

Ontario Fire Code

SECTION 3.4 *INDUSTRIAL TRUCKS*

Illustrated Commentary



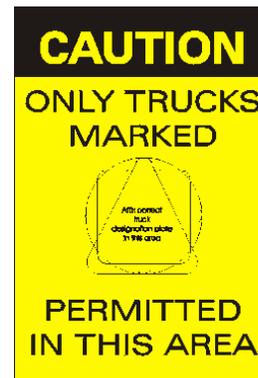
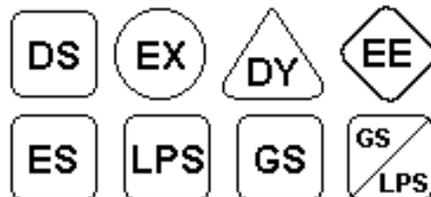
*Office of the
Ontario
Fire Marshal*

3.4.1. General

3.4.1.1. The designation, use, maintenance and operation of industrial trucks, including fork lifts, tractors, sweepers and motorized hand trucks, shall conform to NFPA 505, "Powered Industrial Trucks Including Type Designations, Areas of Use, Maintenance, and Operation".

Application of this standard is intended to reduce the risk of industrial trucks from creating a fire or explosion hazard that could endanger the occupants of buildings and outdoors areas and emergency responders.

Industrial trucks used in areas where combustible, flammable or explosive environments may be present must be of a type designed, designated and maintained for use in that environment. The NFPA 505 standard sets out the criteria for the designation of industrial trucks, their use, maintenance and operation. It lists 13 different types of designations of industrial trucks and tractors. These designations are divided by power types and are approved for use in various environments.



Markers used to identify types of industrial trucks.

3.4.2. Fuel-Fired Industrial Trucks

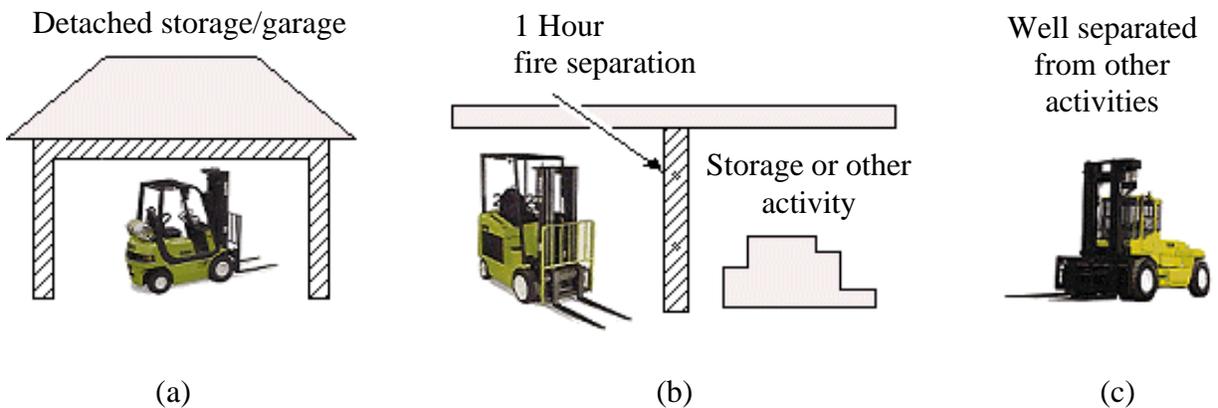
Truck storage

3.4.2.1. Fuel-fired industrial trucks shall be stored

- (a) in detached **buildings**,
- (b) in areas separated from the remainder of the storage **building** by a **fire separation** having a 1-hr **fire-resistance rating**, or
- (c) in areas where the vehicles do not create a hazard to the storage area.

This Article outlines the safe indoor location for storing fuel-fired industrial trucks when not in use.

Trucks must be stored in one of the following areas:



Building means any structure used or intended for supporting or sheltering any use or occupancy.

Fire-resistance rating means the time in hours or fraction thereof that a material or assembly of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions of test and performance criteria, or as determined by extension or interpretation of information derived therefrom as prescribed in the Building Code.

Fire separation means a construction assembly that acts as a barrier against the spread of fire and may or may not have a fire-resistance rating or a fire-protection rating.

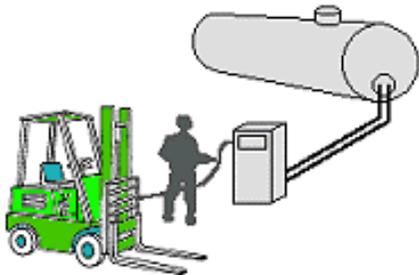
3.4.2. Fuel-Fired Industrial Trucks

Fueling of trucks

3.4.2.2. Except as provided in Article 3.4.2.3., industrial trucks shall be refueled only at designated locations outside **buildings**.

Articles 3.4.2.2. through 3.4.2.4. outline nominal safety requirements for refueling industrial trucks.

With the exception of industrial trucks that are fueled by replaceable propane cylinders, all other types of industrial trucks must be refueled outside of buildings at designated locations per Article 3.4.2.3. Industrial trucks equipped with permanent fuel tanks should only be refueled using suitable dispensing equipment situated in safe locations away from ignition sources. The fuel dispensing may be regulated under the Gasoline Handling Act or under Part 4 of the Ontario Fire Code. Care must be taken not to spill fuel or overfill the fuel tanks, as many fires involving industrial trucks result from spillage during refueling.



Building means any structure used or intended for supporting or sheltering any use or occupancy.

3.4.2. Fuel-Fired Industrial Trucks

Fueling of trucks

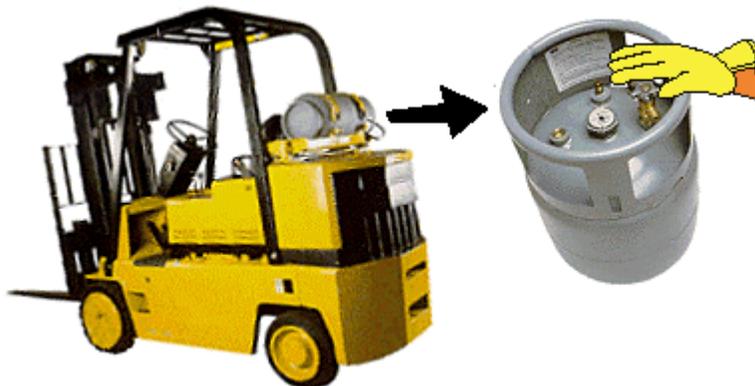
3.4.2.3. Industrial trucks that are fueled by replaceable propane containers may have the containers exchanged indoors at a safe location at least 7.5 m from ignition sources, open pits and underground entrances.

3.4.2.4.(1) Where replaceable propane containers are exchanged, valves at the containers shall be closed.

(2) Where an **approved** automatic quick-closing coupling that closes in both directions when uncoupled is not provided, the engine shall be allowed to operate until the fuel in the system is consumed.

The distance from ignition sources required under Article 3.4.2.3. is intended to reduce the likelihood of discharged propane vapours resulting from the refueling operation, coming in contact with potential ignition sources. Propane refueling operations must also be at least 7.5 m from open pits and underground entrances because propane vapours are heavier than air; discharged propane vapours could pool in an open pit or other subgrade area posing a potential fire risk.

The special precautions outlined in Sentences 3.4.2.4.(1) and (2) are necessary when propane cylinders are exchanged to ensure that gas does not leak during the exchange.



Turn off the valve
before replacing the
propane cylinder

Approved means approved by the Chief Fire Official.

3.4.2. Fuel-Fired Industrial Trucks

Fueling of trucks

3.4.2.5. Propane cylinders shall be stored in conformance with the **Propane Storage, Handling and Utilization Code** made under the **Energy Act**.

The Propane Storage, Handling and Utilization Code is a provincial regulation that contains specific requirements for the storage of propane cylinders by making reference to the "Installation Code for Propane Burning Appliances and Equipment" CAN/CGA-B149.2-M95.

Requirements outlined in the referenced standard include specifications for:

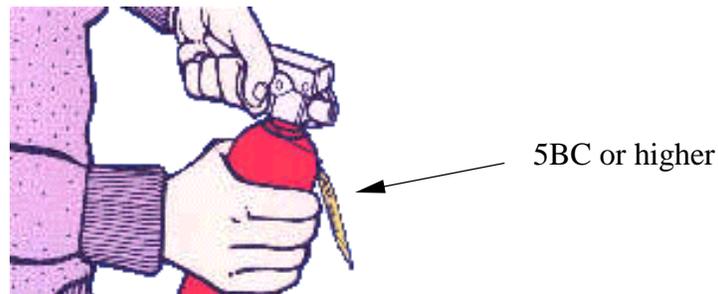
- Cylinder storage facilities and arrangements
 - Distances from property lines
 - Distances from flammable liquids, oxidizing and combustible gases
 - Electrical installations, and
 - Fencing
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3.4.2. Fuel-Fired Industrial Trucks

Portable extinguishers

- 3.4.2.6. Each fuel-fired industrial truck shall be equipped with a 5BC or higher rated portable extinguisher conforming to the requirements of Section 6.2.

Placing a fire extinguisher on an industrial truck provides the operator with immediate access to first aid fire fighting equipment. This requirement specifies that each fuel-fired industrial truck shall be equipped with a listed 5BC or higher rated portable fire extinguisher mounted in brackets designed to accommodate the effects of jarring or vibration.



3.4.3. Battery-Powered Industrial Trucks

Battery charging installations

- 3.4.3.1.(1) Charging installations for battery-powered industrial trucks shall be located at least 1.5 m from combustible materials.
- (2) Battery charging installations serving more than 2 trucks shall be located in well ventilated areas.
- 3.4.3.2. Battery charging equipment shall not be located in **occupancies** where **combustible dusts, fibres**, vapours or gases are present in hazardous quantities.
- 3.4.3.3. Facilities shall be provided at battery charging installations for flushing and neutralizing spilled electrolyte and for protecting charging apparatus from mechanical damage.

Portable extinguishers

- 3.4.3.4. Charging installations for battery-powered industrial trucks shall be equipped with a 10BC or higher rated portable extinguisher conforming to the requirements of Section 6.2.

Fire involving battery-powered trucks can occur due to electrical short circuits, hot resistors, arcing and fusing contacts, lint accumulation or exploding batteries.

Batteries contain corrosive acid or alkali chemical solutions. While charging the batteries, they give off hydrogen and oxygen, which, when combined in certain concentrations, can explode. Battery charging operations must be located in well-ventilated areas away from manufacturing and service areas. The facilities must include ways for flushing and neutralizing spilled electrolyte, ventilation to disburse fumes from gassing batteries and be equipped with at least a 10BC or higher rated portable fire extinguisher.

Combustible dust means dust and particles ignitable and liable to explode when mixed with air.

Combustible fibres means finely divided combustible vegetable or animal fibres and thin sheets or flakes of such materials that in a loose, unbaled condition present a flash fire hazard, and includes cotton, wool, hemp, sisal, jute, kapok, paper and cloth.

Occupancy means the use or intended use of a building or part thereof for the shelter or support of persons, animals or property.

3.4.3. Battery-Powered Industrial Trucks

Personnel restrictions

3.4.3.5. Only trained and authorized personnel shall be permitted to change or charge batteries.

Fire precautions

3.4.3.6. Precautions shall be taken to prevent open flames, sparks or electric arcs in battery charging areas.

Article 3.4.3.5. requires the person who charges or changes the batteries to be trained in order to reduce the risk of fire and injury. The training must incorporate safety precautions and practices that coincide with the battery charging equipment instructions and those provided by the industrial truck manufacturer. The person must take precautions to prevent sparking or arcing in the charging area and ensure that vent caps are operable, and that battery covers where required remain open while charging to dissipate heat and gas.

Due to the presence of hydrogen gas being produced by the batteries while charging, Article 3.4.3.6. requires that precautions are to be taken to prevent open flames, sparks or electrical arcs from occurring in the battery charging area.



- Q1 What is meant by industrial trucks?
A1 Industrial trucks under Section 3.4 of the Fire Code means material handling equipment including power-operated, riding or walking type equipment such as lift trucks, platform trucks, towing tractors, etc.
- Q2 What criteria should be used to determine the suitability of trucks for different areas?
A2 Refer to Ontario Fire Code 3.4.1.1.
- Q3 Do arena ice re-surfacing machines (Zamboni, Olympia, etc.) fall within the scope of Article 3.4.1.1.
A3 The Ontario Fire Code Section 3.4. "Industrial Trucks" and NFPA 505 have been written to address fire safety concerns applicable to material handling equipment used in industrial occupancies. Thus, arena ice re-surfacing machines do not fall within the scope of Article 3.4.1.1. This does not prevent the use of the provisions of the Code as a guide to address fire hazards associated with this equipment.
- Q4 What precautions should be taken when fueling industrial trucks?
A4 Refer to Ontario Fire Code 3.4.2.2., 3.4.2.3., 3.4.2.4. and 3.4.2.5.
- Q5 What precautions should be taken for ensuring that battery-powered industrial truck battery charging operations are safe?
A5 Refer to Ontario Fire Code 3.4.3.1 to 3.4.3.3.
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