, vegetable oil, xylene, mineral spirits and diethyl ether) flammable base products. Examples of Level 2 aerosols include most personal care products including deodorants (except for oil-based antiperspirants), hair sprays, antiseptics and anesthetics. Other products may include some furniture polishes, windshield deicers and engine starter fluids.

Level 3 aerosols are typically petroleum-base products with more than 55 percent flammable base products. Examples of Level 3 aerosols include some automotive products (engine and carburetor cleaners, undercoatings), home products (some wood polishes), paints and lacquers, lubricants, some insecticides and oil-based antiperspirants.

Note that limited quantities of Level 2 and Level 3 aerosols, removed from their combustible cartons on retail display shelves for normal merchandising purposes, are not considered a serious fire hazard.

In storage areas, flammable aerosols can present very severe fire hazards unless the sprinkler system is specifically designed for the aerosol hazard, storage quantities are limited and/or proper controls are in place.

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The following will be helpful to determine the quantity of aerosol in a storage location:

One pallet load is approximately 4 feet by 4 feet by 4 feet with 100 cartons of 12 (nominal 12 ounce) cans per carton, or approximately 112 gallons, or 900 pounds net weight.

### **Protection Guidelines for Incidental Storage – Levels 2 and 3**

Incidental storage is defined as no more than two pallet loads in either an unsprinklered location or a sprinklered location not protected in accordance with NFPA 30B. Even with these incidental storage quantities, the following advisory controls are recommended.

Segregate and isolate the aerosol storage and keep inventory as low as practical. Outside storage in a secure garden-type shed or trailer located away from important buildings is preferred. If this is not practical or feasible, inside storage should be kept away from sources of ignition and arranged in one of the following ways:

- In a separate room
- In metal cabinets; or
- In a chain-link cage; or
- In a designated area at least 8 feet from other combustible storage

### **Protection Guidelines for Accumulated Storage – Levels 2 and 3**

Accumulated storage is defined as more than two pallet loads. Some options for proper control are as follows:

Option 1 - Reduce the inventory through controlled purchasing to levels within incidental storage limitations.

Option 2 - Store aerosols outside in a secure garden-type storage shed or trailer away from important buildings.

Option 3 - In addition to the two pallet loads of incidental storage, an additional 2 1/2 pallet loads is permissible in a separate inside flammable liquid storage room that meets the requirements of NFPA 30. If the storage room is sprinkler protected in accordance with NFPA 30B, the quantity permitted in the storage room may be increased up to a maximum of five pallet loads.

Option 4 - Up to 12 pallet loads of solid pile or palletized storage is permitted in a general purpose warehouse; if rack storage, up to a maximum of 24 pallet loads is permitted. These quantities are conditional, depending upon the following control measures:

- The aerosol storage is segregated by a minimum of 8-foot aisles from ordinary combustibles and consolidated in one area.
- At least 25 feet of separation is maintained from flammable and combustible liquid storage.
- No basement storage of aerosol is permitted.
- Provide wet-pipe automatic sprinkler protection designed in accordance with NFPA 30B over aerosol storage area and for a distance of 20 feet beyond. Protection should be for the most hazardous level of aerosol product present.
- Balance of property in same fire division should be protected throughout with an effective automatic sprinkler system.

Option 5 - Quantities of flammable aerosols in excess of the above 12/24 pallet loads of palletized/rack storage are only permitted provided the following additional control measures are in place (Refer to NFPA 30B for details):

The aerosol storage is segregated and separated from the rest of the warehouse by fire resistant walls or chain link fence enclosure, which extend from floor to underside of roof deck or ceiling.

Openings in enclosures should be provided with self-closing or automatic closing doors or gates or protected with a labyrinth arrangement.

Storage of ordinary combustible commodities should be kept outside the segregated area and at least 8 feet from a fenced enclosure.

An approved fire alarm system should be provided and it should be arranged to cause the doors or gates leading to the aerosol storage area to close automatically.

In aerosol storage situations requiring sprinkler protection, you should contact a qualified sprinkler contractor to evaluate your current system and to help you determine the enhancements necessary to conform with NFPA 30B requirements.