

NFPA®

35

Standard for the
Manufacture of
Organic Coatings

2021



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NFPA® 35

Standard for the

Manufacture of Organic Coatings

2021 Edition

This edition of NFPA 35, *Standard for the Manufacture of Organic Coatings*, was prepared by the Technical Committee on Manufacture of Organic Coatings. It was issued by the Standards Council on October 5, 2020, with an effective date of October 25, 2020, and supersedes all previous editions.

This edition of NFPA 35 was approved as an American National Standard on October 25, 2020.

Origin and Development of NFPA 35

The first edition of NFPA 35 was developed by the NFPA Manufacturing Hazards Council and published in 1938 as *Suggestions for the Fire Protection of Lacquer Manufacturing Plants*. The second edition of this document was published in 1946. The Manufacturing Hazards Council was subsequently disbanded, and responsibility for NFPA 35 transferred to the new Sectional Committee on Coating Manufacture, which operated under the NFPA Committee on Flammable Liquids. The sectional committee undertook a major revision of NFPA 35, expanding its scope to the manufacture of all organic coatings. A new NFPA 35 was published as a Tentative Recommended Practice in 1961 and was officially adopted by the Association in 1964. The sectional committee subsequently rewrote NFPA 35 as a mandatory standard, which was adopted by the Association in 1970. Revisions to the standard were adopted in 1971, 1976, 1982, and 1987.

In 1993, NFPA's Flammable Liquids Project was reorganized, and the former technical (sectional) committee became an independent committee. The new Technical Committee on Manufacture of Organic Coatings processed a 1995 edition of NFPA 35, which incorporated a significant revision to the requirements for deflagration (explosion) venting as a consequence of a major fire and explosion incident at a coatings manufacturing plant.

After adoption of the 1995 edition of NFPA 35, the Technical Committee on Manufacture of Organic Coatings immediately began a major rewrite of NFPA 35, culminating in the 1999 edition, which included the following amendments:

- (1) Editorial revision and reorganization to effect editorial improvement and simplification of the text, making it more easily understood and interpreted
- (2) New building construction requirements to address the hazards of liquid spill fires and their impact on load-bearing building supports
- (3) Improved requirements for deflagration venting
- (4) Improvements to the requirements for transfer of flammable and combustible liquids within operating areas
- (5) Deletion of text relating to open-fire resin cooking processes, which are no longer used
- (6) Guidance on pressure transfer of liquids by air and inert gas
- (7) Revision and simplification of requirements for special hazards, specifically nitrocellulose, monomers, and organic peroxide formulations, including appendix text on handling procedures for nitrocellulose
- (8) A new chapter, Control of Ignition Sources, with particular attention to static electricity hazards and bonding and grounding requirements
- (9) Another new chapter, Management of Fire Hazards

The 2005 edition of NFPA 35 incorporated the following amendments and improvements:

- (1) Editorial revisions to comply with the *Manual of Style for NFPA Technical Committee Documents*
- (2) Adoption of preferred definitions from other NFPA technical documents where such adoption did not conflict with the intent and context of NFPA 35
- (3) Clarification of the requirements for process building heating

- (4) Requirements for “hot box” installations and drum heaters used to heat containers of viscous liquids
- (5) Improved requirements for proper handling of nitrocellulose, including guidance on safe movement using hand trucks and powered industrial trucks
- (6) A requirement that all fires must be investigated to determine their cause
- (7) A new table, Table A.5.6.3, to provide guidance for electrical area classification that is specific to equipment and processes that manufacture organic coatings

The 2011 edition of NFPA 35 incorporated the following major amendments and improvements:

- (1) Definitions for *kettle*, *thin-down tank*, *normal vent*, and *emergency relief vent* were added to aid the user in the application of the provisions of this standard and to reflect usage of these terms within the context of the organic coatings industry.
- (2) The specific requirements in 5.1.6 for means of egress were replaced with a direct reference to NFPA 101, *Life Safety Code*.
- (3) Section 5.4, Ventilation, was completely revised as suggested by the U.S. Chemical Safety and Hazard Investigation Board (CSB), based on their report on the CAI/Arnel explosion and fire that occurred November 22, 2006, in Danvers, MA. The new requirements in this section correlated with the provisions of NFPA 30, *Flammable and Combustible Liquids Code*. Also, these new requirements were applicable to both Class I (flammable) liquids and Class II or Class III (combustible) liquids that are heated up to or above their flash points.
- (4) A new paragraph, 6.6.4.1, required safe operating temperature limit controls for mixing tanks in which contents are heated. This paragraph also was based on suggestions submitted by the CSB as a result of its report on the CAI/Arnel explosion and fire.

The 2016 edition of NFPA 35 incorporated the following amendments and improvements:

- (1) The term *antistatic* was changed to *static dissipating* throughout the standard to remove a term no longer used in the electrostatics community and more accurately describe the property being addressed.
- (2) Building feature requirements, such as walls without unprotected openings and the prohibition of basements, were clarified.
- (3) Exceptions were rewritten as mandatory language as recommended by the *Manual of Style for NFPA Technical Committee Documents*.

In the 2021 edition of NFPA 35, revisions have been made to clarify construction requirements, including construction type, fire resistance ratings of structural elements and building assemblies, and fire protection ratings for opening protectives. In addition, terminology has been updated to align with NFPA 30 classifications of liquids.

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on the fire and explosion hazards associated with the design, construction, and operation of organic coating manufacturing processes and facilities.

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Standard for the

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2021 Edition

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced and extracted publications can be found in Chapter 2 and Annex C.

Chapter 1 Administration

1.1 Scope.

1.1.1 This standard shall apply to facilities that use flammable and combustible liquids, as herein defined, to manufacture organic coatings for automotive, industrial, institutional, household, marine, printing, transportation, and other applications.

1.1.2 This standard shall not apply to the following:

- (1)* Operations involving the use or application of coating materials
- (2)* Storage of organic coatings in locations other than the manufacturing facility

1.2* Purpose. The purpose of this standard shall be to provide minimum requirements for safety to life and property from fire and explosion in facilities and processes that manufacture organic coatings.

1.3 Application. (Reserved)

1.4 Retroactivity. The provisions of this standard reflect a consensus of what is necessary to provide an acceptable degree

of protection from the hazards addressed in this standard at the time the standard was issued.

1.4.1 Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard. Where specified, the provisions of this standard shall be retroactive.

1.4.2 In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate.

1.4.3 The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, and only where it is clearly evident that a reasonable degree of safety is provided.

1.5 Equivalency. Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.5.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.2 The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.6 Units and Formulas. The units of measure in this standard are presented first in U.S. customary units (inch-pound units). International System (SI) of Units follow the inch-pound units in parentheses.

1.6.1 Either system of units shall be acceptable for satisfying the requirements in this standard.

1.6.2 Users of this standard shall apply one system of units consistently and shall not alternate between systems of units.

1.6.3 The values presented for measurements in this standard are expressed with a degree of precision appropriate for practical application and enforcement. It is not intended that the application or enforcement of these values be more precise than the precision expressed.

1.6.4 Where extracted text contains values expressed in only one system of units, the values in the extracted text have been retained without conversion to preserve the values established by the responsible technical committee in the source document.

1.7 Code Adoption Requirements. (Reserved)

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 10, *Standard for Portable Fire Extinguishers*, 2018 edition.

NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, 2016 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2019 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2019 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2017 edition.

NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, 2019 edition.

NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, 2019 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2020 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2021 edition.

NFPA 70®, *National Electrical Code*®, 2020 edition.

NFPA 101®, *Life Safety Code*®, 2021 edition.

NFPA 221, *Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls*, 2021 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, 2017 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, 2017 edition.

NFPA 400, *Hazardous Materials Code*, 2019 edition.

NFPA 496, *Standard for Purged and Pressurized Enclosures for Electrical Equipment*, 2021 edition.

NFPA 505, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations*, 2018 edition.

NFPA 780, *Standard for the Installation of Lightning Protection Systems*, 2020 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2021 edition.

2.3 Other Publications.

2.3.1 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM D5, *Standard Test Method for Penetration of Bituminous Materials*, 2013.

ASTM D56, *Standard Test Method for Flash Point by Tag Closed Cup Tester*, 2016a.

ASTM D86, *Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure*, 2018.

ASTM D92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester*, 2018.

ASTM D93, *Standard Test Methods for Flash Point by Pensky–Martens Closed Cup Tester*, 2018.

ASTM D323, *Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method)*, 2015a.

ASTM D3278, *Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus*, 1996, reapproved 2011.

ASTM D3828, *Standard Test Methods for Flash Point by Small Scale Closed Cup Tester*, 2016a.

ASTM D4359, *Standard Test Method for Determining Whether a Material Is a Liquid or a Solid*, 1990, reapproved 2012.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, 2018ce1.

2.3.2 UL Publications. Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.

UL 9, *Fire Tests of Window Assemblies*, 2009, revised 2015.

UL 10B, *Fire Tests of Door Assemblies*, 2008, revised 2015.

UL 10C, *Positive Pressure Fire Tests of Door Assemblies*, 2016.

UL 263, *Fire Tests of Building Construction and Materials*, 2011, revised 2019.

2.3.3 US Government Publications. US Government Publishing Office, 732 North Capitol Street, NW, Washington, DC 20401-0001.

Title 29, Code of Federal Regulations, Part 1910.146, “Permit-Required Confined Spaces.”

Title 29, Code of Federal Regulations, Part 1910.147, “The Control of Hazardous Energy (Lockout/Tagout).”

2.3.4 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 30, *Flammable and Combustible Liquids Code*, 2021 edition.

NFPA 326, *Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair*, 2020 edition.

NFPA 5000® *Building Construction and Safety Code*®, 2021 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.4 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for

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3.3 General Definitions.

3.3.1 Basement. For the purpose of this standard, a story of a building or structure having one-half or more of its height below ground level and to which access for firefighting purposes is restricted. [30, 2021]

▲ **3.3.2* Boiling Point (BP).** The temperature at which the vapor pressure of a liquid equals the surrounding atmospheric pressure. [30, 2021]

3.3.3 Building. A three-dimensional space that is enclosed by a roof and a wall or walls that cover more than one-half of the possible area of the sides of the space, is of sufficient size to allow entry by personnel, will likely limit the dissipation of heat or dispersion of vapors, and restricts access for firefighting.

▲ **3.3.4 Combustible Liquid.** A liquid that has a closed-cup flash point at or above 100°F (37.8°C), as determined by the test procedures and apparatus set forth in 3.4.4. Combustible liquids are classified according to Section 3.4.

3.3.5 Container. A vessel of 119 gal (450 L) or less capacity used for transporting or storing liquids, excluding intermediate bulk containers. [30, 2021]

3.3.6* Fire Point. The lowest temperature at which a liquid will ignite and achieve sustained burning when exposed to a test flame in accordance with ASTM D92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester*. [30, 2021]

▲ **3.3.7* Flammable Liquid.** Any liquid that has a closed-cup flash point below 100°F (37.8°C), as determined by the test procedures and apparatus set forth in 3.4.4, and a Reid vapor pressure that does not exceed an absolute pressure of 40 psi (276 kPa) at 100°F (37.8°C) as determined by ASTM D323, *Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method)*. Flammable liquids are classified according to Section 3.4.

3.3.8* Flash Point (FP). The minimum temperature of a liquid at which sufficient vapor is given off to form an ignitable mixture with the air, near the surface of the liquid or within the vessel used, as determined by the appropriate test procedure and apparatus specified in 3.4.4. [30, 2021]

3.3.9 Hot Box. For the purpose of this standard, an enclosure or room used to raise and maintain the temperature of a container and its contents above ambient.

3.3.10* Important Building. A building that is considered not expendable in an exposure fire. [30, 2021]

3.3.11 Inert Gas. For purposes of [this standard], a gas that is nonflammable, chemically inactive, noncontaminating for the use intended, and oxygen-deficient to the extent required. [326, 2020]

3.3.12* Inerting. A technique by which a combustible mixture is rendered nonignitable by the addition of an inert gas.

3.3.13 Kettle. For the purpose of this standard, a heated process vessel typically used to manufacture resins.

3.3.14 Liquid. Any material that (1) has a fluidity greater than that of 300 penetration asphalt when tested in accordance with ASTM D5, *Standard Test Method for Penetration of Bituminous Materials*, or (2) is a viscous substance for which a specific melting point cannot be determined but that is determined to be a liquid in accordance with ASTM D4359, *Standard Test Method for Determining Whether a Material Is a Liquid or a Solid*. [30, 2021]

3.3.15 Mix Tank. A portable or fixed agitated vessel in which intermediate or finished products are manufactured, adjusted, and held pending disposition.

3.3.16* Monomer. An unsaturated organic compound whose molecules contain reactive groups that polymerize with each other or with other monomer molecules to produce polymers.

3.3.17 Nitrocellulose. A nitrated cellulose (cotton linters or wood pulp) with a nitrogen content ranging from 10.5 percent to 12.6 percent by weight.

3.3.17.1 Dry Nitrocellulose. Nitrocellulose containing less than the minimum wetting agents described in 3.3.17.3, *Solvent-Wet Nitrocellulose*.

3.3.17.2 Plasticized Nitrocellulose. A colloided, chip-like, flake-like, or particle-type nitrocellulose plasticized with not less than 18 percent by weight plasticizer, such as dibutyl phthalate or dioctyl phthalate.

3.3.17.3 Solvent-Wet Nitrocellulose. A fibrous, granular, cubed, or flake-like nitrocellulose wetted with not less than 25 percent by weight alcohol, toluene, or other organic liquid having a flash point not lower than 25°F (−4°C).

3.3.17.4 Water-Wet Nitrocellulose. A fibrous, granular, cubed, or flake-like nitrocellulose wetted with not less than 25 percent by weight water.

3.3.18 Nonconductive Liquid. A liquid that has an electrical conductivity less than 50 picosiemens per meter.

3.3.19 Organic Coating. A liquid mixture of film-forming binder resins, such as those based on alkyd, nitrocellulose, acrylic, polyester, or other chemistry, and flammable or combustible solvents, such as hydrocarbons, esters, ketones, and alcohols, that convert to a protective, decorative, or utilitarian finish.

3.3.20* Organic Peroxide. A reactive organic compound that consists of an active double oxygen group (–O–O–) combined with an organic radical. Organic peroxides are derived from hydrogen peroxide in which one or both hydrogen atoms are replaced by a hydrocarbon or heterocyclic or acid radical.

3.3.21 Portable Tank. Any closed vessel having a liquid capacity over 60 gal (230 L) and not intended for fixed installation. This includes intermediate bulk containers (IBCs) as defined and regulated by the U.S. Department of Transportation.

3.3.22 Protection for Exposures. Fire protection for structures on property adjacent to [an organic coatings manufacturing facility] that is provided by (1) a public fire department or

(2) a private fire brigade maintained on the property adjacent to the organic coatings manufacturing facility, either of which is capable of providing cooling water streams to protect the property adjacent to the organic coatings manufacturing facility. [30, 2021]

3.3.23 Safety Can. A listed container of not more than 5.3 gal (20 L) capacity having a screen or strainer in each fill and pour opening and having a spring-closing lid and spout cover designed to safely relieve internal pressure when exposed to fire. [30, 2021]

3.3.24 Stable Liquid. Any liquid not defined as unstable. (See 3.3.28.) [30, 2021]

3.3.25 Static Dissipating. For the purpose of this standard, having a surface resistivity less than 1.0×10^{11} ohms per square when tested at 73°F (23°C) and 30 percent relative humidity.

3.3.26 Storage Tank. Any vessel having a liquid capacity that exceeds 60 gal (230 L), is intended for fixed installation, and is not used for processing. [30, 2021]

3.3.27 Thin-Down Tank. For the purpose of this standard, a term used in resin manufacturing for any vessel that is used to dilute the resin.

3.3.28* Unstable Liquid. A liquid that, in the pure state or as commercially produced or transported, will vigorously polymerize, decompose, undergo condensation reaction, or become self-reactive under conditions of shock, pressure, or temperature. [30, 2021]

3.3.29* Vapor Pressure. The pressure, measured in pounds per square inch, absolute (psia), exerted by a liquid, as determined by ASTM D323, *Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method)*. [30, 2021]

3.3.30 Vent.

3.3.30.1 Emergency Relief Vent. An opening, construction method, or device that will automatically relieve excessive internal pressure due to an exposure fire. [30, 2021]

3.3.30.2 Normal Vent. An opening, construction method, or device that allows the relief of excessive internal pressure or vacuum during normal storage and operations. [30, 2021]

3.3.31* Ventilation. For the purpose of this standard, movement of air that is provided for the prevention of fire and explosion. [30, 2021]

Δ 3.4* Classification of Liquids.

3.4.1* Scope.

3.4.1.1 This section shall establish a uniform system of classifying ignitable (flammable or combustible) liquids for proper application of this standard. [30:4.1]

3.4.1.2 This section shall not apply to mists, sprays, or foams. [30:1.1.2(6)]

3.4.1.3 This section shall not apply to liquids that do not have flash points but are capable of burning under certain conditions, such as certain halogenated hydrocarbons and certain mixtures of flammable or combustible liquids and halogenated hydrocarbons.

Δ 3.4.2 Classification Scheme. [30:4.2] Any Class I, Class II, or Class III liquid, as defined in 3.4.2.1, 3.4.2.2, and 3.4.2.3 of this standard that is within the scope of this standard and subject to the requirements of this standard shall be classified in accordance with this subsection.

Δ 3.4.2.1 Class I Liquids.

N 3.4.2.1.1 A liquid with a closed-cup flash point below 100°F (37.8°C) shall be designated as a Class I liquid (i.e., flammable liquid), as determined by the test procedures and apparatus set forth in 3.4.4 and a Reid vapor pressure that does not exceed an absolute pressure of 40 psi (276 kPa) at 100°F (37.8°C), as determined by ASTM D323, *Standard Test Method for Vapor Pressure of Petroleum Products (Reid Method)*. (See A.3.3.7.) [30:4.2.1.1]

Δ 3.4.2.1.2 Class I liquids shall be further subclassified in accordance with the following: (1) *Class IA Liquid* — A liquid that has a flash point below 73°F (22.8°C) and a boiling point below 100°F (37.8°C); (2) *Class IB Liquid* — A liquid that has a flash point below 73°F (22.8°C) and a boiling point at or above 100°F (37.8°C); (3) *Class IC Liquid* — A liquid that has a flash point at or above 73°F (22.8°C), but below 100°F (37.8°C). [30:4.2.1.2]

• N 3.4.2.2 Class II Liquids. A liquid with a closed-cup flash point at or above 100°F (37.8°C) but below 140°F (60°C) shall be designated as a Class II liquid (i.e., combustible liquid), as determined by the test procedures and apparatus set forth in 3.4.4. [30:4.2.2]

Δ 3.4.2.3 Class III Liquids.

N 3.4.2.3.1 A liquid with a closed-cup flash point at or above 140°F (60°C) shall be designated as a Class III liquid (i.e., combustible liquid), as determined by the test procedures and apparatus set forth in 3.4.4. [30:4.2.3.1]

Δ 3.4.2.3.2 Class III liquids, shall be further subclassified in accordance with the following: (1) *Class IIIA Liquid* — A liquid that has a flash point at or above 140°F (60°C), but below 200°F (93°C) or (2) *Class IIIB Liquid* — A liquid that has a flash point at or above 200°F (93°C). [30:4.2.3.2]

N 3.4.3 Determination of Boiling Point (BP).

N 3.4.3.1 For defining the boiling point, atmospheric pressure shall be considered to be an absolute pressure of 14.7 psi (101.4 kPa). [30:4.3.1]

N 3.4.3.2 For mixtures that do not have a constant boiling point, the 20 percent evaporated point of a distillation performed in accordance with ASTM D86, *Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure*, shall be considered to be the boiling point. [30:4.3.2]

Δ 3.4.4 Determination of Flash Point (FP). The flash point of a liquid shall be determined according to the methods specified in 3.4.4.1 through 3.4.4.4. [30:4.4]

3.4.4.1 Except as specified in 3.4.4.1.1, the flash point of a liquid having a viscosity below 5.5 centiStokes at 104°F (40°C) or below 9.5 centiStokes at 77°F (25°C) shall be determined in accordance with ASTM D56, *Standard Test Method for Flash Point by Tag Closed Cup Tester*. [30:4.4.1]

Δ 3.4.4.1.1 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. [30:4.4.1.1]

- N 3.4.4.1.2** Such liquids as stated in 3.4.4.1.1 shall be tested in accordance with 3.4.4.2. [30:4.4.1.2]

3.4.4.2 The flash point of a liquid having a viscosity of 5.5 centiStokes or more at 104°F (40°C) or 9.5 centiStokes or more at 77°F (25°C) or a flash point of 200°F (93.4°C) or higher shall be determined in accordance with ASTM D93, *Standard Test Methods for Flash Point by Pensky–Martens Closed Cup Tester*. [30:4.4.2]

3.4.4.3 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 32°F (0°C) and 230°F (110°C) and viscosities below 150 Stokes at 77°F (25°C). [30:4.4.3]

3.4.4.4 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 is specifically required. [30:4.4.4]

Chapter 4 Location of Plants and Buildings

4.1 Location.

4.1.1 Organic coatings manufacturing operations shall not be located in the same building with other occupancies.

4.1.1.1 Operations incidental to or connected with organic coatings manufacturing shall not be classed as “other operations or occupancies.”

4.1.2 Organic coatings manufacturing operations and processes shall be located so that they are accessible from at least two sides to provide access for **firefighting** and other emergency operations.

4.1.3 Where topographical conditions will allow an accidental release of flammable or combustible liquids to flow from organic coatings manufacturing operations and processes so as to present a fire hazard to other facilities, drainage shall be provided in accordance with Section 5.2.

4.2 General Layout and Design.

4.2.1 Laboratories, offices, and storage areas that are located in the same building as organic coatings manufacturing operations shall be separated from the manufacturing operations by a wall that meets both of the following requirements:

- (1) The wall shall have a minimum 2-hour fire resistance rating.
- (2) Openings in the wall between these areas and the manufacturing area shall be protected by fire doors having a minimum 1½-hour fire protection rating.

4.2.2 Areas where unstable liquids are handled or processed shall be separated from all adjacent areas by walls that meet both of the following requirements:

- (1) The wall shall have a minimum 2-hour fire resistance rating.
- (2) Openings in the walls between these areas and all adjacent areas shall be protected by fire doors having a minimum 1½-hour fire protection rating.

4.2.3 Process Vessels.

4.2.3.1 Process vessels shall be located in accordance with Table 4.2.3.1(a) and Table 4.2.3.1(b).

4.2.3.2 Where unstable liquids are processed and protection for exposures, as defined in 3.3.22, is not provided, the distance required by 4.2.3.1 shall be doubled.

4.2.3.3 The distances required in 4.2.3.1 shall be permitted to be waived where both of the following criteria are met:

- (1) The vessels are housed within a building.
- (2)* The exterior wall of the building facing the line of adjoining property that can be built upon is a wall without unprotected openings having a minimum 2-hour fire resistance rating.

4.2.3.4 Where Class IA or unstable liquids are handled, the blank wall specified in 4.2.3.3(2) shall be designed to provide resistance to damage from an explosion originating inside the building and the building shall meet all applicable requirements of Section 5.5.

Table 4.2.3.1(a) Location of Process Vessels

Process Vessels Having Emergency Relief Venting to Permit Pressure (gauge pressure in psi)	Stable Liquids	Unstable Liquids
≤2.5	Distance in Table 4.2.3.1(b)	2.5 times distance in Table 4.2.3.1(b)
>2.5	1.5 times distance in Table 4.2.3.1(b)	4 times distance in Table 4.2.3.1(b)

For SI units, gauge pressure of 2.5 psi = gauge pressure of 17.2 kPa.

Table 4.2.3.1(b) Reference for Table 4.2.3.1(a)

Capacity of Vessel (gal)	Minimum Distance	
	From Property Line That Is or Can Be Built upon, Including the Opposite Side of a Public Way (ft)	From Nearest Side of Any Public Way or from Nearest Important Building on Same Property (ft)
≤275	5	5
276–750	10	5
751–12,000	15	5
12,001–30,000	20	5
30,001–50,000	30	10

For SI units, 1 gal = 3.8 L; 1 ft = 0.3 m.

Note: Process vessels located in accordance with 4.2.3.3 need not meet the distances specified in Table 4.2.3.1(a) or Table 4.2.3.1(b).