

**MINI-AUDIT GUIDE
TO
PART 4
ONTARIO FIRE CODE
FOR
RETAIL OCCUPANICES**

August 1998

**MINISTRY OF THE
SOLICITOR GENERAL
AND CORRECTIONAL SERVICES**

**OFFICE OF THE
FIRE MARSHAL**

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IMPLEMENTING PART 4 REQUIREMENTS

INTRODUCTION

On August 21, 1998, Part 4 of the Ontario Fire Code dealing with flammable and combustible liquids takes effect. Compliance with Part 4 has been phased in based on the specific requirements. There are three compliance dates. The first compliance date coincides with the effective date of August 21, 1998, and applies primarily to preventative and maintenance procedures. The second compliance date is August 21, 2000, at which time requirements that have a high life safety impact must be completed. All other requirements, with a few exceptions, have a compliance date of August 21, 2002.

It is important to recognize that a deficiency that is not corrected by the compliance date is a violation of the OFC and is subject to prosecution. A building permit may be required where corrective action involves material alterations to building structures or fire safety systems.

To assist property owners in implementing these new requirements, an Audit Guide and a Commentary have been developed by the Office of the Fire Marshal with the assistance of the Fire Service and industry stakeholders. These documents are designed to provide an overview of the regulation governing use, handling and storage of flammable and combustible liquids.

Not all of the requirements are addressed in these two documents. Persons using these guides are reminded that, for accurate and complete reference, recourse should be made to the actual regulations since the an Audit Guide and Commentary do not replace the specific OFC requirements. The OFC, an Audit Guide and Commentary may be purchased from Publications Ontario. Orders may be placed over the phone by dialing 1-800-668-9938.

HOW TO USE THE AUDIT GUIDE AND COMMENTARY

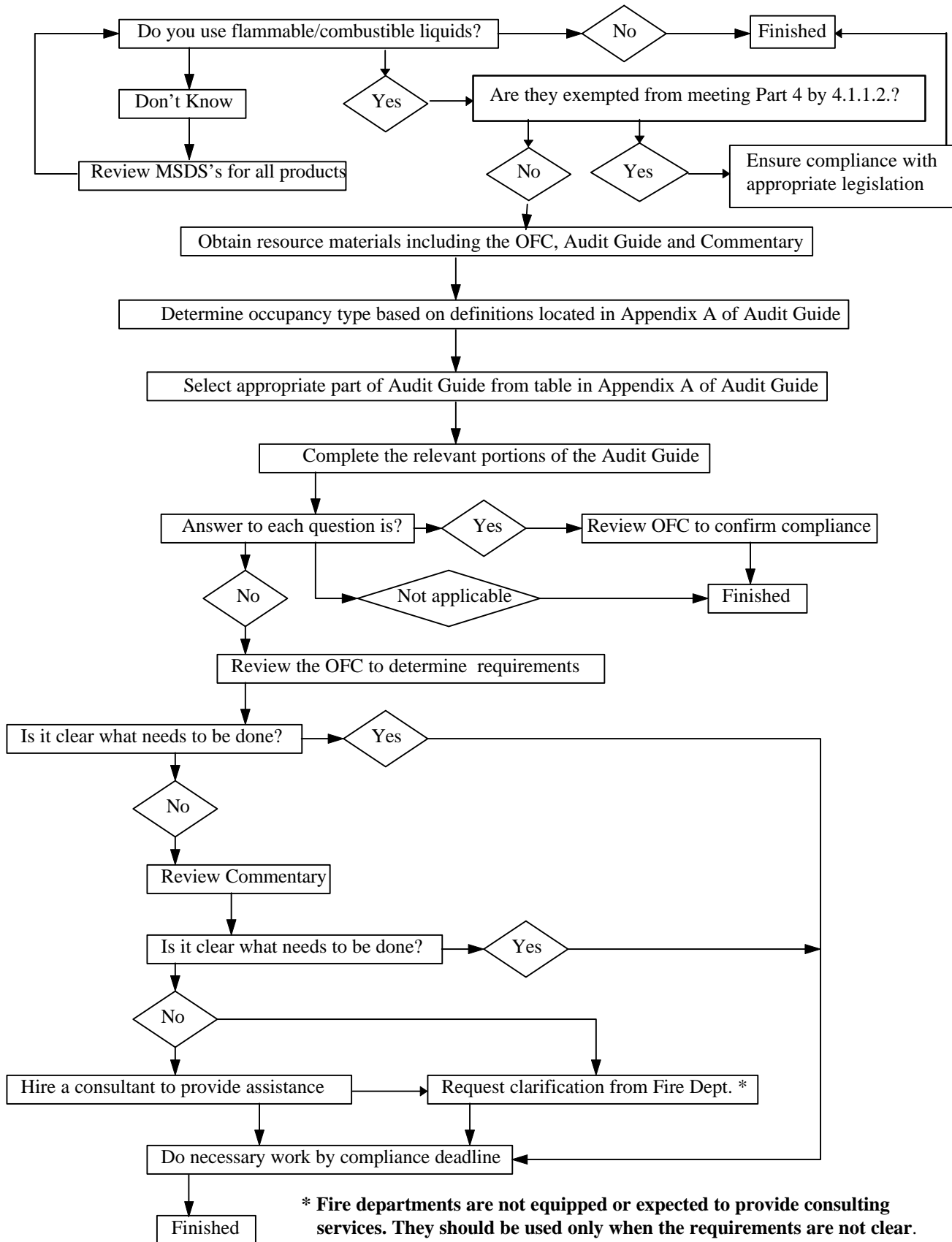
It is suggested that owners begin their review by working through the Audit Guide. The information in this Audit Guide is structured as a series of questions where a “no” (N) response to a question means that it is likely that the feature under examination does not comply with OFC requirements. The OFC reference is included to assist users to quickly access specific requirements. Further information explaining OFC requirements is contained in the Commentary.

Deficiencies must be corrected by the compliance date which is referred to by the subscript numerals in the “No” column. For example, the subscript 2 (e.g. N₂) means that the due date for compliance is August 21, 2000, which is two years after the effective date of August 21, 1998.

Compliance may be achieved by upgrading to satisfy the specific requirement or implementing an approved Compliance Alternative as described in Articles 4.1.1.4. and 4.1.1.5. Either way, the work must be completed by the compliance date.

DECISION FLOW CHART TO IMPLEMENT PART 4

The following flow chart is intended to assist users in complying with the new regulatory requirements set out in Part 4 of the Ontario Fire Code (OFC).



Retail Occupancies

LIST OF TOPICS**SECTION 4.1**

4.1.1.	Scope and Application
4.1.2.	Classification
4.1.3.	Flash Point
4.1.4.	Electrical Installations
⇒ 4.1.5.	Fire Prevention and Protection
⇒ 4.1.6.	Spill Control and Drainage Systems
4.1.7.	Ventilation
⇒ 4.1.8.	Handling of Flammable and Combustible Liquids

APPLICATION**SECTION 4.2**

4.2.1.	Scope
⇒ 4.2.2.	General
⇒ 4.2.3.	Containers and Portable Tanks
⇒ 4.2.5.	Mercantile Occupancies

CONTAINER STORAGE AND HANDLING

Retail Occupancies

Scope

This mini Audit Guide applies only to mercantile occupancies where flammable or combustible liquids are stored. Any dispensing operations take place outside the building. The opening of small paint containers in retail areas for the purpose of tinting is not considered to be dispensing.

In an unsprinklered mercantile building, the maximum quantity of flammable and combustible liquid stored in a single suite and not within a fire separated room, shall not exceed any of the following amounts:

Class IA & IB	0.3 L/m ² to a maximum of 300 litres
Total Class I	2L /m ² to a maximum of 2000 litres
Total Class I, II & IIIA	8L /m ² to a maximum of 8000 litres

In a sprinklered mercantile building, the maximum quantity of flammable and combustible liquid stored in a single suite and not within a fire separated room shall not exceed the following amounts:

Class IA & IB	1L /m ² to a maximum of 1000 litres
Total Class I	6L/m ² to a maximum of 6000 litres
Total Class I, II & IIIA	24L/m ² to a maximum of 24 000 litres

The maximum size of any one container shall not exceed 230 L.

It should be noted that the above limits are the limits for using this mini Audit Guide, not the maximum quantity that is permitted in the building. Where the above limits are exceeded, recourse should be made to the full Audit Guide.

Flammable liquids are classified as follows:

Class	Flash Point	Boiling Point
Class IA liquids,	below 22.8°C	below 37.8°C
Class IB liquids,	below 22.8°C	at or above 37. 8°C
Class IC liquids,	at or above 22.8°C and below 37.8°C	

Retail Occupancies

Combustible liquids are classified as follows:

Class	Flash Point
Class II liquids,	at or above 37.8°C and below 60°C
Class IIIA liquids,	at or above 60°C and below 93.3°C

Used lubricating oil drained from motor vehicles shall be classified as a Class IIIA liquid. When Class I or II liquids are added to used lubricating oil the resulting mixture shall be classified by tests conforming to Subsection 4.1.3. of the Fire Code.

Part 4 does not apply to the following:

- appliances and their ancillary equipment (burning hydrocarbons) to which the Energy Act applies (e.g. residential furnaces),
- the storage, handling, transportation and use of flammable or combustible liquids to which the Gasoline Handling Act and the Energy Act apply, and
- the storage of aerosol products which are covered under Subsection 3.2.5. of the National Fire Code.

4.1.5. Fire Prevention and Protection

Q1. Are portable fire extinguishers provided and maintained in accordance with Section 6.2.? (4.1.5.1.)	Y	N	N/A
Q2. Are all ignition sources controlled in a manner that will not create a fire or explosion hazard to the stored liquid? (4.1.5.3.) This includes any device or activity which produces sparks, heat or has open flames and includes, but is not limited to, cutting and welding, grinding, hot surfaces, frictional heat, static, electrical and mechanical sparks, spontaneous combustion, chemical reactions that produce heat, and radiant heat. (4.1.5.3.)	Y	N	N/A
Q3. Is smoking prohibited in the room or area where flammable or combustible liquids are stored? (4.1.5.4.)	Y	N	N/A
Q4. Are all areas adjacent to the storage of flammable and combustible liquids kept clean of the accumulation of combustible materials? (4.1.5.5.(1)) If cleaning rags are used, are all cleaning rags, both clean and dirty, stored in a proper metal closed container? (4.1.5.5.(2))	Y Y	N N	N/A N/A
Q5. Are emergency planning measures conforming to Section 2.8 of OFC provided for all areas of the facility where flammable or combustible liquids are stored, used, handled or processed? (4.1.5.6.) Is a copy of the Fire Safety Plan available on the site? (4.1.5.6.)	Y Y	N N	N/A N/A

4.1.6. Spill Control and Drainage Systems

Q1. To prevent a spill of flammable or combustible liquids, including water used for fire fighting, from flowing outside of the spill area, off the property site and from reaching any waterway, sewer systems or potable water source, is one of the following provided; a) a non-combustible barrier (dike) of sufficient height to contain the spill? Or b) grading of the area to direct the spill and fire fighting water to a retention pond or reservoir of adequate capacity? (4.1.6.1(1) and 4.3.7.)	Y	N ₂	N/A
Q2. Is the area where the spill is contained, dike area or retention reservoir located such that the spill will not create a:			
• fire exposure to the public?	Y	N ₂	N/A
• fire exposure to any building?	Y	N ₂	N/A
• fire exposure to a means of egress?	Y	N ₂	N/A

<ul style="list-style-type: none"> • fire exposure to a fire department access road? 	Y	N ₂	N/A
<ul style="list-style-type: none"> • fire exposure to valves that control the flow of the flammable or combustible liquids? 	Y	N ₂	N/A
<ul style="list-style-type: none"> • fire exposure to valves that control fire water supply? (4.1.6.2.) 	Y	N ₂	N/A
Q3. Are there maintenance and operating procedures established to prevent the escape of flammable or combustible liquids? (4.1.6.3.(1))	Y	N	N/A
Q4. Is there a written spill procedure? (See Appendix A of the Commentary for details.)	Y	N	N/A
Is the procedure prominently posted and maintained where flammable or combustible liquids are stored, handled or used? (4.1.6.4.)	Y	N	N/A

4.1.8. Handling of Flammable and Combustible Liquids

Q1. Are the containers kept closed when not in use? (4.1.8.1.)	Y	N	N/A
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4.2.2. Container Storage and Handling - General and 4.2.3. Containers and Portable Tanks

Q1. Is it true that containers are <u>not</u> stored in or adjacent to exits, including outdoors, elevators or principal access routes to exits? (4.2.2.1.)	Y	N	N/A
Q2. Are containers kept separated from other dangerous goods? (4.2.2.3.)	Y	N	N/A
<p>Q3. Do the containers with a capacity of not more than 230L and which are used to store flammable and combustible liquids, conform to one of the following design criteria?</p> <p>a) the "Transportation of Dangerous Goods Regulations"</p> <p>b)CSA B376-M "Portable Containers for Gasoline and Other Petroleum Fuels"</p> <p>c)CSA B306-M "Portable Fuel Tanks for Marine Use"</p> <p>d)ULC/ORD-C30 "Safety Containers" (4.2.3.1.)</p> <p>Note: A container of not more than 1L capacity used for Class I liquids and 5 L capacity for Class II & IIIA liquids need not comply with this requirement. (4.2.3.4.(2))</p> <p>This requirement does not apply to food and pharmaceutical products or products containing not more than 50% by volume of water miscible flammable liquid with the remaining liquid being non-flammable. (4.2.1.1. & 4.2.3.1.)</p>	Y	N	N/A

<p>Q4. Are the containers for flammable and combustible liquids distinctly marked or labeled in contrast to any other printed matter on the label with the following warnings:</p> <p>a) the contents of the container are flammable?</p> <p>b) it should be kept away from heat, sparks and open flames?</p> <p>c) the container should be kept closed when not in use? (4.2.3.2.)</p>	<p>Y</p> <p>Y</p> <p>Y</p>	<p>N</p> <p>N</p> <p>N</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p>
<p>Q5. If plastic or glass containers are used for storage or handling of flammable and/or combustible liquids, are they used only where the required liquid purity would be affected by storage in a metal container or if the liquid would cause excessive corrosion of the metal container? (4.2.3.3.)</p> <p>Note: A container of not more than 1L capacity used for Class I liquids and 5 L capacity for Class II & IIIA liquids need not comply with this requirement. (4.2.3.4.(2))</p>	<p>Y</p>	<p>N₂</p>	<p>N/A</p>

4.2.5. Mercantile Occupancies

<p>Q1. In an unsprinklered mercantile building, does the maximum quantity of flammable and combustible liquid being stored in a single suite and not within a fire separated room, not exceed any of the following amounts:</p> <p>Class IA & IB - 0.3 L/m² to a maximum of 300 litres</p> <p>Total Class I - 2L /m² to a maximum of 2000 litres</p> <p>Total Class I, II & IIIA - 8L/m² to a maximum of 8000 litres?</p> <p>(4.2.5.1.(2))</p>	<p>Y</p> <p>Y</p> <p>Y</p>	<p>N₂</p> <p>N₂</p> <p>N₂</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p>
<p>Q2. In a sprinklered mercantile building does the maximum quantity of flammable and combustible liquid stored in a single suite and not within a fire separated room not exceed the following amounts:</p> <p>Class IA & IB - 1L /m² to a maximum of 1000 litres</p> <p>Total Class I - 6L/m² to a maximum of 6000 litres</p> <p>Total Class I, II & IIIA - 24L/m² to a maximum of 24 000 litres?</p> <p>(4.2.5.1.(3))</p>	<p>Y</p> <p>Y</p> <p>Y</p>	<p>N₂</p> <p>N₂</p> <p>N₂</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p>
<p>Q3. Are flammable and combustible liquids stored in closed containers? (4.2.5.2.)</p>	<p>Y</p>	<p>N₂</p>	<p>N/A</p>
<p>Q4. Are the closed containers of flammable and combustible liquids stacked on the floor no more than 1.5 m high, or no more than 1m high on individual fixed shelves? (4.2.5.2.)</p>	<p>Y</p>	<p>N₂</p>	<p>N/A</p>
<p>Q5. Where Class I flammable liquids are stored in any basement area, is this storage only for closed containers with no dispensing? (4.2.5.2.)</p>	<p>Y</p>	<p>N₂</p>	<p>N/A</p>

Sprinkler Protection

Q1. Where sprinkler protection is provided, has it been installed in conformance with NFPA 30 or Section 6.8 of the Fire Code? (4.2.7.7.)	Y	N ₂	N/A
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APPENDIX A**SELECTING THE APPROPRIATE PORTION
OF THE AUDIT GUIDE****CLASSIFICATION OF OCCUPANCIES**

Note: This is a selected list for retail occupancies.

Mercantile

Department stores

Exhibition halls

Markets

Restaurants with an occupant load not more than 30 persons consuming food and drink

Shops

Stores

Supermarkets

OFC Subsection	Topic	Occupancies Subsection Applies to	Guide prepared
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4.1.1.	Scope and Application	All Occupancies	No
4.1.2.	Classification	All Occupancies	No
4.1.3.	Flash Point	All Occupancies	No
4.1.4.	Electrical Installations	All Occupancies	No
4.1.5.	Fire Prevention and Protection	All Occupancies	Yes
4.1.6.	Spill Control and Drainage Systems	All Occupancies	Yes
4.1.7.	Ventilation	All Occupancies	Yes
4.1.8.	Handling of Flammable and Combustible Liquids	All Occupancies	Yes

Container Storage and Handling (Section 4.2)			
4.2.1.	Scope	All Occupancies	No
4.2.2.	General	All Occupancies	Yes
4.2.3.	Containers and Portable Tanks	All Occupancies	Yes
4.2.4.	Assembly and Residential Occupancies, but not nonresidential schools and colleges	<<<< Same***	Yes
4.2.5.	Mercantile Occupancies	<<<< Same***	Yes
4.2.6.	Business and Personal Services, Educational and Institutional Occupancies, including nonresidential schools and colleges	<<<< Same***	Yes
4.2.7.	Industrial Occupancies	<<<< Same***	Yes
4.2.8.	Incidental Use	Industrial	Yes
4.2.9.	Rooms for Container Storage and Dispensing	All Occupancies	Yes
4.2.10.	Cabinets for Container Storage	All Occupancies	Yes
4.2.11.	Outdoor Container Storage	All Occupancies	Yes

*** see 'Classification of Occupancies' for list of occupancies

OFC Subsection	Topic	Occupancies Subsection Applies to	Guide prepared
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Tank Storage (Section 4.3)			
4.3.1.	Design, Construction and Use of Storage Tanks	All Occupancies	Yes
4.3.2.	Installation of Outside Aboveground Storage Tanks	All Occupancies	Yes
4.3.3.	Supports, Foundations and Anchorage for Aboveground Storage Tanks	All Occupancies	Yes
4.3.4.	Normal and Emergency Venting for Aboveground Storage Tanks	All Occupancies	Yes
4.3.5.	Vent Piping for Aboveground Storage Tanks	All Occupancies	Yes
4.3.6.	Openings Other than Vents in Aboveground Storage Tanks	All Occupancies	Yes
4.3.7.	Secondary Containment for Aboveground Storage Tanks	All Occupancies	Yes
4.3.8.	Installation of Underground Storage Tanks	All Occupancies	Yes
4.3.9.	Corrosion Protection of Underground Steel Storage Tanks	All Occupancies	Yes
4.3.10.	Vents for Underground Storage Tanks	All Occupancies	Yes
4.3.11.	Openings Other than Vents in Underground Storage Tanks	All Occupancies	Yes
4.3.12.	Installation of Storage Tanks Inside Buildings	All Occupancies	Yes
4.3.13.	Rooms for Storage Tanks	All Occupancies	Yes
4.3.14.	Openings Other than Vents in Storage Tanks in Buildings	All Occupancies	Yes
4.3.15.	Leakage Testing of Storage Tanks	All Occupancies	Yes
4.3.16.	Leakage Detection of Storage Tanks	All Occupancies	Yes

OFC Subsection	Topic	Occupancies Subsection Applies to	Guide prepared
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Piping and Transfer Systems (Section 4.4)			
4.4.1.	Scope	All Occupancies	No
4.4.2.	Materials for Piping, Valves and Fittings	All Occupancies	Yes
4.4.3.	Corrosion Protection of Piping Systems	All Occupancies	Yes
4.4.4.	Identification of Piping Systems	All Occupancies	Yes
4.4.5.	Joints in Piping Systems	All Occupancies	Yes
4.4.6.	Leakage Testing of Piping Systems	All Occupancies	Yes
4.4.7.	Location and Arrangement of Piping	All Occupancies	Yes
4.4.8.	Valves in Piping Systems	All Occupancies	Yes
4.4.9.	Heating of Piping Systems	All Occupancies	Yes
4.4.10.	Methods of Transfer in Piping Systems	All Occupancies	Yes
4.4.11.	Operating Procedures for Piping Systems	All Occupancies	Yes

Fuel Dispensing Stations (Section 4.5) - Audit Guide not prepared

Bulk Plants (4.6)			
4.6.1.	Scope	Bulk Plants	No
4.6.2.	Storage	Bulk Plants	Yes
4.6.3.	Dispensing	Bulk Plants	No
4.6.4.	Loading and Unloading Facilities	Bulk Plants	Yes
4.6.5.	Fire Protection	Bulk Plants	Yes
4.6.6.	Spill Control	Bulk Plants	Yes

OFC Subsection	Topic	Occupancies Subsection Applies to	Guide prepared
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Piers and Wharves (Section 4.7)- Audit Guide not prepared

Process Plants (Section 4.8)

4.8.1.	Scope	Industrial	No
4.8.2.	Outdoor Processing Equipment	Industrial	Yes
4.8.3.	Processing Buildings	Industrial	Yes
4.8.4.	Fire Prevention and Protection	Industrial	Yes

Distilleries (Section 4.9)

4.9.1.	Scope	Distilleries	No
4.9.2.	General	Distilleries	No
4.9.3.	Storage Tanks and Containers	Distilleries	Yes
4.9.4.	Storage	Distilleries	Yes
4.9.5.	Piping and Pumping Systems	Distilleries	Yes
4.9.6.	Ventilation	Distilleries	Yes
4.9.7.	Spill Control	Distilleries	Yes
4.9.8.	Fire Protection	Distilleries	Yes

OFC Subsection	Topic	Occupancies Subsection Applies to	Guide prepared
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Withdrawal of Storage Tanks from Service (Section 4.10)

4.10.1.	Scope	All Occupancies	No
4.10.2.	Rendering Storage Tanks Temporarily Out of Service	All Occupancies	Yes
4.10.3.	Removal of Underground Storage Tanks	All Occupancies	No
4.10.4.	Disposal and Reuse of Storage Tanks	All Occupancies	No

Tank Vehicles (Section 4.11)

4.11.1	Scope	All Occupancies	No
4.11.2.	General	All Occupancies	Yes
4.11.3.	Loading and Unloading	All Occupancies	Yes

Laboratories (Section 4.12)

4.12.1.	Scope	All Occupancies	No
4.12.2.	Separation	All Occupancies	Yes
4.12.3.	Maximum Quantities	All Occupancies	Yes
4.12.4.	Emergency Planning	All Occupancies	Yes
4.12.5.	Spill Control	All Occupancies	Yes
4.12.6.	Electrical Equipment	All Occupancies	Yes
4.12.7.	Inspection and Maintenance	All Occupancies	Yes
4.12.8.	Ventilation	All Occupancies	Yes
4.12.9.	Refrigeration	All Occupancies	Yes

APPENDIX B**GLOSSARY OF WORDS & PHRASES**

The following words are defined in Part I of the Fire Code

Appliance	Flammable liquid
Approved	Flash point
Assembly Occupancy	Fuel Dispensing Stations
Atmospheric storage tank	Industrial Occupancy
Basement	Institutional Occupancy
Building Code	Mercantile Occupancy
Business & Personal Services occupancy	Noncombustible construction
Chief Fire Official	Occupancy
Closed container	Owner
Combustible liquid	Pressure vessel
Dangerous goods	Process plant
Distilled beverage alcohol	Rack
Distillery	Refinery
Dwelling Unit	Sprinklered
Fire Compartment	Storage tank
Fire Resistance Rating	Storey
Fire Separation	Tank vehicle
Firewall	Unstable liquid
First Storey	

The following words have a specific meaning within Part 4 but are not defined in Part I.

Classification of liquids Part 4 includes both *flammable and combustible liquids*.

Drum means a container having a capacity of less than 230 L but more than 30 L.

Laboratory means a room or building fitted out for scientific experiments, research, testing or teaching.

Portable container means a reusable container that has a capacity of 30 L or less, but excludes a container which is integral with or permanently attached to any appliance, equipment or vehicle.

Portable tank means a *closed container* that is designed to be movable while containing liquid, which is equipped with skids, mountings or accessories to facilitate handling of the tank by mechanical means, and is not permanently attached to a transporting vehicle.

Prepackaged container means a container not intended for reuse.

Ventilation means a system to prevent accumulation of significant quantities of vapour-air mixtures in concentrations not exceeding 25% of the lower explosive limit for any liquid which could be present in the room or enclosed space.

APPENDIX C

List of Flammable and Combustible Liquids

Following is a very abbreviated list of chemicals which might be found in a residential occupancy. For a more complete list see the Appendix to the Commentary.

Liquid	Flash Point (°C)	Boiling Point (°C)	Liquid Class
Acetone	-20.0	56.1	IB
Banana Oil	15.6	148.8	IC
Carbolic Acid	79.4	181.9	IIIA
Cleaning Solvent	59.0	181.0	II
Coal Tar or Creosote	73.9	200.0	IIIA
Denatured Alcohol	15.6	79.4	IB
Ethanol	12.8	78.3	IB
Fuel Oil No 1	38 to 72	151 to 301	II
Fuel Oil No 2	52 to 96	300	II
Gasoline	-43	38-204	IA
Isopropyl Alcohol (IPA)	11.7	82.8	IB
Kerosene	43.3	154.4	II
Methanol	11.1	64.8	IB
Methyl Alcohol (Methanol)	11.1	64.8	IB
Methyl Ethyl Ketone	-8.9	80.0	IB
Naptha	37.7	190.0	IC
Stoddard Solvent	37.7	127.0	IB
Toluene	4.4	110.4	IB
Turpentine	35.0	149.0	IC