

Fire Protection in Spray Booths

Spray painting and varnishing operations are a severe fire hazard. Overspray accumulated in spray booths on fan blades, on filters, and in ductwork is subject to ignition and will contribute to the rapid spread of any fire. This hazard can be effectively controlled when spray booths are cleaned regularly, and have a properly installed and maintained automatic sprinkler system.

Provide Adequate Fire Suppression Protection

Automatic sprinkler systems will protect the interior of the spray booth, the area behind the filters, and the interior of the exhaust duct. In non-sprinklered buildings, the domestic water supply can be used as the water supply for the booth if there is adequate city water pressure and flow, or an alternative system can be installed. Consult with your local fire suppression contractor for the best option.

Sprinkler systems should be tested by a contractor on an annual basis.

Inspect and Maintain Sprinklers

It is important to inspect and maintain your sprinkler system. Improper maintenance can cause sprinkler systems to delay or stop working. This failure could allow fire and smoke to spread beyond the booth, resulting in extensive damage to the surrounding area.

Inspect the sprinkler heads in all spray booths to check for accumulation of overspray residue. Sprinkler heads are designed to activate at a specific temperature, and residue interferes with the activation of the head. Per the manufacturer's specifications, replace any heads that have been painted or coated with new sprinkler heads and protect the new sprinklers from future accumulation by covering them with cellophane bags or thin paper bags (<.003 inches [.076 mm]). Inspect the coverings at frequent intervals and replace them as necessary to limit the accumulation of residue.

Provide Adequate Ventilation

Equip all spray areas with mechanical ventilation adequate to remove flammable or combustible vapors/ mists to a safe location and to maintain the concentration of flammable or combustible vapors/mists in the exhaust stream below 25% of the Lower Flammable Limit (LFL). Be sure that the spray booth filters are properly fitted into their mountings. Overspray deposits in the ductwork are difficult to clean, and may add substantially to a fire load causing the fire to spread rapidly. Filters should be replaced according to the manufacturer's specifications.

Proper Booth Construction and Maintenance

The spray booth should be constructed of noncombustible materials. The interior surfaces should be a smooth design to prevent pocketing of residue and to facilitate ventilation, cleaning, and washing. In order to reduce the fire load in the spray booth, routinely clean the interior of the booth using solvents with flash points above 100 degrees Fahrenheit and non-sparking scrapers and tools. Operate the booth's ventilation system while cleaning. Wet down the scraped-off overspray residue, deposit them in Underwriters Laboratory (UL) or Factory Mutual (FM) listed or FM approved metal waste containers, and remove them from the building immediately. Depending on use, electrical components should be approved for use in Class I or Class II Division 2 locations.

Prohibit smoking, and post "No Smoking" and "No Open Flames" signs, in areas where flammable and combustible liquids, solvents, or adhesives are used, sprayed, or stored.



Definitions

Flammable (Explosive) Limits:

When vapors of a flammable or combustible liquid are mixed with air in the proper proportions in the presence of a source of ignition, rapid combustion or an explosion can occur. The proper proportion is called the **flammable range** and is also often referred to as the **explosive range**. The flammable range includes all concentrations of flammable vapor or gas in air, in which a flash will occur or a flame will travel if the mixture is ignited. There is a minimum concentration of vapor or gas in air below which propagation of flame does not occur on contact with a source of ignition. There is also a maximum proportion of vapor in air above which propagation of flame does not occur. These boundary-line mixtures of vapor with air are known as the **lower and upper flammable limits (LFL or UFL)** respectively, and they are usually expressed in terms of percentage by volume of vapor in air.

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