



FIRE DEPARTMENT

Spray Finishing - 2018 IFC

Date of Review		Permit Number	
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Business/Bldg. Name		Address of Project	
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Designer Name		Designer's Phone	
Designer's Fax		Designer's Email	

Worksheet Legend: or OK = acceptable **N** = need to provide, **NA** = not applicable

The Following Information Shall be Submitted for Review:

1.		Digital plans are provided.
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2.		Manufacturers' drawings and datasheets are provided for pre-manufactured booths.
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3.		No Smoking" signs are provided IFC 2403.2.6.
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4.		"No Welding" signs are provided, IFC 2403.2.7.
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Spray Booth or Room Construction:

5.		Except for 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 specified in the IBC.
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6.		Floors for spray room or booth are noncombustible or covered with a non-sparking material, IFC 2404.3.2 & 2404.3.3.3.
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7.		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 gages), IFC 2404.3.3.1.
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8.		Interior surfaces are smooth, IFC 2404.3.2.
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9.		Aluminum shall not be used for interior surfaces of spray booths or rooms, IFC 2404.3.3.1.
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10.		Premanufactured spray booth exit doors shall have a minimum width of 30 in. and a minimum height of 80 in., IFC 2404.3.2.4. Spray room exits comply with IBC Chapter 10.
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11.		The booth shall be separated at least 3 ft. from other operations and construction unless the booth is
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		adjacent to a 1-hour fire-resistive wall or a noncombustible exterior wall, IFC 2404.3.3.4.
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12.		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. ft., IFC 2404.3.3.6.
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Electrical Equipment and Wiring (NFPA 70):

13.		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, IFC 2403.2.1.
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14.		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, IFC 2403.2.1.3.
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15.		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, IFC 2404.6.2.3.
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16.		Luminaires located outside of the spray booth shall be equipped with vapor-tight seals. Exterior luminaires shall be listed for ordinary hazard locations, IFC 2404.6.2.2
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Mechanical Ventilation:

17.		Spray area ventilation is designed to be on at all times during spraying and for a period of time after spraying, IFC 2404.7 and IMC.
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18.		Spray equipment is interlocked with ventilation such that spraying cannot occur unless ventilation is operating, IFC 2404.8 and IMC.
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19.		Air exhausted from a spray area shall be not recirculated unless the spraying operation occurs in an 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 atmosphere exceeds 25% of the lower flammable limit an alarm is transmitted and spraying activities are stopped, IFC 2404.7.3. In occupied booths recirculation is permitted when all of the requirements of 2404.7.3.1 & 2404.7.3.2 are satisfied, and documentation is provided demonstrating the atmosphere does not pose a life safety hazard to personnel inside spraying space.
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20.		Open-face or open-front spray booth shall be designed, installed & maintained so that the average air velocity into the spray booth through all openings is not less than 100 feet per minute. Exception: for fixed or automated electrostatic spray application equipment, the average air velocity into the spray booth through all openings shall be not less than 50 feet per minute. 2404.7.3.1
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21.		Each booth and spray room have an independent exhaust duct system discharging outside unless multiple booths with a combined frontal area do not exceed 18 sq. ft. and if more than 1 fan serves one booth, fans are interconnected to operate simultaneously IFC 2404.7.5.
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22.		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
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		direction of the exhaust discharge, and 10 ft. above grade, IFC 2404.7.6.
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23.		Details of exhaust duct doors, panels, or other means that permit inspection, maintenance, cleaning, or access to fire protection devices are provided, NFPA 33, 7.9.
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24.		Other products conveying outlets terminate 10 ft. from the property line, 10 ft. from openings, 3 ft. from walls and roofs, and 10 ft. above grade, IFC 2404.7.6.
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25.		Fan motor and belt locations are detailed and verify the motors are not inside the booth or duct and spec sheets are provided verifying fans are nonferrous or non-sparking, Belts shall not enter the duct or booth unless the belt and pulley within are tightly enclosed IFC 2404.7.7.
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26.		Air intake filters that are part of a wall or ceiling assembly are listed as Class I or II in accordance with UL 900. Exhaust filters shall be required. Equipment data sheets are provided IFC 2404.7.8.
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27.		Filter supports are of noncombustible materials, IFC 2404.7.8.1.
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28.		Gauges and alarm locations for ensuring air velocity are maintained, and detailed, IFC 2404.7.8.3
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29.		Booths using automatic dry filter rolls shall advance the filter when the air velocity is less than 100 linear feet/minute. If the automatic filter roll fails to advance the spray operation shall shut down, IFC 2404.7.8.4.
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Fire Protection:

30.		Booths, exhaust ducts, and both sides of dry filters shall be protected by a fire-extinguishing system, IFC 2404.4.
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31.		If automatic sprinkler protection is used, the sprinklers shall be protected from the residue, IFC 2404.5.2.
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32.		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, IFC 2404.6.1.2.1
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33.		Each automated spray operation shall be equipped with a manual fire alarm and emergency shutdown station, IFC 2404.8.1.1. No less than one manual fire alarm & emergency shutdown station shall be provided with ready access for operating personnel 2404.8.1.2
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34.		Air makeup and spraying area exhaust systems shall not be interlocked with the fire alarm system and remain operational during a fire alarm condition, IFC 2404.8.2.
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35.		The size and placement of portable fire extinguishers shall be based on the requirements for an extra (high) hazard occupancy, IFC 2404.4.1, IFC 906.3.
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Spray Booths or Rooms with Drying Operations:

36.		Spraying equipment, drying apparatus, and ventilating systems are equipped with interlocks to (IFC 2404.6.1.2.1) _____ A. prevent spraying while drying.
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		<p>_____ B. purge spray vapors 3 minutes before drying.</p> <p>_____ C. cause drying shutdown on ventilation failure.</p> <p>_____ D. causes drying shutdown when booth exceeds 200°F.</p>
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37.		In spray booths or rooms equipped with drying apparatus, spray apparatus shall be limited to the low volume type of equipment, IFC 2404.6.1.1.
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Storage, Handling, and Use of Flammable and Combustible Liquids:

38.		The container sizes (closed type or provided with covers) that supply spray nozzles shall be limited to an individual volume of 10 gallons, IFC 2403.3.1.
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39		Metal parts of spray booths, exhaust ducts, and piping systems conveying Class I or II liquids shall be electrically grounded in accordance with NFPA 70. Metallic parts located in resin application areas, including but not limited to exhaust ducts, ventilation fans, spray application equipment, workpieces, and piping shall be electrically grounded. IFC 2403.2.5
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40.		Piping systems for Class I and II liquids shall be permanently grounded, IFC2403.2.5
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41.		Class I liquids used for cleaning shall be used in the equipment listed and approved for such purposes in accordance with the requirements in Section IFC 2403.3.5. When Class I liquids are used for cleaning spray nozzles and equipment, the spray booth or room ventilation system shall be operated, IFC 2403.3.5.2.
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Dipping Operations:

42.		Construction of Dip Tanks shall be constructed in accordance with Section 2405.3.1 through 2405.3.4.3 and NFPA 34. Dip tanks, including drain boards, shall be of heavy metal, reinforced concrete, or masonry. IFC 2405.3
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43.		Dip Tanks operations conducted in buildings used for Group A, I, or R occupancies shall be in a room designed for that purpose, equipped with an approved automatic sprinkler system and separated vertically from other areas in accordance with the IBC
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44.		Protection against the accumulation of vapors, self-ignition, and excessive-high temperatures shall be provided for dipping liquids that are heated directly or heated by the surface of the object being dipped.
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45.		<p>An approved automatic fire extinguishing system or dip tank cover in accordance with Section 2405.4 shall be provided.</p> <ol style="list-style-type: none"> 1. Dip tanks less than 150 gallons or 10 sq. ft. in liquid surface area 2. Liquids with a flashpoint below 110 F, IFC 2405.4.1
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46.		An approved automatic fire extinguishing system designed in accordance with NFPA 34 shall be provided for tanks with a 150-gallon capacity or more or 10 sq. ft. or larger in liquid surface area. IFC 2405.4.1.1
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47.		The size and placement of portable fire extinguishers shall be based on the requirements for an extra (high) hazard occupancy, IFC 2405.4.2 and Section 906
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48.		Flammable vapor areas shall be provided with mechanical ventilation. Required ventilation systems shall be arranged such that the failure of any fan shall automatically stop the dipping conveyor system.
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49.		Dip tanks utilizing a conveyor system shall be arranged such that in the case of a fire, the conveyor shall
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		automatically stop, and the required tank drains shall open.
50.		Hardening and tempering tanks shall comply with Section 2405.3 through 2405.3.3, 2405.4.2 & 2405.8, but shall be exempt from other provisions of Section 2405.
51.		Hardening and temping tanks shall be located as far as possible from furnaces and shall not be located near combustible floors. IFC 2405.9.1
52.		Hardening and temping tanks shall be provided with noncombustible hoods. Vent ducts shall be treated as flues and proper clearances shall be maintained. IFC 2405.9.2
53.		Hardening and temping tanks shall be equipped with a high temp. limit switch arranged to sound an alarm when the temp of the quenching medium reaches 50 F below the flash point. IFC 2405.9.3
54.		Harding and temping tanks greater than 500 gallons or 25 square feet in liquid area shall be equipped by an approved automatic fire extinguishing system complying with Chapter 9. 2405.9.4
55.		Air under pressure shall not be used to fill or agitate oil in tanks. 2405.9.5

Powder Coating:

56.		Powder coating using finely ground particles of protective finishing material applied in dry powder form by a fluidized bed, an electrostatic bed, powder spray guns, or electrostatic powder spray guns shall comply with Sections 2406.2 through 2406.7. In addition, Section 2407 shall apply to fixed electrooptic equipment used in powder coating operations.
57.		An approved automatic fire-extinguisher system shall be provided in powder coating areas in accordance with Chapter 9, IFC 2406.4.
58.		Automated powder application equipment shall be equipped with a supervised flame detection device that responds to an open flame within 0.5 seconds. Activation of the flame detection shall: 1) Shut down electrical power and compressed air to the conveyor, ventilation system, and powder coating equipment. 2) Close segregation dampers in ductwork. 3) Activate an audible alarm in the powder coating room or booth, IFC 2406.4.1. Plans and equipment datasheets for the flame detection system shall be submitted in accordance with IFC Section 907.1.1.
59.		Ventilation is designed to maintain the atmosphere less than 50 percent of the minimum explosive concentration of the material being applied. Plans should include the material data sheets for the powder(s) that will be applied and the ventilation design data, IFC 2406.7.
60.		The size and placement of portable fire extinguishers shall be based on the requirements for an extra (high) hazard occupancy, IFC 2406.4.2, 906.3.

Electrostatic Apparatus:

61.		Barriers. Booths, fencing, railings, or guards shall be placed about the equipment such that either by location or character or both, isolation of the process is maintained from plant storage and personnel. Railings, fencing, and guards shall be of conductive material, adequately grounded, and not less than 5 feet from processing equipment. IFC 2407.3.1
62.		Electrodes and electrostatic atomizing heads shall be insulated from the ground, 2407.3.

63.	Sufficient detail shall be provided that demonstrates a minimum clearance of 2 times the sparking distance is provided between materials being coated and electrodes, the spraying nozzle, and its conductors. A sign indicating the minimum required separation distance shall be conspicuously posted IFC 2407.2.
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64.	Electrostatic equipment shall be equipped with automatic shutdown designed to disconnect the power supply to the high-voltage transformer and signal the operator when the ventilation system fails, the conveyor carrying articles stops past the high voltage grid, when an occurrence of ground or imminent ground at any point can occur in the high-voltage system, or when the required clearance specified in Section 2407.2 is reduced, 2407.8.
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65.	Hand electrostatic equipment shall be interlocked such that the equipment will not operate unless ventilation is in operation, IFC 2407.9.
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66.	<p>Automated liquid electrostatic spraying shall be equipped with a supervised flame detection system. Within 0.5 seconds of activation the flame detection system shall:</p> <ol style="list-style-type: none"> 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, <p>IFC 2407.4.1 Plans shall be submitted in accordance with Section 907.1.1.</p>
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67.	<p>Detailed are the locations of the signs to:</p> <ol style="list-style-type: none"> 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, IFC 2407.5.2.
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Additional Comments:

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Review/Inspection Date: 00/00/00 [] Approved or [] Unapproved FD
 Reviewer: FM Gabriel Hammett