CHAPTER 28
LUMBER YARDS AND AGRO-INDUSTRIAL, SOLID BIOMASS AND WOODWORKING FACILITIES

User note:
About this chapter: Chapter 28 provides requirements that are intended to prevent fires and explosions, facilitate fire control and reduce exposures to and from facilities storing, selling or processing wood and forest products, including sawdust, wood chips, shavings, bark mulch, shorts, finished planks, sheets, posts, poles, timber and raw logs and the hazard they represent once ignited. Also included are solid biomass feedstock and raw products associated with agro-industrial facilities and the outdoor storage of pallets at pallet manufacturing and recycling facilities. This chapter requires active and passive fire protection features to reduce on and off-site exposures, limit fire size and development and facilitate firefighting by employees and the fire service.

SECTION 2801
GENERAL

2801.1 Scope. The storage, manufacturing and processing of solid biomass feedstock, timber, lumber, plywood, veneers mulch, and agro-industrial byproducts shall be in accordance with this chapter.

2801.2 Permit. Permits shall be required as set forth in Section 105.6.

SECTION 2802
DEFINITIONS

2802.1 Definitions. The following terms are defined in Chapter 2:
AGRO-INDUSTRIAL.
BIOMASS.
COLDDECK.
FINES.
HOGGED MATERIALS.
PLYWOOD AND VENEER MILLS.
RAW PRODUCT.
SOLID BIOFUEL.
SOLID BIOMASS FEEDSTOCK.
STATIC PILES.
TIMBER AND LUMBER PRODUCTION FACILITIES.
TIPPING AREA.

SECTION 2803
GENERAL REQUIREMENTS

2803.1 Open yards. Open yards required by the International Building Code shall be maintained around structures.

2803.2 Dust control. Equipment or machinery located inside buildings that generates or emits combustible dust shall be provided with an approved dust collection and exhaust system installed in accordance with Chapter 22 and the International Mechanical Code. Equipment or systems that are used to collect, process or convey combustible dusts shall be provided with an approved explosion control system.

2803.2.1 Explosion venting. Where a dust explosion hazard exists in equipment rooms, buildings or other enclosures, such areas shall be provided with explosion (deflagration) venting or an approved explosion suppression system complying with Section 911.

2803.3 Waste removal. Sawmills, planning mills and other woodworking plants shall be equipped with a waste removal system that will collect and remove sawdust and shavings. Such systems shall be installed in accordance with Chapter 22 and the International Mechanical Code.

Exception: Manual waste removal when approved.

2803.3.1 Housekeeping. Provisions shall be made for a systematic and thorough cleaning of the entire plant at sufficient intervals to prevent the accumulations of combustible dust and spilled combustible or flammable liquids.

2803.3.2 Metal scrap. Provision shall be made for separately collecting and disposing of any metal scrap so that such scrap will not enter the wood handling or processing equipment.

2803.4 Electrical equipment. Electrical wiring and equipment shall comply with NFPA 70.

2803.5 Control of ignition sources. Protection from ignition sources shall be provided in accordance with Sections 2803.5.1 through 2803.5.3.

2803.5.1 Cutting and welding. Cutting and welding shall comply with Chapter 35.

2803.5.2 Static electricity. Static electricity shall be prevented from accumulating on machines and equipment subject to static electricity buildup by permanent grounding and bonding wires or other approved means.

2803.5.3 Smoking. Where smoking constitutes a fire hazard, the fire code official is authorized to order the owner or occupant to post approved “No Smoking” signs complying with Section 310. The fire code official is authorized to designate specific locations where smoking is allowed.
2803.6 Fire apparatus access roads. Fire apparatus access roads shall be provided for buildings and facilities in accordance with Section 503.

2803.7 Access plan. Where storage pile configurations change because of changes in product operations and processing, the access plan shall be submitted for approval where required by the fire code official.

2803.8 Site identification. Facility name and address shall be posted at main fire department entrance and clearly visible from the street. 24-hour emergency contact telephone numbers shall be posted at the main entrance and clearly visible from the street. Addresses shall be a minimum of 4 inches (102 mm) high, of contrasting color to the background and readily visible at night.

2803.9 Material-handling equipment. Approved material handling equipment shall be available for moving stored materials.

SECTION 2804
FIRE PROTECTION

2804.1 General. Fire protection in timber and lumber production mills and plywood and veneer mills shall comply with Sections 2804.2 through 2804.4.

2804.2 Fire alarms. An approved means for transmitting alarms to the fire department shall be provided in timber and lumber production mills and plywood and veneer mills.

2804.2.1 Manual fire alarms. A manual fire alarm system complying with Section 907.2 shall be installed in areas of timber and lumber production mills and plywood and veneer mills.

Exception: Where dryers or other sources of ignition are protected by a supervised automatic sprinkler system complying with Section 903.

2804.3 Portable fire extinguishers or standpipes and hose. Portable fire extinguishers or standpipes and hose supplied from an approved water system shall be provided within 50 feet (15 240 mm) of travel distance to any machine producing shavings or sawdust. Portable fire extinguishers shall be provided in accordance with Section 906 for extra-high hazards.

2804.4 Automatic sprinkler systems. Automatic sprinkler systems shall be installed in accordance with Section 903.3.1.1.

SECTION 2805
PLYWOOD, VENEER AND COMPOSITE BOARD MILLS

2805.1 General. Plant operations of plywood, veneer and composite board mills shall comply with Sections 2805.2 and 2805.3.

2805.2 Dryer protection. Dryers shall be protected throughout by an approved, automatic deluge water-spray suppression system complying with Chapter 9. Deluge heads shall be inspected quarterly for pitch buildup. Deluge heads shall be flushed during regular maintenance for functional operation. Manual activation valves shall be located within 75 feet (22 860 mm) of the drying equipment.

2805.3 Thermal oil-heating systems. Facilities that use heat transfer fluids to provide process equipment heat through piped, indirect heating systems shall comply with this code and NFPA 664.

SECTION 2806
LOG STORAGE AREAS

2806.1 General. Log storage areas shall comply with Sections 2806.2 through 2806.3.

2806.2 Cold decks. Cold decks shall not exceed 500 feet (152.4 m) in length, 300 feet (91 440 mm) in width and 20 feet (6096 mm) in height. Cold decks shall be separated from adjacent cold decks or other exposures by a minimum of 100 feet (30 480 mm).

Exception: The size of cold decks shall be determined by the fire code official where the decks are protected by special fire protection including, but not limited to, additional fire flow, portable turrets and deluge sets, and hydrant hose houses equipped with approved fire-fighting equipment capable of reaching the entire storage area in accordance with Chapter 9.

2806.3 Pile stability. Log and pole piles shall be stabilized by approved means.

SECTION 2807
STORAGE OF WOOD CHIPS AND HOGGED MATERIAL ASSOCIATED WITH TIMBER AND LUMBER PRODUCTION FACILITIES

2807.1 General. The storage of wood chips and hogged materials associated with timber and lumber production facilities shall comply with Sections 2807.2 through 2807.5.

2807.2 Size of piles. Piles shall not exceed 60 feet (18 288 mm) in height, 300 feet (91 440 mm) in width and 500 feet (152 m) in length. Piles shall be separated from adjacent piles or other exposures by approved fire apparatus access roads.

Exception: The fire code official is authorized to allow the pile size to be increased where additional fire protection is provided in accordance with Chapter 9. The increase shall be based on the capabilities of the system installed.

2807.2.1 Pile height indicators. Indicator posts taller than the highest point of each pile shall be located at readily recognizable locations. The posts shall be marked at 5 foot (1524 mm) increments, and shall be provided to give visual height references at or near the highest point(s) of each pile. The post(s) shall not be positioned so as to interfere with access to the piles.

2807.3 Pile fire protection. Automatic sprinkler protection shall be provided in conveyor tunnels and combustible enclosures that pass under a pile. Combustible or enclosed
conveyor systems shall be equipped with an approved automatic sprinkler system.

2807.4 Material-handling equipment. Approved material-handling equipment shall be readily available for moving wood chips and hogged material.

2807.5 Emergency plan. The owner or operator shall develop a plan for monitoring, controlling and extinguishing spot fires. The plan shall be submitted to the fire code official for review and approval.

2807.6 Static Pile Protection. Static piles shall be monitored by an approved means to measure temperatures within the static piles. Internal pile temperatures shall be monitored and recorded weekly. Such records shall be maintained. An operational plan indicating procedures and schedules for the inspection, monitoring and restricting of excessive internal temperatures in static piles shall be submitted to the fire code official for review and approval.

2807.6.1 Internal temperature. If any location in a pile is found to have an internal temperature of 160°F (71°C) immediate action must be taken to reduce the temperature. If any location in a pile is found to have an internal temperature of 180°F (82°C) or greater, the following procedures must immediately be taken:

1. The area with the high temperature shall be dug out of the main pile. This overheated material shall be pushed out in the designated push out area. The material shall be no greater than 3 ft. in depth in the push out area.
2. Water shall be stationed closely to the affected area, prior to digging out the hotspot, to immediately douse any flare ups that may occur when air is added to overheated area.
3. Continual temperature probing and removal of material greater than 180°F (82°C) shall be conducted until all overheated material is separated into the push out area.

2807.6.2 Delivery & tipping area. Feedstock and raw materials shall be placed into designated tipping areas or separated piles upon delivery and shall comply with all storage requirements for compost and mulch. Tipping areas shall comply with all of the following:

1. Size. Tipping areas shall not exceed a maximum area of 50 feet (15240 mm) by 50 (15240 mm) feet.
2. Height. Material within a tipping area shall not exceed 12 feet (3658 mm) in height at any time.
3. Separation. Tipping areas shall be separated from all piles and other tipping areas by a minimum 20-foot-wide fire access lane.
4. Raw Product. Shall remain in tipping area until deemed safe and no longer incendiary.
5. Water System. A water system shall be available to wet down/cool the raw product in case of fire within the tipping area.
6. Duration. Raw product shall be kept in tipping area long enough to ensure no load was delivered that is already over heated. Raw product shall be less than 160°F before mixing with main pile.

2807.6.3 Push-out or clear area. Approved push-out or clear areas shall be provided for pile storage.

2807.6.4 Location. Exterior lumber storage shall not be located within 10 feet (3048 mm) of a property line.

Exceptions:
1. The separation distance is allowed to be reduced to 3 feet (914 mm) for storage not exceeding 6 feet (1828 mm) in height.
2. The separation distance is allowed to be reduced when the fire code official determines that no hazard to the adjoining property exists.

2807.6.5 Fire Emergency Protection Plan. The owner or operator shall prepare a fire protection plan for any facilities processing and/or storing piles in excess of 6 feet (1828 mm) in height or 12 feet (3657 mm) width of combustible material, and all commercial facilities. The fire protection plan shall address monitoring, controlling, and extinguishing fires. The fire protection plan shall be submitted to the fire code official.

Fire protection plan shall include the following:
1. A scaled and dimensioned site plan indicating property lines, buildings, access roads, fire hydrants, location of tipping areas, pile height indicators, piles and push out areas.
2. Pile contents (hogged material, compost, tipping, manure, etc.) and maximum pile dimensions of each pile.
3. Monitoring procedures, and schedules for checking for pile temperature and moisture content.
4. Fire suppression methods and emergency plans.
5. Other procedures and methods to reduce fire within piles.
6. Employee training.
7. Equipment and resources available on-site, and through contract, for fire prevention and suppression.
8. Thresholds for calling 9-1-1.
9. Reports and other justifications if requesting to exceed this standard.

SECTION 2808
STORAGE AND PROCESSING OF MULCH, WOODCHIPS, HOGGED MATERIAL, FINES, COMPOST AND RAW PRODUCT ASSOCIATED WITH YARD WASTE AND RECYCLING FACILITIES

2808.1 General. The storage and processing of mulch, wood chips, hogged materials, fines, compost and raw product produced from yard waste, debris and recycling facilities shall comply with Sections 2808.2 through 2808.10.
2808.2 Storage site. Storage sites shall be level and on solid ground or other all-weather surface. Sites shall be thoroughly cleaned before transferring wood products to the site.

2808.2.1 Delivery & tipping Area. Feedstock and raw materials shall be placed into designated tipping areas or separated piles upon delivery and shall comply with all storage requirements for compost and mulch.

2808.3 Size of piles. Piles shall not exceed 25 feet (7620 mm) in height, 150 feet (45 720 mm) in width and 250 feet (76 200 mm) in length.

Exception: The fire code official is authorized to allow the pile size to be increased through fire department appeal, where a fire protection plan is provided for approval that includes, but is not limited to, the following:

1. Storage yard areas and materials-handling equipment selection, design and arrangement shall be based on sound fire prevention and protection principles.
2. Factors that lead to spontaneous heating shall be identified in the plan, and control of the various factors shall be identified and implemented, including provisions for monitoring the internal condition of the pile.
3. The plan shall include means for early fire detection and reporting to the public fire department; and facilities needed by the fire department for fire extinguishment including a water supply and fire hydrants.
4. Fire apparatus access roads around the piles and access roads to the top of the piles shall be established, identified and maintained.
5. Regular yard inspections by trained personnel shall be included as part of an effective fire prevention maintenance program.

Additional fire protection called for in the plan shall be provided and shall be installed in accordance with this code. The increase of the pile size shall be based on the capabilities of the installed fire protection systems and features.

2808.3.1 Pile height indicators. Indicator posts taller than the highest point of each pile shall be located at readily recognizable locations. The posts shall be marked at 5 foot (1524 mm) increments, and shall be provided to give visual height references at or near the highest point(s) of each pile. The post(s) shall not be positioned so as to interfere with access to the piles.

2808.4 Pile separation. Piles shall be separated from adjacent piles by approved fire apparatus access roads.

2808.5 Combustible waste. The storage, accumulation and handling of combustible materials and control of vegetation shall comply with Chapter 3.

2808.6 Static pile protection. Static piles shall be monitored by an approved means to measure temperatures within the static piles. Internal pile temperatures shall be monitored and recorded weekly. Such records shall be maintained. An operational plan indicating procedures and schedules for the inspection, monitoring and restricting of excessive internal temperatures in static piles shall be submitted to the fire code official for review and approval.

2808.7 Pile fire protection. Automatic sprinkler protection shall be provided in conveyor tunnels and combustible enclosures that pass under a pile. Combustible conveyor systems and enclosed conveyor systems shall be equipped with an approved automatic sprinkler system.

2808.7.1 Delivery & tipping area. A maximum of two designated tipping areas may be provided at a single facility and shall be shown on the approved facility site plan. Tipping areas shall comply with the following:

1. Size. Tipping areas shall not exceed a maximum area of 50 feet by (15 240 mm) by 50 feet (15 240 mm).
2. Height. Material within a tipping area shall not exceed five (5) feet in height at any time.
3. Separation. Tipping areas shall be separated from all piles and other tipping area by a minimum 20-foot-wide fire access lane.
4. Water system. A water system shall be available to wet down/ cool the raw product in case of fire within the tipping area.
5. Duration. Raw product shall be kept in tipping area long enough to ensure no load was delivered that is already over heated. Raw product shall be less than 160° F before mixing with main pile.

2808.7.2 Push-out/clear area. Approved push-out or clear areas shall be provided for temporary pile storage. Any pile in place exceeding thirty (30) days and when piles are over 100 cubic yards (76.5 m3) in size shall have a push out area. The intent is to provide areas to spread piles and move unburned material away from a pile in the event of fire or hotspot within the pile.

Push-out/clear areas shall be located not more than 250 feet (76 200 mm) from the pile and shall be not located within 20 feet (6096 mm) of any building, or other combustibles. The push-out/clear area shall be sized to hold no less than a quarter of the size of the single largest pile it serves at a maximum depth of 3 feet (914 mm). Water shall be immediately available to aid in cooling.

2808.7.3 Conveyor systems. Automatic sprinkler protection shall be provided in conveyor tunnels and combustible enclosures that pass under a pile. Combustible conveyor systems and enclosed conveyor systems shall be equipped with an approved automatic sprinkler system.

2808.7.4 Fire hydrants. The fire code official may increase the distance required to a fire hydrant as set forth in Section 507 when the conditions of this section are complied with. The omitting of an onsite hydrant or increased overall distance to the nearest hydrants will be evaluated with the application for permit.

2807.8 Fire extinguishers. Portable fire extinguishers complying with Section 906 and with a minimum rating of
4-A:60-B:C shall be provided on all vehicles and equipment operating on piles and at all processing equipment.

2708.9 **Material-handling equipment.** Approved material handling equipment shall be available for moving wood chips, hogged material, wood fines and raw product during fire-fighting operations.

2708.10 **Fire Emergency Protection Plan.** The owner or operator shall prepare a fire protection plan for any facilities processing and/or storing piles in excess of 6 feet (1828 mm) in height or 12 feet (3657 mm) width of combustible material, and all commercial facilities. The fire protection plan shall address monitoring for, controlling, and extinguishing fires. The fire protection plan shall be submitted to the fire code official.

Fire protection plan shall include the following:

1. A scaled and dimensioned site plan indicating property lines, buildings, access roads, fire hydrants, location of tipping areas, pile height indicators, piles and push out areas.
2. Pile contents (hogged material, compost, tipping, manure, etc.) and maximum pile dimensions of each pile.
3. Monitoring procedures, and schedules for checking for pile temperature and moisture content.
4. Fire suppression methods and emergency plans.
5. Other procedures and methods to reduce fire within piles.
6. Employee training.
7. Equipment and resources available on-site, and through contract, for fire prevention and suppression.
8. Thresholds for calling 9-1-1.
9. Reports and other justifications if requesting to exceed this standard.

**SECTION 2809**

**EXTERIOR STORAGE OF FINISHED LUMBER and SOLID BIOFUEL PRODUCTS**

2809.1 **General.** Exterior storage of finished lumber and solid biofuel products shall comply with Sections 2809.2 through 2809.5.

2809.2 **Size of piles.** Exterior storage shall be arranged to form stable piles with a maximum height of 20 feet (6096 mm). Piles shall not exceed 150,000 cubic feet (4248 m³) in volume.

2809.3 **Fire apparatus access roads.** Fire apparatus access roads in accordance with Section 503 shall be located so that a maximum grid system unit of 50 feet by 150 feet (15 240 mm by 45 720 mm) is established.

2809.4 **Security.** Permanent storage areas shall be surrounded with an approved fence. Fences shall be not less than 6 feet (1829 mm) in height.

**Exceptions:**

1. Lumber piles inside of buildings and production mills for lumber, plywood and veneer.
2. Solid biofuel piles inside of buildings and agro-industrial processing facilities for solid biomass feedstock.

2809.5 **Fire protection.** An approved hydrant and hose system or portable fire-extinguishing equipment suitable for the fire hazard involved shall be provided for open storage yards. Hydrant and hose systems shall be installed in accordance with NFPA 24. Portable fire extinguishers complying with Section 906 shall be located so that the distance of travel from the nearest unit does not exceed 75 feet (22 860 mm).

2809.6 **Location.** Exterior lumber storage shall not be located within 10 feet (3048 mm) of a property line.

**SECTION 2810**

**OUTDOOR STORAGE OF PALLETS AT PALLET MANUFACTURING AND RECYCLING FACILITIES**

2810.1 **General.** The outside storage of wood pallets and wood composite pallets on the same site as a pallet manufacturing or recycling facility shall comply with Sections 2810.2 through 2810.11.

2810.2 **Site plan.** Each site shall maintain a current site plan that includes a general description of the property, the boundaries of the lot, the size and location of buildings, and all of the following:

1. Utilities.
2. Type of construction and presence of sprinkler protection for other buildings on the site.
3. Water supply sources for fire-fighting purposes.
4. Location of hazardous material storage areas.
5. Location of pallet storage.
6. Equipment protected with a dust collection system.
7. Fire apparatus access roads.
8. Designated smoking areas.
9. Location of fire alarm control panels.

2810.3 **Fire prevention plan.** The owner or owner’s authorized representative shall prepare an approved fire prevention plan that includes all of the following:

1. Frequency of walk-through inspections to verify compliance with the plan.
2. Hot work permit program in accordance with Chapter 35.
3. Preventive maintenance program for equipment associated with pallet activities.
4. Inspection, testing and maintenance of fire protection systems in accordance with Chapter 9.
2810.4 Fire safety and emergency evacuation plan. The owner or owner’s authorized representative shall prepare and train employees in an approved fire safety and emergency evacuation plan in accordance with Chapter 4.

2810.5 Security management plan. The owner or owner’s authorized representative shall prepare a security management plan based on a security risk assessment and shall make the plan and assessment available to the fire code official upon request.

2810.6 Clearance to property line. Stacks of pallets shall not be stored within 0.75 times the stack height or 8 feet (2438 mm) of the property line, whichever is greater, or shall comply with Section 2810.11.

2810.7 Clearance to important buildings. Stacks of pallets shall not be stored within 0.75 times the stack height of any important building on site, or shall comply with Section 2810.11.

2810.8 Height. Pallet stacks shall not exceed 20 feet (6096 mm) in height.

2810.9 Fire flow. Fire flow requirements for the site shall be determined by the fire code official.

2810.10 Portable fire extinguishers. Portable fire extinguishers shall be provided within 75 feet (22860 mm) of any pallet stack.

2810.11 Alternative approach. Where approved by the fire code official, pallet stacks located closer to a property line or structure than as required by Sections 2810.6 and 2810.7 shall be provided with additional fire protection including, but not limited to, the following:

1. The storage yard areas and materials-handling equipment selection, design, and arrangement are based on an approved risk assessment.
2. Automatic fire detection that transmits an alarm to a supervising station in accordance with NFPA 72.
3. Fire apparatus access roads around all storage areas.
CHAPTER 29
MANUFACTURE OF ORGANIC COATINGS

User note:

About this chapter: Chapter 29 regulates materials and processes associated with the manufacture of paints as well as bituminous, asphaltic and other diverse compounds formulated to protect buildings, machines and objects from the effects of weather, corrosion and hostile environmental exposures. Paint for decorative, architectural and industrial uses comprises the bulk of organic coating production. Painting and processes related to the manufacture of nonflammable and noncombustible or water-based products are exempt from the provisions of this chapter. The application of organic coatings is covered by Chapter 24. Elimination of ignition sources, maintenance of fire protection equipment and isolation or segregation of hazardous operations are emphasized.

SECTION 2901
GENERAL

2901.1 Scope. Organic coating manufacturing processes shall comply with this chapter, except that this chapter shall not apply to processes manufacturing nonflammable or water thinned coatings or to operations applying coating materials.

2901.2 Permits. Permits shall be required as set forth in Section 105.6.

2901.3 Maintenance. Structures and their service equipment shall be maintained in accordance with this code and NFPA 35.

SECTION 2902
DEFINITION

2902.1 Definition. The following term is defined in Chapter 2: ORGANIC COATING.

SECTION 2903
GENERAL PRECAUTIONS

2903.1 Building features. Manufacturing of organic coatings shall be done only in buildings that do not have pits or basements.

2903.2 Location. Organic coating manufacturing operations and operations incidental to or connected with organic coating manufacturing shall not be located in buildings having other occupancies.

2903.3 Fire-fighting access. The fire department shall be able to access the organic coating manufacturing operations shall be accessible from at least one side for the purpose of fire control. Approved aisles shall be maintained for the unobstructed movement of personnel and fire suppression equipment.

2903.4 Fire protection systems. Fire protection systems shall be installed, maintained, periodically inspected and tested in accordance with Chapter 9.

2903.5 Portable fire extinguishers. A minimum of one portable fire extinguisher complying with Section 906 for extra hazard shall be provided in organic coating areas.

2903.6 Open flames. Open flames and direct-fired heating devices shall be prohibited in areas where flammable vapor air mixtures exist.

2903.7 Smoking. Smoking shall be prohibited in accordance with Section 310.

2903.8 Power equipment. Power-operated equipment and industrial trucks shall be of a type approved for the location.

2903.9 Tank maintenance. The cleaning of tanks and vessels that have contained flammable or combustible liquids shall be performed under the supervision of persons knowledgeable of the fire and explosion potential.

2903.9.1 Repairs. Where necessary to make repairs involving “hot work,” the work shall be authorized by the responsible individual before the work begins.

2903.9.2 Empty containers. Empty flammable or combustible liquid containers shall be removed to a detached, outside location and, if not cleaned on the premises, the empty containers shall be removed from the plant as soon as practical.

2903.10 Drainage. Drainage facilities shall be provided to direct flammable and combustible liquid leakage and fire protection water to an approved location away from the building, any other structure, storage area or adjoining premises.

2903.11 Alarm system. An approved fire alarm system shall be provided in accordance with Section 907.

SECTION 2904
ELECTRICAL EQUIPMENT AND PROTECTION

2904.1 Wiring and equipment. Electrical wiring and equipment shall comply with this chapter and shall be installed in accordance with NFPA 70.
2904.2 Hazardous locations. Where Class I liquids are exposed to the air, the design of equipment and ventilation of structures shall be such as to limit the Class I, Division 1, locations to the following:

1. Piping trenches.
2. The interior of equipment.
3. The immediate vicinity of pumps or equipment locations, such as dispensing stations, open centrifuges, plate and frame filters, open vacuum filters, change cans and the surfaces of open equipment. The immediate vicinity shall include a zone extending from the vapor liberation point 5 feet (1524 mm) horizontally in all directions and vertically from the floor to a level 3 feet (914 mm) above the highest point of vapor liberation.

2904.2.1 Other locations. Locations within the confines of the manufacturing room where Class I liquids are handled shall be Class I, Division 2, except locations indicated in Section 2904.2.

2904.2.2 Ordinary equipment. Ordinary electrical equipment, including switchgear, shall be prohibited, except where installed in a room maintained under positive pressure with respect to the hazardous area. The air or other media utilized for pressurization shall be obtained from a source that will not cause any amount or type of flammable vapor to be introduced into the room.

2904.3 Bonding. Equipment including, but not limited to, tanks, machinery and piping, shall be bonded and connected to a ground where an ignitable mixture is capable of being present.

2904.3.1 Piping. Electrically isolated sections of metallic piping or equipment shall be grounded or bonded to the other grounded portions of the system.

2904.3.2 Vehicles. Tank vehicles loaded or unloaded through open connections shall be grounded and bonded to the receiving system.

2904.3.3 Containers. Where a flammable mixture is transferred from one portable container to another, a bond shall be provided between the two containers, and one shall be grounded.

2904.4 Ground. Metal framing of buildings shall be grounded with resistance of not more than 5 ohms.

SECTION 2905
PROCESS STRUCTURES

2905.1 Design. Process structures shall be designed and constructed in accordance with the International Building Code.

2905.2 Fire apparatus access. Fire apparatus access complying with Section 503 shall be provided for the purpose of fire control to at least one side of organic coating manufacturing operations.

2905.3 Drainage. Drainage facilities shall be provided in accordance with Section 2903.10 where topographical conditions are such that flammable and combustible liquids are capable of flowing from the organic coating manufacturing operation so as to constitute a fire hazard to other premises.

2905.4 Explosion control. Explosion control shall be provided in areas subject to potential deflagration hazards as indicated in NFPA 35. Explosion control shall be provided in accordance with Section 911.

2905.5 Ventilation. Enclosed structures in which Class I liquids are processed or handled shall be ventilated at a rate of not less than 1 cubic foot per minute per square foot [0.00508 m³/(s · m²)] of solid floor area. Ventilation shall be accomplished by exhaust fans that take suction at floor levels and discharge to a safe location outside the structure. Noncontaminated intake air shall be introduced in such a manner that all portions of solid floor areas are provided with continuous uniformly distributed air movement.

2905.6 Heating. Heating provided in hazardous areas shall be by indirect means. Ignition sources such as open flames or electrical heating elements, except as provided for in Section 2904, shall not be permitted within the structure.

SECTION 2906
PROCESS MILLS AND KETTLES

2906.1 Mills. Mills, operating with close clearances, which process flammable and heat-sensitive materials, such as nitrocellulose, shall be located in a detached building or in a noncombustible structure without other occupancies. The amount of nitrocellulose or other flammable material brought into the area shall not be more than the amount required for a batch.

2906.2 Mixers. Mixers shall be of the enclosed type or, where of the open type, shall be provided with properly fitted covers. Where flow is by gravity, a shutoff valve shall be installed as close as practical to the mixer, and a control valve shall be provided near the end of the fill pipe.

2906.3 Open kettles. Open kettles shall be located in an outside area provided with a protective roof; in a separate structure of noncombustible construction; or separated from other areas by a noncombustible wall having a fire-resistance rating of at least 2 hours.

2906.4 Closed kettles. Contact-heated kettles containing solvents shall be equipped with safety devices that, in case of a fire, will turn off the process heat, turn on the cooling medium and inject inert gas into the kettle.

2906.4.1 Vaporizer location. The vaporizer section of heat-transfer systems that heat closed kettles containing solvents shall be remotely located.

2906.5 Kettle controls. The kettle and thin-down tank shall be instrumented, controlled and interlocked so that any failure of the controls will result in a safe condition. The kettle shall be provided with a pressure-rupture disc in addition to the primary vent. The vent piping from the rupture disc shall be of minimum length and shall discharge to an approved location. The thin-down tank shall be adequately vented. Thinning operations shall be provided with an adequate vapor removal system.
SECTION 2907
PROCESS PIPING

2907.1 Design. All piping, valves and fittings shall be designed for the working pressures and structural stresses to which the piping, valves and fittings will be subjected, and shall be of steel or other material approved for the service intended.

2907.2 Valves. Valves shall be of an indicating type. Terminal valves on remote pumping systems shall be of the deadman type, shutting off both the pump and the flow of solvent.

2907.3 Support. Piping systems shall be supported adequately and protected against physical damage. Piping shall be pitched to avoid unintentional trapping of liquids, or approved drains shall be provided.

2907.4 Connectors. Approved flexible connectors shall be installed where vibration exists or frequent movement is necessary. Hose at dispensing stations shall be of an approved type.

2907.5 Tests. Before being placed in service, all piping shall be free of leaks when tested for a minimum of 30 minutes at not less than 1.5 times the working pressure or not less than 5 pounds per square inch gauge (psig) (35 kPa) at the highest point in the system.

SECTION 2908
RAW MATERIALS IN PROCESS AREAS

2908.1 Nitrocellulose quantity. The amount of nitrocellulose brought into the operating area shall not exceed the amount required for a work shift. Nitrocellulose spillage shall be promptly swept up and disposed of properly.

2908.2 Organic peroxides quantity. Organic peroxides brought into the operating area shall be in the original shipping container. When in the operating area, the organic peroxide shall not be placed in locations exposed to ignition sources, heat or mechanical shocks.

SECTION 2909
RAW MATERIALS AND FINISHED PRODUCTS

2909.1 General. The storage, handling and use of flammable and combustible liquids in process areas shall be in accordance with Chapter 57.

2909.2 Tank storage. Tank storage for flammable and combustible liquids located inside of structures shall be limited to storage areas at or above grade that are separated from the processing area in accordance with the International Building Code. Processing equipment containing flammable and combustible liquids and storage in quantities essential to the continuity of the operations shall not be prohibited in the processing area.

2909.3 Tank vehicle. Tank car and tank vehicle loading and unloading stations for Class I liquids shall be separated from the processing area, other plant structures, nearest lot line of property that can be built upon or public thoroughfare by a minimum clear distance of 25 feet (7620 mm).

2909.3.1 Loading. Loading and unloading structures and platforms for flammable and combustible liquids shall be designed and installed in accordance with Chapter 57.

2909.3.2 Safety. Tank cars for flammable liquids shall be unloaded such that the safety to persons and property is ensured. Tank vehicles for flammable and combustible liquids shall be loaded and unloaded in accordance with Chapter 57.

2909.4 Nitrocellulose storage. Nitrocellulose storage shall be located on a detached pad or in a separate structure or a room enclosed in accordance with the International Building Code. The nitrocellulose storage area shall not be utilized for any other purpose. Electrical wiring and equipment installed in storage areas adjacent to process areas shall comply with Section 2904.2.

2909.4.1 Containers. Nitrocellulose shall be stored in closed containers. Barrels shall be stored on end and not more than two tiers high. Barrels or other containers of nitrocellulose shall not be opened in the main storage structure but at the point of use or other location intended for that purpose.

2909.4.2 Spills. Spilled nitrocellulose shall be promptly wetted with water and disposed of by use or burning in the open at an approved detached location.

2909.5 Organic peroxide storage. The storage of organic peroxides shall be in accordance with Chapter 62.

2909.5.1 Size. The size of the package containing organic peroxide shall be selected so that, as nearly as practical, full packages are utilized at one time. Spilled peroxide shall be promptly cleaned up and disposed of as specified by the supplier.

2909.6 Finished products. Finished products that are flammable or combustible liquids shall be stored outside of structures, in a separate structure, or in a room separated from the processing area in accordance with the International Building Code. The storage of finished products shall be in tanks or closed containers in accordance with Chapter 57.