



PHOENIX FIRE CODE SUMMARY

Spray Finishing

REFERENCE FIRE CODE SECTION *Phoenix Fire Code* (2003 ed.), Chapter 15—"Flammable Finishes," Chapter 34, "Flammable & Combustible Liquids," and *NFPA 33*, "Spray Application Using Flammable or Combustible Materials."

SCOPE OF THIS FIRE CODE SUMMARY An explanation of the hazards associated with the application of flammable finishes and the code requirements for the installation of spray booths, spray rooms and spray areas.

HAZARDS OF SPRAY APPLICATION OF FLAMMABLE/COMBUSTIBLE FINISHES

Improper application of spray finishes using flammable/combustible liquids represents one of the most common violations observed by the Fire Department have the potential to pose a significant fire/explosion hazard when not performed in accordance with manufacturer's instructions, a "workman-like manner" and the Phoenix Fire and Building Codes. Woodworking shops and auto collision centers are the most common businesses that apply flammable finishes with a spray apparatus.

Most of the paint, lacquers, stains or varnishes and solvents used in spray operations are generally flammable or combustible liquids. They are heavier than air, can travel up to 35 feet and readily ignite when exposed to an ignition source. Examples of an ignition source include an ember from a nearby grinding operation, a spark from an electrical motor, or slag from a welding/cutting operation. Application of flammable finishes typically occurs in a spray booth, spray room or spray area.

COMMONLY USED HAZARDOUS MATERIALS

Most paints, lacquers, stains, varnishes, etc., are proprietary blends and generally flammable or combustible liquids. To determine the exact flammable properties of a specific product, consult the Material Safety Data Sheet (MSDS) from the manufacturer or supplier.

Solvents commonly used in flammable spray application include the following:

Chemical Name	CAS No.	PFC Classification	704 H	704 F	704 R
Acetone	67-64-1	Flammable Liquid I-B	2	3	0
Lacquer Thinner	MIX	Flammable Liquid I-B	2	3	0
Methyl Ethyl Ketone	78-93-3	Flammable Liquid I-B	2	3	0
Mineral Spirits	64742-88-7	Combustible Liquid II	3	2	0
Styrene Monomer	100-42-5	Flammable Liquid I-C	2	3	1
Urethane Thinner	000-372-0-0	Flammable Liquid I-B	3	3	0
Xylene	95-47-6	Flammable Liquid I-B	2	3	0

SUMMARY OF FIRE CODE REQUIREMENTS

Phoenix Fire Code Requirements. The following summarizes the requirements for applications of flammable finishes contained in the Phoenix Fire Code, Chapters 15 and 34 and NFPA 33. Flammable finishes are *material coatings in which the material being applied is a flammable liquid, combustible liquid or flammable or combustible gel coating.*

Protection from Ignition Sources

- ❑ Electrical wiring and equipment shall comply with the *Phoenix Electrical Code* (PFC 1503.2.1).
- ❑ Electrical wiring and equipment in spray spaces and vapor areas shall be of an explosion-proof type approved for use in such hazardous location (PFC 1503.2.1.1).
- ❑ Electrical wiring and equipment located outside of, but within 5 feet horizontally and 3 feet vertically of openings in a spray booth or a spray rooms shall be approved for the applicable hazard location (PFC 1503.2.1.4).
- ❑ Open flame and spark-producing devices shall be located at least 20 feet from spray spaces or vapor areas (PFC 1503.2.2).
- ❑ "NO SMOKING" signs shall be conspicuously posted in spray spaces or vapor areas (PFC 1503.2.6).

Exhaust Duct Termination

- ❑ The termination point for exhaust ducts discharging to the atmosphere shall be at least 30 feet from the property line, 10 feet from building openings and 6 feet from exterior walls and roofs. (PFC 1504.2.6).

Storage and Dispensing of Flammable/Combustible Liquids

- ❑ Pumps & hosing used to transfer Class I, II or IIIA liquids shall be approved or listed for flammable/combustible liquids (PFC 3405.1).
- ❑ Containers used in the transfer of Class I flammable liquids shall be properly grounded and bonded (PFC 3405.3.2).
- ❑ Rags soaked in flammable/combustible liquids shall be stored in approved metal waste cans equipped with self-closing lids and disposed of at least once daily (PFC 1503.4.3).
- ❑ An 80B rated fire extinguisher shall be placed not less than 10 feet nor more than 50 feet from a Class I or II liquid storage area (PFC 3404.3.7.5.2).
- ❑ An 80B rated fire extinguisher outside of, but no more than 10 feet from a liquid storage room (PFC 3404.3.7.5.2).

Fire Protection Features

- ❑ Spray booths and spray rooms, exhaust plenums, exhaust ducts and both sides of dry filters shall be protected by an approved automatic fire-extinguishing system (PFC 1504.6.1).
- ❑ Automatic fire-extinguishing systems shall be equipped with an interlock to stop spray operations and work piece conveyors upon discharge of the system (PFC 1504.6.2).
- ❑ Ventilation systems shall NOT be interlocked with the fire alarm system and shall remain in operation in a fire alarm condition (PFC 1504.6.3)
- ❑ A 40-B fire extinguisher shall be placed within 30 feet, or an 80-B fire extinguisher shall be placed within 50 feet, of the spray booth or area (PFC 1504.6.4).
- ❑ Fire extinguishers shall be conspicuously located, unobstructed and unobscured (PFC 906.6).
- ❑ Sprinkler heads in spraying areas shall be protected from accumulation of residue. In addition, sprinkler heads contaminated by overspray shall be replaced (PFC 1504.6.1).

Maintenance of Spray Booth Safety Features

- ❑ Mechanical ventilation shall be kept in operation at all times while spraying operations are being conducted and for a sufficient time thereafter to allow finishes to be exhausted (PFC 1504.2.1).
- ❑ Spraying equipment shall be interlocked such that spraying operation cannot be conducted unless the ventilation system is in operation (PFC 1504.2.1).
- ❑ Ventilation systems shall be maintained such that the average air velocity shall be greater than 100 feet per minute (PFC 1504.2.3).
- ❑ Glass panels shall be of heat-treated glass, wired glass or hammered-wire glass (PFC 1504.5.1).
- ❑ Light fixtures attached to the walls or ceiling of a spraying area, but which are outside of any classified areas are separated by vapor tight glass panels (PFC 1504.5.2).

Heated Spray Booths

- ❑ Spray booths with integral drying apparatus shall be listed (PFC 1504.7.2).
- ❑ The spraying and drying apparatus, and the ventilation system shall be equipped with interlocks to (PFC 1504.7.2.1):
 - Prevent the spraying apparatus from operating while drying is in progress.
 - Purge spray vapors from for at least 3 minutes before drying apparatus can function.
 - Shut off the drying apparatus automatically if the air temperature in the booth exceeds 200°F.
 - Shut off drying apparatus in the event of a ventilation system failure.

Solvent Distillation Units

- ❑ A solvent distillation unit placed indoors must be located at least 8 feet from any ignition sources. This classified area also extends 3 feet about the floor and out to 25 feet horizontally. (PFC Table 3403.1.1)
- ❑ A solvent distillation unit placed outdoors must be located at least 8 feet from any ignition sources. This classified area also extends 3 feet about the floor and out to 10 feet horizontally. (PFC Table 3403.1.1)
- ❑ Solvent distillation units with a capacity of 60 gallons or less shall be listed, labeled and installed in accordance PFC 3405.4 and UL 2208 (PFC 3405.4.1).
- ❑ A portable fire extinguisher having a rating of at least 40-B shall be located no closer than 10 feet and no farther than 30 feet from the solvent distillation unit. (PFC 3405.4.9).
- ❑ Solvent distillation units shall be used in locations in accordance with its listing (PFC 3405.4.6).

REQUIRED FIRE CODE PERMITS AND FEES

The following Fire Departments permits are required:

- ❑ **Flammable Finishes (PFC 105.7.12)**: A construction permit is required to install or modify a spray booth, spray room or spray area. Permit Fee To Install: \$575.00. Permit Fee to Modify: \$225.00.
- ❑ **Flammable Finishes (PFC 105.6.16)**: An operating permit is required to apply flammable finishes. Permit Fee: \$135.00.

- ❑ **Hazardous Materials Above Permit Quantity:** If the quantity of hazardous materials in storage/use/handling exceeds the permit quantity listed in PFC Table 4607.1, an additional operational permit is required. The permit quantity for flammable/combustible liquids common to flammable/combustible liquid spray operations include:
 - Class I-A Flammable Liquids 10 gallons
 - Class I-B & I-C Flammable Liquids (combined) 30 gallons
 - Class II Combustible Liquids 60 gallons
 - Class IIIA Combustible Liquids 60 gallons
- ❑ **Fire Suppression System (IFC 105.7.10):** A construction permit is required for installation or modification of any fire protection system or automatic sprinkler system.

OTHER REQUIREMENTS

The following additional requirements may apply:

- ❑ **Hazardous Material Permit Application:** A Hazardous Materials Permit Application, a Hazardous Materials Inventory Statement (HMIS) and a Site Plan must be submitted to the Special Hazards Unit of the Phoenix Fire Department (PFC 2701.5.2). An Annual Assessment Fee will be levied once the Permit Application/HMIS has been evaluated by the Special Hazards Unit (PFC 105.8.1).
- ❑ **Plumbing/Electrical/Mechanical/Structural Permit:** Installation of a spray booth, spray area or spray room requires a construction permit from the Development Services Department. Submit two sets of plans. Each set should include a site plan, floor plan and structural/ mechanical/ plumbing electrical details as required. A copy of the Hazardous Material Inventory Statement (HMIS) should be included. Permit fee is based on project valuation. See Development Services Fee Schedule at http://phoenix.gov/DEVSERV/fee_schedule.pdf.
- ❑ **Zoning:** For city site planning and zoning regulations, go to the Site Planning Section, Development Services Department, 200 W. Washington, 2nd Floor, Counter 6.
- ❑ **Certificate of Occupancy:** To change, establish or re-establish the occupancy of a building, go to the Building Safety Section, Development Services Department, 200 W. Washington, 2nd floor, Counter 5.
- ❑ **Solvent distillation units** used in conjunction with spray booths, spray room or spray area require the following:
 - **Flammable Liquids:** If more than 10 gallons of Class 1-A or 30 gallons of Class 1-B or 1-C flammable liquid is used, a Fire Department operating permit is required (PFC 105.5.14.1).
 - **Development Services Department:** An over-the-counter installation permit from the Development Services Department is required to install a solvent distillation unit. Permit fee is based on project valuation, See Development Services Fee Schedule at http://phoenix.gov/DEVSERV/fee_schedule.pdf.

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