



MILPITAS FIRE DEPARTMENT
FIRE PREVENTION DIVISION

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**FLAMMABLE/COMBUSTIBLE LIQUID SPRAY BOOTH
INSTALLATION**

PERMITS

1. Installation permit
2. Fixed extinguishing system or automatic sprinkler system permit to be obtained by the installer prior to system installation
Spraying/Dipping.
3. Hazardous Materials (Range and/or Level).

SPRAY BOOTH OR ROOM CONSTRUCTION

Verify:

4. With the exception of automobile undercoating operations, limited spraying areas or resin application areas used for the manufacturing of reinforced plastics, spray room operations located in A, E, I, or R occupancies are located in a spray room protected with an approved sprinkler system and separated from other areas by construction.
5. Floors for spray room or booth are noncombustible or covered with a non-sparking material.
6. The booth is constructed of steel not less than .0478-inch (18 gauge) and for two-layer metal assemblies each sheet is not less than .0359-inch (20 gage).

7. Interior surfaces are smooth.
8. Aluminum shall not be used for interior surfaces of spray booths or rooms.
9. Pre-manufactured spray booth exit doors shall have a minimum width of 30 inches and minimum height of 80 inches.
10. The booth shall be separated at least 3 ft. from other operations and construction unless the booth is adjacent to a 1-hour fire-resistive wall or a noncombustible exterior wall.
11. The aggregate square footage for multiple booths does not exceed 10 percent of the floor area or the basic area allowed for a Group H-2 occupancy. The area of a single spray booth shall not exceed 1,500 sq. feet.

ELECTRICAL EQUIPMENT AND WIRING

Verify:

12. Spray spaces and vapor areas have wiring and equipment designed for hazardous (classified) locations. Such locations are Class I, Division 1 or Class II, Division I locations.
13. Electrical wiring and equipment outside of but within 5 ft. horizontally and 3 ft. vertically of openings in a spray booth or a spray room shall be approved for Class I, Division 1 or Class II, Division I locations.
14. The lighting through glass panels or other transparent materials is fixed and protected by heat treated or wired glass, and any integral luminaires are listed for Class I, Division 2 or Class II, Division 2 locations.
15. Luminaires located outside of the spray booth shall be equipped with vapor tight seals. Exterior luminaires shall be listed for ordinary hazard locations.

MECHANICAL VENTILATION

Verify:

16. Spray area ventilation is designed to be on at all times during spraying and for a period of time after spraying.

17. Spray equipment is interlocked with ventilation such that spraying can not occur unless ventilation is operating.

18. Air exhausted from a spray area shall be not recirculated unless the spraying operation occurs in a unmanned spray area, solid particulates are removed, the atmosphere in the spray area is maintained at less than 25 percent of the lower flammable limit, approved equipment is provided to monitor the vapor concentration and in the event the LFL is $> 25\%$, and alarm is transmitted an alarm and shuts down the automatic spraying operation. In occupied booths recirculation is permitted when all of the requirements of 1504.7.2 are satisfied and documentation is provided demonstrating the atmosphere does not pose a life safety hazard to personnel inside of the spray booth, room, or area.

19. The ventilation design provides a minimum airflow velocity of 100 linear feet/minute (FPM) measured using the cross-sectional area of the spray booth.

20. Each booth and spray room have an independent exhaust duct system discharging outside unless multiple booths with a combined frontal area does not exceed 18 sq. ft. and if more than 1 fan serves one booth, fans are interconnected to operate simultaneously.

21. Ducts conveying flammable vapors are terminated 30 ft. from the property line, 10 ft. from openings, 6 ft. from walls and roofs, 30 ft. from combustible walls or openings into buildings which are in the direction of the exhaust discharge, and 10 ft. above grade.

22. Details of exhaust duct doors, panels, or other means that permit inspection, maintenance, cleaning or access to fire protection devices are provided.

23. Other product conveying outlets terminate 10 ft. from the property line, 10 ft. from openings, 3 ft. from walls and roofs, and 10 ft. above grade.

24. Fan motor locations are detailed and verify the motors are not inside the booth or duct and spec sheets are provided verifying fans are nonferrous or nonsparking.

25. Air intake filters that are part of a wall or ceiling assembly are listed as Class I or II in accordance with UL 900. Equipment data sheets are provided.

26. Filter supports are of noncombustible materials.

27. Gauges and alarm locations for ensuring air velocity are maintained, and detailed.

28. Booths using automatic dry filter rolls shall advance the filter when the air velocity is less than 100 lineal feet/minute. If the automatic filter roll fails to advance the spray operation shall shutdown.

FIRE PROTECTION

Verify:

29. Booths, exhaust ducts, and both sides of dry filters shall be protected by a fire-extinguishing system.

30. If automatic sprinkler protection is used, the sprinklers shall be protected from residue.

31. Fire protection systems protecting automated spray operations shall be interlocked to stop the spray operations and workpiece conveyors serving the flammable vapor areas. If provided, activation of the fire protection system shall activate the fire alarm system.

32. Each automated spray operation shall be equipped with a manual fire alarm and emergency shutdown station.

33. Air makeup and spraying area exhaust systems shall not be interlocked with the fire alarm system and remain operational during a fire alarm condition.

34. The size and placement of portable fire extinguishers shall be based on the requirements for an extra (high) hazard occupancy.

SPRAY BOOTHS OR ROOMS WITH DRYING OPERATIONS

Verify:

35. Spraying equipment, drying apparatus, and ventilating system are equipped with interlocks to:

- A. prevent spraying while drying.
- B. purge spray vapors 3 minutes before drying.
- C. cause drying shutdown on ventilation failure.
- D. cause drying shutdown when booth exceeds 2000F.

36. In spray booths or rooms equipped with drying apparatus, the spray applicable shall be limited to low volume spraying equipment.

STORAGE, HANDLING AND USE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS

Verify:

37. The container sizes (closed type or provided with covers) that supply spray nozzles shall be limited to individual volume of 10 gallons.

38. Bonding shall be provided when transferring flammable liquids from one container to another.

39. Piping systems for Class I and II liquids shall be permanently grounded.

40. Class I liquids used for cleaning shall be used in equipment listed and approved for such purposes. When Class I liquids are used for cleaning spray nozzles and equipment, the spray booth or room ventilation system shall be operated.

POWDER COATING

41. Unless powder coating is performed in a listed spray booth assembly, powder coating shall be performed in a ventilated enclosed room or booth constructed of noncombustible materials or in a room designed.

42. An approved automatic fire-extinguisher systems shall be provided in powder coating areas.

43. Automated powder application equipment shall be equipped with a supervised flame detection device that responds to an open flame within 0.5 second. Activation of the flame detection shall: 1) shut down electrical power and compressed air to the conveyor, ventilation system, and the powder coating equipment, 2) close segregation dampers in ductwork, 3) activate an audible alarm in the powder coating room or booth. Plans and equipment data sheets for the flame detection system shall be submitted.

44. Ventilation is designed to maintain the atmosphere less than 50 percent of the minimum explosive concentration of the dry powder. Plans should include the material data sheets for the powder(s) that will be applied and the ventilation design data.

45. The size and placement of portable fire extinguishers shall be based on the requirements for an extra (high) hazard occupancy.

ELECTROSTATIC APPARATUS

46. With the exception of high-voltage grids, electrostatic atomizing heads and connections to the atomizing heads, transformers, power packs, and control apparatus shall be located outside of the spraying or vapor areas or the installed equipment shall comply with the hazardous (classified).

47. Electrodes and electrostatic atomizing heads shall be insulated from ground.

48. Sufficient detail shall be provided that demonstrates a minimum clearance of 2 times the sparking distance is provided between materials

being coated and electrodes, electrostatic spraying heard or their conductors. A sign indicating the minimum required separation distance shall be conspicuously posted.

49. Electrostatic equipment shall be equipped with automatic shutdown without time delay designed to disconnect the power supply to the high-voltage transformer and signal the operator when the ventilation system fails or stops, the conveyor carrying articles stop past the high voltage grid, when an occurrence of a ground or imminent ground at any point can occur in the high-voltage system, or when the required clearance specified.

50. Hand electrostatic equipment shall be interlocked such that the equipment will not operate unless ventilation is in operation.

51. For automated liquid electrostatic spraying a supervised flame detection system. Within 0.5 seconds of activation the flame detection system shall:

- 1) activate a local alarm. If so equipped, activation of the flame detection system in a building equipped with a fire alarm system shall activate alarm signals throughout the building
- 2) stop the liquid coating material delivery system,
- 3) terminate spray operations,
- 4) stop conveyors into and out of the flammable vapor area,
- 5) disconnect power to high-voltage elements in the spray area and the system.

Plans shall be submitted.

52. Detailed are the locations of the signs to:

- 1) designate the process zone as dangerous,
- 2) identify grounding requirements for all electrically conductive objects in the spray area, including persons,
- 3) restrict access to qualified persons only.