National Fire Code of Canada 1990

First Revisions and Errata

Issued by the
Associate Committee on the National Fire Code
National Research Council of Canada
Ottawa

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The attached pages identify revisions and errata to the National Fire Code of Canada 1990. The revisions have been approved by the Associate Committee on the National Fire Code for immediate implementation.

In accordance with the ACNFC Policies and Procedures, the list of referenced documents in Table 1.1.6.A. of the 1990 NFC is updated annually. The revisions contained herein include updates to 30 June 1990. Where changes to the title have been made, the relevant requirements have also been updated.

The errata are corrections which have been identified and are included to facilitate the use of the Code. Revisions are identified by an r in the margin nearest the change; errata are identified by an e.
1991 first revisions and errata

1.1.6.2.
Table 1.1.6.A.
3.2.2.7.(1)
3.3.6.9.(1)
3.4.1.1.(1)
4.10 (Table of Contents)
4.1.1.1.(3)
4.1.5.5.
4.2.3.3.
4.2.4.5.
4.2.7.13.
Table 4.2.9.A.
4.2.10.5.
4.4.2.1.(4)
4.4.7.13.(2)
4.5.2.2.(4)
4.5.2.5.(2)
4.5.2.8.(1)
4.5.8.3.
4.10.4.2.(3)
5.4.1.2.(2)
5.4.2.1.(2)
5.11.1.5.
5.14.1.1.(3)
5.17.2.6.(3)
6.2.1.2.(1)
6.2.2.2.
6.2.3.4.
6.5.4.16.
6.6.2.9.
Part 1
Application and Definitions

Section 1.1 Application

1.1.1. General

1.1.1.1. Responsibility. Unless otherwise specified, the owner or the owner's authorized agent shall be responsible for carrying out the provisions of this Code.

1.1.2. Equivalents

1.1.2.1. Materials, Systems and Equipment

(1) The provisions of this Code are not intended to limit the appropriate use of materials, systems and equipment not specifically described herein.

(2) Materials, systems, equipment and procedures not specifically described herein or that vary from the specific requirements in this Code or for which no recognized test procedure has been established may be used if it can be shown that they are suitable on the basis of past performance, or on the basis of acceptable tests or evaluation.

(3) Where no published test method exists, any test submitted to determine equivalency shall be designed to simulate or exceed anticipated service conditions or shall be designed to compare the performance of the materials, systems or equipment with similar materials, systems or equipment that is known to be acceptable.

1.1.3. Alternate Test Standards

1.1.3.1. Acceptability. The results of tests based on test standards other than as described in this Code may be used provided such alternate test standards will provide comparable results.

1.1.4. Alternatives

1.1.4.1. Acceptability

(1) Alternatives to requirements in this Code may be permitted provided the authority having jurisdiction is satisfied that

(a) the existing fire protection measures provide an acceptable degree of fire safety, or

(b) measures are taken to provide an acceptable degree of fire safety.

(See Appendix A.)

1.1.4.2. Intervals between Inspections and Tests. Longer intervals between the inspections and tests specified in this Code may be permitted provided the authority having jurisdiction is satisfied that such intervals do not reduce the reliability of the system or equipment requiring inspection or testing.

1.1.5. Records

1.1.5.1. Retention Period. Where this Code requires that records of inspections, maintenance procedures or tests be retained for examination by the authority having jurisdiction, such records shall be retained during the required time interval between the inspections, maintenance procedures or tests, or for 2 years, whichever is greater.

1.1.6. Referenced Documents

1.1.6.1. Conflicting Requirements. When a conflict exists between the provisions of this Code and those of a referenced document, the provisions of this Code shall govern.
1.1.6.2. Effective Date

(1) Unless otherwise specified herein, the documents referenced in this Code shall include all amendments, revisions and supplements effective to 30 June 1990.

(2) Where reference is made in this Code to the National Building Code of Canada, such reference is to the 1990 edition.

(3) Documents referenced in this Code shall be the editions designated in Table 1.1.6.A.

Table 1.1.6.A.
Forming Part of Article 1.1.6.2.

Documents Referenced in the National Fire Code of Canada 1990

<table>
<thead>
<tr>
<th>Issuing Agency</th>
<th>Document Number</th>
<th>Title of Document</th>
<th>Code Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI</td>
<td>B16.5-1988</td>
<td>Pipe Flanges and Flanged Fittings</td>
<td>4.4.5.3.(1)</td>
</tr>
<tr>
<td>API 5L-1990</td>
<td>Specification for Line Pipe</td>
<td>4.4.2.1.(4)</td>
<td></td>
</tr>
<tr>
<td>API 12B-1977</td>
<td>Specification for Bolted Tanks for Storage of Production Liquids</td>
<td>4.3.1.2.(1)</td>
<td></td>
</tr>
<tr>
<td>API 12D-1982</td>
<td>Specification for Field Welded Tanks for Storage of Production Liquids</td>
<td>4.3.1.2.(1)</td>
<td></td>
</tr>
<tr>
<td>API 12F-1988</td>
<td>Specification for Shop Welded Tanks for Storage of Production Liquids</td>
<td>4.3.1.2.(1)</td>
<td></td>
</tr>
<tr>
<td>API 620-1990</td>
<td>Recommended Rules for the Design and Construction of Large, Welded, Low-Pressure Storage Tanks</td>
<td>4.3.1.3.(1)</td>
<td></td>
</tr>
<tr>
<td>API 650-1988</td>
<td>Welded Steel Tanks for Oil Storage</td>
<td>4.3.1.2.(1)</td>
<td></td>
</tr>
<tr>
<td>API RP 1104-1988</td>
<td>Standard for Welding Pipelines and Related Facilities</td>
<td>4.3.3.1.(1)</td>
<td></td>
</tr>
<tr>
<td>API 1107-1978</td>
<td>Recommended Pipeline Maintenance Welding Practices</td>
<td>4.4.5.2.(1)</td>
<td></td>
</tr>
<tr>
<td>API 2000-1982</td>
<td>Venting Atmospheric and Low-Pressure Storage Tanks</td>
<td>4.4.11.5.(6)</td>
<td></td>
</tr>
<tr>
<td>API 2200-1983</td>
<td>Repairs to Crude Oil, Liquefied Petroleum Gas and Products Pipelines</td>
<td>4.4.11.5.(6)</td>
<td></td>
</tr>
<tr>
<td>API 2201-1985</td>
<td>Procedures for Welding or Hot Tapping on Equipment Containing Flammables</td>
<td>4.4.11.5.(6)</td>
<td></td>
</tr>
<tr>
<td>ASME 1989</td>
<td>Boiler and Pressure Vessel Code</td>
<td>4.3.1.3.(1)</td>
<td></td>
</tr>
<tr>
<td>ASME/ANSI B31.3-1990</td>
<td>Chemical Plant and Petroleum Refinery Piping</td>
<td>4.4.2.1.(5)</td>
<td></td>
</tr>
<tr>
<td>ASTM A53-90</td>
<td>Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless</td>
<td>4.4.2.1.(4)</td>
<td></td>
</tr>
</tbody>
</table>

Column 1 2 3 4 91/1
<table>
<thead>
<tr>
<th>Issuing Agency</th>
<th>Document Number</th>
<th>Title of Document</th>
<th>Code Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM</td>
<td>D56-87</td>
<td>Specification for Flash Point by the Tag Closed Tester</td>
<td>4.1.3.1.(1)</td>
</tr>
<tr>
<td>ASTM</td>
<td>D93-85</td>
<td>Specification for Flash Point by the Pensky-Martens Closed Tester</td>
<td>4.1.3.1.(2)</td>
</tr>
<tr>
<td>ASTM</td>
<td>D323-89</td>
<td>Specification for Vapor Pressure of Petroleum Products (Reid Method)</td>
<td>1.2.1.2.</td>
</tr>
<tr>
<td>ASTM</td>
<td>D3278-89</td>
<td>Test Methods for Flash Point of Liquids by Setaflash Closed-Cup Apparatus</td>
<td>4.1.3.1.(4)</td>
</tr>
<tr>
<td>ASTM</td>
<td>D3828-87</td>
<td>Test Method for Flash Point by Setaflash Closed Tester</td>
<td>4.1.3.1.(3)</td>
</tr>
<tr>
<td>CGA</td>
<td>CAN/CSA-B149.2-M86</td>
<td>Propane Installation Code</td>
<td>5.6.1.1.(4)</td>
</tr>
<tr>
<td>CGSB</td>
<td>CAN/CGSB-4.162-M80</td>
<td>Hospital Textiles—Flammability Performance Requirements</td>
<td>2.3.2.3.</td>
</tr>
<tr>
<td>CGSB</td>
<td>20-GP-12Ma-1989</td>
<td>Braided Water Hose, Knitted or Spiral Wound Reinforcement</td>
<td>6.2.3.4.</td>
</tr>
<tr>
<td>CSA</td>
<td>B51-M1986</td>
<td>Boiler, Pressure Vessel, and Pressure Piping Code</td>
<td>4.3.1.3.(2)</td>
</tr>
<tr>
<td>CSA</td>
<td>CAN/CSA-B139-M90</td>
<td>Installation Code for Oil Burning Equipment</td>
<td>4.1.1.1.(3)</td>
</tr>
<tr>
<td>CSA</td>
<td>B306-M1977</td>
<td>Portable Fuel Tanks for Marine Use</td>
<td>4.2.3.1.(1)</td>
</tr>
<tr>
<td>CSA</td>
<td>B346-M1980</td>
<td>Power-Operated Dispensing Devices for Flammable Liquids</td>
<td>4.5.3.1.(1), (2)</td>
</tr>
<tr>
<td>CSA</td>
<td>B376-M1980</td>
<td>Portable Containers for Gasoline and Other Petroleum Fuels</td>
<td>4.2.3.1.(1)</td>
</tr>
<tr>
<td>CSA</td>
<td>B620-1987</td>
<td>Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods</td>
<td>4.2.3.1.(2)</td>
</tr>
<tr>
<td>CSA</td>
<td>C22.1-1990</td>
<td>Canadian Electrical Code, Part I</td>
<td>4.11.2.4.</td>
</tr>
<tr>
<td>CSA</td>
<td>CAN/CSA-W117.2-M87</td>
<td>Safety in Welding, Cutting and Allied Processes</td>
<td>5.18.1.1.</td>
</tr>
</tbody>
</table>
### Table 1.1.6.A. (Cont'd)

<table>
<thead>
<tr>
<th>Column 1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td><strong>Document Number</strong></td>
<td><strong>Title of Document</strong></td>
<td><strong>Code Reference</strong></td>
</tr>
<tr>
<td>CSA</td>
<td>CAN/CSA-Z245.1-M90</td>
<td>Steel Line Pipe</td>
<td>4.4.2.1.(4) 4.5.2.8.(1)</td>
</tr>
<tr>
<td>CTC</td>
<td>General Order No. O-32</td>
<td>Flammable Liquids Bulk Storage Regulations</td>
<td>4.3.2.1.(3) 4.4.7.4.(4) 4.6.6.1.</td>
</tr>
<tr>
<td>CTC</td>
<td>General Order No. O-36</td>
<td>Ammonium Nitrate Storage Facilities Regulations</td>
<td>5.5.2.1.</td>
</tr>
<tr>
<td>CTC</td>
<td>1977-3 RAIL</td>
<td>Pipe Crossings under Railways (No. E-10) Regulations</td>
<td>4.4.7.4.(3)</td>
</tr>
<tr>
<td>CTC</td>
<td>1982-8 RAIL</td>
<td>Railway Prevention of Electric Sparks Regulations</td>
<td>4.6.6.5.(2) 4.7.5.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>10-1988</td>
<td>Portable Fire Extinguishers</td>
<td>3.3.4.5. 6.2.1.1. 6.2.3.3. 6.2.3.4. Table 6.2.3.A. 6.2.4.1.</td>
</tr>
<tr>
<td>NFPA</td>
<td>11-1988</td>
<td>Low Expansion Foam and Combined Agent Systems</td>
<td>6.8.1.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>11A-1988</td>
<td>Medium and High Expansion Foam Systems</td>
<td>6.8.1.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>12-1989</td>
<td>Carbon Dioxide Extinguishing Systems</td>
<td>6.8.1.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>12A-1989</td>
<td>Halon 1301 Fire Extinguishing Systems</td>
<td>6.8.1.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>12B-1990</td>
<td>Halon 1211 Fire Extinguishing Systems</td>
<td>6.8.1.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>13-1989</td>
<td>Installation of Sprinkler Systems</td>
<td>3.3.3.3.(2)</td>
</tr>
<tr>
<td>NFPA</td>
<td>14-1990</td>
<td>Installation of Standpipe and Hose Systems</td>
<td>6.4.1.1.</td>
</tr>
<tr>
<td>NFPA</td>
<td>17-1990</td>
<td>Dry Chemical Extinguishing Systems</td>
<td>6.8.1.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>18-1990</td>
<td>Wetting Agents</td>
<td>6.8.1.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>35-1987</td>
<td>Manufacture of Organic Coatings</td>
<td>5.4.2.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>37-1990</td>
<td>Installation and Use of Stationary Combustion Engines and Gas Turbines</td>
<td>4.3.12.3.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>40-1988</td>
<td>Storage and Handling of Cellulose Nitrate Motion Picture Film</td>
<td>5.4.6.1.</td>
</tr>
<tr>
<td>NFPA</td>
<td>40E-1996</td>
<td>Storage of Pyroxyl Plastic</td>
<td>5.4.4.3.</td>
</tr>
<tr>
<td>Issuing Agency</td>
<td>Document Number</td>
<td>Title of Document</td>
<td>Code Reference</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>NFPA</td>
<td>68-1988</td>
<td>Guide for Venting of Deflagrations</td>
<td>3.7.3.3.(2)</td>
</tr>
<tr>
<td>NFPA</td>
<td>72D-1986</td>
<td>Installation, Maintenance and Use of Proprietary Protective Signalling Systems</td>
<td>6.3.1.4.</td>
</tr>
<tr>
<td>NFPA</td>
<td>82-1990</td>
<td>Incinerators, Waste and Linen Handling Systems and Equipment</td>
<td>2.6.2.2.</td>
</tr>
<tr>
<td>NFPA</td>
<td>86-1990</td>
<td>Ovens and Furnaces</td>
<td>3.7.4.1.</td>
</tr>
<tr>
<td>NFPA</td>
<td>91-1990</td>
<td>Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying</td>
<td>3.2.1.2.</td>
</tr>
<tr>
<td>NFPA</td>
<td>96-1987</td>
<td>Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment</td>
<td>3.3.2.3.(6)</td>
</tr>
<tr>
<td>NFPA</td>
<td>231-1990</td>
<td>General Storage</td>
<td>3.3.2.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>231C-1986</td>
<td>Rack Storage of Materials</td>
<td>3.3.3.3.(2), (3)</td>
</tr>
<tr>
<td>NFPA</td>
<td>231D-1989</td>
<td>Storage of Rubber Tires</td>
<td>3.3.4.3.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>505-1987</td>
<td>Fire Safety Standard for Powered Industrial Trucks</td>
<td>3.4.1.1.(1)</td>
</tr>
<tr>
<td>NFPA</td>
<td>701-1989</td>
<td>Standard Methods of Fire Tests for Flame-Resistant Textiles and Films</td>
<td>2.3.2.2.</td>
</tr>
<tr>
<td>PACE</td>
<td>79-1</td>
<td>Product Identification Guidelines</td>
<td>4.3.11.3.(5)</td>
</tr>
<tr>
<td>ULC</td>
<td>C30-1974</td>
<td>Guide for the Investigation of Metal Safety Containers</td>
<td>4.2.3.1.(1)</td>
</tr>
<tr>
<td>ULC</td>
<td>C107C-M1984</td>
<td>Guide for Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable Liquids</td>
<td>4.4.2.1.(3)</td>
</tr>
<tr>
<td>ULC</td>
<td>C142.13-M1988</td>
<td>Guide for Steel Tanks Mounted on Service Truck Platforms for Transportation of Flammable and Combustible Liquids</td>
<td>4.5.2.8.(2)</td>
</tr>
<tr>
<td>ULC</td>
<td>C558-1975</td>
<td>Guide for the Investigation of Internal Combustion Engine-Powered Industrial Trucks</td>
<td>4.11.2.4.(2)</td>
</tr>
<tr>
<td>ULC</td>
<td>C583-1974</td>
<td>Guide for the Investigation of Electric Battery Powered Industrial Trucks</td>
<td>3.4.1.1.(3)</td>
</tr>
<tr>
<td>Column 1</td>
<td>Column 2</td>
<td>Column 3</td>
<td>Column 4</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
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<tr>
<td>Issuing Agency</td>
<td>Document Number</td>
<td>Title of Document</td>
<td>Code Reference</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN/ULC-S109-M87</td>
<td>Standard for Flame Tests of Flame-Resistant Fabrics and Films</td>
<td>2.3.2.1.(1)</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN-S111-M80</td>
<td>Standard Method of Fire Tests for Air Filter Units</td>
<td>5.14.2.3.</td>
</tr>
<tr>
<td><strong>r</strong> ULC</td>
<td>CAN/ULC-S503-M90</td>
<td>Carbon Dioxide Hand and Wheeled Fire Extinguishers</td>
<td>6.2.1.2.(1)</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN/ULC-S504-M86</td>
<td>Dry Chemical and Dry Powder Hand and Wheeled Fire Extinguishers</td>
<td>6.2.1.2.(1)</td>
</tr>
<tr>
<td><strong>r</strong> ULC</td>
<td>CAN-S507-M83</td>
<td>9 Litre Stored Pressure Water Type Fire Extinguishers</td>
<td>6.2.1.2.(1)</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN/ULC-S508-M90</td>
<td>Rating and Fire Testing of Fire Extinguishers and Class D Fire Extinguishing Media</td>
<td>6.2.2.2.</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN/ULC-S512-M87</td>
<td>Halogenated Agent Hand and Wheeled Fire Extinguishers</td>
<td>6.2.1.2.(1)</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN/ULC-S531-M87</td>
<td>Standard for Smoke Alarms</td>
<td>2.1.3.3.(1)</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN/ULC-S536-M86</td>
<td>Standard for Inspection and Testing of Fire Alarm Systems</td>
<td>6.3.1.2.(1)</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN4-S601-M84</td>
<td>Standard for Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids</td>
<td>4.3.1.2.(1)</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN4-S603-M85</td>
<td>Standard for Steel Underground Tanks for Flammable and Combustible Liquids</td>
<td>4.3.1.2.(1)</td>
</tr>
<tr>
<td><strong>r</strong> ULC</td>
<td>CAN4-S603.1-M85</td>
<td>Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids</td>
<td>4.3.1.2.(1), 4.3.8.5.(1), 4.3.9.1.(1), 4.5.2.9.(1), 4.10.4.2.(2)</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN/ULC-S612-M88</td>
<td>Hose for Flammable and Combustible Liquids</td>
<td>4.5.5.1.(1)</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN4-S615-M83</td>
<td>Reinforced Plastic Underground Tanks for Petroleum Products</td>
<td>4.3.1.2.(2), 4.3.8.5.(2), 4.3.16.4.(5), 4.10.4.2.(2)</td>
</tr>
<tr>
<td>ULC</td>
<td>S620-M1980</td>
<td>Standard for Valves for Flammable and Combustible Liquids</td>
<td>4.4.8.1.(2), 4.5.5.2.(1), 4.5.6.3.(1), 4.3.3.2.</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN4-S630-M84</td>
<td>Standard for Shop Fabricated Steel Aboveground Vertical Tanks for Flammable and Combustible Liquids</td>
<td>4.3.1.2.(1)</td>
</tr>
<tr>
<td><strong>r</strong> ULC</td>
<td>CAN/ULC-S633-M90</td>
<td>Flexible Underground Hose Connectors for Flammable and Combustible Liquids</td>
<td>4.4.7.13.(2)</td>
</tr>
<tr>
<td>ULC</td>
<td>CAN/ULC-S642-M87</td>
<td>Standard for Compounds and Tapes for Threaded Pipe Joints</td>
<td>4.4.5.1.</td>
</tr>
<tr>
<td><strong>r</strong> ULC</td>
<td>CAN/ULC-S643-M90</td>
<td>Standard for Shop Fabricated Steel Above Ground Utility Tanks for Flammable and Combustible Liquids</td>
<td>4.3.1.2.(1)</td>
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</tbody>
</table>
Part 3
Industrial and Commercial Occupancies

Section 3.1 General

3.1.1. Scope

3.1.1.1. Scope. This Part provides for life safety and property protection in industrial and commercial occupancies by requiring that certain fire protection measures be applied in specific occupancies where the use, storage and handling of hazardous materials or the stockpiling of combustible materials create a serious fire hazard.

Section 3.2 Wood Products

3.2.1. Woodworking Plants

3.2.1.1. Outdoor Lumber Storage. The outdoor storage of lumber shall conform to Subsection 3.2.2.

3.2.1.2. Exhaust Systems

(1) Every machine that produces wood dust, particles or shavings shall be provided with a blower and exhaust system installed in conformance with NFPA 91, “Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying.”

(2) Operations that generate sparks or combustible vapours shall not be served by woodworking exhaust systems.

3.2.1.3. Shavings and Sawdust Collection. Loose shavings and sawdust shall be collected at frequent intervals and deposited in receptacles described in Article 2.4.1.4.

3.2.1.4. Fire Extinguishers. A portable extinguisher or a garden-type hose conforming to Article 6.2.3.4. shall be provided within 7.5 m of any machine producing wood dust, particles or shavings.

3.2.1.5. Heat-Producing Appliances. Where electrically-heated glue pots, soldering irons or other heat-producing appliances are in use, they shall be provided with an indicating switch and a red pilot light.

3.2.1.6. Flammable Liquids and Combustible Liquids

(1) The storage and handling of flammable liquids or combustible liquids shall conform to Part 4.

(2) Spray coating operations using flammable liquids or combustible liquids in woodworking plants shall conform to Part 5.

3.2.2. Outdoor Storage of Lumber and Forest Products

(See Appendix A.)

3.2.2.1. Site Preparation

(1) Except as permitted in Sentence (2), the storage site for lumber and other forest products shall be level, solid ground, paved or surfaced with material such as cinders, gravel or crushed stone.

(2) Soft storage beds may be used for logs where embedment of stones or cinders may cause damage to cutting knives.

(3) Piling of forest products on refuse- or sawdust-filled land shall not be permitted except where the site is covered with a layer of compacted earth to a minimum depth of 150 mm.
3.2.2.2. Clearances

(1) To minimize fire exposure, yard storage areas for forest products shall be separated from mill operations and other structures by an acceptable clear space permanently available for fire fighting operations. (See Appendix A.)

(2) In retail and wholesale lumber storage yards, stickered lumber piles shall be located not less than 15 m from property lines or buildings. (See Appendix A.)

(3) Storage yards shall be maintained free of combustible ground vegetation, including grass and weeds, for at least 4.5 m from the stored material and not less than 30 m from brush and forested areas.

(4) Lumber and timber treated with combustible liquids shall be stored in piles that are separated from other stored material so that the distance between piles is at least twice the height of the treated pile, but not less than 4.5 m.

3.2.2.3. Waste Disposal. Sawdust, chips and other waste material shall not be permitted to accumulate in piling areas in retail and wholesale lumber yards.

3.2.2.4. Storage beneath Power Lines. Stickered lumber piles shall not be stored beneath electrical power lines having voltages in excess of 750 V or supplying power to fire emergency systems.

3.2.2.5. Pile Heights

(1) Pile heights for stickered lumber piles shall not exceed 6 m.

(2) The height of randomly stacked or unranked piles shall not exceed 6 m unless special extinguishing equipment, such as portable turrets, deluge sets and monitor towers, is installed.

3.2.2.6. Fire Department Access Routes

(1) At least 2 fire department access routes conforming to Subsection 2.5.1. shall be provided to each lumber yard and located as remotely as possible from each other.

(2) Groups of lumber piles shall be arranged with a maximum width of 15 m and a maximum length of 45 m, with fire department access routes surrounding each group.

3.2.2.7. Fencing

(1) Where the total area occupied by outdoor lumber storage exceeds 1 000 m², the area occupied by the lumber shall be surrounded by a firmly anchored fence that is

(a) substantially constructed to discourage climbing,

(b) not less than 1.8 m high, and

(c) provided with gates not less than 3 m wide, to permit the entry of fire department vehicles, in conformance with Article 3.2.2.6.

(2) The gates required in Clause (1)(c) shall be locked when the lumber storage area is not staffed.

3.2.2.8. Burning of Waste Materials

(1) Shavings, sawdust and refuse materials shall be burned only in boilers or furnaces, or in incinerators or refuse burners conforming to Subsection 2.6.2.

(2) The refuse burners or incinerators required in Sentence (1) shall be located not less than 15 m from buildings, piles of logs or lumber. (See Appendix A.)

(3) A storage bin conforming to Article 2.4.1.5. shall be provided at each boiler, furnace, incinerator and refuse burner referred to in Sentence (1).

3.2.2.9. Ignition Sources

(1) Salamanders, braziers or other open flames shall not be used in storage yards.

(2) Smoking shall be prohibited in lumber yards, except as permitted in Subsection 2.4.2.

3.2.2.10. Fire Alarm Boxes and Telephones. The fire department telephone number and the location of the nearest fire-alarm boxes and telephones shall be posted conspicuously in working locations in the open yard and in each building.

3.2.2.11. Portable Extinguishers

(1) Portable extinguishers conforming to Part 6 or water barrels of not less than 200 L capacity with


3.3.6.11. Spill Control

(1) Spills of liquid or solid dangerous goods shall be prevented from entering public sanitary and storm sewer systems, natural waterways or potable water sources, by

(a) constructing noncombustible sills, curbs or dikes of sufficient height to contain the spills, or
(b) grading the site or sloping the floor to divert liquids to a drainage system conforming to Subsection 4.1.6.

(See Appendix A.)

3.3.6.12. Fire Department Access

(1) Except as provided in Sentences (2) and (3), fire department access to buildings described in Article 3.3.6.1. shall be in conformance with Section 2.5.

(2) When the collective individual storage area for dangerous goods exceeds 10 m², buildings regulated by Sentence (1) shall be accessible to fire department vehicles from at least two sides for the purpose of fire fighting. (See Appendix A.)

(3) In buildings regulated by Sentence (1), access openings to each storey provided in conformance with the National Building Code of Canada shall not be less than 750 mm wide by 1100 mm high. (See Appendix A.)

3.3.6.13. Labels. Products classified as dangerous goods shall display appropriate identifying labels from the time they enter a facility until they are issued as finished products or waste material. (See Appendix A.)

3.3.6.14. Placards

(1) Individual storage areas used for storage of dangerous goods shall be clearly designated as such by posted placards conforming to the Transportation of Dangerous Goods Regulations, and in conformance with Sentences (2) to (5). (See Appendix A.)

(2) Where storage consists of a single product, only the UN Product Identification Number (PIN) need be posted.
(3) Where storage consists of multiple products within the same class, the individual class and division placard shall be posted.

(4) Where storage consists of more than one class, a placard for each individual class, or the Transportation of Dangerous Goods Regulations “Danger” symbol shall be posted at the entrance to the storage area.

(5) Individual storage areas described in Sentence (1) shall be identified in the fire safety plan as required in Article 3.3.2.11.

3.3.6.15. Training

(1) In buildings regulated by this Subsection, at least one person trained in conformance with the Transportation of Dangerous Goods Regulations, in the correct procedures for handling, storing and offering for transport of dangerous goods shall be in responsible charge during operating hours, and available to respond to a day or night emergency.

(2) All employees involved in the storage and handling of dangerous goods shall be provided with training on safe handling procedures and correct responses to an emergency situation.

Section 3.4 Industrial Trucks

3.4.1. General

3.4.1.1. Industrial Trucks

(1) Except as provided in Sentences (2) and (3), the designation, use, maintenance and operation of industrial trucks shall conform to NFPA 505, “Fire Safety Standard For Powered Industrial Trucks.”

(2) Fuel-fired industrial trucks shall conform to ULC-C558, “Guide for the Investigation of Internal Combustion Engine-Powered Industrial Trucks.”

(3) Battery-powered industrial trucks shall conform to ULC-C583, “Guide for the Investigation of Electric Battery Powered Industrial Trucks.”

Section 3.5 Salvage Shops and Salvage Yards including Automobile Wrecking Yards

3.5.1. General

3.5.1.1. Roof Storage. The roof of a building located in a salvage yard shall not be used for storage purposes.

3.5.1.2. Open Fires. Fires shall not be permitted in a salvage yard except when used for heating purposes or for operating machinery or equipment.

3.5.1.3. Fencing

(1) Salvage yards of more than 1,000 m² shall be surrounded by a firmly anchored fence that is
   (a) substantially constructed to discourage climbing,
   (b) not less than 1.8 m high, and
   (c) provided with gates not less than 3 m wide, to permit the entry of fire department vehicles.

(2) The gates required in Clause (1)(c) shall be locked when the salvage yard is not staffed.

3.5.1.4. Spill Control. Provision shall be made for the safe drainage and disposal of fuel or waste oils emptied from vehicles, tanks or other containers, in conformance with Subsection 4.5.7.

3.5.2. Piling

3.5.2.1. Piles

(1) Piles which include combustible salvage shall be at least 3 m from property lines and not more than 3 m in height and 100 m² in area.

(2) Piles of salvage material shall be separated by a clear space of 3 m, and this space shall be kept clear of all grass and weeds.

(3) Tanks or drums shall be stored in piles separate from piles of other materials.
4.7.3. Storage Tanks ..........89
4.7.4. Piping, Valves and
    Fittings ..........................89
4.7.5. Bonding and Grounding ...89
4.7.6. Fire Prevention and
    Protection ........................90
4.7.7. Bulk Transfer Stations ....90
4.7.8. Cargo Hose ..................90
4.7.9. Cargo Pumps .................90
4.7.10. Pump Houses ...............91
4.7.11. Transfer Operations ......91

Section 4.8 Process Plants
4.8.1. Application ..................91
4.8.2. Location ....................91
4.8.3. Processing Buildings .......92
4.8.4. Fire Prevention and
    Protection ........................92

Section 4.9 Distilleries
4.9.1. Application ..................93
4.9.2. General ......................93
4.9.3. Design, Construction and
    Use of Storage Tanks and
    Containers ........................93
4.9.4. Storage .......................93
4.9.5. Piping and Pumping
    Systems ...........................93
4.9.6. Ventilation ....................93
4.9.7. Liquid Spills and Leaks ...94

Section 4.10 Withdrawal of Storage
    Tanks from Service
4.10.1. Scope .......................94
4.10.2. Rendering Storage Tanks
    Temporarily Out of
    Service ...........................94
4.10.3. Removal of Underground
    Storage Tanks .....................95
4.10.4. Disposal and Reuse of
    Storage Tanks .....................95

Section 4.11 Tank Vehicles
4.11.1. Application ..................96
4.11.2. Transportation of
    Containers ........................96
4.11.3. Tank Vehicle Design .......96
4.11.4. Construction of Cargo
    Tanks ..............................97
4.11.5. Shut-Off Valves ..........97
4.11.6. Bonding .....................98
4.11.7. Accident Damage
    Protection ........................98
4.11.8. Brakes .......................98
4.11.9. Portable Extinguishers ....98
4.11.10. Vehicle Lighting and Power
    Circuits ...........................98
4.11.11. Vehicle Operation .........98
4.11.12. Loading and Unloading ...99
Part 4
Flammable and Combustible Liquids

Section 4.1 General

4.1.1 Scope

4.1.1.1. Application

(1) Except as provided in Sentences (2) and (3), this Part provides for the storage, handling, use and processing of flammable liquids and combustible liquids in buildings, structures and open areas. (See Appendix A.)

(2) Areas in process plants, where conditions must be addressed by design and operational details specific to the hazard, need not conform to the requirements of this Part, where alternative protection is provided in conformance with Part 1. (See Appendix A.)

(3) This Part shall not apply to

(a) the transportation of flammable liquids or combustible liquids under the Transportation of Dangerous Goods Regulations,
(b) oil-burning appliances and equipment within the scope of CAN/CSA B139-M “Installation Code for Oil Burning Equipment,”
(c) the storage of flammable liquids or combustible liquids on farms for individual farm use and on isolated construction projects, or
(d) the storage of flammable liquids or combustible liquids in aerosol containers covered under Subsection 3.3.5.

4.1.2 Classification

4.1.2.1. Classification

(1) For the purposes of this Part, flammable liquids and combustible liquids shall be classified in conformance with Sentences (2) and (3).

(2) Flammable liquids shall be Class I liquids, and shall be subdivided into:

(a) Class IA liquids, which shall include those having a flash point below 22.8°C and a boiling point below 37.8°C,
(b) Class IB liquids, which shall include those having a flash point below 22.8°C and a boiling point at or above 37.8°C, and
(c) Class IC liquids, which shall include those having a flash point at or above 22.8°C and below 37.8°C.

(3) Combustible liquids shall be Class II or Class IIIA liquids, and shall be subdivided into:

(a) Class II liquids, which shall include those having a flash point at or above 37.8°C and below 60°C, and
(b) Class IIIA liquids, which shall include those having a flash point at or above 60°C and below 93.3°C (see Appendix A).

(See Appendix A.)

4.1.2.2. Heated Combustible Liquids.

When a combustible liquid, or any liquid having a flash point at or above 93.3°C, is being processed, stored, handled or used at a temperature at or above its flash point, it shall be treated as a flammable liquid.

4.1.3 Flash Point

4.1.3.1. Determination of Flash Point

(1) Except as provided in Sentences (2) and (4), the flash point of liquids having a viscosity less than 6 mm²/s at 37.8°C and a flash point below 93.3°C shall be determined in conformance with ASTM D 56, “Flash Point by the Tag Closed Tester.”

(2) Except as provided in Sentences (3) and (4), the flash point of liquids having a viscosity of 6 mm²/s or more at 37.8°C or a flash point of 93.3°C or
higher shall be determined in conformance with ASTM D 93, "Flash Point by the Pensky-Martens Closed Tester."

3. ASTM D 3828, "Standard Methods of Tests for Flash Point of Petroleum and Petroleum Products by Setaflash Closed Tester" is permitted to be used for testing aviation turbine fuels within the scope of this procedure.

4. ASTM D 3278, "Standard Method of Tests for Flash Point of Liquids by Setaflash Closed Tester" is permitted to be used for paints, enamels, lacquers, varnishes and related products and their components having flash points between 0°C and 110°C, and having a viscosity less than 15,000 mm²/s (150 stokes) at 25°C. (See Appendix A.)

4.1.4. Electrical Equipment

4.1.4.1. Electrical Equipment. Electrical equipment in a location where flammable liquids or combustible liquids are present shall conform to the requirements of the appropriate provincial or territorial legislation, or in the absence of such legislation, to the requirements of CSA C22.1, "Canadian Electrical Code, Part 1." (See Appendix A.)

4.1.5. Fire Prevention and Protection

4.1.5.1. General. Unless otherwise required in this Part, all fire prevention and protection requirements for areas directly involved in the storage, handling and use of flammable liquids and combustible liquids shall comply with this Subsection.

4.1.5.2. Portable Extinguishers. Portable extinguishers shall be provided and maintained as required elsewhere in this Part and in Part 6.

4.1.5.3. Additional Fire Protection Equipment. In addition to extinguishers required in Article 4.1.5.2., fire protection equipment shall be provided where there are special hazards of operation, dispensing or storage.

4.1.5.4. Ignition Sources. Open flames and spark-producing devices shall not be used in a manner that will create a fire hazard in areas described in Article 4.1.5.1.

4.1.5.5. Smoking. Except for acceptable designated smoking areas, smoking shall not be permitted in areas described in Article 4.1.5.1., and signs that conform to Article 2.4.2.2. shall be prominently posted in those areas.

4.1.5.6. Removal of Combustibles

1. Areas described in Article 4.1.5.1. shall be kept clean and free of ground vegetation and accumulations of combustible materials not essential to operations.

2. Cleaning rags shall be stored in receptacles conforming to Article 2.4.1.5.

4.1.5.7. Emergency Planning

1. Except as provided in Sentence (2), emergency planning measures conforming to Section 2.8 shall be provided for all buildings or parts of buildings described in Article 4.1.1.1.

2. The fire safety plan required as part of the emergency planning measures in Sentence (1) shall be retained on site for reference by the authority having jurisdiction and personnel.

4.1.5.8. Access for Fire Fighting. Required aisles and other access paths shall be maintained to permit the unobstructed movement of personnel and fire department apparatus so that fire fighting operations can be carried out in any part of an area used for the storage, use or handling of flammable liquids or combustible liquids.

4.1.5.9. Welding and Cutting. Welding and cutting operations shall conform to Part 5.

4.1.5.10. Basement Storage

1. Except as permitted in Sentence (2) and in dwelling units in basements as described in Article 4.2.4.5., and in mercantile occupancies as described in Sentence 4.2.5.2.(3), flammable liquids shall not be stored, handled or used in basements.

2. Not more than 5 L of flammable liquid is permitted to be stored in basements, provided it is stored in safety cans conforming to Subsection 4.2.3. (See Appendix A.)
4.1.9. Liquid Spills and Leaks

4.1.9.1. Liquid Spills and Leaks

(1) Maintenance and operating procedures shall be established to prevent the escape of flammable liquids or combustible liquids to areas where they would create a fire hazard.

(2) Except as provided in Sentence (3), all reasonable steps shall be taken to recover escaped liquid and to remove or treat the contaminated soil.

(3) Liquid spilled or leaked shall be removed with the aid of an absorbent and disposed of in an acceptable manner or shall be flushed to a location conforming to Article 4.1.6.2.

Section 4.2 Container Storage and Handling

4.2.1. Application

4.2.1.1. Application

(1) This Section applies to the storage and handling of flammable liquids and combustible liquids in portable tanks, drums, portable containers and prepackaged containers not covered elsewhere in this Part, except that it shall not apply to the following:

(a) containers in service stations, bulk plants, and process plants, including refineries and distilleries,
(b) fuel tanks for motors or engines,
(c) prepackaged containers of alcoholic beverages, foods and pharmaceutical products, and
(d) other products such as detergents, insecticides and fungicides containing not more than 50 per cent by volume of water-miscible flammable liquids or combustible liquids with the remainder of the solution being non-flammable.

4.2.2. General

4.2.2.1. Prohibited Locations. Flammable liquids or combustible liquids shall not be stored in or adjacent to exits, elevators or principal routes that provide access to exits.

4.2.2.2. Fencing. An outside storage area of flammable liquids or combustible liquids shall be fenced in an acceptable manner where necessary to prevent the entry of unauthorized personnel.

4.2.2.3. Separation from Other Dangerous Goods

(1) Except as provided in Sentence (2), flammable liquids and combustible liquids shall be separated from other dangerous goods in conformance with Section 3.3 of this Code.

(2) For the purposes of applying Table 3.3.6.B., Class IIIA combustible liquids shall be treated as Class 3 dangerous goods. (See Appendix A.)

4.2.3. Drums, Portable Containers, Prepackaged Containers and Portable Tanks

4.2.3.1. Containers

(1) Except as permitted in Articles 4.2.3.3. and 4.2.3.4., the storage, handling and use of flammable liquids or combustible liquids in containers having an individual capacity of less than 230 L shall be permitted only in the following containers:

(a) drums and prepackaged containers meeting the requirements of the Transportation of Dangerous Goods Regulations,
(b) portable containers of metal or plastic conforming to CSA-B376, "Portable Containers for Gasoline and Other Petroleum Fuels,"
(c) portable fuel tanks conforming to CSA-B306, "Portable Fuel Tanks for Marine Use," and
(d) safety cans conforming to ULC-C30, "Guide for the Investigation of Metal Safety Containers."

(2) The storage, handling and use of flammable liquids or combustible liquids in portable tanks shall be permitted, provided such tanks are constructed in conformance with CSA Preliminary Standard B620, "Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods."

4.2.3.2. Markings or Labels

(1) Except as provided in Sentence (2) and Article 4.2.3.1., all drums and prepackaged containers
for flammable liquids or combustible liquids shall be distinctly marked or labelled in easily legible type which is in contrast to any other printed matter on the label with a warning to indicate that the material in the container is flammable, that it should be kept away from heat, sparks and open flames and that it should be kept closed when not in use.

(2) Markings referred to in Sentence (1) are not required when the drum or prepackaged container is labelled in conformance with the requirements of the Transportation of Dangerous Goods Act and its Regulations, or the Hazardous Products Act and its Regulations.

**4.2.3.3. Plastic and Glass Containers.**

- Except as permitted in Article 4.2.3.4., the storage, handling and use of flammable liquids and combustible liquids in glass or plastic prepacked containers shall be permitted only if the required liquid purity (such as ACS analytical reagent grade or higher) would be affected by storage in metal containers or if the liquid would cause excessive corrosion of the metal containers.

**4.2.3.4. Other Containers**

(1) Except as permitted in Sentence (2), the storage, handling and use of flammable liquids and combustible liquids having a flash point below 60°C, in containers other than those in Article 4.2.3.1., shall not be permitted within a building.

(2) Containers of not more than 1 L capacity in the case of flammable liquids and 5 L in the case of combustible liquids need not conform to Article 4.2.3.1.

**4.2.4. Assembly and Residential Occupancies**

**4.2.4.1. Application.** This Subsection shall apply to the storage and handling of flammable liquids and combustible liquids in buildings classified as assembly or residential occupancies, except that it shall not apply to nonresidential schools, universities or colleges covered in Subsection 4.2.6.

**4.2.4.2. Maximum Quantities**

(a) 30 L of Class I liquids,
(b) 150 L of Class II liquids, or
(c) 600 L of Class IIIA liquids.

(2) When two or more classes of liquid are stored in the same building, the total quantity permitted for each class of liquid shall be calculated as follows:

\[
\frac{q_I + q_{II} + q_{III}}{30 + 150 + 600} \leq 1
\]

where

- \(q_I\) = the actual quantity of Class I liquid present,
- \(q_{II}\) = the actual quantity of Class II liquid present,
- \(q_{III}\) = the actual quantity of Class IIIA liquid present.

(3) Quantities of flammable liquids or combustible liquids exceeding those permitted in Sentence (1) are permitted, provided they are kept in a single storage cabinet conforming to Subsection 4.2.10., or in a storage room having no openings that communicate directly with the public portions of the building, and conforming to Subsection 4.2.9.

**4.2.4.3. Storage Cabinets and Storage Rooms.** The storage cabinet and storage room in Sentence 4.2.4.2.(3) shall not be located above or below the first storey.

**4.2.4.4. Exterior Balconies.** Flammable liquids and combustible liquids shall not be stored on exterior balconies.

**4.2.4.5. Dwelling Units.** Not more than 15 L of flammable liquids and combustible liquids, of which not more than 5 L shall be flammable liquid, are permitted to be stored in each dwelling unit. (See Sentence 4.1.1.1.(3) for oil burning equipment.)

**4.2.4.6. Attached Garages and Sheds.** Not more than 50 L of flammable liquids and combustible liquids, of which not more than 30 L shall be flammable liquids, are permitted to be stored in a garage or shed attached to a dwelling unit.
When two or more classes of liquids are stored in a single storey, the maximum quantity permitted for each class of liquid shall be calculated as follows:

\[ q_{IA} + q_{IB} + q_{IC} + q_{II} + q_{III} \leq 1 \]

where

- \( q_{IA, IB \text{ or } IC} \) = the actual quantity of Class IA, IB or IC liquid present,
- \( q_{II} \) = the actual quantity of Class II liquid present,
- \( q_{III} \) = the actual quantity of Class IIIA liquid present,
- \( Q_{IA, IB \text{ or } IC} \) = the maximum quantity of Class IA, IB or IC liquid permitted in Tables 4.2.7.A. or 4.2.7.8. for the arrangement,
- \( Q_{II} \) = the maximum quantity of Class II liquid permitted in Tables 4.2.7.A. or 4.2.7.B. for the arrangement,
- \( Q_{III} \) = the maximum quantity of Class IIIA liquid permitted in Tables 4.2.7.A. or 4.2.7.B. for the arrangement.

### 4.2.7.6. Spill Control
Drainage for spilled flammable liquids and combustible liquids, including water used for fire fighting, shall be provided in conformance with Subsection 4.1.6.

### 4.2.7.7. Fire Suppression Systems
Where protection is required by Sentence 4.2.7.5., storage areas for containers of flammable liquids and combustible liquids shall be protected by an acceptable automatic sprinkler system or equivalent fixed fire suppression system. (See Appendix A.)

### 4.2.7.8. Clearances

1. The clearance between the top of storage and the lowest structural members, sprinkler head deflectors or other overhead fire protection system components shall be not less than 450 mm.

2. A clearance of not less than 400 mm shall be maintained between stored flammable liquids and combustible liquids and walls, except that where the width of storage adjacent to the wall is not more than 1.5 m, such wall clearance is not required. (See Appendix A.)

### 4.2.7.9. Aisles
Except as provided in Article 4.2.7.10., main aisles, access aisles and aisles defining individual storage areas, shall be in conformance with Article 3.3.2.2.

### 4.2.7.10. Separation from Other Dangerous Goods
Flammable liquids and combustible liquids shall not be stored with other dangerous goods unless in conformance with Article 4.2.2.3.

### 4.2.7.11. Combustible Materials
Combustibles other than those used for the packaging of the flammable liquids or combustible liquids shall not be stored in the same individual storage area with such liquids.

### 4.2.7.12. Absorbents
Acceptable absorbent materials shall be available in the storage area for use in clean-up of spilled flammable liquids or combustible liquids.

### 4.2.7.13. Ventilation
Storage areas described in Article 4.2.7.1. shall be ventilated in conformance with the requirements of Subsection 4.1.7.

### 4.2.8. Incidental Use

### 4.2.8.1. Application
Except as otherwise noted in this Part, this Subsection applies to industrial occupancies where the use and handling of flammable liquids or combustible liquids is secondary to the principal activity. (See Appendix A.)

### 4.2.8.2. Containers

1. Where flammable liquids and combustible liquids are not kept in appropriate storage rooms or cabinets, they shall be kept in closed containers or portable tanks conforming to Article 4.2.3.1., or in storage tanks conforming to Clauses 4.3.1.1.(2)(a) or (2)(b).

2. Containers of flammable liquids or combustible liquids shall be kept closed when not actually in use.

### 4.2.8.3. Maximum Quantities

1. Except as provided in Sentences (2) and (3), the quantity of flammable liquids and combustible
liquids permitted to be located outside of a storage room or storage cabinet, in any one fire compartment of a building, shall not be more than
(a) 600 L of flammable liquids or combustible liquids in closed containers, of which not more than 100 L shall be Class IA liquid, and
(b) 5 000 L of Class IB, IC, II or IIIA liquids in storage tanks or portable tanks.

(2) Where required for normal plant activity, quantities of flammable liquids and combustible liquids may exceed those permitted in Sentence (1), but shall not be greater than the supply for one day of normal operation.

(3) Where larger quantities than are permitted by Sentence (1) are required, such quantities shall be in storage tanks installed in conformance with Article 4.3.12.7.

4.2.8.4. Handling

(1) Areas in which flammable liquids or combustible liquids are transferred from one storage tank or container to another, or are used in such a way as to release potentially explosive concentrations of flammable vapours, shall be
(a) separated from possible sources of ignition by a spatial separation of not less than 6 m, or by a fire separation (see Appendix A),
(b) provided with a drainage system to control spills in conformance with Subsection 4.1.6.,
(c) provided with acceptable absorbent materials to assist in clean-up of small liquid spills,
(d) provided with either natural or mechanical ventilation in conformance with Subsection 4.1.7., and
(e) separated from other dangerous goods in conformance with Article 4.2.2.3.

4.2.9. Rooms for Container Storage

4.2.9.1. Maximum Quantities

(1) Except as provided in Sentence (2), where flammable liquids and combustible liquids are stored in rooms required in this Part, the storage densities averaged over the total room areas and the total quantities of such liquids shall conform to Table 4.2.9.A.

(2) The maximum quantities and densities of flammable liquids and combustible liquids permitted in Sentence (1) may be doubled provided the storage room is protected by an acceptable automatic sprinkler system or equivalent fixed extinguishing system. (See A-4.2.7.7.)

Table 4.2.9.A.
Forming Part of Article 4.2.9.1.

<table>
<thead>
<tr>
<th>Maximum Total Quantity of Liquid, L</th>
<th>Minimum Fire Separation Around Storage Room, m</th>
<th>Maximum Density, L/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 000</td>
<td>2</td>
<td>200</td>
</tr>
<tr>
<td>1 500</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Column 1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

4.2.9.2. Spill Control

(1) Storage rooms in Article 4.2.9.1. shall be liquid-tight where the walls join the floor.

(2) Storage rooms in Sentence (1) shall be designed to accommodate possible spills of flammable liquids and combustible liquids in conformance with Subsection 4.1.6.

4.2.9.3. Ventilation

(1) Every storage room in Article 4.2.9.1. shall be ventilated in conformance with the requirements in this Subsection and with Subsection 4.1.7.

(2) Mechanical ventilation shall be used if flammable liquids are dispensed within the storage room.

(3) Mechanical ventilation in storage rooms shall provide at least 18 m³/h of exhaust air per square metre of room area, but not less than 250 m³/h.

(4) Exhaust air from a ventilation system shall be discharged outdoors and shall be taken from
a point within 300 mm of the floor near a wall, with at least one make-up air inlet located near the opposite wall.

(5) Where make-up air for a mechanical ventilation system is taken from within the building, the opening shall be protected in conformance with Subsection 2.2.2.

(6) Make-up air for a natural ventilation system shall be supplied directly from outside the building from a source that is remote from any discharge outlet.

(7) Ducts used to ventilate a flammable liquid and combustible liquid storage room shall be used solely for that purpose and shall conform to the National Building Code of Canada.

4.2.9.4. Aisles. The contents of flammable liquid and combustible liquid storage rooms in Article 4.2.9.1. shall be arranged to provide aisle widths of not less than 1 m.

4.2.9.5. Dispensing. Dispensing of flammable liquids or combustible liquids from drums shall be by acceptable pumps or through acceptable self-closing valves.

4.2.9.6. Portable Extinguishers. Portable extinguishers shall be provided for storage rooms described in Article 4.2.9.1. in conformance with Part 6.

4.2.10. Cabinets for Container Storage

4.2.10.1. Containers. Flammable liquids and combustible liquids stored in cabinets required in this Part shall be in containers conforming to Sentence 4.2.3.1.(1).

4.2.10.2. Maximum Quantities. The total quantity of flammable liquids and combustible liquids stored in a cabinet shall be 500 L, of which not more than 250 L may be flammable liquids.

4.2.10.3. Maximum Number of Cabinets (1) Except as provided in Sentences (2) and (3), not more than 3 cabinets shall be located in a fire compartment.

(2) In industrial occupancies, more than 3 cabinets may be located in a fire compartment provided

(a) not more than 3 cabinets are grouped together in one location, and

(b) the distance between groups of cabinets in Clause (a) is not less than 30 m.

(3) In Group B institutional occupancies, only one cabinet shall be located in a fire compartment.

4.2.10.4. Labelling. Cabinets for container storage shall be labelled in conspicuous lettering to indicate that the cabinet contains flammable materials and that open flames must be kept away.

4.2.10.5. Construction (1) Except as permitted in Sentence (2), storage cabinets in Article 4.2.10.1. shall be constructed to limit the internal temperature rise to not more than 139°C above ambient temperature for a period of 10 min when the entire cabinet is subjected to a temperature equal to that set forth in CAN/ULC-S101-M “Standard Methods of Fire Endurance Tests of Building Construction and Materials.”

(2) When acceptable, wood storage cabinets constructed in conformance with Clauses (a) to (g) may be used in lieu of those described in Sentence (1).

(a) The top, sides and bottom of wood cabinets shall be constructed of an exterior grade of plywood not less than 25 mm thick.

(b) A 50 mm deep liquid-tight metal pan shall be provided at the bottom of wood cabinets.

(c) All joints on wood cabinets shall be rabbeted and fastened in 2 directions with flathead wood screws.

(d) When more than one door is used on wood cabinets, there shall be a rabbeted overlap of not less than 25 mm.

(e) Hinges on wood cabinets shall be mounted so as to maintain their holding capacity due to loosening or burning-out of the screws.

(f) Doors on wooden cabinets shall be provided with latches that will keep them securely closed.
4.2.10.5.

(g) Wood cabinets shall be provided with liquid-tight sills beneath doors, extending not less than 50 mm above the bottom of the cabinet.

4.2.11. Outdoor Container Storage

4.2.11.1. Quantities and Clearances

(1) Except as provided in Sentence (2), the quantities and clearances for flammable liquids and combustible liquids stored in drums, portable containers and prepackaged containers in outdoor storage areas shall conform to Table 4.2.11.A.

(2) The clearances required in Sentence (1) do not apply where not more than 5 000 L of flammable liquids or combustible liquids are stored adjacent to a building on the same property, provided that either

(a) the building is limited to 1 storey in building height and is used for the storage or handling of flammable liquids or combustible liquids, or

(b) the exposed wall has a fire-resistance rating of at least 2 h and has no openings within 3 m of such outdoor storage.

4.2.11.2. Mixed Storage. Where 2 or more liquids with different flash points are stored outdoors in containers that form a single pile, the maximum total quantity permitted in the pile shall be equal to that permitted for the liquid with the lowest flash point.

4.2.11.3. Fire Department Access. A lane not less than 6 m wide constructed in conformance with the National Building Code of Canada shall be provided in outdoor storage areas to permit the approach of fire department vehicles to within 60 m of any part of a pile. (See Appendix A.)

4.2.11.4. Spill Control. Outdoor storage areas for flammable liquids or combustible liquids shall be designed to accommodate possible spillage in conformance with Subsection 4.1.6.

Table 4.2.11.A.
Forming Part of Article 4.2.11.1.

<table>
<thead>
<tr>
<th>Class of Liquid</th>
<th>Maximum Total Quantity, per Pile, L</th>
<th>Minimum Distance Between Piles, m</th>
<th>Minimum Distance to a Property Line or to a Building on the Same Property, m</th>
</tr>
</thead>
</table>
| Class IA
  (Flash point below 22.8°C) | 5 000                                | 1.5                              | 6                                                                               |
| Class IB or IC
  (Flash point at or above 22.8°C and below 37.8°C) | 15 000                               | 1.5                              | 6                                                                               |
| Class II
  (Flash point at or above 37.8°C and below 60°C) | 35 000                               | 1.5                              | 6                                                                               |
| Class IIIA
  (Flash point at or above 60°C and below 93.3°C) | 85 000                               | 1.5                              | 6                                                                               |
| Column 2                 | 2                                    | 3                                | 4                                                                               |
shall be considered to be leaking when any pressure drop is detected within a 2 h period after steady temperature conditions have been established and the source of pressure has been removed.

(4) Pneumatic test pressures applied to underground storage tanks shall be measured by an instrument calibrated in increments of not more than 1 kPa.

(5) Where a pneumatic leakage test is conducted before a tank is backfilled in the case of a new tank, or after the tank is uncovered in the case of a previously installed tank, the test pressure shall be in conformance with the production testing requirements of CAN4-S603, "Standard for Steel Underground Tanks for Flammable and Combustible Liquids," or of CAN4-S615, "Standard for Reinforced Plastic Underground Tanks for Petroleum Products."

(6) Where a pneumatic leakage test is performed on a completely buried storage tank, the test pressure shall be not less than 35 and not more than 70 kPa (gauge).

(7) Measures shall be taken to guard against the hazards associated with pneumatic leakage testing where explosive mixtures of vapours from flammable liquids or combustible liquids and air may be present in the area of a tank that has been in use.

4.3.16.5. Liquid Media Leakage Tests

(1) Where a leakage test incorporating a liquid test medium, including a flammable liquid or combustible liquid, is performed on an underground storage tank, the tank shall be considered to be leaking when, with compensation for volume differentials caused by effects of temperature and tank shell distortion, the test indicates a liquid loss.

(2) The level of water at the bottom of underground storage tanks shall be measured at least weekly in conformance with Sentences (3) and (4), except that at service stations the measurements shall be taken each day the service station is in operation.

(3) A record for each storage tank showing the measurements described in Sentences (1) and (2), a comparison of these measurements with meter readings and a computation of any gain or loss of liquid shall be retained for examination by the authority having jurisdiction, in conformance with Article 1.1.5.1.

(4) When a loss of liquid or a gain of water is indicated by the measurements described in Sentences (1) and (2), or when the level of water at the bottom of an underground storage tank exceeds 50 mm, immediate corrective action shall be taken, and the authority having jurisdiction shall be notified within 24 h after the water gain or liquid loss is detected. (See Article 4.3.16.1. for leakage testing.)

Section 4.4 Piping and Transfer Systems

4.4.1. Application

4.4.1.1. Application

(1) This Section applies to piping and transfer systems for flammable liquids and combustible liquids.

(2) Except where otherwise stated in this Part, this Section shall not apply to the following:

(a) tubing or casings and piping for oil or gas wells,
(b) piping for vehicles, aircraft, watercraft and portable or stationary engines,
(c) piping systems in service stations and distilleries,
(d) piping systems on piers and wharves, and
(e) piping within the scope of the applicable provincial boiler and pressure vessel Codes.
4.4.2. Materials for Piping, Valves and Fittings

4.4.2.1. Materials

(1) Materials for piping systems containing flammable liquids or combustible liquids shall be suitable for the maximum anticipated working pressures and operating temperatures and for the chemical properties of the contained liquid.

(2) Except as provided in Sentence (3), the use of materials for piping systems in Sentence (1) that are subject to failure from internal stress or rupture by mechanical damage and combustible or low-melting-point materials that are subject to failure even in moderate fires shall not be permitted.

(3) Piping systems conforming to ULC-C107C, “Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable Liquids” may be used for underground installations.

(4) Except as provided in Sentence (5), where steel piping, including welded and seamless grades, is used, it shall meet the requirements of
   (a) API-5L, “Specification for Line Pipe,”
   (b) ASTM A53, “Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless,” or
   (c) CAN/CSA Z245.1-M, “Steel Line Pipe.”

(5) Where service pressures exceeding 875 kPa (gauge) may occur, piping and fittings shall be designed in conformance with ASME/ANSI B31.3, “Chemical Plant and Petroleum Refinery Piping.”

4.4.2.2. Special Materials. Where problems of corrosion, contamination, sanitation or standards of purity require special materials, acceptable materials other than metallic may be used for piping, valves and fittings.

4.4.3. Corrosion Protection of Piping Systems

4.4.3.1. Corrosion Protection. All exposed and underground piping, couplings, flanges and bolts for flammable liquids or combustible liquids shall be protected where necessary against external corrosion.

4.4.4. Identification of Piping Systems

4.4.4.1. Identification

(1) Pipelines for flammable liquids or combustible liquids shall be marked with the contents of the line, and these markings shall be maintained in a clearly legible form.

(2) Piping for flammable liquids or combustible liquids shall not be painted red.

4.4.4.2. Plans

(1) Plans showing piping systems for flammable liquids or combustible liquids, including tank and pumping arrangements, shall be available to the fire department on request.

(2) Sets of plans shall be kept at 2 separate locations.

4.4.5. Joints in Piping Systems

4.4.5.1. Threaded Joints. Threaded joints in piping systems for flammable liquids or combustible liquids shall be made using joint compound or polytetrafluoroethylene tape conforming to CAN/ULC-S642, “Standard for Compounds and Tapes for Threaded Pipe Joints.”

4.4.5.2. Welded Piping

(1) Welding of piping for flammable liquids or combustible liquids shall conform to Part 5 and with provincial regulations or, in the absence of such regulations, with the appropriate requirements of
   (a) API-1104, “Standard for Welding Pipelines and Related Facilities,” or
   (b) API RP1107, “Recommended Pipeline Maintenance Welding Practices.”

(2) Flanged joints for piping shall be provided in welded systems at intervals which will facilitate dismantling and avoid subsequent in-place cutting and welding operations.

4.4.5.3. Flanged Joints

(1) Except as permitted in Sentence (2), flanged joints for piping shall be made with forged or cast steel flanges designed, constructed and installed
4.4.7.10. Overhead Piping

(1) Overhead piping for flammable liquids or combustible liquids shall be installed close to the ceiling or beams or along walls not less than 1.8 m above the floor to protect it against mechanical damage.

(2) Where practicable, overhead piping referred to in Sentence (1) shall be supported from building framing members.

(3) In buildings of steel frame construction, piping referred to in Sentence (1) shall be fastened to steel beams or columns by acceptable pipe hangers attached to the flanges.

(4) Piping under concrete ceilings shall be suspended with the use of through bolts or expansion shields.

4.4.7.11. Supports for Overhead Piping

(1) Piping shall be supported on pipe hangers or other supports so that allowable stresses in the pipe are not exceeded. (See Appendix A.)

(2) Anchors of the expansion shield type used to suspend piping shall not be used to suspend piping from unsound or lightweight concrete or from gypsum assemblies.

4.4.7.12. Protection of Pipe Risers. Exposed pipe risers shall be protected against mechanical damage by installing such risers adjacent to walls or pilasters, between flanges of steel columns or within securely anchored larger perforated pipe, and by providing mechanical guards where the risers are exposed to mobile equipment.

4.4.7.13. Provision for Expansion and Contraction

(1) In the design of flammable liquid or combustible liquid piping systems, provision shall be made for thermal expansion and contraction.

(2) Flexible hose connectors conforming to CAN/ULC-S633-M, "Flexible Underground Hose Connectors for Flammable and Combustible Liquids" may be used where necessary in systems carrying flammable liquids or combustible liquids to prevent excessive stresses resulting from vibration, settling or temperature changes.

4.4.8. Valves in Piping Systems

4.4.8.1. Design

(1) Except as provided in Sentence (2), valves in piping systems for flammable liquids or combustible liquids shall be designed to accommodate the temperatures and pressures of those systems and shall conform to ULC-C842, "Guide for the Investigation of Valves for Flammable and Combustible Liquids."

(2) Hose nozzle and emergency valves shall conform to ULC-S620M, "Valves for Flammable and Combustible Liquids."

4.4.8.2. Shut-Off Valves

(1) Shut-off valves shall be provided in all flammable liquid or combustible liquid piping and pumping systems.

(2) Where practicable, valves referred to in Sentence (1) shall be located outdoors or be immediately accessible from outdoors.

(3) Except as permitted in Sentence (4) steel shut-off valves shall be provided:

(a) at connections to all aboveground storage tanks,
(b) on supply piping where it enters buildings or structures,
(c) on branch lines from the main supply line,
(d) on supply lines at dispensing locations, and
(e) to isolate one part of a piping system from another.

(4) Stainless steel, monel metal or lined steel bodied valves may be used when special conditions warrant their use.

4.4.8.3. Diaphragm Valves. Diaphragm valves shall have no direct connections between the liquid and air section that might permit leakage of the liquid past the packing into the air lines.

4.4.8.4. Globe Valves. Globe valves shall be arranged so that the packing is on the low pressure side.

4.4.8.5. Indicating Valves. Rising stem or other indicating valves shall be used where necessary to determine whether the valves are open or shut.
4.4.8.6. **Meters.** Where cast iron meters are used, they shall be isolated by the use of steel valves.

4.4.8.7. **Identification**

(1) All aboveground valves shall be identified so that
(a) valves controlling flammable liquids are identified by an octagonal red tag, and
(b) valves controlling combustible liquids are identified by a circular tag coloured other than red, green or red-orange.

(2) Identification tags required in Sentence (1) shall be of enamelled metal, anodized aluminum, pressed fibre or solvent resistant plastic.

(3) Identification tags shall indicate the name of the product in clear, legible, permanent characters.

(4) Every identification tag shall be kept clean so that its colour and inscription are easily recognizable.

4.4.9. **Heating of Piping Systems**

4.4.9.1. **Design.** Heating equipment for piping systems containing flammable liquids or combustible liquids shall be designed not to overheat or create an ignition source for the liquids being heated.

4.4.9.2. **Steam Heating**

(1) Flammable liquid and combustible liquid piping may be heated by steam lines provided the minimum steam temperature and pressure to make the liquid fluid are used and Sentences (2) and (3) are complied with.

(2) A pressure regulator shall be provided in the steam line with a relief valve on the downstream side of the regulator.

(3) Piping and steam lines shall be enclosed in insulation conforming to the requirements of the National Building Code of Canada.

4.4.9.3. **Electrical Heating Cables.** Electrical heating cables including electrical induction heating shall conform to Subsection 4.1.4.

4.4.9.4. **Thermal Electrical Conduction Heating**

(1) Thermal electrical conduction heating conforming to Sentence (2) may be used by passing a low-voltage alternating current through the pipe.

(2) Systems permitted in Sentence (1) shall be installed and tested as complete units and shall conform to the following:
(a) unheated sections of piping shall be isolated from heated sections by means of nonconductive fittings;
(b) thermostatic controls, high temperature limit controls and fuses shall have the lowest practical rating to ensure satisfactory operation;
(c) all parts of the piping and fittings shall be enclosed by insulating coverings of a type which will prevent accidental grounding of the systems; and
(d) switches, transformers, contactors and other spark-producing equipment shall be located in an area not subject to flammable vapours.

(3) Upon completion of installation, systems permitted in Sentence (1) shall be tested to ensure that all components are functioning as intended.

4.4.9.5. **Open Flames.** The use of open flames as a heat source shall not be permitted for heating piping for flammable liquids or combustible liquids.

4.4.10. **Methods of Transfer in Piping Systems**

4.4.10.1. **Location of Outdoor Pumps.** Pumps for flammable liquid or combustible liquid piping systems installed aboveground and outside of buildings shall be located not less than 3 m from the property line and not less than 1.5 m from building openings.

4.4.10.2. **Pump Houses and Pump Rooms**

(1) Pumps located indoors shall be in rooms that conform to the requirements of Subsection 4.2.9.

(2) Pump houses and pump rooms shall not be used for any purpose other than to serve the pumping equipment.

4.4.10.3. **Pits**

(1) Pits for subsurface pumps for piping systems or for piping connected to submersible pumps shall be designed to withstand the forces to which they may be subjected without causing damage to the system.
Flammable liquids shall not be stored or handled within any building having a basement, cellar or pit in which flammable vapours may accumulate. (See Appendix A.)

Only acceptable enclosed pumping equipment shall be used to transfer flammable liquids to or from the fuel tanks of vehicles inside service stations.

The location of facilities for the dispensing of gasoline shall conform to the appropriate requirements of Subsection 3.3.5. of the National Building Code of Canada.

4.5.2.3. Storage Tanks in Buildings

Where combustible liquids with flash points above 60°C are stored and dispensed inside buildings from storage tanks, the individual tanks shall have a capacity of not more than 2 500 L and the aggregate capacity of all the tanks shall not exceed 10 000 L.

All fill pipes, vent piping and valves associated with the storage tanks referred to in Sentence (1) shall conform to Subsections 4.3.5. and 4.3.6. and shall be permanently marked to indicate the liquid in each tank and the equipment controlled by the valves.

4.5.2.4. Marine Service Stations. The dispensing area at marine service stations shall be at a location which will permit safe access by water craft.

4.5.2.5. Containers

All packaged flammable liquid and combustible liquid products stored above ground shall be in closed metal containers or in other acceptable containers distinctly marked with the generic name of the container contents.

Where flammable liquids or combustible liquids are sold in containers, such containers shall be:

(a) acceptable prepackaged containers that are clearly marked with the name of the liquid they contain,
(b) shipping containers conforming to Article 4.2.3.1., securely closed to prevent leaks or spills and clearly marked with the name of the liquid they contain,
(c) portable containers meeting the requirements of Clause 4.2.3.1.(1)(b), or
(d) sample containers for testing by other regulatory officials.

Every container at a service station for dispensing flammable liquids or combustible liquids shall be kept tightly closed when disconnected from its pumping apparatus.

Every container referred to in Sentence (3) that is equipped with a pump shall have a vapour-tight connection between the pump and the container.

4.5.2.6. Empty Containers. The storage of empty containers which previously contained flammable liquids or combustible liquids shall conform to Sentences 4.5.2.2.(1) and (2) and 4.5.2.5.(3).

4.5.2.7. Filling of Containers. Portable containers and drums shall not be filled beyond their safe filling level.

4.5.2.8. Piping

Except as provided in Sentence (2), all piping associated with flammable liquid or combustible liquid storage tanks shall be made of steel and shall conform to API-5L, “Specification for Line Pipe,” ASTM A53, “Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless” or CAN/CSA-Z245.1-M, “Steel Line Pipe.”

Non-metallic piping systems conforming to ULC-C107C, “Glass Fibre Reinforced Plastic Pipe and Fittings for Flammable Liquids” may be used for underground installations.

4.5.2.9. Corrosion Protection for Piping

Except as permitted in Sentence (2), steel piping at service stations shall be provided with corrosion protection in conformance with CAN/CSA-S603.1, “Galvanic Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids.”

Piping protection not conforming to Sentence (1) may be installed provided it conforms to good engineering practice based on tests and the corrosion history of the area. (See Appendix A.)

4.5.2.10. Piping Supports and Guards.

Piping shall be firmly supported and protected by installing guards when necessary to prevent vehicle impact or other mechanical damage.
4.5.2.11. Pits. Pits for subsurface pumps or for piping connected to submersed pumps shall conform to Article 4.4.10.3.

4.5.3. Dispensing Systems

4.5.3.1. Dispensing Equipment

(1) Except as provided in Sentence (2), fixed dispensing equipment for flammable liquids or combustible liquids shall conform to CSA-B346, "Power-Operated Dispensing Devices for Flammable Liquids."

(2) Where flow rates from dispensing equipment conforming to CSA-B346, "Power-Operated Dispensing Devices for Flammable Liquids" are not adequate for the intended application, other acceptable dispensing equipment may be used.

4.5.3.2. Location

(1) Fixed equipment for dispensing flammable liquids shall be installed outside buildings and not less than
   (a) 3 m from any right-of-way,
   (b) 3 m from any property line,
   (c) 7.5 m horizontally from any open flame,
   (d) 7.5 m from other ignition sources, except for electrical installations conforming to Article 4.1.4.1,
   (e) 4.5 m from building openings, except those openings in buildings for the shelter of operating personnel in which electrical installations conform to Article 4.1.4.1.

(2) Fixed equipment for dispensing combustible liquids is permitted to be installed inside buildings when
   (a) such buildings are not open to the public, and
   (b) acceptable measures are taken to ensure proper safety (see Appendix A.)

4.5.3.3. Protection against Collision Damage

(1) Fixed dispensing equipment shall be protected against collision damage by
   (a) a concrete island not less than 100 mm high, or
   (b) other acceptable means.

4.5.4. Shut-Off Devices

4.5.4.1. Location and Identification

(1) Devices to shut off the power to all dispensing units shall be provided at a location remote from the dispensing units or shielded from any fire that might occur at the dispensing units.

(2) The shut-off devices required in Sentence (1) shall be clearly identified and easily accessible.

4.5.4.2. Emergency Shut-Off Devices

(1) Except as provided in Sentence (2), an emergency shut-off switch to stop all dispensing units at self-service outlets shall be located at the central control console described in Sentence 4.5.8.2.(2) so that it is readily accessible to the attendant.

(2) At card or key activated self-service outlets, the emergency shut-off switch required in Sentence (1) shall be in an acceptable location that is readily accessible to the customer.

4.5.5. Marine Service Stations. At marine service stations a readily accessible valve shall be provided in each pipeline at or within 7.5 m of the pier to shut off the supply from shore.

4.5.5. Delivery Hose and Nozzles

4.5.5.1. Delivery Hose

(1) Delivery hose shall conform to CAN4-S612M, "Hose for Flammable and Combustible Liquids."

(2) Except as permitted in Sentences (3) and (4), hose through which flammable liquids or combustible liquids are dispensed at a service station shall be restricted to a maximum extended length of 4.5 m.

(3) Where a retracting mechanism is used, a maximum extended length of 6 m shall be permitted.

(4) At marine service stations or at card or key activated dispensing units, the length of extended hose may exceed the values in Sentences (2) and (3).

4.5.5.2. Hose Nozzle Valves

(1) Hose nozzle valves through which a flammable liquid or combustible liquid having a flash point below 60°C is dispensed by a motorized dis-
pensing unit into a vehicle tank shall conform to ULC-S620M, “Valves for Flammable and Combustible Liquids” and shall be constructed so that the valve

(a) can be kept open only by the continuous application of manual pressure, or
(b) is equipped with a device at the nozzle which will
   (i) allow automatic dispensing,
   (ii) automatically shut off when the vehicle tank is filled, and
   (iii) shut off if the nozzle is dropped or falls from the fill pipe.

(2) Dispensing nozzles at marine service stations and self-service outlets shall be of the automatic closing type without a hold-open device and shall conform to ULC-S620M, “Valves for Flammable and Combustible Liquids.”

4.5.6. Remote Pumping Systems

4.5.6.1. Application. This Subsection shall apply to systems for dispensing flammable liquids or combustible liquids where such liquids are transferred from bulk storage to individual or multiple dispensing units by pumps located elsewhere than at the dispensing units.

4.5.6.2. Pumps and Control Equipment

(1) Pumps, including associated control equipment, shall be designed so that the system will not be subject to pressures above the design working pressure.

(2) Pumps shall be securely anchored and protected against damage from vehicles.

4.5.6.3. Emergency Valves

(1) An emergency valve conforming to ULC-S620M, “Valves for Flammable and Combustible Liquids” and incorporating a fusible element having a maximum temperature rating of 71°C shall be installed in the supply line so that the shear point of the valve is at a level not higher than nor more than 25 mm below the base of the dispensing unit.

(2) Emergency valves required in Sentence (1) shall close automatically in the event of severe impact or fire exposure to the dispensing unit.

(3) The emergency valve required in Sentence (1) shall be maintained in operating condition and serviced at least every 12 months.

4.5.6.4. Pump Location

(1) Pumps installed aboveground and outside buildings shall be located not less than 3 m from any property line and 1.5 m from any building opening.

(2) When an outside pump location is impractical, pumps may be installed inside buildings as provided in Article 4.5.2.2, or in pits as provided in Article 4.5.2.11.

4.5.6.5. Leakage Testing. After the completion of the installation, including paving, all underground lines connected to tanks shall be tested for leakage in conformance with Subsection 4.4.6.

4.5.6.6. Marine Service Stations

(1) Except as permitted in Sentence (2), tanks and pumps not integral with the dispensing unit at marine service stations shall be located on the shore or on a pier of the solid-fill type.

(2) Where shore locations would result in excessively long supply lines to the dispenser, storage tanks may be installed on a pier provided
   (a) that the applicable portions of Subsection 4.3.7 relating to spacing, diking and piping are complied with, and
   (b) the quantity stored does not exceed 5 000 L aggregate capacity.

(3) No storage tank at a marine service station shall be located closer than 4.5 m horizontally from the normal annual high-water mark.

(4) Storage tanks located on shore and supplying marine service stations may be located aboveground where rock or a high water table make underground tanks impractical.

(5) Where storage tanks at a marine service station are at an elevation above the dispensing unit, an electrically operated solenoid valve, designed to open only when the dispensing apparatus is being operated, and to prevent gravity draining of the tank in the event of a rupture of the supply line to the dispensing unit, shall be provided at the storage tank outlet, positioned adjacent to and outside the valve specified in Article 4.3.6.1.
4.5.6.6. Piping between storage tanks located on shore and dispensing units at a marine service station shall conform to Section 4.4., except that where dispensing is from a floating structure, suitable lengths of acceptable flexible hose may be employed between the piping on shore and the piping on the floating structure.

4.5.7. Drainage and Waste Disposal

4.5.7.1. Spill Control and Waste Disposal

(1) Provision shall be made in areas where flammable liquids are dispensed to prevent spilled liquid from entering buildings or waterways by providing grading or curbing and drainage.

(2) Flammable liquids and combustible liquids shall not be dumped into sewers but shall be stored outside in tanks or drums conforming to Article 4.5.7.2. until removed from the premises.

4.5.7.2. Waste Oil

(1) Except as provided in Sentences (2) and (3), the storage and handling of waste oil shall conform to the appropriate requirements for the storage and handling of flammable liquids contained in this Part. (See Appendix A.)

(2) A pipe to convey waste oil is permitted to extend inside a building provided that such pipe is equipped with a trap, and extends to the lowest point in a waste oil storage tank.

(3) Not more than 2,500 L of waste oil is permitted to be stored above ground at a service station within 15 m of buildings or areas of the property to which the public has access.

4.5.8. Supervision and Dispensing Procedures

4.5.8.1. Attendants

(1) Except as provided in Sentence (2), every service station shall have at least one attendant on duty when the station is open for business.

(2) Service stations which do not serve the general public do not require an attendant.

(3) Except as permitted at self-service outlets, a competent employee shall be in constant control of the dispensing of flammable liquids and combustible liquids with flash points below 60°C into the fuel tanks of motor vehicles or watercraft or into portable containers.

4.5.8.2. Self-Service Outlets

(1) Instructions for the operation of dispensing units in self-service outlets shall be posted in a conspicuous location.

(2) A control console shall be provided at self-service outlets within 25 m of all dispensing units so that the attendant has an unobstructed view of all units at the same time.

(3) The control console in Sentence (2) shall be equipped to regulate the operation of each dispensing unit.

(4) A 2-way communication system between the control console and each pump island shall be provided at self-service outlets.

(5) At service stations which provide both attended service and self-service, the attendant required in Sentence 4.5.8.1.(1) is permitted to dispense flammable liquids or combustible liquids at the attended service island, provided that

   (a) each island has an emergency shut-off switch as described in Article 4.5.4.2., and
   (b) the attendant is never more than 25 m from the self-service island or control console.

4.5.8.3. Special Dispensing Devices.

Except as provided in Article 4.5.8.4. for card or key activated equipment, special type dispensing devices including coin operated, card operated and preset units shall not be permitted at self-service outlets unless there is at least one qualified attendant on duty for each 12 hoses which can be operated simultaneously while the outlet is open to the public.

4.5.8.4. Card or Key Operated Dispensing Devices

(1) Card or key activated dispensing devices are permitted at unattended self-service outlets and service stations that are not open to the general public, in conformance with Sentences (2) to (6). (See Appendix A.)

(2) Except as provided in Sentences (3) to (6), installation of card or key activated dispensing devices shall conform to the requirements for self-service outlets and service stations in this Section.
facilities and power controls shall be locked.

(3) Where underground storage tank facilities are operated on a seasonal basis
   (a) the liquid level of each storage tank shall be measured at the close of each season of operation, a record of such measurements shall be maintained for inspection and all fill pipe covers and covers over openings for measuring liquid levels, dispensing facilities and power controls shall be locked,
   (b) prior to the start of an operating season, the liquid level in each storage tank shall be measured, the measurements compared with those recorded at the close of the previous season, and when a loss of liquid or water intrusion is apparent, immediate action shall be taken to determine and correct the condition.

(4) When an underground storage tank is reactivated for the storage of flammable liquids or combustible liquids, the authority having jurisdiction shall be notified.

(5) If the storage tank in Sentence (4) has been out of service for more than 12 months, the tank and piping shall be tested in conformance with Subsection 4.3.16.

4.10.3. Removal of Underground Storage Tanks

4.10.3.1. Removal
   (1) Except as permitted in Article 4.10.3.2., when underground storage tanks have no further use or have been out of service for 2 years,
      (a) such tanks, together with connected piping and dispensing equipment, shall have all flammable liquids and combustible liquids removed from them,
      (b) such tanks shall be removed from the ground and purged of vapours, and
      (c) the piping shall be
         (i) removed from the ground, or
         (ii) purged of vapours and the ends permanently sealed by capping or plugging.
   (2) If contaminated, soil surrounding the storage tanks in Sentence (1) shall be replaced with clean fill, to an acceptable degree.

4.10.3.2. Abandonment in Place. Where it is impractical to remove an underground storage tank, the owner of the underground storage tank shall apply to the authority having jurisdiction for permission to abandon the tank in place, in conformance with Section 7.4 of the “Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products.”

4.10.4. Disposal and Reuse of Storage Tanks

4.10.4.1. Disposal. Where storage tanks are to be disposed of, sufficient openings shall be cut in the tanks to render them unfit for further use.

4.10.4.2. Reuse
   (1) Except as permitted in Sentence (2), underground storage tanks shall not be reused for the storage of flammable liquids or combustible liquids.
   (2) Storage tanks may be reused for the storage of flammable liquids or combustible liquids only after having been refurbished and found to meet the requirements of CAN4-S603.1, “Galvanic Corrosion Protection Systems for Steel Underground Tanks for
Flammable and Combustible Liquids” or CAN4-S615, “Reinforced Plastic Underground Tanks for Petroleum Products.”

(3) Where inspection or tests of an excavated storage tank reveal excessive denting, pitting or gouging, causing any reduction of shell thickness in excess of 1 mm, or any dents greater than 30° from the normal configuration, the tank shall be rejected for use.

4.10.4.3. Riveted Storage Tanks. Riveted storage tanks shall not be relocated.

Section 4.11 Tank Vehicles

4.11.1. Application

4.11.1.1. Application. This Section applies to tank vehicles used for the transportation of asphalt and stable flammable liquids and combustible liquids but does not apply to aircraft servicing vehicles or to fuel tanks used in the operation of motor vehicles. (See Appendix A.)

4.11.2. Transportation of Containers

4.11.2.1. Drums

(1) Except as provided in Article 4.11.2.2., drums for flammable liquids or combustible liquids shall not be transported unless they conform to the requirements of Shipping Container Specifications 5, 5A, 5B, 5C, 5L or 5M of the Canadian Transport Commission.

(2) Drums for combustible liquids shall not be transported unless constructed of steel not less than 1.14 mm thick.

4.11.2.2. Wooden Barrels. Wooden barrels may be used as containers for flammable liquids or combustible liquids when the liquids are nontoxic and require such containers as part of their conditioning process.

4.11.2.3. Piling of Containers

(1) Except as provided in Sentence (2), containers of flammable liquids and combustible liquids which are in excess of 50 L and are not permanently attached to the chassis of the vehicle shall be piled only a single tier high on the vehicle.

(2) Wooden barrels containing distilled beverage alcohol may be transported in 2 tiers.

4.11.2.4. Container Design

(1) Except as permitted in Sentence (2), containers for the transportation of flammable liquids or combustible liquids having a capacity of 250 L or more shall conform to the requirements for the construction of cargo tanks on tank vehicles as defined in CSA Preliminary Standard B620, “Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods.”

(2) Containers used for the transportation of flammable liquids or combustible liquids on service vehicles, and having a capacity of 500 L or less, shall conform to ULC-Subject C142.13, “Guide for Steel Tanks Mounted on Service Truck Platforms for Transport of Flammable and Combustible Liquids.”

4.11.2.5. Securing of Containers to Vehicles. Except for the transportation of empty tanks, tanks that are not permanently attached to the chassis of a vehicle shall be secured to a cradle or sill which is anchored to the chassis of the vehicle by means of hook-bolts or other acceptable devices.

4.11.3. Tank Vehicle Design

4.11.3.1. Design and Construction

(1) Tank vehicles shall be designed and constructed taking into account the relationship between the cargo tank, the supporting members, the weight and temperature of the cargo, road performance, braking and durability.

(2) The design of the suspension system for tank vehicles shall incorporate features to ensure stability when turning.

(3) The exhaust system of tank vehicles used for transporting flammable liquids or combustible liquids shall be located remotely from its fuel system and other combustible materials and shall terminate in such a position that heat from the exhaust system shall not create a hazard to the tank contents, the facility being refuelled or the facility from which the tank vehicle is being filled.
Part 5
Hazardous Materials, Processes and Operations

Section 5.1 General

5.1.1. Scope

5.1.1.1. Application. This Part applies to materials, processes and operations that involve a risk from explosion, high flammability or related conditions which create a hazard to life safety.

5.1.2. Means of Egress

5.1.2.1. Means of Egress. Hazardous materials, processes and operations shall be located and the premises maintained so that the means of egress will not be obstructed in any manner that would interfere with evacuation of the floor area in the event of a fire.

5.1.3. Electrical Installations

5.1.3.1. General. Electrical installations shall conform to the requirements of the appropriate provincial legislation or, in the absence of such legislation, to the requirements of CSA C22.1, “Canadian Electrical Code, Part I,” except that alternatives to these requirements may be permitted as described in Part I in areas other than as described in Article 5.1.3.2.

5.1.3.2. Hazardous Locations. Where wiring or electrical equipment is located in areas in which flammable gases or vapours, combustible or electrically conductive dusts or combustible fibres are present in quantities sufficient to create a hazard, such wiring and electrical equipment shall conform to the requirements of CSA C22.1, “Canadian Electrical Code, Part I.” (See Appendix A.)

5.1.4. Ventilation

5.1.4.1. Ventilation. Ventilation shall be provided for hazardous locations and processes in conformance with the National Building Code of Canada and with the requirements of this Part.

5.1.5. Flash Point

5.1.5.1. Flash Point. The flash points of flammable liquids and combustible liquids shall be determined in conformance with Subsection 4.1.3.

5.1.6. Fire Safety Plan

5.1.6.1. Fire Safety Plan

(1) Except as provided in Sentences (2) and (3), a fire safety plan conforming to the requirements of Section 2.8 shall be prepared for areas described in Article 5.1.1.1.

(2) In addition to the information required in Sentence (1), the fire safety plan shall include

(a) the location and identification of storage and use areas for specific products, in conformance with Article 3.3.2.6., and

(b) the names, addresses and telephone numbers of persons to be contacted in case of fire during nonoperating hours.

(3) In addition to the information required in Sentences (1) and (2), where radioactive materials are stored or handled, the fire safety plan shall include

(a) methods to control a fire emergency and to recover radioactive materials and equipment containing radioactive materials safely and efficiently,

(b) the names, addresses and telephone numbers of primary and alternative sources of expert radiation safety advice and assistance, and

(c) the location of primary and alternative sources of radiation survey instruments.
Section 5.2 Explosives and Fireworks

5.2.1. Explosives

5.2.1.1. Explosives. The storage, handling and use of explosives, blasting agents, detonators, propellant explosives, pyrotechnics and ammunition shall be in conformance with the “Explosives Act, R.S., c. 102, S.1” and the “Explosive Regulations.”

5.2.2. Fireworks

5.2.2.1. Fireworks

(1) The manufacture, storage, transportation and sale of fireworks shall conform to the “Explosives Act, R.S., c. 102, S.1” and the “Explosive Regulations.”

(2) The handling and discharge of fireworks shall conform to the “Manual of Display Fireworks,” as published by the Department of Energy, Mines and Resources.

Section 5.3 Matches

5.3.1. Storage

5.3.1.1. Application. Notwithstanding the small quantity exemptions provided in Table 3.3.6.A., storage of more than 100 kg of safety matches, or 10 kg of “strike anywhere” matches shall be in conformance with the requirements of Section 3.3 and this Section.

5.3.1.2. Classification. Matches shall be classified, packaged and labelled by the manufacturer as Class 4 Division 1 Flammable Solids, in conformance with the Transportation of Dangerous Goods Regulations.

5.3.1.3. Arrangement. In storage areas regulated by Article 5.3.1.1., shipping cartons containing matches shall be arranged in piles not exceeding 3 m in height and 40 m³ in volume, and separated by aisles not less than 2.4 m wide.

5.3.1.4. Separation. In mixed storage areas matches shall be stored alone, separated from the remaining storage area by a fire separation not required to have a fire-resistance rating.

Section 5.4 Nitrocellulose Based Products

5.4.1. General

5.4.1.1. Application. Notwithstanding the small quantity exemptions provided in Table 3.3.6.A., the storage and handling of more than 50 kg of nitrocellulose based products shall be regulated by Section 3.3 and this Section.

5.4.1.2. Classification

(1) Nitrocellulose not classified as explosives shall be classified in conformance with the “Transportation of Dangerous Goods Regulations” as

(a) Flammable Solids, Class 4.1 dangerous goods, or

(b) Flammable liquids or combustible liquids, Class 3.2 or 3.3 dangerous goods.

(2) Nitrocellulose solutions classified as Class 3.2 or 3.3 dangerous goods in conformance with Clause (1)(b) shall also be regulated by the relevant requirements in Part 4 of this Code.

5.4.1.3. Fire Suppression Systems. Notwithstanding the provisions of Article 3.3.6.9., buildings where nitrocellulose is manufactured or stored in quantities exceeding 50 kg shall be sprinklered in conformance with Article 6.5.1.1.

5.4.2. Storage of Raw Materials

5.4.2.1. Storage

(1) Nitrocellulose in drums shall be stored and handled in conformance with Section 6 – 1 of NFPA 35, “Standard for the Manufacture of Organic Coatings.”

(2) Nitrocellulose that is not stored in conformance with Sentence (1) shall be stored in conformance with Subsection 5.4.4.

5.4.2.2. Identification

(1) Nitrocellulose that is stored in buildings together with other materials shall be clearly identified.

(2) Rooms and buildings in which nitrocellulose is stored shall be identified at their entrances by signs with letters not less than 50 mm high.
5.11.4. Ambient Conditions. A storage room for oxidizing substances shall be dry, cool and well ventilated.

5.11.5. Fire Suppression Systems. Notwithstanding the provisions of Sentence 3.3.6.9.(2), oxidizing substances shall be stored only in rooms that are equipped with an acceptable automatic fire suppression system suitable for the hazard. (See Appendix A.)

5.11.6. Refrigerated Storage. Oxidizing substances, including organic peroxides, shall be stored in refrigerated areas where such refrigeration is necessary to stabilize the substances.

5.11.7. Storage Precautions
   (1) Oxidizing substances shall not be stored with any corrosive substances, or with any flammable, oxidizable or chemically reactive materials.
   (2) Oxidizing substances shall not be stored on combustible floors, platforms or pallets.

5.11.8. Containers and Packaging. Oxidizing substances shall be stored in acceptable packages or containers.

5.11.9. Individual Storage Areas. Containers of oxidizing substances shall be stored in individual storage areas not greater than 6 m wide and 4.5 m high, except that organic peroxides shall not be piled more than 1.5 m high.

5.11.10. Facilities for Dispensing
   (1) Packages or containers of organic peroxides shall not be opened, or the product dispensed, within the storage room.
   (2) Facilities shall be provided outside of storage rooms for opening containers and dispensing organic peroxides.

Section 5.12 Dust Producing Processes

5.12.1. Dust Collection

5.12.1.1. Dust Removal
   (1) Building and machinery surfaces shall be kept clean of accumulations of combustible dusts, in an acceptable manner, using equipment suitable for use in atmospheres containing combustible dusts. (See Appendix A.)
   (2) The cleaning equipment required in Sentence (1) and ancillary hoses and tools shall be electrically conductive and shall be bonded to ground.
   (3) Tools for vacuum cleaning machines shall be made of materials that will not create electrostatic charges.
   (4) Except as permitted in Sentence (1) compressed air or other compressed gases shall not be used to blow dust from surfaces inside buildings.

5.12.1.2. Dust Collecting Systems and Equipment
   (1) Dust-collecting systems shall be installed where necessary to keep the accumulation of dust at a safe concentration in the interior of buildings.
   (2) Dust-collecting equipment shall be made of noncombustible material.
   (3) Dust collecting systems shall be of a design which will prevent sparks due to physical contact in the fan assembly. (See Appendix A.)
   (4) Dust collector systems shall be designed and maintained for an air velocity in the ducts of not less than 18 m/s.

5.12.1.3. Dust Collectors
   (1) Except as provided in Sentence (2), dust collectors shall be located outside buildings or shall be equipped with exhaust stacks or ducts leading to the outside.
   (2) Dust collectors located inside buildings shall be designed in conformance with good engineering practice such as described in the National Fire Protection Association standards on dust explosion hazards. (See Appendix A.)
   (3) Dust collectors within buildings shall be designed with explosion venting to the exterior.

5.12.1.4. Bonding and Grounding. All electrically conducting parts of dust systems, dust collectors and the machines they serve shall be bonded and grounded.

5.12.1.5. Explosion Venting. Except as provided in Article 5.12.1.10., manufacturing activities that create significant concentrations of combustible
dusts shall be located only in buildings which have explosion venting to the outdoors of not less than 650 cm² for each cubic metre of room or building volume, with the vents designed to release at a pressure of not more than 1 kN/m².

5.12.1.6. Electrical Interlocks. Equipment required to have a dust exhaust system shall not be capable of operating until the dust exhaust system is in operation.

5.12.1.7. Vent Stacks
(1) Permanently open vent stacks may be used to ventilate storage containers where mechanical dust collector systems are not practical provided that the vent stacks
(a) have a cross-sectional area not less than twice that of all spouts discharging into the container,
(b) are installed not more than 30⁰ from the vertical,
(c) extend from the top of the container to a point not less than 1.2 m above the roof, and
(d) are designed to prevent the entry of snow and rain.

5.12.1.8. Separators. Magnetic or pneumatic separators shall be installed as necessary to prevent the entrance of foreign materials that may cause sparks in equipment such as shellers, crackers, crushers, grinding machines, pulverizers or similar machines which produce combustible dusts.

5.12.1.9. Ignition Sources. Smoking, open flame and spark-producing equipment shall not be allowed in areas containing combustible dust producing operations.

Section 5.13 Combustible Fibres

5.13.1. Storage

5.13.1.2. Loose Combustible Fibres
(1) Up to 3 m³ of loose combustible fibres may be kept in any building provided storage is in a metal-lined bin equipped with a self-closing metal-lined cover.

(2) Quantities of loose combustible fibres exceeding 3 m³ but not exceeding 15 m³ shall be stored in rooms separated from the remainder of the building by a fire separation having a fire-resistance rating of not less than 1 h.

(3) Quantities of loose combustible fibres exceeding 15 m³ but not exceeding 30 m³ shall be stored in rooms separated from the remainder of the building by a fire separation having a fire-resistance rating of not less than 2 h.

(4) Quantities of more than 30 m³ of loose combustible fibres shall not be stored in an individual room unless the room is sprinkled and separated from the remainder of the building by a fire separation having a fire-resistance rating of at least 2 h.

5.13.1.3. Baled Combustible Fibres
(1) Except as permitted in Sentences (2), (3) and (4), baled combustible fibres shall be stored so that
(a) no individual storage area exceeds 250 m²,
(b) the height of storage in an individual storage area does not exceed 4.5 m,
(c) subsidiary aisles within individual storage areas are not less than 1 m wide, and
(d) the clearance between piles and building walls is not less than 1 m.

(2) Except as permitted in Sentence (4), where baled combustible fibres are stored in sprinkled buildings, the maximum area of any individual storage area shall be 500 m².

(3) Where baled raw pulp is stored in an unsprinkled building,
(a) the maximum area of any individual storage area shall be 500 m²,
(b) the maximum height of storage shall be 6 m.

(4) Where baled raw pulp is stored in a sprinkled building,
(a) the maximum area of any individual storage area shall be 1 000 m²,
(b) the maximum height of storage shall be 6 m.
The sides of baled storage piles shall be inclined back from the base of the pile with a slope of not less than 1 m for each 10 m of height.

5.13.1.4. Clearance from Sprinklers. The clearance between the top of any pile and sprinkler head deflectors shall be not less than 914 mm.

5.13.1.5. Heating Equipment. Storage areas for combustible fibres shall not contain fuel-fired appliances or electrical heating elements, and shields shall be provided that will prevent stored material from coming within 300 mm of any part of the heating system.

5.13.2. Fire Protection

5.13.2.1. Standpipe and Hose Systems. Combustible fibres shall be stored only in warehouses which are protected by standpipe and hose systems installed in conformance with the National Building Code of Canada.

5.13.2.2. Portable Extinguishers. Portable extinguishers each containing not less than 9 L of water shall be provided in conformance with Part 6.

5.13.2.3. Smoke Venting. Automatic smoke venting hatches constituting not less than 64 cm² for each square metre of floor area, shall be provided in buildings used to store combustible fibres.

Section 5.14 Spray Coating Operations

5.14.1. Location

5.14.1.1. Fire Separations and Fire Suppression Systems

(1) Except as provided in Sentences (2) to (4), spray coating operations shall be separated from the remainder of the building by a fire separation having a fire-resistance rating of at least 2 h.

(2) Spray coating operations need not be separated from the remainder of the building in conformance with Sentence (1), provided that

(a) the building is sprinklered in conformance with Article 6.5.1.1., and

(b) the spray coating operations are confined within a spray booth.

(3) Where spray coating operations are confined within a spray booth, and where an automatic fire suppression system is provided to protect the spray booth, exhaust ducts and spraying area, the fire separation required in Sentence (1) need not have a fire-resistance rating, but shall be vapour tight. (See Appendix A.)

(4) In low hazard industrial occupancies, where spray coating operations are confined within a spray booth, and where an automatic fire suppression system is provided to protect the spray booth, exhaust ducts and spraying area, the spraying area need not be separated from the remainder of the building. (See Appendix A.)

5.14.2. Construction

5.14.2.1. Spray Booth

(1) A spray booth shall consist of a steel frame covered with sheet steel having a minimum thickness of 1.14 mm or be of equivalent noncombustible construction.

(2) The interior surfaces of a spray booth shall be smooth and continuous.

(3) The floor of a spray booth and the operators’ working areas shall be of noncombustible material.

5.14.2.2. Baffles

(1) Spray booth baffle plates shall be of a noncombustible material and be removable or arranged to facilitate cleaning.

(2) Spray booth baffle plates shall not be located in exhaust ducts.

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

5.14.2.4. Blowers. Fan blades and casings in exhaust blowers for spray booths shall be non-ferrous, or the fan shall be constructed so that a movement of the wheel or shaft will not permit two ferrous parts of the fan to rub or strike together.
5.14.3. Ventilation

5.14.3.1. Mechanical Ventilation. Mechanical ventilation with sufficient air movement to prevent dangerous flammable vapour or powder concentrations shall be provided in all spraying areas in conformance with Subsection 4.1.7.

5.14.3.2. Air Velocity

(1) Except as provided in Sentence (2), the exhaust air velocity at the face of the spray booth shall be not less than 0.5 m/s.

(2) Electrostatic spraying shall have an exhaust air velocity of not less than 0.3 m/s at the face of the spray booth.

5.14.3.3. Exhaust Ducts. A separate exhaust duct shall be provided for each spray booth, except that a common duct may be used if it serves spray booths having a combined open frontal area of not more than 1.7 m².

5.14.3.4. Air Recirculation. Air exhausted from spray operations shall not be recirculated.

5.14.3.5. Gauges and Alarms. Gauges or audible alarms that will ensure that the required air velocity will be maintained shall be installed at spray booths.

5.14.4. Exhaust Ducts

5.14.4.1. Construction. Exhaust ducts for spray booths shall be securely supported and constructed of sheet steel in conformance with Table 5.14.4.A.

Table 5.14.4.A
Forming Part of Article 5.14.4.1.

<table>
<thead>
<tr>
<th>Maximum Dimension of Duct, mm</th>
<th>Minimum Thickness of Sheet Steel, mm</th>
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5.14.4.2. Clearances

(1) Except as provided in Sentence (2), a clearance of 450 mm shall be maintained between ducts venting spray booths and unprotected combustible material.

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

5.14.4.3. Access Doors. Exhaust ducts for spray booths shall be provided with access doors for cleaning purposes.

5.14.4.4. Exhaust Outlets. Except for water-wash types, the exhaust outlet to atmosphere from all spray booths shall be not less than 1.8 m from any combustible exterior wall or roof and shall be located so that air does not discharge toward any combustible surface or unprotected opening within 7.5 m.

5.14.5. Electrical Equipment

5.14.5.1. Installation. Except where separated from the spraying area by vapour-tight separations with no openings, all electrical equipment within the spraying area, including lighting fixtures, shall conform to Article 5.1.3.2.

5.14.5.2. Electric Motors. Electric motors for exhaust fans shall not be placed inside spray booths or ducts.

5.14.5.3. Bonding and Grounding. All metal parts of spray booths, exhaust ducts and piping systems conveying flammable liquids or combustible liquids shall be electrically bonded and grounded.

5.14.6. Flammable Liquids and Combustible Liquids

5.14.6.1. Storage and Handling. Flammable liquids and combustible liquids for use in spraying areas shall be stored and handled in conformance with Part 4, and at no time shall the amount of flammable liquids and combustible liquids in the spraying areas exceed one day's supply.

5.14.6.2. Containers. Paint shall be kept in closed containers when not in use.
(2) Electrostatic fluidized beds and associated equipment shall be installed in conformance with good engineering practice.

(3) With the exception of charging electrodes and their connections, transformers, power packs, control apparatus and all other electrical components shall be located outside the powder coating area.

5.16.6.2. Temperatures

(1) Where a part to be coated is preheated prior to the application of the powder, the temperature of the part shall not exceed the ignition temperature of the powder being used.

(2) The surface temperature of electrostatic fluidized bed coating areas shall not exceed 66°C.

5.16.6.3. Bonding and Grounding

(1) Powder transport, application and recovery equipment shall be bonded and grounded.

(2) All electrically conductive objects within the charging influence of the electrodes of electrostatic fluidized beds shall be grounded, and a sign shall be posted indicating the necessity of such grounding.

5.16.6.4. High Voltage Circuits. High voltage circuits in electrostatic fluidized beds shall be so designed that any discharge produced when the charging electrodes of the bed are approached or contacted by a grounded object shall not be of sufficient intensity to ignite any powder-air mixture likely to be encountered or result in any appreciable shock hazard.

5.16.6.5. Separators. Separators shall be used to prevent tramp iron or other spark-producing materials from being introduced into the powders being applied.

5.16.6.6. Powder Recovery Systems. All waste air-suspended powders shall be safely removed by exhaust ducts to a powder recovery system and shall not be released to the outside atmosphere.

5.16.6.7. Waste Dust Removal. Any accumulations of waste dust from dry powder finishes shall be removed by vacuum cleaning equipment.

5.16.6.8. Contact Points

(1) Objects being coated shall be maintained in contact with the conveyor or other support.

(2) Hangers for objects being coated shall be kept clean and areas of contact with such objects shall have sharp points or edges.

5.16.6.9. Smoking. Signs prohibiting smoking which conform to Article 2.4.2.2. shall be conspicuously posted at all powder coating areas and powder storage rooms.

5.16.7. Organic Peroxides and Dual Component Coatings

5.16.7.1. Location. All spraying operations involving the use of organic peroxides and other dual component coatings shall be conducted in sprinklered spray booths as described in Section 5.14.

5.16.7.2. Initiator Storage. Organic peroxide initiators shall be stored so that they will be kept away from contact with all other stored materials.

5.16.7.3. Handling Equipment. Handling equipment, including spray guns, which are specifically designed for use with organic peroxides shall be used to apply such coatings.

5.16.7.4. Containers. Separate containers shall be used exclusively for the storage of resin and organic peroxide.

5.16.7.5. Pressure Tank Inserts. Organic peroxide pressure tank inserts shall be constructed of stainless steel, polyethylene or material that is equally inert to organic peroxide.

5.16.7.6. Foreign Materials. Precautions shall be taken to prevent any mixing of foreign materials with dusts or overspray residues resulting from the sanding or spraying of finishing materials containing organic peroxides.

5.16.7.7. Absorbents. Noncombustible absorbents shall be used to remove peroxide spills, and such absorbents shall be disposed of in an acceptable manner.

5.16.7.8. Handling

(1) Organic peroxides shall be handled in conformance with Sections 5.10 and 5.11.
Quantities of organic peroxides shall be withdrawn only as required on a daily basis, and unused material shall be disposed of on the completion of the day’s work.

Organic peroxides shall not be subjected to shock or friction during handling.

Organic peroxides shall not be subjected to heating surfaces, open flames and sparks or be subjected to solar radiation.

Where organic peroxides are stored, mixed or applied, only nonsparking tools shall be used, and signs prohibiting smoking which conform to Article 2.4.2.2. shall be prominently displayed.

Organic peroxides shall not be mixed directly with any catalyst.

Only trained personnel shall work with organic peroxides.

Section 5.17 Fumigation and Thermal Insecticidal Fogging

5.17.1. General

5.17.1.1. Application

This Section applies to the fumigation or thermal insecticidal fogging of buildings, including the fumigation of equipment or commodities within structures, tanks, bins or under tarpaulins.

Buildings in which frequent fumigation operations are conducted on a routine basis need not conform to Article 5.17.2.1. (See Appendix A.)

5.17.2. Safety Precautions

5.17.2.1. Notification

Except as permitted in Sentence 5.17.1.1.(2), the public fire department shall be notified in writing not less than 24 h before any building is to be closed for fumigation and shall be advised of the chemicals to be used, the proposed date and time of use, types of respiratory protective devices required and the degree of flammability of the fumigant or fog being used.

Except as permitted in Sentence 5.17.1.1.(2), the occupants of any premises adjacent to that in which fumigation or thermal insecticidal fogging is to take place shall be given prior notice.

5.17.2.2. Ignition Sources. All flames and other sources of ignition shall be eliminated in a building undergoing fumigation or thermal insecticidal fogging.

5.17.2.3. Electric Power. Electric power supply shall be shut off to the premises undergoing fumigation or thermal insecticidal fogging.

5.17.2.4. Air Temperature. The air temperature in the building undergoing fumigation or thermal insecticidal fogging shall be kept sufficiently low to prevent the actuation of any sprinkler system.

5.17.2.5. Breathing Apparatus. Protective breathing apparatus shall be made available at the premises undergoing fumigation or thermal insecticidal fogging.

5.17.2.6. Access to Premises

No person shall be permitted to enter a premise undergoing fumigation or thermal insecticidal fogging until the premise has been ventilated and is safe for human occupancy.

Warning signs shall be posted in a conspicuous location near every entrance to the premises being fumigated.

One person shall be on duty at each entrance to premises undergoing fumigation or thermal insecticidal fogging to prevent any person from entering until such premises have been ventilated in conformance with Sentence (1).

Section 5.18 Welding and Cutting

5.18.1. General

5.18.1.1. General. The protection of persons and property from injury or damage by fire or other causes arising from electric and gas welding and cutting equipment, its installation, operation and maintenance, shall conform to CSA W117.2, “Code
Part 6
Installation, Inspection, Testing, Maintenance and Operation of Fire Protection Equipment

Section 6.1 General

6.1.1. Scope

6.1.1.1. Application
(1) This Part provides for the installation, inspection, testing, maintenance and operation of automatic sprinkler systems, special extinguishing systems, and portable extinguishers, and the inspection, testing, maintenance and operation of water supplies for fire protection, fire alarm systems, standpipe and hose systems, and emergency power installations.

6.1.1.2. Maintenance. Fire protection installations shall be maintained in operating condition. (See Appendix A.)

6.1.1.3. Notification. Where tests, repairs or alterations are made to fire protection installations, including sprinkler and standpipe systems, an acceptable procedure of notification shall be established, and such procedure may include the notification of the fire department and the building occupants.

Section 6.2 Portable Extinguishers

6.2.1. General

6.2.1.1. Selection and Installation. Portable extinguishers shall be selected and installed in conformance with NFPA 10, "Portable Fire Extinguishers" and with the requirements of this Code.

6.2.1.2. Standards

(1) Portable extinguishers shall conform to
(a) CAN/ULC-S504, "Dry Chemical and Dry Powder Hand and Wheeled Fire Extinguishers,"
(b) CAN/ULC-S503-M, "Carbon Dioxide Hand and Wheeled Fire Extinguishers,"
(c) CAN/ULC-S512, "Halogenated Agent Hand and Wheeled Fire Extinguishers," or
(d) CAN4-S507, "9 Litre Stored Pressure Water Type Fire Extinguishers."

6.2.1.3. Location

(1) Portable extinguishers shall be located in or adjacent to corridors or aisles that provide access to exits.

(2) Portable extinguishers in proximity to a fire hazard shall be located so as to be accessible without exposing the operator to undue risk. (See Appendix A.)

6.2.1.4. Instructions. All instructions for operating, maintaining and recharging portable extinguishers shall be permanently fixed to each unit.

6.2.1.5. Corrosive Atmospheres. Portable extinguishers subject to damage in a corrosive atmosphere shall not be installed where such an atmosphere exists without providing appropriate corrosion protection for the extinguisher.

6.2.1.6. Mounting Brackets. When portable extinguishers are located on vehicles or in areas where they are subject to jarring or vibration, brackets designed to accommodate these effects shall be used.
6.2.1.7. Health and Safety Hazard. Portable extinguishers shall be of a type that does not constitute a hazard to health and safety in its maintenance and use.

6.2.2. Classification and Identification

6.2.2.1. Classification of Fires. For the purposes of this Section, fires are identified as Class A, Class B, Class C and Class D fires. (See Appendix A.)

6.2.2.2. Rating of Extinguishers. Portable extinguishers shall be rated and identified in conformance with CAN/ULC-S508-M, "Rating and Fire Testing of Fire Extinguishers and Class D Fire Extinguishing Media."

6.2.3. Installation Requirements

6.2.3.1. Hazard Protection. Portable extinguishers shall be provided for the protection of the building structure and occupancy hazards in conformance with this Subsection and as specified elsewhere in this Code. (See Appendix A.)

6.2.3.2. Dwelling Units. Portable extinguishers shall be installed in all buildings except dwelling units.

6.2.3.3. Number of Extinguishers for Class A Fires. The number of portable extinguishers required in each building shall conform to Table 3-2.1 of NFPA 10, "Portable Fire Extinguishers," but in no case shall there be less than one portable extinguisher per storey having a minimum rating of 1-A, except that portable extinguishers are not required within dwelling units.

6.2.3.4. Hose Stations in Lieu of Extinguishers

(1) Up to half of the number of portable extinguishers required per floor area in Table 3-2.1 of NFPA 10, "Portable Fire Extinguishers" may be replaced by hose stations equipped with not less than 23 m of hose conforming to CGSB 20-GP-12Ma, "Braided Water Hose, Knitted or Spiral Wound Reinforced," connected to an acceptable water supply and spaced so that the travel distance to the nearest hose does not exceed 25 m.

(2) The water supply piping and hose serving the hose stations referred to in Sentence (1) shall be at least 19 mm diam, and the hose shall be equipped with an acceptable combination water-spray nozzle.

6.2.3.5. Extinguishers for Class B Fires. Portable extinguishers for Class B fires shall be provided as required in Table 6.2.3.A.

<table>
<thead>
<tr>
<th>Portable Extinguishers for Class B Fires</th>
<th>Grade of Hazard(1)</th>
<th>Basic Minimum Extinguisher Rating, per Unit</th>
<th>Maximum Travel Distance to Extinguishers, m</th>
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<tr>
<td>Light</td>
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<td>3</td>
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</tbody>
</table>

Note to Table 6.2.3.A.: (1) Graded in conformance with NFPA 10, "Portable Fire Extinguishers."

6.2.3.6. Extinguishers for Commercial Cooking Equipment. Alkali base dry chemical portable extinguishers shall be provided to protect commercial cooking equipment.

6.2.3.7. Extinguishers for Class C Fires

(1) Portable extinguishers for Class C fires shall be provided for fires in or near electrical equipment.

(2) Distribution of portable extinguishers for Class C fires shall conform to the applicable provisions for the distribution of extinguishers for Class A or Class B fires in the vicinity of the electrical equipment.

6.2.4. Inspection, Testing and Maintenance

6.2.4.1. Inspection, Testing and Maintenance. Except as otherwise required in this Section, inspection, testing and maintenance of portable extinguishers shall be in conformance with NFPA 10, "Portable Fire Extinguishers."
When sprinklers are required to be tested in conformance with Sentence (1), not less than 6 sprinklers of each type shall be tested, except that not less than 2 sprinklers per floor per individual system shall be tested.

6.5.4.14. **Defective Sprinklers.** All sprinklers shall be replaced in sprinkler systems from which sample sprinklers have been tested and found defective.

6.5.4.15. **Spare Sprinklers**

(1) Where sprinkler systems are installed, a supply of spare sprinklers and equipment shall be maintained in conformance with Sentences (2) to (5).

(2) Spare sprinklers shall be kept in a cabinet located where the temperature will at no time rise above 38°C.

(3) The stock of spare sprinklers to be kept on hand shall be as follows:
   (a) for installations containing not more than 300 sprinklers, not less than 6 spare sprinklers,
   (b) for installations containing from 301 to 1,000 sprinklers, not less than 12 spare sprinklers, and
   (c) for installations containing more than 1,000 sprinklers, not less than 24 spare sprinklers.

(4) Spare sprinklers shall correspond to the types and temperature ratings of the sprinklers in use.

(5) A sprinkler wrench shall be kept in the cabinet where the spare sprinklers are stored.

6.5.4.16. **Fire Department Connections.**

Fire department connections for sprinkler systems shall be maintained in conformance with Article 6.4.1.7.

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### Section 6.6 Water Supply Systems for Fire Protection

#### 6.6.1. General

6.6.1.1. **Maintenance.** Water supplies for fire protection, including hydrants, shall be maintained so as to be capable of providing the flow and pressure of water for which they were designed.

6.6.1.2. **Valve Inspections.** Valves controlling water supplies to fire protection systems shall be inspected weekly to ensure that they are wide open and are sealed or locked in that position.

6.6.1.3. **Ice Accumulations.** Water supply systems for fire protection shall be kept free of ice accumulations.

6.6.1.4. **Antifreeze Solutions.** Where antifreeze solutions are used to maintain pumping systems operable under freezing conditions, the specific gravity shall be such that the solution will remain unfrozen at a temperature not less than 8°C below the expected minimum temperature of the surrounding atmosphere.

6.6.1.5. **Internal Scale and Rust.** Water supply piping systems shall be cleaned and flushed when necessary to remove deposits of scale or rust that reduce the flow of water below that for which the piping is designed.

#### 6.6.2. Tanks

6.6.2.1. **Tank Inspections.** An annual inspection shall be made of all tanks for fire protection, tank supporting structures and water supply systems including piping, control valves, check valves, heating systems, mercury gauges and expansion joints to ensure that they are in satisfactory operating condition.

6.6.2.2. **Tank Heating Equipment.** Tank heating equipment and accessories shall be inspected daily during freezing weather to ensure that they are in operating condition and that heater valves are open.

6.6.2.3. **Temperature Readings**

(1) The temperature of water contained in tanks shall be read daily during freezing weather and measures shall be taken to ensure that it does not fall below 4°C.

(2) For tanks in buildings the temperature of the tank enclosure shall be read daily during freezing weather and measures shall be taken to ensure that it does not fall below 4°C.
weather and measures shall be taken to ensure that the temperature of the water does not fall below 4°C.

6.6.2.4. Sediment Accumulation and Corrosion

(1) Tanks shall be inspected at least once every 2 years for sediment accumulations and for corrosion.

(2) Accumulations of sediment found during inspections shall be removed.

(3) Corroded iron or steel work shall be scraped and repainted as required.

6.6.2.5. Cathodic Protection Equipment. Where cathodic protection equipment is installed to prevent corrosion of steel tanks, arrangements shall be made for annual inspections and maintenance of the equipment.

6.6.2.6. Inspection of Gravity Tanks

(1) Gravity tanks shall be inspected annually to ensure that the tank roof is tight and in good repair, that hatches or doors are kept closed and properly secured and that the frostproof casing of the tank riser makes a tight joint with the bottom of the tank.

(2) Gravity tanks shall be overflowed monthly to ensure that they are full.

6.6.2.7. Housekeeping. The space between overflow pipes and the tops of gravity tanks, the valve pits at the bottoms of the risers and the entire area around the bases of the columns of tanks shall be kept free of rubbish and waste materials.

6.6.2.8. Expansion Joints. Gravity tank expansion joints shall be repacked and adjusted if binding or leaks develop.

6.6.2.9. Inspection of Pressure Tanks

(1) Pressure tanks shall be inspected weekly during which

(a) the water level shall be observed, and

(b) the pressure shall be read.

(2) Water levels and pressure for pressure tanks shall be maintained at the specified levels.

6.6.3. Fire Pumps and Reservoirs

6.6.3.1. Reservoirs. The water level in the fire pump reservoir shall be observed weekly and maintained at the proper level.

6.6.3.2. Pump Room Temperature. Measures shall be taken to ensure that the ambient air temperature in the pump room never falls below the minimum recommended by the engine manufacturer, or 4°C, whichever is higher. (See Appendix A.)

6.6.3.3. Fire Pump Testing

(1) Except as provided in Sentence (2), fire pumps shall be operated at least weekly at their rated speeds until the satisfactory performance of the pump, driver and controller is verified. (See Appendix A.)

(2) For fire pumps that are driven by electric motor, the tests described in Sentence (1) shall be performed at least monthly.

(3) Internal combustion engine fire pumps shall be operated for a sufficient time to bring the engines up to normal operating temperatures, and the storage batteries, lubrication systems, oil and fuel supplies shall be maintained at the correct levels.

(4) Fire pumps shall be tested at full rated capacity at least once per year to ensure that they are capable of delivering the rated flow.

6.6.3.4. Records. Records shall be kept of all fire pump tests, and such records shall be retained for examination by the authority having jurisdiction, in conformance with Article 1.1.5.1.

6.6.4. Hydrants

6.6.4.1. Maintenance

(1) Hydrants shall be maintained in operating condition.

(2) Hydrants shall be kept clear of ice, snow and other obstructions and their locations shall be clearly identified.

6.6.4.2. Inspection Frequency. Hydrants shall be inspected semi-annually and after each use in conformance with Article 6.6.4.4. and shall be tested annually in conformance with Article 6.6.4.5.