

STANDARD INFORMATION

Standard Number: NFPA 33

Standard Name: Spray Application Using Flammable or Combustible Materials

Standard Edition and Issue Date: 2018 Edition Date November 10, 2017

Date of Revision: November 10, 2017

Date of Previous Revision of Standard: September 7, 2015

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **June 30, 2020**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revise requirements and which products will require re-evaluation. **NOTE:** Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revise requirements.

Overview of Changes:

- Revised requirements for spraying locations
- Revised requirements for spray rooms and spray booths
- Additional requirements for movement power vehicles in spray areas
- Revised requirements for heating of recirculated air and the manifolding of exhaust ducts.

Specific details of new/revise requirements are found in table below.

If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).

Client Action:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revise paragraphs noted in the attached or explain why these new/revise requirements do not apply to your product (s).

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.



STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown lined-out below.</i>
4	Info	General Requirements
4.1	Info	Location of Spray Application Operations
4.1.1		Locations in Other Occupancies. Spray application operations and processes shall not be conducted in any building that is classified as an assembly, an educational, a day care, a health care, an ambulatory health care, a detention/correctional, a residential, a mercantile, a business, or a storage occupancy, unless the following requirements are met: (1) The spraying is located in a room that is separated both vertically and horizontally from all surrounding areas by construction having a fire resistance rating of not less than 2 hours <u>or in a spray room (see Section 5.2).</u> (2) The room is protected by an approved automatic sprinkler system designed and installed in accordance with NFPA 13.
4.4		<i>New section added;</i> Non-combustible Material A material that complies with any one of the following shall be considered a noncombustible material: (1)* The material, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat. (2) The material is reported as passing ASTM E136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C. (3) The material is reported as complying with the pass/fail criteria of ASTM E136 when tested in accordance with the test method and procedure in ASTM E2652, Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C.
4.4.2		Where the term limited-combustible is used in this standard, it shall also include the term noncombustible. <i>New section added;</i>
4.5		Limited-Combustible Material. A material shall be considered a limited-combustible material where both of the following conditions of 4.5.1 and 4.5.2, and the conditions of either 4.5.3 or 4.5.4, are met.



CLAUSE	VERDICT	COMMENT
4.5.1		The material does not comply with the requirements for a noncombustible material in accordance with Section 4.4.
4.5.2		The material, in the form in which it is used, exhibits a potential heat value not exceeding 8141 kJ/kg (3500 Btu/lb) where tested in accordance with NFPA 259.
4.5.3		The material has a structural base of a non-combustible material with a surfacing not exceeding a thickness of 3.2 mm (1/8 in.) where the surfacing exhibits a flame spread index not greater than 50 when tested in accordance with ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials, or UL 723, Standard for Test for Surface Burning Characteristics of Building Materials.
4.5.4		The material is composed of materials which, in the form and thickness used, neither exhibit a flame spread index greater than 25 nor evidence of continued progressive combustion when tested in accordance with ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials, or UL 723, Standard for Test for Surface Burning Characteristics of Building Materials, and are of such composition that all surfaces that would be exposed by cutting through the material on any plane would neither exhibit a flame spread index greater than 25 nor evidence of continued progressive combustion when tested in accordance with ASTM E84 or UL 723.
4.5.5		Where the term limited-combustible is used in this standard, it shall also include the term noncombustible.
		<i>New section added;</i>
4.6		Classification of Liquids. Any liquid within the scope of this standard and subject to the requirements of this standard shall be classified in accordance with this section.
		Flammable liquids, as defined in 3.3.13.2, shall be classified as Class I liquids and shall be further subclassified in accordance with the following:
4.6.1		(1) Class IA Liquid — Any liquid that has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (2) Class IB Liquid — Any liquid that has a flash point below 22.8°C (73°F) and a boiling point at or above 37.8°C (100°F) (3) Class IC Liquid — Any liquid that has a flash point at or above 22.8°C (73°F), but below 37.8°C (100°F)
		Combustible liquids, as defined in 3.3.13.1, shall be classified in accordance with the following:
4.6.2		(1) Class II Liquid — Any liquid that has a flash point at or above 37.8°C (100°F) and below 60°C (140°F) (2) Class III Liquid — Any liquid that has a flash point at or above 60°C (140°F) (a) Class IIIA Liquid — Any liquid that has a flash point at or above 60°C (140°F), but below 93°C (200°F) (b) Class IIIB Liquid — Any liquid that has a flash point at or above 93°C (200°F)



CLAUSE	VERDICT	COMMENT
		<i>New section added;</i>
4.7		Determination of Flash Point. The flash point of a liquid shall be determined according to the methods specified in 4.7.1 through 4.7.4.
4.7.1		Except as specified in 4.7.1.1, the flash point of a liquid having a viscosity below 5.5 centiStokes at 40°C (104°F) or below 9.5 centiStokes at 25°C (77°F) shall be determined in accordance with ASTM D56, Standard Test Method for Flash Point by Tag Closed Cup Tester.
4.7.1.1		Cut-back asphalts, liquids that tend to form a surface film, and liquids that contain suspended solids shall not be tested in accordance with ASTM D56, Standard Test Method for Flash Point by Tag Closed Cup Tester, even if they otherwise meet the viscosity criteria. Such liquids shall be tested in accordance with 4.7.2.
4.7.2		The flash point of a liquid having a viscosity of 5.5 centi- Stokes or more at 104°F (40°C) or 9.5 centiStokes or more at 25°C (77°F) or a flash point of 93.4°C (200°F) or higher shall be determined in accordance with ASTM D93, Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester.
4.7.3		As an alternative, ASTM D3278, Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus, shall be permitted to be used for paints, enamels, lacquers, varnishes, and related products and their components that have flash points between 0°C (32°F) and 110°C (230°F) and viscosities below 150 Stokes at 25°C (77°F).
4.7.4		As an alternative, ASTM D3828, Standard Test Methods for Flash Point by Small Scale Closed Cup Tester, shall be permitted to be used for materials other than those for which ASTM D3278, Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus, is specifically required.
5	Info	Construction and Design of Spray Areas, Spray Rooms, and Spray Booths
5.1	Info	Spray Areas
		<i>New clause added;</i>
5.1.1.1		The interior surfaces of the spray area shall be smooth, designed and installed to prevent pockets that can trap residues, and designed to facilitate ventilation and cleaning.
		<i>New clause added;</i>
5.1.1.2		Air intake filters that are a part of a wall or ceiling assembly shall be listed in accordance with ANSI/UL 900, Standard for Air Filter Units.
		<i>New clause added;</i>
5.1.4		Enclosed spray areas shall be provided with means of egress that meet the applicable requirements of Chapter 40 of NFPA 101.



CLAUSE	VERDICT	COMMENT
		<i>New clause added;</i>
5.2		Spray Rooms. In addition to the requirements of Section 5.1, spray rooms shall be constructed of and separated vertically and horizontally from all surrounding areas by construction assemblies that have a fire resistance rating of not less than 2 hours.
		<i>New section added;</i>
5.3		Spray Booths.
5.3.1		Spray booths shall meet the requirements of Sections 5.1 and 5.3.
5.3.2		If walls or ceiling assemblies are constructed of sheet metal, single-skin assemblies shall be no thinner than 1.2 mm (0.0478 in.), and each sheet of double-skin assemblies shall be no thinner than 0.9 mm (0.0359 in.).
5.3.3		Structural sections of spray booths shall be permitted to be sealed with a caulk or sealant to minimize air leakage.
5.3.4		Spray booths that are used exclusively for powder coating shall meet the requirements of Chapter 15 and shall be permitted to be constructed of fire-retardant combustible materials where approved by the authority having jurisdiction.
5.3.4.1		Listed spray booth assemblies that are constructed of other materials shall be permitted.
5.3.5		Spray application operations and processes that involve the use of finishing materials containing nitrocellulose shall be confined to water-wash spray booths as defined in this standard unless otherwise specified in 5.3.5.1.
5.3.5.1		Spray application of finishing materials containing nitrocellulose shall be permitted in a dry-type spray booth provided that residue is removed from all baffle plates at least daily and all filters are changed at least daily.
6	Info	Electrical and Other Sources of Ignition
6.2	Info	General
		<i>New clause added;</i>
6.2.1.1		Resin application operations shall meet the requirements of Chapter 17.
		<i>New clause added;</i>
6.2.1.2		For the purposes of this standard, the Zone system of electrical area classification shall be applied as follows: (1) The inside of open or closed containers or vessels shall be considered a Class I, Zone 0 location. (2) A Class I, Division 1 location shall be permitted to be alternatively classified as a Class I, Zone 1 location.



CLAUSE	VERDICT	COMMENT
		<p>(3) A Class I, Division 2 location shall be permitted to be alternatively classified as a Class I, Zone 2 location.</p> <p>(4) A Class II, Division 1 location shall be permitted to be alternatively classified as a Zone 21 location.</p> <p>(5) A Class II, Division 2 location shall be permitted to be alternatively classified as a Zone 22 location.</p>
6.10		<p>Movement of Powered Vehicles. Powered vehicles shall <u>be listed for the electrical area classification in which they are used, and unlisted powered vehicles shall not be moved into or out of a spray area or operated in a spray area unless the spray application operation or process is stopped and the ventilation system is maintained in operation.</u></p>
7	Info	<p>Ventilation</p> <p><i>New clause added;</i></p>
7.6		<p>Heating of Recirculated Air. Where recirculated air is heated, the following requirements shall be met:</p> <p>(1) The air heater shall be located downstream of the recirculation particulate filter and vapor concentration monitor.</p> <p>(2) The surface temperature of the air heater shall not exceed 93°C (200°F).</p>
7.7	Info	<p>Manifolding of Exhaust Ducts</p> <p><i>New clause added;</i></p>
7.7.1		<p>Multiple cabinet spray booths whose combined frontal area does not exceed 1.7 m² (18 ft²) shall be permitted to be manifolderd if the sprayed materials used will not react and cause ignition of the residue in the ducts.</p>
7.7.2		<p>Where treatment of exhaust is necessary for air pollution control or for energy conservation, ducts shall be permitted to be manifolderd if all of the following conditions are met:</p> <p>(1) The sprayed materials used will not react and cause ignition of the residue in the ducts.</p> <p>(2) No finishing materials containing nitrocellulose are used.</p> <p>(3) An air-cleaning system is provided to reduce the amount of overspray carried into the duct manifold.</p> <p>(4) Automatic sprinkler protection is provided at the junction of each booth exhaust with the manifold, in addition to the protection required by Chapter 9.</p> <p>(5) The installation is approved by the authority having jurisdiction.</p>
8	Info	<p>Storage, Handling, and Distribution of Flammable and Combustible Liquids</p>
8.3	Info	<p>Mixing</p>



CLAUSE	VERDICT	COMMENT
		Mixing rooms shall meet all of the following requirements:
8.3.3		<u>(6) Ventilation systems provided in accordance with 8.3.3(5) shall be in operation during operating hours or whenever vapors are present.</u> (7) Mixing rooms shall be classified for purposes of electrical area classification in accordance with 6.5.4 <u>Chapter 7 of NFPA 30.</u>
9	Info	Protection
		<i>New section added;</i>
9.2		Ventilation Systems. Air make-up systems and spray area exhaust systems shall remain functioning during any fire condition.
9.2.1		Where air exhausted from spray areas is recirculated, an interlock shall shut down the recirculation of air during any fire condition unless it can be demonstrated that shutdown creates a greater hazard.
9.2.2		Air make-up systems, spray area recirculation systems, and spray area exhaust systems shall be permitted to be shut down and dampers shall be permitted to close where the automatic fire protection system type requires that ventilation be discontinued.
		<i>New section added;</i>
9.3		Coating Material Delivery Systems
9.3.1		Where a pump is used to supply the liquid used in the spray application process, an automatic means shall be provided to shut off the supply of liquid in the event of fire.
9.3.2		When pressurized tanks larger than 19 L (5 gal) are used to supply the liquid used in the spray application process, an automatic means shall be provided to shut off liquid flow at the tank outlet in the event of fire.
		<i>New clause added;</i>
9.4		Conveyors. For operations where the workpiece is automatically conveyed through the spray area, activation of the automatic fire protection system shall automatically stop any conveyors into and out of the spray area.
9.5	Info	Automated Spray Application Operations
9.5.1	Info	Interlock
		<i>New clause added;</i>
9.5.1.1		The requirements of 9.5.1 shall not apply to operations where the supply of flammable or combustible liquids is located within the spray area and does not exceed 18.9 L (5 gal).



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		Emergency Shutdown. For automated spray application operations, one or more manual emergency system shutdown stations shall be installed to serve each spray area <u>in accordance with the following requirements:</u>
9.5.1.2		<u>(1) When activated, the stations shall accomplish at least the functions listed in Section 9.3, Section 9.4, and 9.5.1.</u> <u>(2) At least one such station shall be within ready access of operating personnel.</u> <u>(3) If access to the station required in 9.5.2(2) is likely to involve exposure to danger, an additional station shall be located adjacent to an exit from the area.</u>
9.6	Info	Automatic Sprinkler System
		Duct Protection. Sprinkler systems protecting stacks or ducts with widths or diameters equal to or greater than 0.25 m (10 in.) but less than 3.7 m (12 ft) shall meet all of the following requirements:
9.6.6		<u>6)* The system demand shall include the discharge from the hydraulically most remote adjacent sprinklers in a common 30.5 m (100 linear ft) area of duct (horizontal and/or vertical).</u> <u>(7)* The supply line to the duct sprinklers, if taken from the ceiling sprinkler system, shall be equipped with an accessible listed control valve.</u>
15	Info	Powder Coating
		<i>New section added;</i>
15.5	Info	Protection
15.5.1		General
15.5.1.1		Spray areas, as defined in this standard, shall be protected with an approved automatic fire protection system.
15.5.1.2		The requirement in 15.5.1.1 shall apply to both manual and automated spray application processes.
15.5.2		Protection Systems
		The automatic fire protection system shall be permitted to be, and shall be installed in accordance with, any of the following:
15.5.2.1		(1) An automatic water sprinkler system that meets all applicable requirements of NFPA 13 (2) An automatic foam water sprinkler system that meets all applicable requirements of NFPA 16 (3) A carbon dioxide extinguishing system that meets all applicable requirements of NFPA 12 (4) A dry chemical extinguishing system that meets all applicable requirements of NFPA 17 (5) A gaseous agent extinguishing system that meets all applicable requirements of NFPA 2001



CLAUSE	VERDICT	COMMENT
		(6) A water mist fire protection system that meets the applicable requirements of NFPA 750
15.5.2.2		The fire alarm and fire protection system shall be supervised in accordance with NFPA 72.
15.5.3		<p>Automated Spray Application Operations. For automated spray application operations, activation of the automatic fire protection system shall automatically accomplish all of the following:</p> <ol style="list-style-type: none"> (1) Activate a local alarm in the vicinity of the spraying operation (2) Transmit an alarm signal to the facility's fire alarm system, if such a system is provided (3) Shut down the coating material delivery system (4) Shut down all spray application operations (5) Stop any conveyors into and out of the spray area
15.5.3.1		<p>Emergency Shutdown. For automated spray application operations, one or more manual emergency system shutdown stations shall be installed to serve each spray area in accordance with the following requirements:</p> <ol style="list-style-type: none"> (1) When activated, the stations shall accomplish at least the functions listed in 15.5.3 and 15.5.8.1. (2) At least one such station shall be within ready access of operating personnel. (3) If access to the station required in 15.5.3.1(2) is likely to involve exposure to danger, an additional station shall be located adjacent to an exit from the area.
15.5.4		Ventilation Systems. Ventilation systems shall be shut down during any fire alarm condition.
15.5.5		Automatic Sprinkler Systems
15.5.5.1		The automatic sprinkler system shall be a wet pipe system, a dry pipe system, a preaction system, or an open-head deluge system, whichever is most appropriate for the portion of the spray operation being protected.
15.5.5.2		<p>The automatic sprinkler system for powder coating operations shall be in accordance with the following requirements:</p> <ol style="list-style-type: none"> (1) Sprinklers shall be designed for Ordinary Hazard (Group 2) as defined in NFPA 13. (2) The sprinkler design area shall not be required to exceed the area of the booth or room in which spraying is conducted.
15.5.5.3		The water supply shall be sufficient to supply all sprinklers likely to open in any one fire incident without depleting the available water for use in hose streams.
15.5.5.4		Where sprinklers are installed to protect spray areas, water shall be permitted to be supplied from domestic water systems, provided the domestic supply can meet the demand for the design criteria of 15.5.5.2.



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15.5.5.5		The sprinkler system shall be controlled by a separate listed indicating valve(s), operable from floor level.
15.5.5.6		Sprinklers shall be protected against overspray residue by either location or covering in order to operate quickly in event of fire.
15.5.5.6.1		Sprinklers shall be permitted to be covered by either cellophane bags that are equal to or less than 0.08 mm (0.003 in.) thick or by thin paper bags.
15.5.5.6.2		The coverings permitted in 15.5.5.6.1 shall be replaced frequently so that heavy deposits of residue do not accumulate.
15.5.5.7		Sprinklers that have been painted or coated by overspray or residues shall be replaced with new sprinklers.
15.5.6		Automatic Carbon Dioxide, Dry Chemical, and Clean Agent Systems. The fire protection system shall be capable of discharging its contents into the entire protected area simultaneously.
15.5.7		Portable Fire Extinguishers. Portable fire extinguishers shall be provided and located in accordance with NFPA 10.
15.5.8		Protection for Automated Powder Application Equipment
15.5.8.1		Automated powder application equipment, both listed and unlisted, shall be further protected by listed optical flame detection, installed and supervised in accordance with NFPA 72
15.5.8.1.1		<p>The optical flame detection shall, in the event of ignition, react to the presence of flame within one-half (0.5) second and shall accomplish all of the following:</p> <ol style="list-style-type: none"> (1) Stop any conveyors into and out of the spray area (2) Shut off ventilation (3) Shut off application, transfer, and powder collection equipment (4) Close segregation dampers in associated ductwork to interrupt airflows (5) Disconnect power to the high-voltage elements in the spray area and de-energize the system
15.5.8.2		<p>Automated powder application equipment that is unlisted shall be further protected by the following:</p> <ol style="list-style-type: none"> (1) In addition to meeting the requirements in 15.5.3 and 15.5.8.1, the optical flame detection system shall also activate the automatic fire protection system, if provided. (2) Automatic electrostatic equipment enclosures inside the booth shall be protected with an approved automatic fire protection system, and activation of this system shall automatically accomplish the requirements of 15.5.3 and 15.5.8.1. (3) Manual activation stations shall be installed in accordance with the following: <ol style="list-style-type: none"> (a) At least one such station shall be within ready access of operating personnel.



CLAUSE	VERDICT	COMMENT
		(b) If access to the station required in 15.5.8.2(3)(a) is likely to involve exposure to danger, an additional station shall be located adjacent to an exit from the area. (c) These devices shall activate the fire protection system as specified in 15.5.2 for the affected automated zone, if applicable, and accomplish the requirements in 15.5.8.1.
15.5.8.2.1		The requirements of 15.5.8.2 shall not apply to a closed-head wet pipe automatic sprinkler system.
17	Info	Styrene Cross-Linked Composites Manufacturing (Glass Fiber-Reinforced Plastics)
17.7	Info	Use and Handling <i>New clause added;</i>
17.7.3.1		Accumulated overchop shall be disposed of when it has reached an average thickness of 50 mm (2 in.). <i>New clause added;</i>
17.7.3.2		Used paper, polyethylene film, or similar material shall be placed in a noncombustible container and disposed of when removed from the facility.
18	Info	Spray Application Operations in Membrane Enclosures
18.3	Info	Location
18.3.1		Outside of Buildings. The spray area shall be separated from permanent structures by a minimum of 4.6 m (15 ft) <u>and shall not block emergency vehicle access to adjacent buildings.</u>
18.7	Info	Ventilation. <i>New clause added;</i>
18.7.2.1		Equipment used to monitor the concentration of solvent vapors shall be calibrated for the solvents used. <i>New clause added;</i>
18.7.2.2		The calibration frequency required by 18.7.2.1 shall be per the manufacturer's recommendations.
CUSTOMERS PLEASE NOTE: This Table and column "Verdict" can be used in determining how your current or future production is or will be in compliance with new/revised requirements.		