

Ontario Fire Code

SECTION 5.12

SPRAY APPLICATIONS USING FLAMMABLE AND COMBUSTIBLE MATERIALS

Illustrated Commentary



***Office of the
Ontario
Fire Marshal***

5.12.1. Location

- 5.12.1.1. Spray operations shall be separated from the remainder of the **building** in conformance with the **Building Code**, where applicable.

A spray operation using a flammable or combustible liquid, or combustible dusts is recognised by the Building Code as being a Group F, Division 1, *High Hazard Industrial* occupancy.

Spray operations that are major occupancies must be fire separated from the remainder of the building in conformance with the Building Code. (Major occupancy means the principal occupancy for which a building or part thereof is used or intended to be used, and includes the subsidiary occupancies that are an integral part of the principal occupancy.)

The fire separation is intended to protect other occupancies from a fire occurring in the high hazard industrial occupancy.

The Building Code requires a Group F, Division 1 major occupancy to be fire separated from Group F, Division 2 and 3 major occupancies by a fire separation having a 2 hour fire-resistance rating. The Building Code also requires a Group F, Division 1 major occupancy to be fire separated from Group D, *business and personal service* major occupancies and Group E, *mercantile* major occupancies by a fire separation having a 3 hour fire-resistance rating.

Where the spraying operation is subsidiary to the major occupancy, a fire separation is not required. For example a spray finishing operation in a furniture manufacturing plant is not required to be fire separated from the remainder of the building.

Major Occupancy	Minimum Fire-Resistance Rating of Fire Separation				
	Adjoining Major Occupancy				
	D	E	F1	F2	F3
F1	3	3	-	2	2

NOTE: Article 2.1.2.3. prohibits a Group F, Division 1 major occupancy in a building containing any group A, B or C occupancy.

Building means any structure used or intended for supporting or sheltering any use or occupancy.

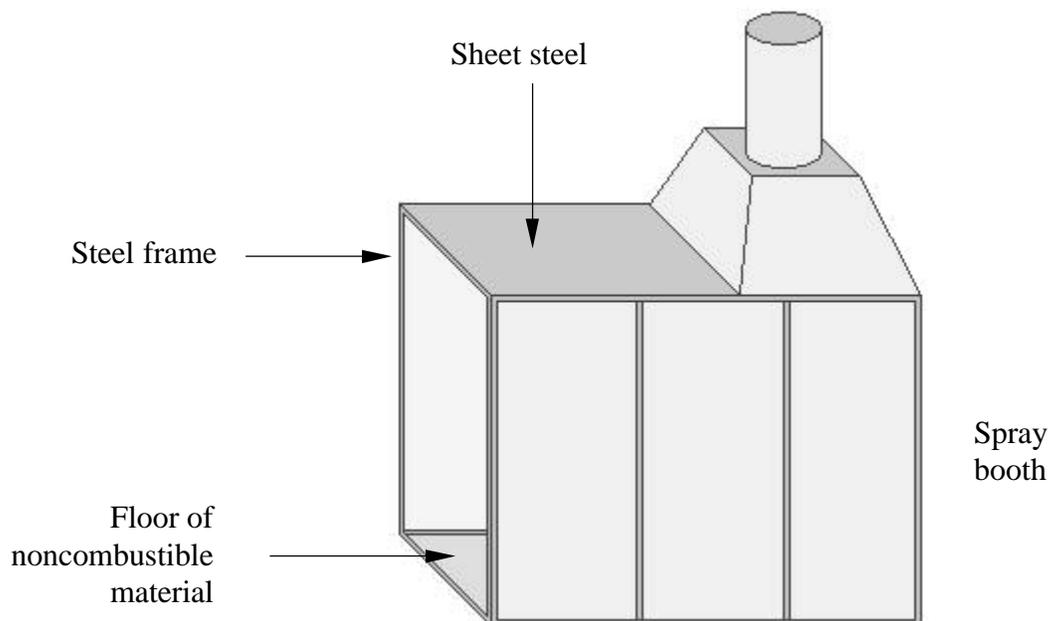
Building Code means the Ontario Building Code made under the Building Code Act or a predecessor to that Act.

5.12.2. Construction
General

- 5.12.2.1.(1) A **spray booth** shall consist of a steel frame covered with sheet steel having a minimum thickness of 1.14 mm, or be of equivalent **noncombustible construction**.
- (2) The interior surfaces of a **spray booth** shall be smooth and continuous.
- (3) The floor of a **spray booth** and the operator's working area shall be of noncombustible materials.

The intent of Sentence (1) and (3) is to limit the combustible loading of the spray booth and to reduce the risk of a fire in the spray area spreading to other parts of the building. Sentence (1) also specifies the minimum steel thickness required in order to avoid premature collapse of the spray booth under fire conditions.

The intent of Sentence (2) is to minimize accumulation of combustible overspray residues by requiring the surfaces to be clean.



Noncombustible construction means that type of construction in which a degree of fire safety is attained by the use of noncombustible materials for structural members and other building assemblies.

Spray Booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.2. Construction

Baffle plates

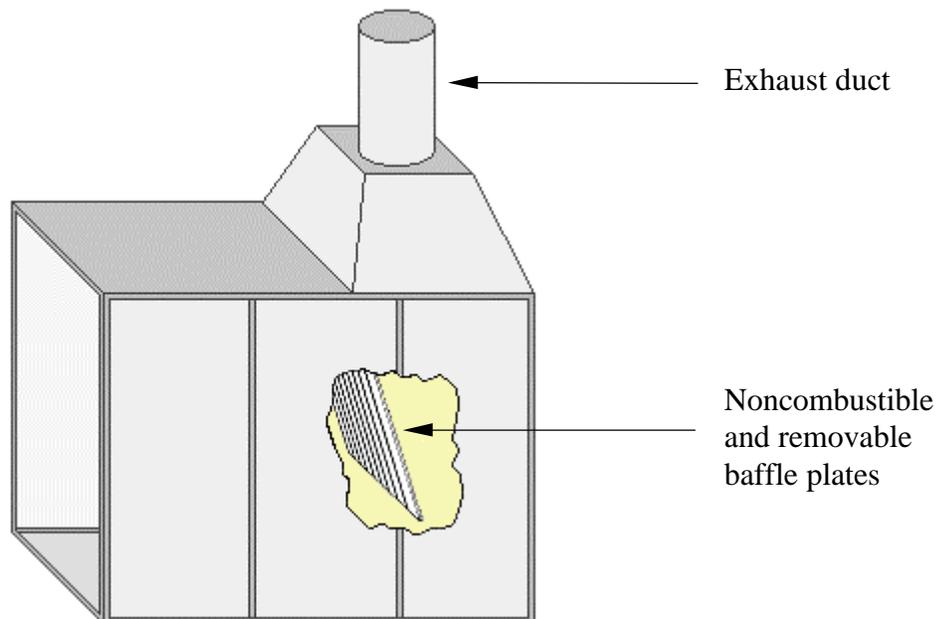
- 5.12.2.2.(1) **Spray booth** baffle plates shall be of noncombustible material and be removeable or arranged to facilitate cleaning.
- (2) **Spray booth** baffle plates shall not be located in exhaust ducts.

Sentence (1) is intended to reduce the risk of fire in dry-type spray booths by:

- limiting the combustible content of the booth components, and
- ensuring baffle plates are accessible so that combustible overspray residues may be cleaned.

The intent of Sentence (2) is to:

- avoid obstructions in the ventilation system that could reduce the system's exhaust capacity,
- prevent an accumulation of spray residue that would enable fire to spread from the spray area to other parts of the building or to the building exterior (via the roof), and
- prevent the creation of a vapour cloud that could explode in presence of an ignition source.



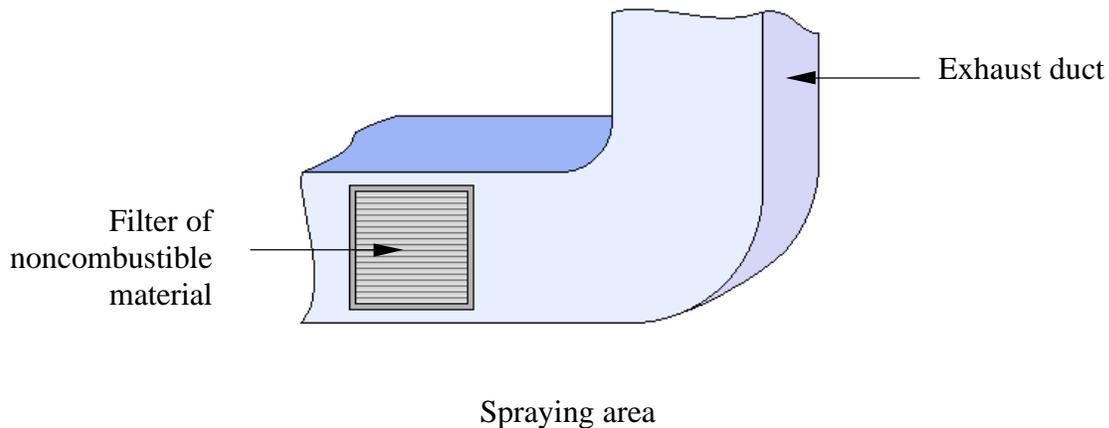
Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.2. Construction

Filters in ducts

- 5.12.2.3. Filters in ducts used to ventilate **spraying areas** shall be made from noncombustible material or have a rate of combustibility no greater than Class 2 filters conforming to CAN4-S111, "Standard Method of Fire Tests for Air Filter Units".

Limiting the combustible content of filters in the exhaust ducts is intended to reduce the possibility of the filters contributing to a fire.



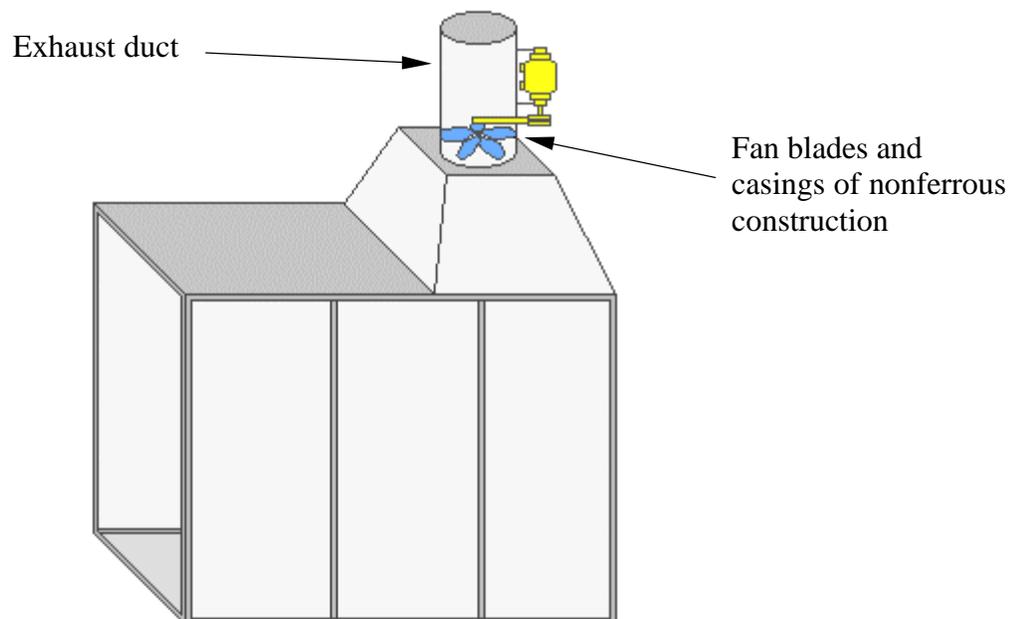
Spraying area means the area that is within 6 m of a spray boot or spraying operation and that is not separated therefrom by a vapour-tight separation.

5.12.2. Construction

Fan blades and casings

- 5.12.2.4.(1) Except as permitted in Sentence (2), fan blades and casings in exhaust blowers for **spray booths** shall be nonferrous.
- (2) Ferrous material for the fan blades and casings may be **approved** if the exhaust blower is designed, constructed and maintained to prevent two ferrous parts from rubbing or striking each other under all operating conditions.

Fan blades and casings made of ferrous material can generate mechanical sparks if they rub or strike each other. This in turn can ignite combustible spray residues, explosive vapours or mists and cause a fire or explosion.



Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

Approved means approved by the **Chief Fire Official**.

5.12.3. Ventilation

Ventilation

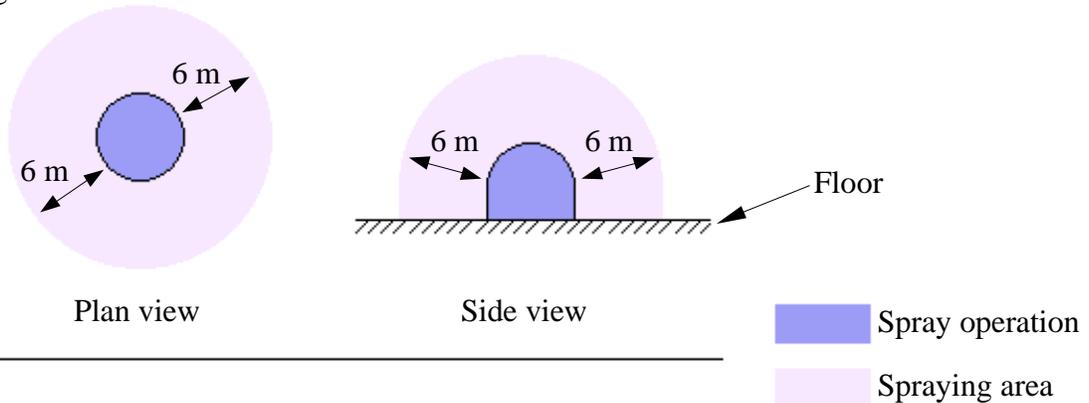
- 5.12.3.1. Ventilation shall be provided in all **spraying areas** to maintain the concentration of flammable vapours and **combustible dusts** at or below 25 per cent of their **lower explosive limit**.

The intent of this Article is to avoid accumulation of flammable vapours and combustible dusts in areas where sources of ignition could ignite them.

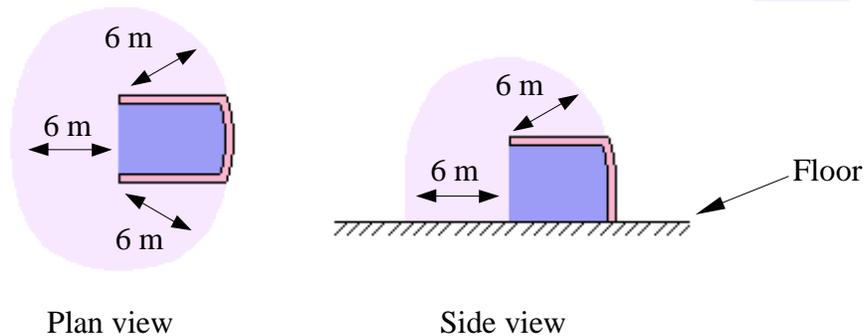
Mechanical ventilation is provided to:

- remove combustible overspray residues or ignitable concentrations of vapours or mists,
- prevent overspray to areas outside of the spraying area, and
- reduce the risk of vapour clouds igniting and flashing back into spray area.

Open spraying area



Spray booth



Combustible dust means dust and particles ignitable and liable to explode when mixed with air.

Lower explosive limit means the minimum concentration of vapour in air at which the propagation of flame occurs on contact with a source of ignition.

Spraying area means the area that is within 6 m of a spray booth or spraying operation and that is not separated therefrom by a vapour-tight separation.

5.12.3. Ventilation

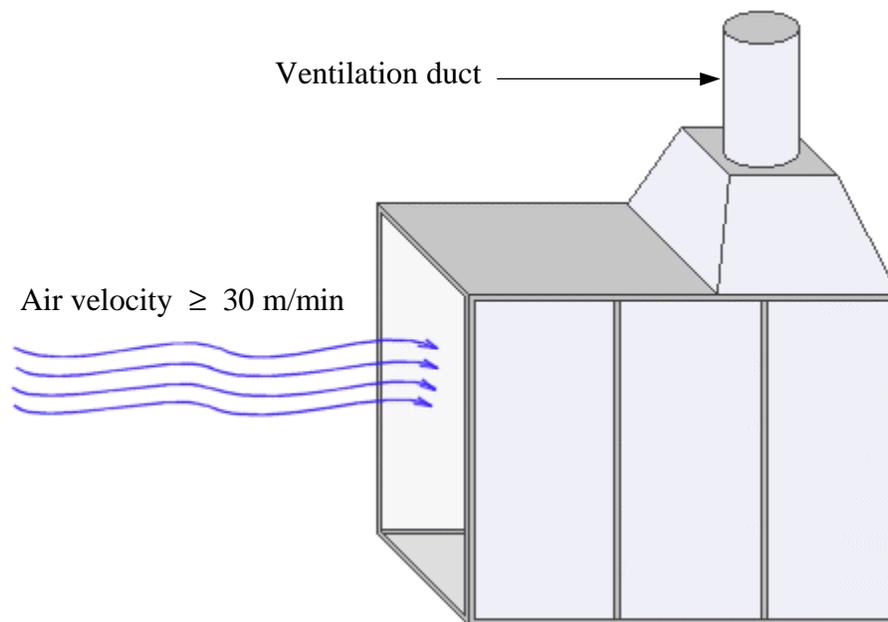
Air velocity

5.12.3.2. Except as provided in Article 5.12.3.3., the exhaust air velocity at the face of the **spray booth** shall be at least 30 m/min.

The intent of this Article is to avoid accumulations of combustible overspray residues or ignitable concentrations of vapours or mists in areas where sources of ignition could generate a fire or explosion.

A minimum exhaust air velocity of 30 m/min is required at the face of any spray booth (except electrostatic-type spray booths) in order to:

- prevent overspray to areas outside of the spraying area,
- remove combustible overspray residues or ignitable concentrations of vapours or mists,
- reduce the risk of vapour clouds igniting and flashing back into spray areas.



Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.3. Ventilation

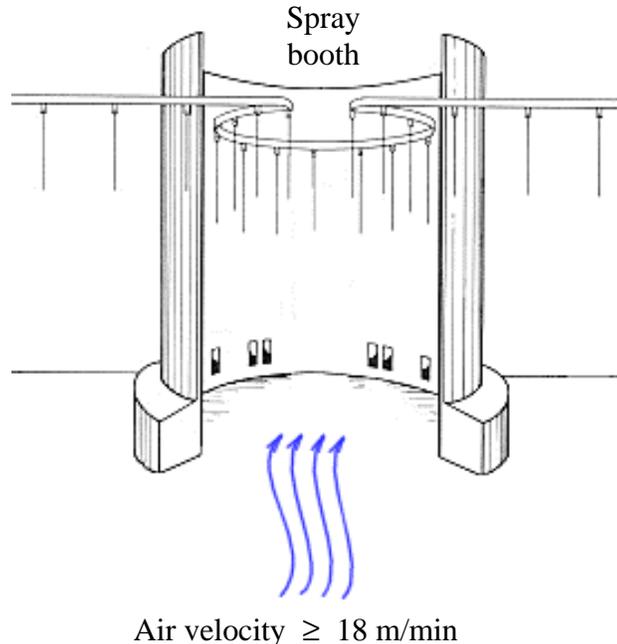
Air velocity

5.12.3.3. Electrostatic spraying shall have an exhaust air velocity of at least 18 m/min at the face of the **spray booth**.

The intent of this Article is to avoid accumulation of combustible overspray residues or ignitable concentrations of vapours or mists in areas where sources of ignition could generate a fire or explosion.

A minimum exhaust air velocity of 18 m/min is required at the face of electrostatic-type spray booths in order to:

- prevent overspray to areas outside of the spraying area,
- remove combustible overspray residues or ignitable concentrations of vapours or mists,
- reduce the risk of vapour clouds igniting and flashing back into spray areas.

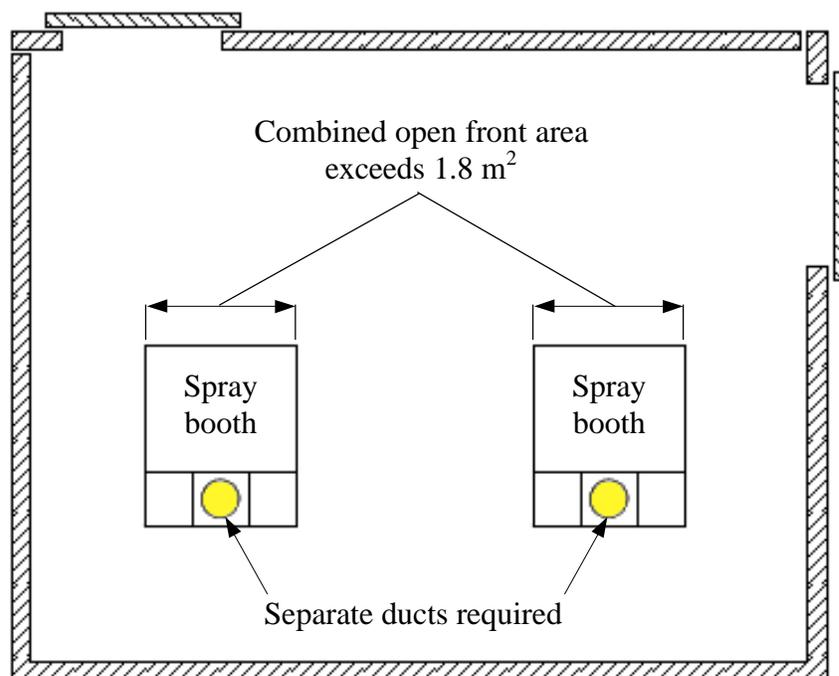


Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.3. Ventilation
Combined ducting

5.12.3.4. A separate exhaust duct shall be provided for each **spray booth**, except that a common duct may be used if it serves **spray booths** having a combined open frontal area of not more than 1.8 m^2 .

This requirement in this Article is intended to reduce the risk of a fire or explosion originating in one spray booth spreading to other spray booths or areas via the ductwork where spray booths have a combined open frontal area of 1.8 m^2 or more.



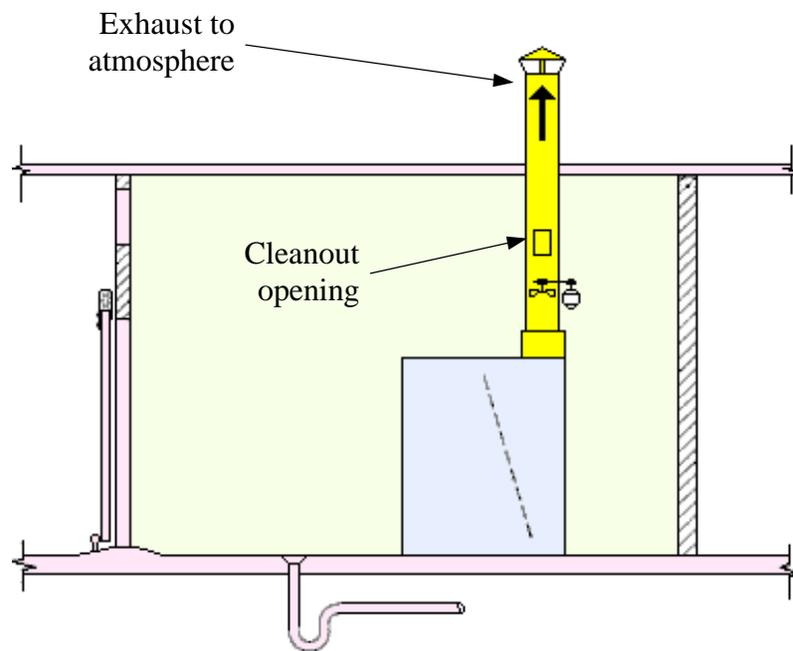
Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.3. Ventilation

Exhaust air

- 5.12.3.5. Air exhausted from spray operations shall not be recirculated, except where recirculation is acceptable, as described in NFPA 33, "Spray Application Using Flammable and Combustible Materials".

Prohibiting the use of recirculated air avoids accumulating ignitable concentrations of vapours or mists. In the presence of sources of ignition, they could cause a fire or explosion.



5.12.3. Ventilation

Monitoring air velocity

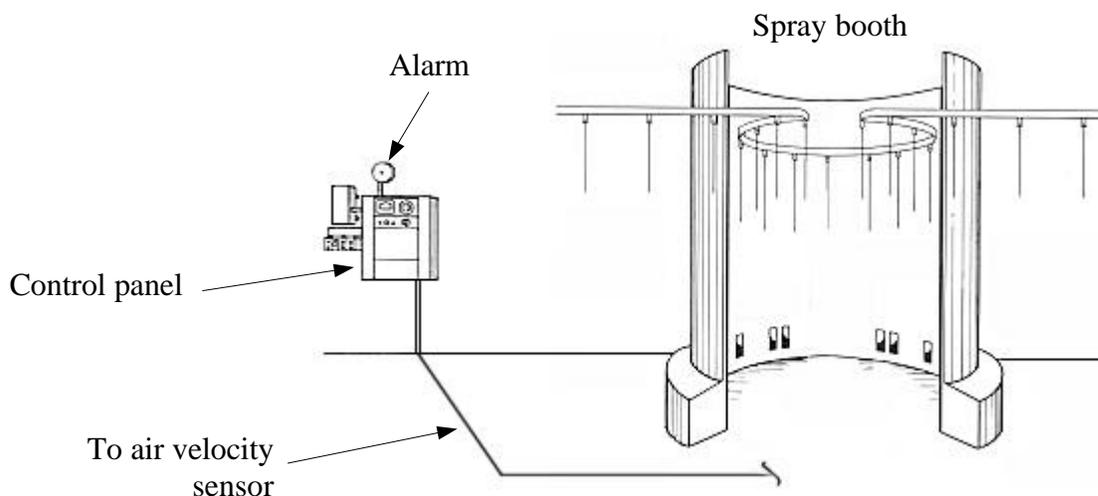
- 5.12.3.6.(1) Gauges or alarms that indicate when the air velocity is less than the air velocity required by Article 5.12.3.2. or 5.12.3.3. shall be installed for **spray booths**.
- (2) When the gauge or alarm indicates that the air velocity is less than that required by Article 5.12.3.2. or 5.12.3.3., immediate corrective action shall be taken to remedy the condition that has resulted in the reduction of the ventilation.

The intent of Sentence (1) is to ensure that spray booth operators are alerted to reductions in the minimum exhaust air velocity at the face of spray booths (18 m/min for electrostatic-type spray booths and 30 m/min for all other types of spray booths).

The intent of Sentence (2) is to ensure that immediate corrective action is taken to eliminate the cause of the drop in the air velocity.

Some causes could be:

- Buildup of deposits on the fan blades and/or filter.
- Duct obstructions
- Fan failure
- Loss of power.



Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.4. Exhaust Ducts

Duct support and construction

5.12.4.1. Exhaust ducts for **spray booths** shall be securely supported and constructed of sheet steel in conformance with Table 5.12.4.A.

TABLE 5.12.4.A.
Forming Part of Article 5.12.4.1.

Maximum Dimension of Duct, mm	Minimum Thickness of Sheet Steel, mm
Up to 200 mm incl.	0.56
Over 200 mm to 450 mm incl.	0.69
Over 450 mm to 750 mm incl.	0.86
Over 750 mm	1.14

The specifications for exhaust ducts are intended to reduce the risk of a fire in the exhaust duct from spreading to other parts of the building.

These specifications:

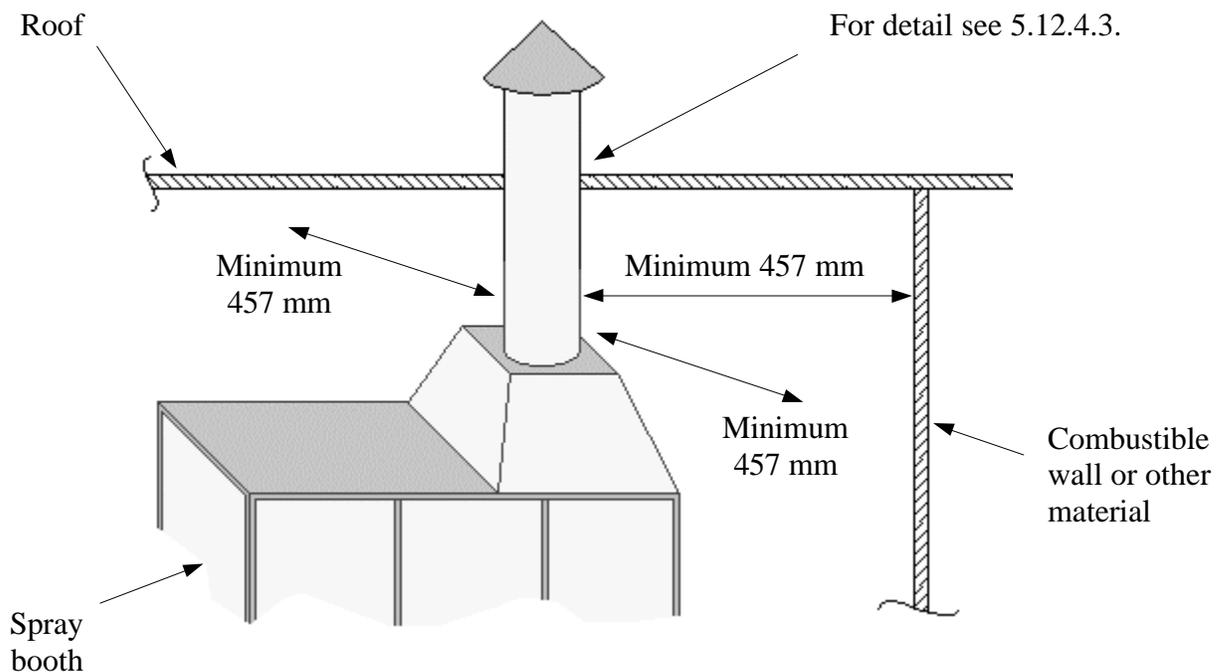
- limit the combustible content of the ducts by specifying sheet steel construction
- avoid the collapse of the exhaust ducts under fire conditions by specifying maximum dimensions for ducts with corresponding minimum sheet steel thickness
- avoid collapse by requiring the ducts to be securely supported.

Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.4. Exhaust Ducts
Clearances

5.12.4.2. Except as provided in Article 5.12.4.3., a clearance of 457 mm shall be maintained between ducts venting **spray booths** and unprotected combustible material.

The specified minimum clearance reduces the risk, that in the event of a fire in the exhaust ducts, heat radiated by the ducts will not ignite adjacent combustible materials. This in turn reduces the risk of spreading fire to other parts of the building.



Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

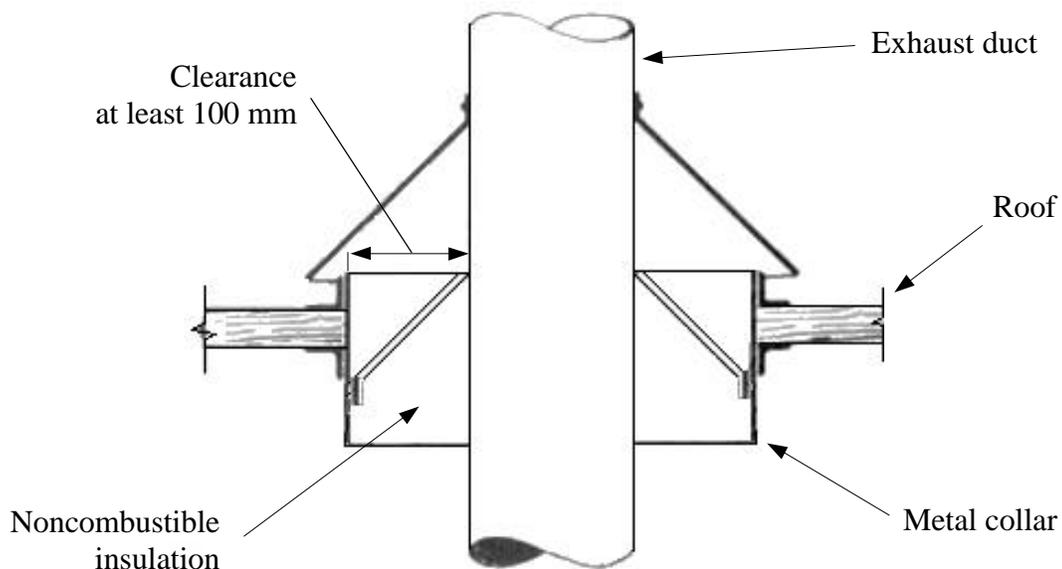
5.12.4. Exhaust Ducts
Collars

- 5.12.4.3.(1) Where exhaust ducts pass through combustible roofs or **partitions**, metal collars shall provide not less than a 100 mm clearance between the duct and combustible material.
- (2) The space between the duct and combustible material shall be sealed with noncombustible insulating material.

This Article requires an effective thermal barrier to be provided between the exhaust ducts and the adjacent combustible materials. In the event of a fire in the exhaust duct, the thermal barrier prevents the fire from spreading to the combustible materials. This in turn reduces the risk of fire spreading to other parts of the building.

The thermal barrier must be comprised of:

- a metal collar that maintains a minimum clearance of 100 mm between the duct and adjacent combustible material, and
- insulating material that will not be ignited by heat radiated from the ducts in the event of a fire.

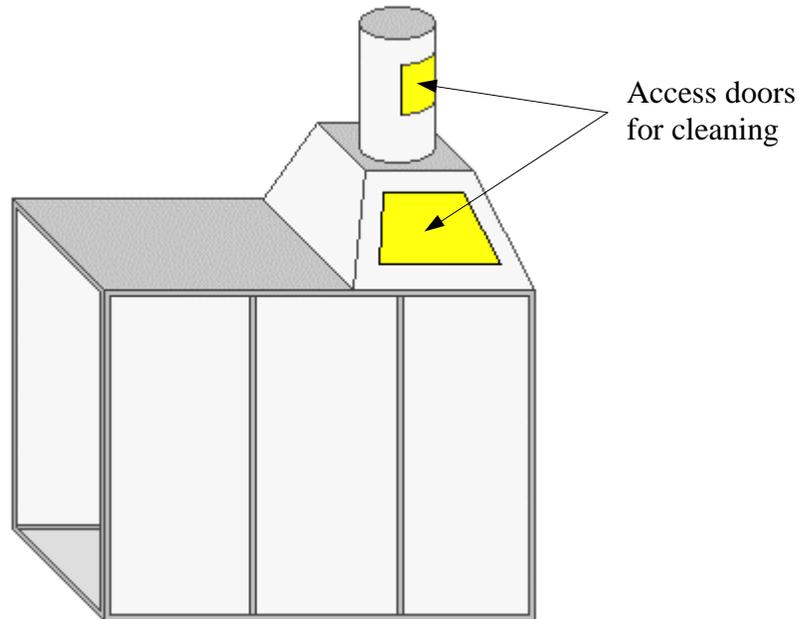


Partition means an interior wall 1 storey or part of a storey in height that is not load-bearing.

5.12.4. Exhaust Ducts
Access doors

5.12.4.4. Exhaust ducts for **spray booths** shall be provided with access doors for cleaning purposes.

Access doors are provided to ensure that all parts of the exhaust system can be accessed for cleaning.



Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.4. Exhaust Ducts

Exhaust outlet locations

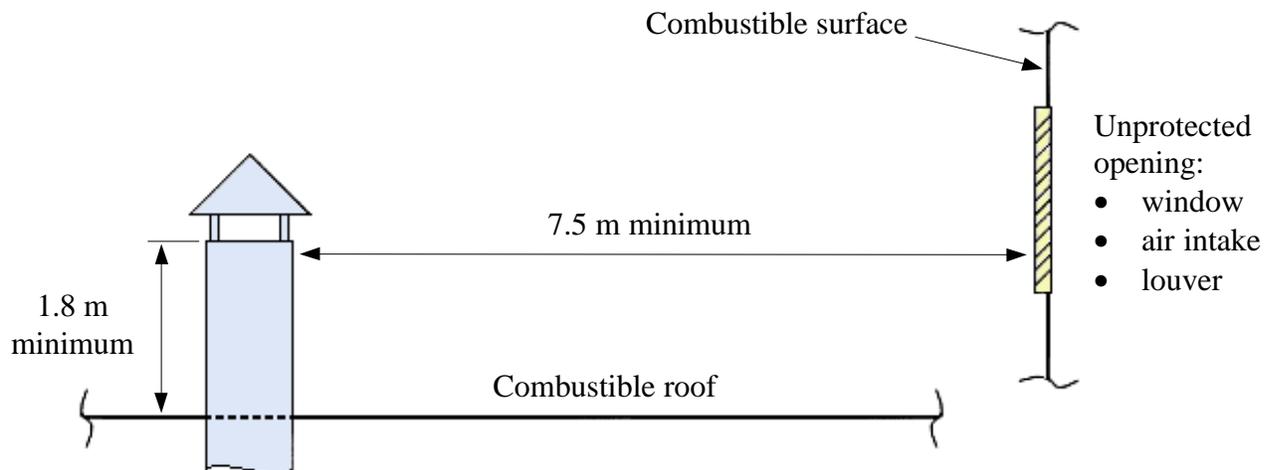
5.12.4.5.(1) Except for water-wash types, the exhaust outlet to atmosphere from **spray booths** shall

- (a) be 1.8 m from any combustible exterior wall or roof, and
- (b) be located so that the air does not discharge toward any combustible surface or unprotected opening within 7.5 m.

The intent is to reduce the risk that a fire or exhaust vapours or mists burning in the exhaust ducts of spray booths (other than water-wash types) could:

- spread to other parts of the building, or to an adjacent building,
- ignite adjacent combustible materials, including roofing materials and exterior walls,
- spread through building openings that are near or facing exhaust air discharge points, or
- re-enter the spray area.

These clearances are not required for a water-wash type spray booth.



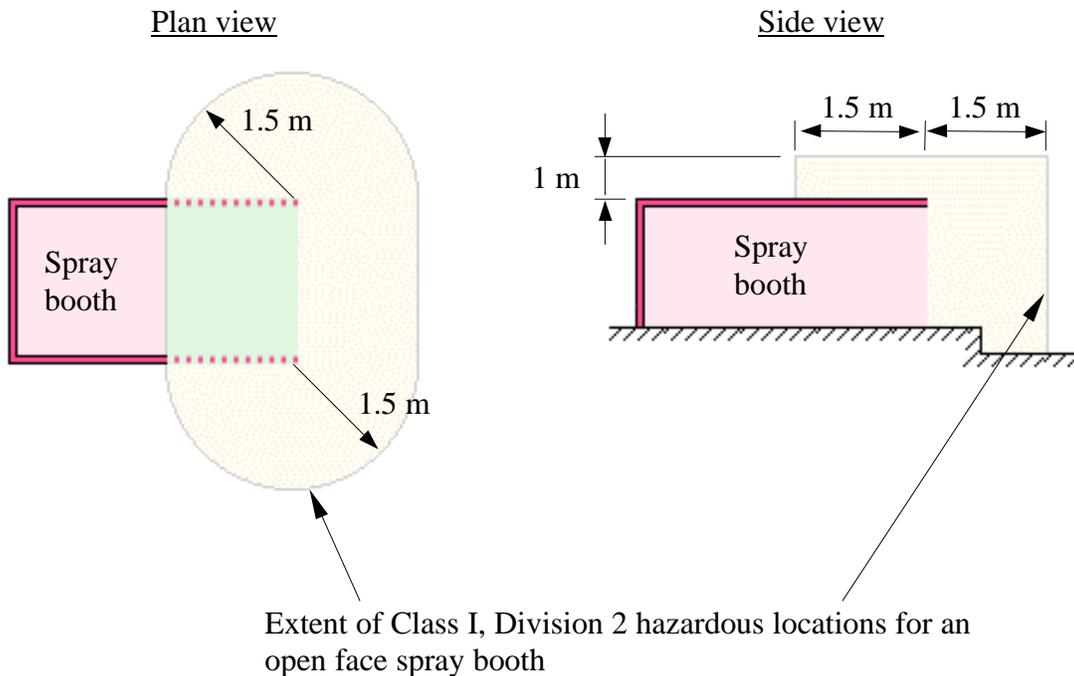
Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.5. Electrical Equipment
Hazardous locations

5.12.5.1. Electrical equipment within the **spraying area** including lighting fixtures shall conform to Part 1, Sections 18 and 20 of the **Electrical Safety Code** made under the **Power Corporation Act**.

The sizes of hazardous areas for finishing processes, in and around the spray booth for example, are defined in the Electrical Safety Code with requirements for the electrical equipment found on those locations.

Compliance with these sections of the Electrical Safety Code is intended to ensure that electrical equipment located within the spraying area does not increase the risk of igniting flammable or combustible vapours, mists and combustible overspray residues.



Note: The interior of spray booths and their exhaust ducts are Class I, Division 1 hazardous locations. Refer to the Electrical Safety Code for other applications.

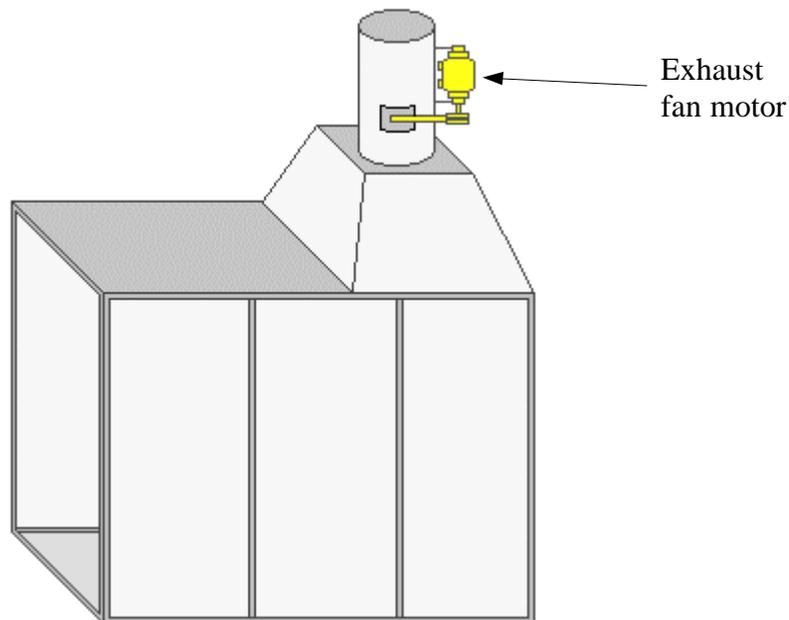
Spraying area means the area that is within 6 m of a spray booth or spraying operation and that is not separated therefrom by a vapour-tight separation.

5.12.5. Electrical Equipment

Motors for exhaust fans

- 5.12.5.2. Electric motors for exhaust fans shall not be placed inside **spray booths** or ducts.

The electric motor when operating may produce sparks that could ignite vapours in the spray booth or duct. Combustible residue may also accumulate on the motor and be ignited by the sparks or by the heat generated by the motor.

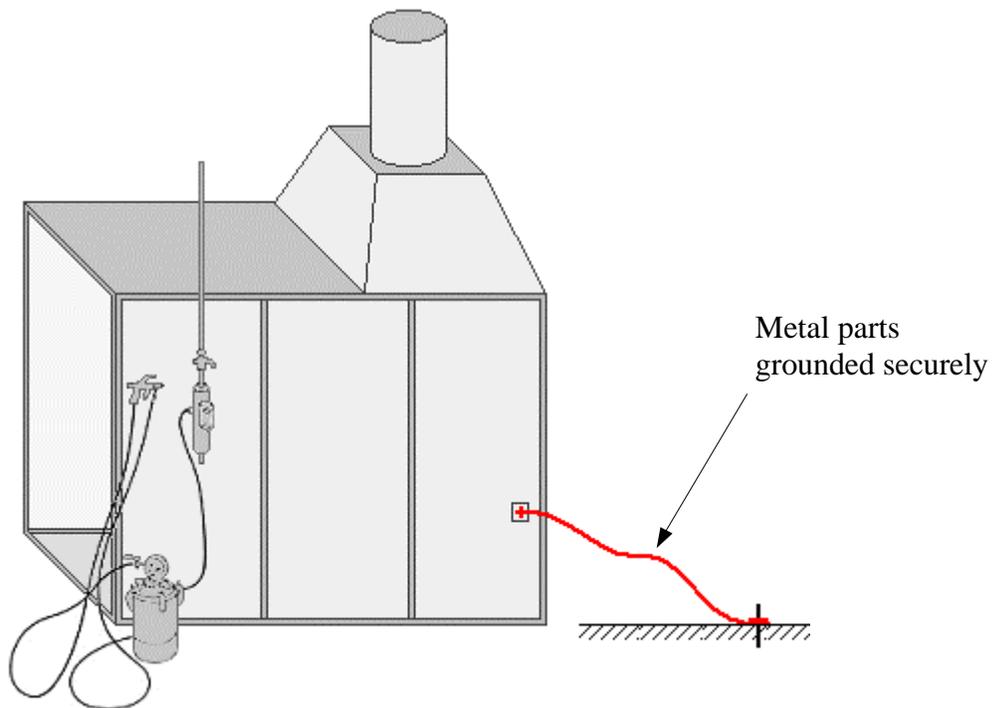


Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.5. Electrical Equipment
Grounding

5.12.5.3. Metal parts of **spray booths**, exhaust ducts and piping systems conveying **flammable** or **combustible liquids** shall be electrically grounded.

Electrically grounding the specified metal parts helps avoid the build-up of static electric charges on surfaces or between the spray nozzles and painted parts. These charges could generate sparks of sufficient energy to ignite flammable vapours or explosive dusts and cause an explosion or fire.



Combustible liquid means any liquid having a flash point at or above 37.8°C and below 93.3°C.

Flammable liquid means a liquid having a flash point below 37.8°C and having a vapour pressure not more than 275.8 kPa (absolute) at 37.8°C as determined by ASTM D 323, "Vapor Pressure of Petroleum Products (Reid Method)".

Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

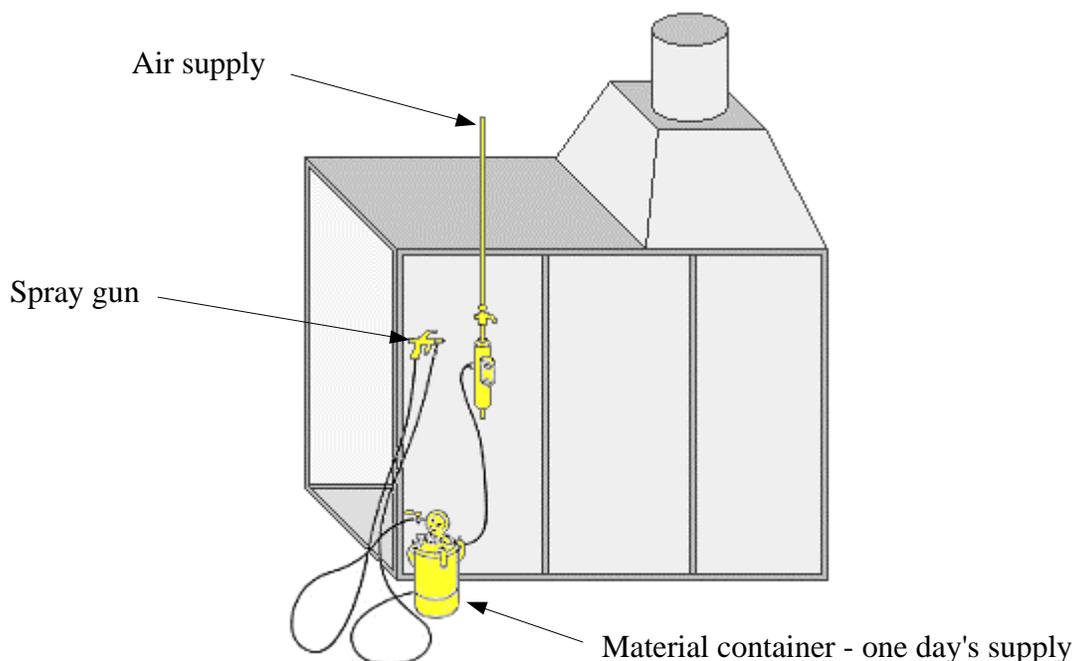
5.12.6. Flammable and Combustible Liquids
Storage and handling

- 5.12.6.1.(1) **Flammable** and **combustible liquids** for use in **spraying areas** shall be stored and handled in an **approved** manner.
- (2) The amount of **flammable** and **combustible liquids** in the **spraying areas** shall not exceed one day's supply.

The intent is to limit the fire load within the spraying area and ensure that the flammable and combustible liquids are stored and handled safely.

Sentence (1) is now redundant since flammable and combustible liquids are required to be stored and handled in conformance with Part 4, Flammable and Combustible Liquids, of the Fire Code.

Sentence (2) limits the quantities of all types of flammable and combustible liquids that may be used in the spraying area to not exceed one day's supply.



Approved means approved by the Chief Fire Official.

Combustible liquid means any liquid having a flash point at or above 37.8°C and below 93.3°C.

Flammable liquid means a liquid having a flash point below 37.8°C and having a vapour pressure not more than 275.8 kPa (absolute) at 37.8°C as determined by ASTM D 323, "Vapor Pressure of Petroleum Products (Reid Method)".

Spraying area means the area that is within 6 m of a spray booth or spraying operation and that is not separated therefrom by a vapour-tight separation

5.12.6. Flammable and Combustible Liquids

*Paint storage*5.12.6.2. Paint shall be kept in **closed containers** when not in use.

This requirement is intended to reduce the risk of releasing flammable or combustible liquids or vapours that could be ignited and cause a fire or explosion.



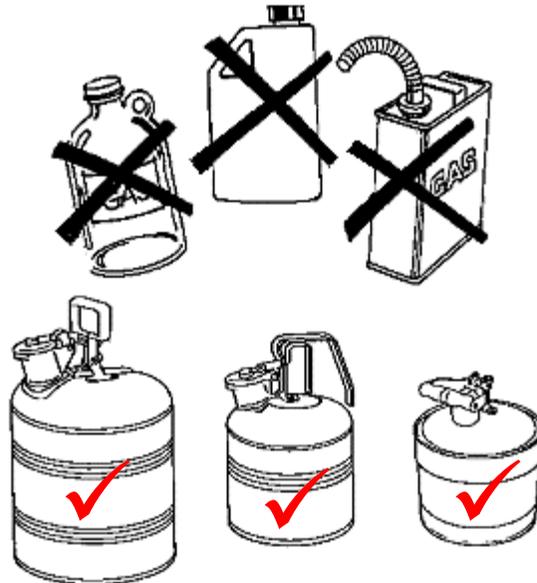
Closed container means a container so sealed by means of a lid or other device that neither liquid nor vapour will escape from it at ordinary temperatures.

5.12.6. Flammable and Combustible Liquids

Thinners and solvents

- 5.12.6.3. Thinners and solvents shall be dispensed only from **listed** and labelled safety cans.

The intent is to prohibit the use of untested and unapproved containers. This reduces the risk of releasing flammable or combustible liquids or vapours that could be ignited.



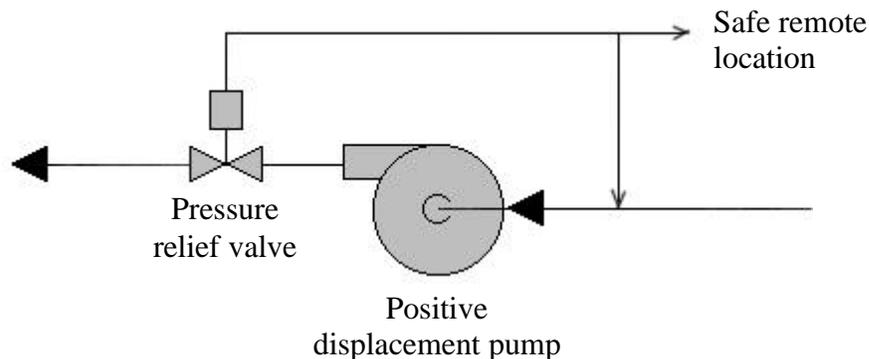
Listed means equipment or materials included in a list published by a certification organization accredited by the Standards Council of Canada.

5.12.6. Flammable and Combustible Liquids

Pump discharge relief valves

5.12.6.4. Where **flammable liquids** are supplied to spray nozzles by positive displacement pumps, the pump discharge line shall be provided with a suitable relief valve discharging to the pump suction or to a safe remote location.

In the event the discharge line becomes over-pressurized, a relief valve will discharge the excess pressure to the pump suction or to a safe location. The relief valve protects the discharge line from potential failure due to over-pressure. This prevents the accidental release of flammable liquids or vapours.

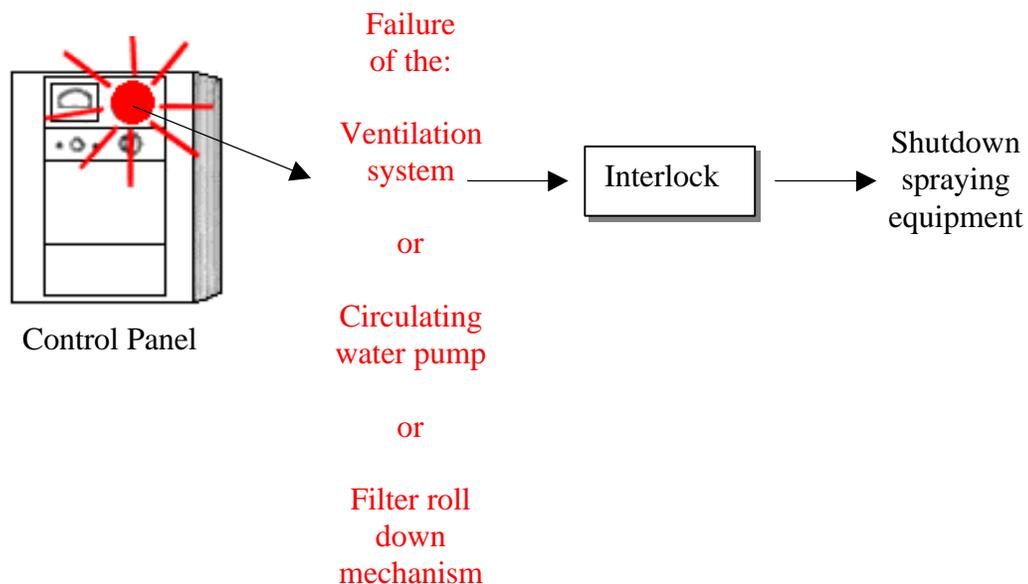


Flammable liquid means a liquid having a flash point below 37.8°C and having a vapour pressure not more than 275.8 kPa (absolute) at 37.8°C as determined by ASTM D 323, "Vapor Pressure of Petroleum Products (Reid Method)".

5.12.7. Control of Fire Hazards
Interlocks

5.12.7.1. The spraying equipment for a **spray booth** shall be interlocked to shut down in the event of failure of the ventilation system, failure of the circulating water pump of a water-wash system or failure of the filter roll-down mechanism of a dry **spray booth**.

Application of this Article ensures that the spraying equipment will shut down and not operate if the spray booth ventilation system fails, or is inoperative. Without the ventilation system operating, use of the spray equipment will cause flammable vapours to accumulate and spread to other areas of the building. These vapours could be ignited, resulting in a fire or explosion.



Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

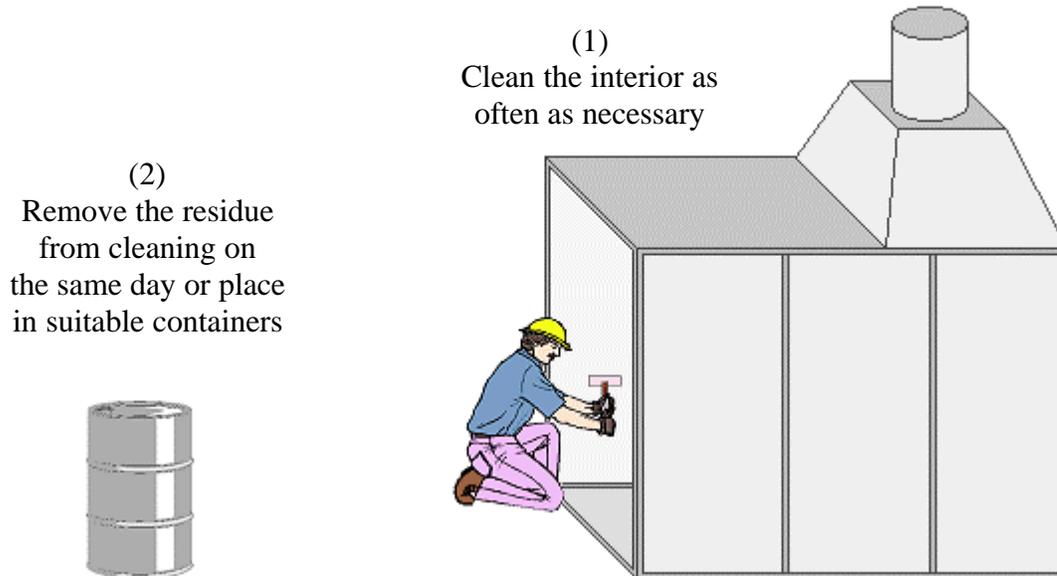
5.12.7. Control of Fire Hazards

Cleaning and residue disposal

- 5.12.7.2.(1) The inner surface of **spray booths** shall be cleaned of combustible residue as often as necessary to prevent a fire hazard.
- (2) Combustible residue from cleaning operations shall, on the same day as the cleaning operations, be removed from the premises or placed in receptacles conforming to Articles 2.4.1.9. and 2.4.1.10.

To reduce the combustible content and fire severity in spray booths, and reduce the risk of a fire in the spraying area spreading to other parts of the building:

- Sentence (1) is intended to reduce the accumulation of combustible overspray residues in the spray booth.
- Sentence (2) is intended to ensure that residue from cleaning is promptly removed from the area and/or properly contained.



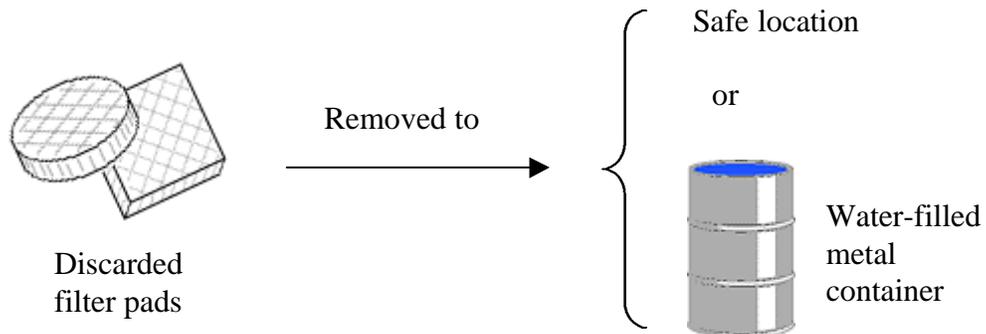
Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.7. Control of Fire Hazards

Filter pads and rolls

5.12.7.3. Discarded filter pads and filter rolls shall be removed to a safe location or placed in a water-filled metal container and disposed of after each day's operation.

Proper handling and disposal of discarded filter pads and filter rolls is intended to limit the combustible content in the area and reduce the risk of a fire spreading to other parts of the building.

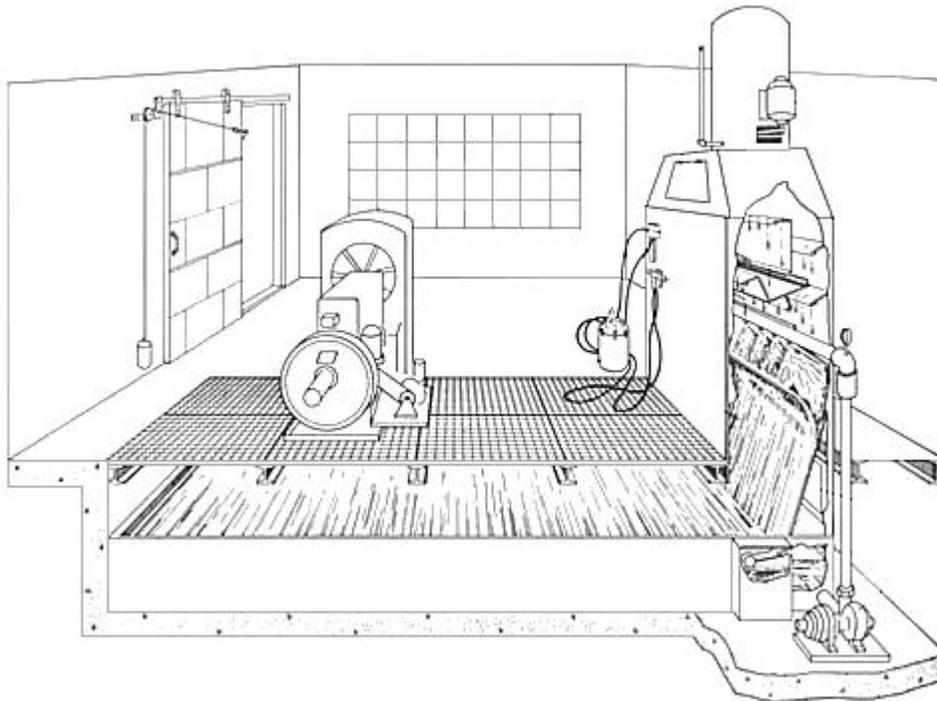


5.12.7. Control of Fire Hazards

Filters prohibited

- 5.12.7.4. A water-wash **spray booth** shall be used when applying spray material that is susceptible to spontaneous heating.

Water-wash spray booths remove residue from the exhaust airstream by passing it through a water curtain. The water accumulates in a tank where the residues are removed manually or automatically. Using water to collect overspray residue that is susceptible to spontaneous heating reduces the likelihood of a fire due to spontaneous heating.

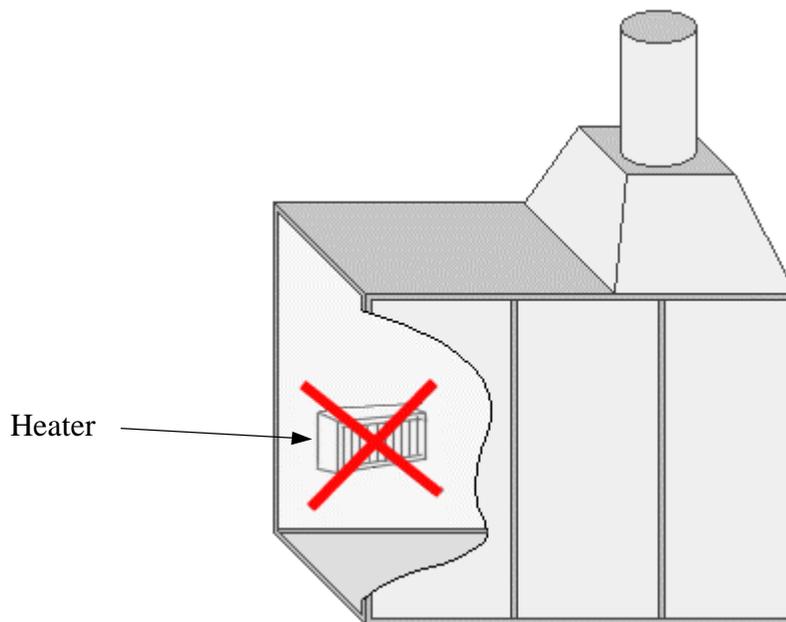


Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.7. Control of Fire Hazards
Heating equipment

5.12.7.5. **Space-heating appliances**, steam pipes and other hot surfaces shall not be located in an area where deposits of combustible residue may accumulate.

Separating heating equipment, piping or other hot surfaces from combustible overspray residue accumulations reduces the potential for ignition and fire.



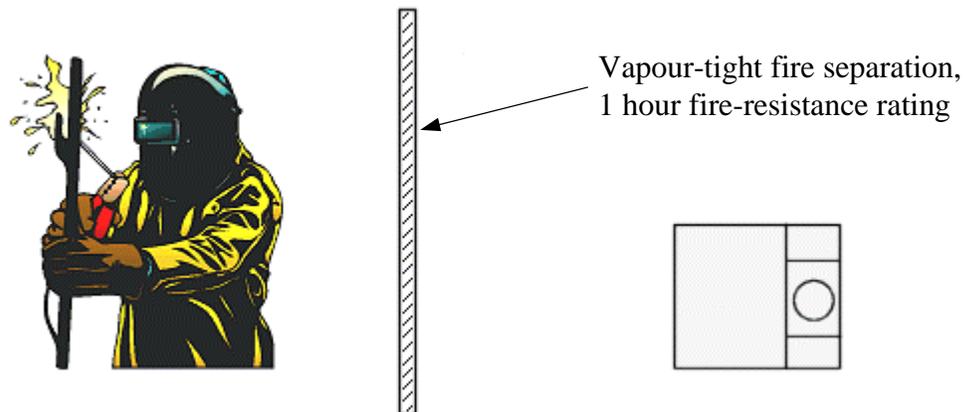
Space-heating appliance means an appliance that supplies heat to a room or space directly or indirectly or to rooms or spaces of a building through a heating system.

5.12.7. Control of Fire Hazards

Ignition sources

- 5.12.7.6. Open flame or spark producing devices shall not be used within a **spraying area**, unless separated therefrom by a vapour-tight **fire separation** having a 1-hr **fire-resistance rating**.

This Article is intended to reduce the risk of igniting flammable vapours, combustible mists or overspray residues with smoking material, flames or sparks and causing a fire or explosion.



Provide the fire separation when open flame or spark producing devices have to be within 6 m of the spraying operation.

Fire-resistance rating means the time in hours or fraction thereof that a material or assembly of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions of test and performance criteria, or as determined by extension or interpretation of information derived therefrom as prescribed in the Building Code.

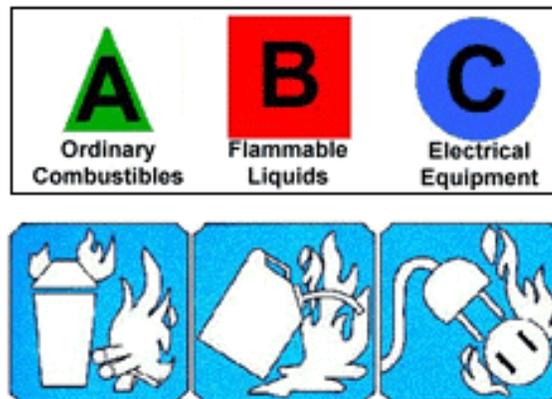
Fire separation means a construction assembly that acts as a barrier against the spread of fire and may or may not have a fire-resistance rating or a fire-protection rating.

Spraying area means the area that is within 6 m of a spray booth or spraying operation and that is not separated therefrom by a vapour-tight separation.

5.12.8. Fire Protection Equipment
Portable extinguishers

5.12.8.1. Portable extinguishers shall be installed near **spraying areas** in conformance with Section 6.2.

Providing extinguishers for spraying areas facilitates quick response to extinguish fire in its incipient stage before it involves additional flammable liquids or combustible deposits.



Spraying area means the area that is within 6 m of a spray booth or spraying operation and that is not separated therefrom by a vapour-tight separation.

5.12.8. Fire Protection Equipment
Sprinkler installations

- 5.12.8.2.(1) Except as permitted in Sentences (2) and (3), automatic sprinkler protection shall be provided in each **spraying area**, **spray booth** and **spray room** in conformance with NFPA 13, "Installation of Sprinkler Systems".
- (2) Where spraying operations are confined within a **spray booth**, fire protection may be provided for the **spray booth** only, in conformance with NFPA 33, "Spray Application Using Flammable or Combustible Materials".
- (3) This Article does not apply where the existing situation is **approved** and does not endanger life safety, or **approved** alternative measures to the requirements set out in this Article are taken to provide life safety.

To prevent a fire involving a spraying operation from developing and spreading beyond the area of origin, Article 5.12.8.2. requires fire protection features for each spraying area, spray booth and spray room.

The fire protection features may consist of:

- automatic sprinklers installed in conformance with the NFPA 13, "Installation of Sprinkler Systems",
- a fire suppression system in conformance with NFPA 33, "Spray Applications Using Flammable or Combustible Materials" to protect spraying operations that are confined within a spray booth,
- existing situations that do not endanger life safety and are approved, or
- alternative measures that provide for life safety and are approved

Approved means approved by the Chief Fire Official.

Spraying area means the area that is within 6 m of a spray booth or spraying operation and that is not separated therefrom by a vapour-tight separation.

Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

Spray room means a spraying area on a floor area or part thereof in which an open spraying operation is confined and that is separated from the remainder of the building in which it is located by a noncombustible vapour-tight separation.

5.12.8. Fire Protection Equipment
Sprinkler head protection

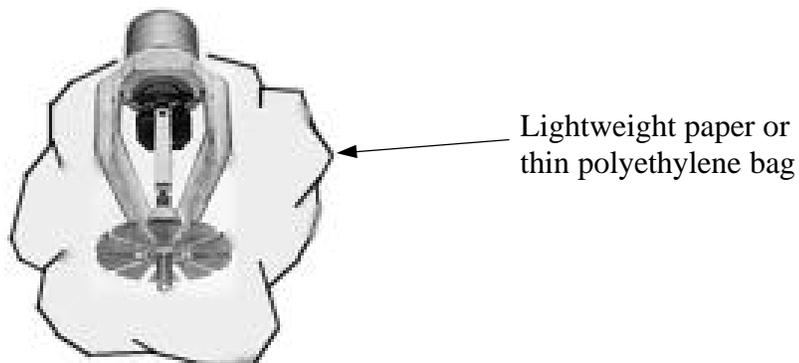
- 5.12.8.3.(1) Sprinkler heads in **spray booths** shall be protected with lightweight paper or thin polyethylene bags.
- (2) Bags protecting sprinkler heads shall be replaced before they have accumulated excessive deposits.

Shielding the sprinkler heads prevents accumulating deposits of overspray residues on the heads.

These deposits may:

- decrease sprinkler operating times, and
- reduce sprinkler effectiveness.

This in turn may allow the fire to grow and spread to other parts of the building.



The bag or paper should be replaced regularly as soon as build-up is measurable.

Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

5.12.9. Drying Operations

Spray booths used for drying

- 5.12.9.1. Except as permitted in Article 5.12.9.4., **spray booths, spray rooms** or other enclosures used for spraying operations shall not be used for drying by any arrangement that could cause an increase in the surface temperatures of the **spray booths, spray rooms** or other enclosures.

Drying operations may increase surface temperatures within these enclosures and ignite flammable vapours, combustible mists or overspray residues.

Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

Spray room means a spraying area on a floor area or part thereof in which an open spraying operation is confined and that is separated from the remainder of the building in which it is located by a noncombustible vapour-tight separation.

5.12.9. Drying Operations

Location of equipment

- 5.12.9.2. Except as provided in Articles 5.12.9.3. and 5.12.9.4., drying or curing equipment that utilizes components capable of producing ignition, such as an open flame, a spark, or a hot surface, shall not be installed in or near a **spraying area**.

Drying or curing equipment with components capable of producing ignition (such as an open flame, a spark, or hot surfaces) could ignite flammable vapours, combustible mists or overspray residues, and cause a fire or explosion.

Spraying area means the area that is within 6 m of a spray booth or spraying operation and that is not separated therefrom by a vapour-tight separation.

5.12.9. Drying Operations

Location of equipment

- 5.12.9.3.(1) Equipment described in Article 5.12.9.2. may be installed in an area adjacent to the **spraying area** provided the adjacent area is equipped with a ventilating system arranged to
- (a) purge the drying space before the heating system can be started,
 - (b) maintain the atmosphere at any source of ignition at or below 25 per cent of the **lower explosive limit** of any combustible or flammable materials in use, and
 - (c) automatically shut down the heating system in the event of failure of the ventilating system.

This Article permits drying and curing equipment that may produce ignition sources to be installed in a area adjacent to the spraying area provided, flammable vapours, combustible mists or overspray residues are kept at less than 25 per cent of the lower explosive limit.

This is achieved by:

- interlocks to prevent operation of heating or curing equipment until the area is purged,
- ventilation adequate to maintain the purged atmosphere and prevent vapour, mist or overspray from entering the heating or curing area, and
- interlocks to prevent operation of heating or curing equipment without adequate ventilation.

Lower explosive limit means the minimum concentration of vapour in air at which the propagation of flame occurs on contact with a source of ignition.

Spraying area means the area that is within 6 m of a spray booth or spraying operation and that is not separated therefrom by a vapour-tight separation.

5.12.9. Drying Operations

Spray booths used for drying

5.12.9.4.(1) **Spray booths** may be used for drying operations where

- (a) the **spray booth** conforms to the appropriate requirements for drying ovens in Section 5.18,
- (b) the interior of the enclosure is kept reasonably free of over-spray deposits,
- (c) portable drying apparatus, if used, is of the infrared type, and such apparatus, wiring and connections are removed from the enclosure during spraying operations, and
- (d) interlocks are installed to
 - (i) prevent the use of spraying apparatus while the drying operation is taking place,
 - (ii) provide for the purging of the enclosure of spray vapours for a minimum of 3 min before the drying apparatus can be energized,
 - (iii) ensure that the ventilating system maintains the concentration of flammable vapours at or below 25 per cent of the **lower explosive limit** within the enclosure during the drying process, and
 - (iv) ensure that the drying apparatus will automatically shut off in the event of failure of the ventilating system.

Spray booths are permitted to be used for drying operations provided certain precautions are taken to control the risks associated with such use.

Clause (a) ensures that the enclosure of the spray booth meets all requirements for conducting drying operations. Refer to Section 5.18. for reading additional requirements.

Clause (b) minimises the accumulation of combustible overspray residues that are subject to ignition and increase the overall combustible content of the area.

Clause (c) restricts the portable drying apparatus to infrared types and requires that the apparatus and its associated equipment are removed from the spray booth during spraying operations. The infrared drying apparatus ensures that surface temperatures in the spray booth are not increased to a point that would ignite flammable vapours. The drying apparatus and its associated equipment has to be removed prior to spraying in order to eliminate sources of ignition within the spray booth.

Clause (d) requires interlocks to:

- prevent operation of spraying equipment during heating or curing operations,
- prevent operation of heating or curing equipment until the spray booth is purged,
- maintain the atmosphere at a safe level at or below 25 per cent of the lower explosive limit, and
- shut off drying equipment in the event of ventilation system failure.

Lower explosive limit means the minimum concentration of vapour in air at which the propagation of flame occurs on contact with a source of ignition.

Spray booth means a power-ventilated structure that encloses or accommodates a spraying operation so that spray vapour and residue can be controlled and exhausted.

- Q1. What is meant by spray applications using flammable and combustible materials?
A1. Spray applications using flammable and combustible materials applies to any spraying activity whether conducted in a booth, room or open area.
- Q2. What are the construction requirements for spray booths?
A2. Refer to Subsection 5.12.2. of the Ontario Fire Code for information regarding the construction of spray booths.
- Q3. What are the ventilation requirements for spray applications?
A3. Refer to Subsection 5.12.3. of the Ontario Fire Code for information regarding the ventilation requirements for spray applications.
- Q4. What are the construction requirements for exhaust ducts for spray booths?
A4. Refer to Subsection 5.12.4. of the Ontario Fire Code for information regarding construction requirements for exhaust ducts for spray booths.
- Q5. What are the prohibitions regarding electrical equipment?
A5. Refer to Subsection 5.12.5. of the Ontario Fire Code for information regarding requirements and prohibitions for electrical equipment in spraying areas.
- Q6. What are the storage requirements for flammable and combustible liquids?
A6. Refer to Subsection 5.12.6. of the Ontario Fire Code for information regarding the storage of flammable and combustible liquids in spraying areas.
- Q7. What are the requirements for controlling fire hazards?
A7. Refer to Subsection 5.12.7. of the Ontario Fire Code for information regarding the control of fire hazards.
- Q8. What are the prohibitions regarding drying operations?
A8. Refer to Subsection 5.12.9. of the Ontario Fire Code for information regarding drying operations in spraying areas and the use of spray booths for drying operations.
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