CHAPTER 21

DRY CLEANING

User note:

About this chapter: *Chapter 21 provides provisions that are intended to reduce hazards associated with use of flammable and combustible dry cleaning solvents. These materials, like all volatile organic chemicals, generate significant quantities of static electricity and are thus readily ignitable. Many flammable and nonflammable dry cleaning solvents also possess health hazards when involved in a fire.*

SECTION 2101
GENERAL

2101.1 Scope. Dry cleaning plants and their operations shall comply with the requirements of this chapter.

2101.2 Permit required. Permits shall be required as set forth in Section 105.6.

SECTION 2102
DEFINITIONS

2102.1 Definitions. The following terms are defined in Chapter 2:

DRY CLEANING.

DRY CLEANING PLANT.

DRY CLEANING ROOM.

DRY CLEANING SYSTEM.

SOLVENT OR LIQUID CLASSIFICATIONS.

Class I solvents.

Class II solvents.

Class IIIA solvents.

Class IIIB solvents.

Class IV solvents.

SECTION 2103
CLASSIFICATIONS

2103.1 Solvent classification. Dry cleaning solvents shall be classified according to their *flash point*s as follows:

1. Class I solvents are liquids having a *flash point* below 100°F (38°C).
2. Class II solvents are liquids having a *flash point* at or above 100°F (38°C) and below 140°F (60°C).
3. Class IIIA solvents are liquids having a *flash point* at or above 140°F (60°C) and below 200°F (93°C).
4. Class IIIB solvents are liquids having a *flash point* at or above 200°F (93°C).
5. Class IV solvents are liquids classified as nonflammable.

2103.2 Classification of dry cleaning plants and systems. Dry cleaning plants and systems shall be classified based on the solvents used as follows:

1. Type I—systems using Class I solvents.
2. Type II—systems using Class II solvents.
3. Type III-A—systems using Class IIIA solvents.
4. Type III-B—systems using Class IIIB solvents.
5. Type IV—systems using Class IV solvents in which dry cleaning is not conducted by the public.
6. Type V—systems using Class IV solvents in which dry cleaning is conducted by the public.

Spotting and pretreating operations conducted in accordance with Section 2106 shall not change the type of the dry cleaning plant.

2103.2.1 Multiple solvents. Dry cleaning plants using more than one class of solvent for dry cleaning shall be classified based on the numerically lowest solvent class.

2103.3 Design. The occupancy classification, design and construction of dry cleaning plants shall comply with the applicable requirements of the *International Building Code*.

SECTION 2104
GENERAL REQUIREMENTS

2104.1 Prohibited use. Type I dry cleaning plants shall be prohibited. Limited quantities of Class I solvents stored and used in accordance with this section shall not be prohibited in dry cleaning plants.

2104.2 Building services. Building services and systems shall be designed, installed and maintained in accordance with this section and Chapter 6.

2104.2.1 Ventilation. Ventilation shall be provided in accordance with Section 502 of the *International Mechanical Code* and DOL 29 CFR Part 1910.1000, where applicable.

2104.2.2 Heating. In Type II dry cleaning plants, heating shall be by indirect means using steam, hot water or hot oil only.

2104.2.3 Electrical wiring and equipment. Electrical wiring and equipment in dry cleaning rooms or other locations subject to flammable vapors shall be installed in accordance with NFPA 70.

2104.2.4 Bonding and grounding. Storage tanks, treatment tanks, filters, pumps, piping, ducts, dry cleaning units, stills, tumblers, drying cabinets and other such equipment, where not inherently electrically conductive, shall be bonded together and grounded. Isolated equipment shall be grounded.

SECTION 2105
OPERATING REQUIREMENTS

2105.1 General. The operation of dry cleaning systems shall comply with the requirements of Sections 2105.1.1 through 2105.3.

2105.1.1 Written instructions. Written instructions covering the proper installation and safe operation and use of equipment and solvent shall be given to the buyer.

2105.1.1.1 Type II, III-A, III-B and IV systems. In Type II, III-A, III-B and IV dry cleaning systems, machines shall be operated in accordance with the operating instructions furnished by the machinery manufacturer. Employees shall be instructed as to the hazards involved in their departments and in the work they perform.

2105.1.1.2 Type V systems. Operating instructions for customer use of Type V dry cleaning systems shall be conspicuously posted in a location near the dry cleaning unit. A telephone number shall be provided for emergency assistance.

2105.1.2 Equipment identification. The manufacturer shall provide nameplates on dry cleaning machines indicating the class of solvent for which each machine is designed.

2105.1.3 Open systems prohibited. Dry cleaning by immersion and agitation in open vessels shall be prohibited.

2105.1.4 Prohibited use of solvent. The use of solvents with a *flash point* below that for which a machine is designed or *listed* shall be prohibited.

2105.1.5 Equipment maintenance and housekeeping. Proper maintenance and operating practices shall be observed in order to prevent the leakage of solvent or the accumulation of lint. The handling of waste material generated by dry cleaning operations and the maintenance of facilities shall comply with the provisions of this section.

2105.1.5.1 Floors. Class I and II liquids shall not be used for cleaning floors.

2105.1.5.2 Filters. Filter residue and other residues containing solvent shall be handled and disposed of in covered metal containers.

2105.1.5.3 Lint. Lint and refuse shall be removed from traps daily, deposited in *approved* waste cans, removed from the premises, and disposed of safely. At all other times, traps shall be held securely in place.

2105.1.5.4 Customer areas. In Type V dry cleaning systems, customer areas shall be kept clean.

2105.2 Type II systems. Special operating requirements for Type II dry cleaning systems shall comply with the provisions of Sections 2105.2.1 through 2105.2.3.

2105.2.1 Inspection of materials. Materials to be dry cleaned shall be searched thoroughly and foreign materials, including matches and metallic substances, shall be removed.

2105.2.2 Material transfer. In removing materials from the washer, provisions shall be made for minimizing the dripping of solvent on the floor. Where materials are transferred from a washer to a drain tub, a nonferrous metal drip apron shall be placed so that the apron rests on the drain tub and the cylinder of the washer.

2105.2.3 Ventilation. A mechanical ventilation system that is designed to exhaust 1 cubic foot of air per minute for each square foot of floor area [0.0058 $m^3/(s \cdot m^2)$] shall be installed in dry cleaning rooms and in drying rooms. The ventilation system shall operate automatically when the dry cleaning equipment is in operation and shall have manual controls at an *approved* location.

2105.3 Type IV and V systems. Type IV and V dry cleaning systems shall be provided with an automatically activated exhaust ventilation system to maintain an air velocity of not less than 100 feet per minute (0.51 m/s) through the loading door when the door is opened. Such systems for dry cleaning equipment shall comply with the *International Mechanical Code*.

Exception: Dry cleaning units are not required to be provided with exhaust ventilation where an exhaust hood is installed immediately outside of and above the loading door and operates at an airflow rate as follows:

$Q = 100 \times A_{LD}$ **(Equation 21-1)**

where:

Q = flow rate exhausted through the hood, cubic feet per minute (m^3/s).

A_{LD}= area of the loading door, square feet (m^2).

SECTION 2106
SPOTTING AND PRETREATING

2106.1 General. Spotting and pretreating operations and equipment shall comply with the provisions of Sections 2106.2 through 2106.5.

2106.2 Class I solvents. The maximum quantity of Class I solvents permitted at any work station shall be 1 gallon (4 L). Spotting or prespotting shall be permitted to be conducted with Class I solvents where they are stored in and dispensed from *approved* safety cans or in sealed DOT-approved metal shipping containers of not more than 1-gallon (4 L) capacity.

2106.2.1 Spotting and prespotting. Spotting and pre-spotting shall be permitted to be conducted with Class I solvents where dispensed from plastic containers of not more than 1 pint (0.5 L) capacity.

2106.3 Class II and III solvents. Scouring, brushing, and spotting and pretreating shall be permitted to be conducted with Class II or III solvents. The maximum quantity of Class II or III solvents permitted at any work station shall be 1 gallon (4 L). In other than Group H-2 occupancy, the aggregate quantities of solvents shall not exceed the *maximum allowable quantity per control area* for use-open system.

2106.3.1 Spotting tables. Scouring, brushing or spotting tables on which articles are soaked in solvent shall have a liquid-tight top with a curb on all sides not less than 1 inch (25 mm) high. The top of the table shall be pitched to ensure thorough draining to a 1-1/2-inch (38 mm) drain connected to an *approved* container.

2106.3.2 Special handling. Where *approved*, articles that cannot be washed in the usual washing machines are allowed to be cleaned in scrubbing tubs. Scrubbing tubs shall comply with the following:

1. Only Class II or III liquids shall be used.
2. The total amount of solvent used in such open containers shall not exceed 3 gallons (11 L).
3. Scrubbing tubs shall be secured to the floor.
4. Scrubbing tubs shall be provided with permanent 1-1/2-inch (38 mm) drains. Such drain shall be provided with a trap and shall be connected to an *approved* container.

2106.3.3 Ventilation. Scrubbing tubs, scouring, brushing or spotting operations shall be located such that solvent vapors are captured and exhausted by the ventilating system.

2106.3.4 Bonding and grounding. Metal scouring, brushing and spotting tables and scrubbing tubs shall be permanently and effectively bonded and grounded.

2106.4 Type IV systems. Flammable and combustible liquids used for spotting operations shall be stored in *approved* safety cans or in sealed DOTn-approved shipping containers of not more than 1 gallon (4 L) in capacity. Aggregate amounts shall not exceed 10 gallons (38 L).

2106.5 Type V systems. Spotting operations using flammable or *combustible liquids* are prohibited in Type V dry cleaning systems.

SECTION 2107
DRY CLEANING SYSTEMS

2107.1 General equipment requirements. Dry cleaning systems, including dry cleaning units, washing machines, stills, drying cabinets, tumblers and their appurtenances, including pumps, piping, valves, filters and solvent coolers, shall be installed and

maintained in accordance with NFPA 32. The construction of buildings in which such systems are located shall comply with the requirements of this section and the *International Building Code*.

2107.2 Type II systems. Type II dry cleaning and solvent tank storage rooms shall not be located below grade or above the lowest floor level of the building and shall comply with Sections 2107.2.1 through 2107.2.3.

Exception: Solvent storage tanks installed underground, in vaults or in special enclosures in accordance with Chapter 57.

2107.2.1 Fire-fighting access. Type II dry cleaning plants shall be located so that access is provided and maintained from one side for fire-fighting and fire control purposes in accordance with Section 503.

2107.2.2 Number of means of egress. Type II dry cleaning rooms shall have not less than two *means of egress* doors located at opposite ends of the room, not less than one of which shall lead directly to the outside.

2107.2.3 Spill control and secondary containment. Curbs, drains or other provisions for spill control and secondary containment shall be provided in accordance with Section 5004.2 to collect solvent leakage and fire protection water and direct it to a safe location.

2107.3 Solvent storage tanks. Solvent storage tanks for Class II, IIIA and IIIB liquids shall conform to the requirements of Chapter 57 and be located underground or outside, above ground.

Exception: As provided in NFPA 32 for inside storage or treatment tanks.

SECTION 2108
FIRE PROTECTION

2108.1 General. Where required by this section, *fire protection systems*, devices and equipment shall be installed, inspected, tested and maintained in accordance with Chapter 9.

2108.2 Automatic sprinkler system. An *automatic sprinkler system* shall be installed in accordance with Section 903.3.1.1 throughout dry cleaning plants containing Type II, Type III-A or Type III-B dry cleaning systems.

Exceptions:

1. An *automatic sprinkler system* shall not be required in Type III-A dry cleaning plants where the aggregate quantity of Class III-A solvent in dry cleaning machines and storage does not exceed 330 gallons (1250 L) and dry cleaning machines are equipped with a feature that will accomplish any one of the following:
    1.1. Prevent oxygen concentrations from reaching 8 percent or more by volume.
    1.2. Keep the temperature of the solvent not less than 30°F (16.7°C) below the flash point.
    1.3. Maintain the solvent vapor concentration at a level lower than 25 percent of the lower explosive limit (LEL).
    1.4. Utilize equipment *approved* for use in Class I, Division 2 hazardous locations in accordance with NFPA 70.
    1.5. Utilize an integrated dry-chemical, clean agent or water-mist automatic fire-extinguishing system designed in accordance with Chapter 9.
2. An *automatic sprinkler system* shall not be required in Type III-B dry cleaning plants where the aggregate quantity of Class III-B solvent in dry cleaning machines and storage does not exceed 3,300 gallons (12 490 L).

2108.3 Automatic fire-extinguishing systems. Type II dry cleaning units, washer-extractors, and drying tumblers in Type II dry cleaning plants shall be provided with an *approved* automatic fire-extinguishing system installed and maintained in accordance with Chapter 9.

Exception: Where *approved*, a manual steam jet not less than 3/4 inch (19 mm) with a continuously available steam supply at a pressure not less than 15 pounds per square inch gauge (psig) (103 kPa) is allowed to be substituted for the automatic fire-extinguishing system.

2108.4 Portable fire extinguishers. Portable fire extinguishers shall be selected, installed and maintained in accordance with this section and Section 906. Not fewer than two 2-A:10-B:C portable fire extinguishers shall be provided near the doors inside dry cleaning rooms containing Type II, Type III-A and Type III-B dry cleaning systems.