

# Protect your business by storing aerosol products properly.



A wide range of products are stored as aerosols including lubricants, cleaning agents, personal hygiene products, paints, and food products. These products present a unique fire hazard and require special storage practices as a result.

## Aerosol Design

Typical aerosol cans are high-strength metal units that contain the base product (oils, cleaners, etc.) and a propellant. The working pressures are typically around 140 to 180 psi.

There are a wide range of propellants that are used in both liquefied and compressed gas form. Hydrocarbon propellants are common for their ability to maintain consistent pressure and spray pattern over a long shelf life. One of the most common propellants is a mixture of propane and butane.

The base product can range from low hazard materials such as water-based liquids to highly flammable paints or cleaning agents. This is an important factor when assessing fire plans for a facility where these products are stored.



## Classification of Aerosols

The 2019 NFPA 30B, Code for the Manufacture and Storage of Aerosol Products classifies aerosols into three levels. Factory Mutual uses the same classification system for their Data Sheet (DS) 7-31, Storage of Aerosol Products. These levels relate to the chemical heats of combustion of the product and are used to determine proper protection methods.

Aerosol cooking spray products and aerosols stored in plastic containers have their own classifications.

Standards require labeling of the products in accordance with these levels which will assist you in identifying the correct protection requirements.

## Fire Hazards of Aerosol Products

In fire events, Level 2 and Level 3 aerosol products have been shown to produce intense heat and the potential for ruptured cans to rocket, making manual firefighting extremely difficult. Ruptured cans can also create additional fires outside of where the fire originated, overwhelming sprinkler protection.

Level 2 aerosol products are typically alcohol-based. This means most of the base product is water-soluble, which makes them easier to protect than Level 3 aerosol products.

Level 3 aerosol products are typically petroleum solvent-based. The lack of water solubility, in conjunction with the higher heat output, makes these products more difficult to control.

Level 1 aerosols have been shown to be relatively easy to protect in comparison, and the required protection reflects that.

## Protection of Aerosol Products in Storage

Level 2 and Level 3 aerosol product storage requires rapid sprinkler response. Quick-response sprinklers, including early suppression fast-response (ESFR) sprinklers or in-rack sprinklers, have shown to be the best method for controlling these fires. This is due to their ability to quickly react to the fire involving the packaging before the aerosol products themselves are involved.

There are limited quantity exceptions where the protection guidelines in NFPA 30B do not have to be met. If you are storing more than one pallet of Level 2 or 3 aerosols, the amounts likely exceed these limits. In many cases, one pallet of Level 3 aerosols will exceed these limits by itself.

There are guidelines for having segregated aerosol storage within a general-purpose warehouse. This requires the segregated storage area be separated from the rest of the warehouse by either one or two hour interior walls, chain-link fencing that must meet specific requirements, or a clearly marked separation area distinct from other storage commodities. In each of these instances, there are varying amounts of product and sizes of storage areas allowed based on the separation method used. These options require sprinkler protection per NFPA 30B or FM DS 7-31 to be in place.

## Storage of Aerosol Products

If large amounts of aerosols are being stored, a separate aerosol product warehouse may be required. Aerosol product warehouses are required to be standalone structures with adequate separation from other structures based on protection or to be separated from the rest of the facility by 4-hour fire walls.

In some cases, aerosol products require separation from any storage of flammable or combustible liquids. This is addressed in both NFPA 30B and FM DS 7-31.

### Protection of Aerosols in Production Areas

For aerosol product storage in production areas, there are guidelines in place. Flammable liquids cabinets can be used for limited quantities. NFPA 30B does outline maximum quantities and protection criteria for aerosol storage inside liquid storage rooms based on the size of the room.

### References:

NFPA Fire Protection Handbook Twentieth Edition Volume I, Section 6, Chapter 16 – Manufacture and Storage of Aerosol Products

2019 NFPA 30B, Code for the Manufacture and Storage of Aerosol Products

Factory Mutual Data Sheet 7-31 Storage of Aerosol Products



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