



# **ABOVEGROUND STORAGE TANKS AND HANDLING OF CLASS I AND CLASS II LIQUIDS**

**WEBB COUNTY FIRE  
MARSHAL'S OFFICE  
1110 WASHINGTON ST  
LAREDO, TX 78040  
(956) 523-5911**



This booklet comprehensively outlines the prerequisites for ABOVEGROUND STORAGE TANKS AND HANDLIN OF CLASS I and CLASS II LIQUIDS. It aligns with the guidelines set forth in the International Fire Code 2021 and NFPA 30.

## Contents

<b>CHAPTER 57 FROM THE INTERNATIONAL FIRE CODE 2021 FLAMMABLE AND COMBUSTIBLE LIQUIDS</b> .....	7
<b>Leaks</b> .....	7
<b>5703.6.3.1 Existing piping</b> .....	7
<b>5704.2.7.1 Materials used in tank construction</b> .....	7
<b>5706.6.1.1 Vehicle maintenance</b> .....	7
<b>Tank Storage</b> .....	7
<b>5704.2 Tank storage</b> .....	7
<b>5706.1 General</b> .....	8
<b>5706.2 Storage and dispensing of flammable and combustible liquids on farms and construction sites</b> .....	8
<b>5706.2.1 Combustibles and open flames near tanks</b> .....	8
<b>5706.2.2 Marking of tanks and containers</b> .....	8
<b>5706.2.3 Containers for storage and use</b> .....	8
<b>5706.2.4 Permanent and temporary tanks</b> .....	9
<b>5706.2.4.1 Fill-opening security</b> .....	9
<b>5706.2.4.2 Vents</b> .....	9
<b>5706.2.4.3 Location</b> .....	9
<b>5706.2.4.4 Locations where above-ground tanks are prohibited</b> .....	9
<b>5706.2.5 Type of tank</b> .....	9
<b>5706.2.5.1 Tanks with top openings only</b> .....	9
<b>5706.2.5.1.1 Pumps and fittings</b> .....	10
<b>5706.2.5.2 Tanks for gravity discharge</b> .....	10
<b>5706.2.6 Spill control drainage control and diking</b> .....	10
<b>5706.2.7 Portable fire extinguishers</b> .....	10
<b>5706.2.8 Dispensing from tank vehicles</b> .....	10
<b>5706.2.8.1 Location</b> .....	11
<b>5706.3 Well drilling and operating</b> .....	11
<b>5706.3.1 Location</b> .....	11
<b>5706.3.1.1 Storage tanks and sources of ignition</b> .....	11
<b>5706.3.1.2 Streets and railways</b> .....	11
<b>5706.3.1.3 Buildings</b> .....	11
<b>5706.3.1.3.1 Group A, E or I buildings</b> .....	11

5706.3.1.3.2 Existing wells.....	11
5706.3.2 Waste control.....	11
5706.3.2.1 Discharge on a street or water channel.....	11
5706.3.2.2 Discharge and combustible materials on ground.....	12
5706.3.3 Sumps.....	12
5706.3.3.1 Maximum width.....	12
5706.3.3.2 Backfilling.....	12
5706.3.3.3 Security.....	12
5706.3.4 Prevention of blowouts.....	12
5706.3.5 Storage tanks.....	12
5706.3.6 Soundproofing.....	12
5706.3.7 Signs.....	12
5706.3.8 Field-loading racks.....	12
5706.4 Bulk plants or terminals.....	13
5706.4.1 Building construction.....	13
5706.4.2 Means of egress.....	13
5706.4.3 Heating.....	13
5706.4.4 Ventilation.....	13
5706.4.4.1 Basements and pits.....	13
5706.4.4.2 Dispensing of Class I liquids.....	13
5706.4.5 Storage.....	13
5706.4.6 Overfill protection of Class I and II liquids.....	13
5706.4.7 Wharves.....	14
5706.4.7.1 Transferring approvals.....	14
5706.4.7.2 Transferring location.....	14
5706.4.7.3 Superstructure and decking material.....	14
5706.4.7.4 Tanks allowed.....	14
5706.4.7.5 Transferring equipment.....	14
5706.4.7.6 Piping, valves and fittings.....	14
5706.4.7.7 Loading and unloading.....	15
5706.4.7.8 Mechanical work.....	15
5706.4.8 Sources of ignition.....	15
5706.4.9 Drainage control.....	15

<b>5706.4.10 Fire protection.....</b>	<b>16</b>
<b>5706.4.10.1 Portable fire extinguishers.....</b>	<b>16</b>
<b>5706.4.10.2 Fire hoses.....</b>	<b>16</b>
<b>5706.4.10.3 Obstruction of equipment.....</b>	<b>16</b>
<b>5706.4.10.4 Fire apparatus access.....</b>	<b>16</b>
<b>5706.5 Bulk transfer and process transfer operations.....</b>	<b>16</b>
<b>5706.5.1 General.....</b>	<b>16</b>
<b>5706.5.1.1 Location.....</b>	<b>16</b>
<b>5706.5.1.2 Weather protection canopies.....</b>	<b>17</b>
<b>5706.5.1.3 Ventilation.....</b>	<b>17</b>
<b>5706.5.1.4 Sources of ignition.....</b>	<b>17</b>
<b>5706.5.1.5 Spill control and secondary containment.....</b>	<b>17</b>
<b>5706.5.1.6 Fire protection.....</b>	<b>17</b>
<b>5706.5.1.7 Static protection.....</b>	<b>17</b>
<b>5706.5.1.8 Stray current protection.....</b>	<b>18</b>
<b>5706.5.1.9 Top loading.....</b>	<b>18</b>
<b>5706.5.1.10 Bottom loading.....</b>	<b>18</b>
<b>5706.5.1.10.1 Dry disconnect coupling.....</b>	<b>18</b>
<b>5706.5.1.10.2 Venting.....</b>	<b>18</b>
<b>5706.5.1.10.3 Vapor-tight connection.....</b>	<b>19</b>
<b>5706.5.1.10.4 Vapor-processing equipment.....</b>	<b>19</b>
<b>5706.5.1.11 Switch loading.....</b>	<b>19</b>
<b>5706.5.1.12 Loading racks.....</b>	<b>19</b>
<b>5706.5.1.13 Transfer apparatus.....</b>	<b>19</b>
<b>5706.5.1.14 Inside buildings.....</b>	<b>19</b>
<b>5706.5.1.15 Tank vehicle and tank car certification.....</b>	<b>19</b>
<b>5706.5.1.16 Tank vehicle and tank car stability.....</b>	<b>19</b>
<b>5706.5.1.16.1 Tank vehicles.....</b>	<b>19</b>
<b>5706.5.1.16.2 Chock blocks.....</b>	<b>19</b>
<b>5706.5.1.16.3 Tank cars.....</b>	<b>20</b>
<b>5706.5.1.18 Security.....</b>	<b>20</b>
<b>5706.5.2 Bulk transfer.....</b>	<b>20</b>
<b>5706.5.2.1 Vehicle motor.....</b>	<b>20</b>

5706.5.3 Process transfer.....	20
5706.5.3.1 Piping, valves, hoses and fittings. ....	20
5706.5.3.1.1 Shutoff valves. ....	20
5706.5.3.1.2 Hydrostatic relief.....	21
5706.5.3.2 Vents.....	21
5706.5.3.3 Motive power. ....	21
5706.5.4 Dispensing from tank vehicles and tank cars.....	21
5706.5.4.1 Marine craft and special equipment. ....	21
5706.5.4.2 Emergency refueling. ....	21
5706.5.4.3 Aircraft fueling. ....	21
5706.5.4.4 Fueling of vehicles at farms, construction sites and similar areas. ....	22
5706.5.4.5 Commercial, industrial, governmental or manufacturing.....	22
5706.6 Tank vehicles and vehicle operation.....	24
5706.6.1 Operation of tank vehicles.....	24
5706.6.1.1 Vehicle maintenance. ....	24
5706.6.1.2 Leaving vehicle unattended.....	24
5706.6.1.3 Vehicle motor shutdown. ....	24
5706.6.1.4 Outage. ....	24
5706.6.1.5 Overfill protection. ....	24
5706.6.1.6 Securing hatches. ....	25
5706.6.1.7 Liquid temperature. ....	25
5706.6.1.8 Bonding to underground tanks.....	25
5706.6.1.9 Smoking. ....	25
5706.6.1.10 Hose connections.....	25
5706.6.1.10.1 Simultaneous delivery.....	25
5706.6.1.11 Hose protection.....	25
5706.6.2 Parking.....	25
5706.6.2.1 Parking near residential, educational and institutional occupancies and other high-risk areas.....	25
5706.6.2.2 Parking on thoroughfares. ....	26
5706.6.2.3 Duration exceeding 1 hour. ....	26
5706.6.3 Garaging.....	26
5706.6.4 Portable fire extinguisher. ....	26

<b>5706.7 Refineries</b> .....	26
<b>5706.7.1 Corrosion protection</b> .....	26
<b>5706.7.2 Cleaning of tanks</b> .....	27
<b>5706.7.3 Storage of heated petroleum products</b> .....	27
<b>5706.8 Vapor recovery and vapor-processing systems</b> .....	27
<b>5706.8.1 Over-pressure/vacuum protection</b> .....	27
<b>5706.8.2 Vent location</b> .....	27
<b>5706.8.3 Vapor collection systems and overfill protection</b> .....	27
<b>5706.8.4 Liquid-level monitoring</b> .....	27
<b>5706.8.5 Overfill protection</b> .....	27
<b>Handling</b> .....	28
<b>5705.3 Use, dispensing and mixing inside of buildings</b> .....	28
<b>5705.3.8 Use, dispensing and handling outside of buildings</b> .....	28
<b>Tank Vehicle and Tank Car</b> .....	28
<b>5706.5.1.16 Tank vehicle and tank car stability</b> .....	28
<b>5706.5.1.16.1 Tank vehicles</b> .....	28
<b>5706.5.1.16.2 Chock blocks</b> .....	28
<b>5706.5.1.16.3 Tank cars</b> .....	28
<b>Monitoring</b> .....	28
<b>5706.5.1.17 Monitoring</b> .....	28
<b>Security</b> .....	28
<b>5706.5.1.18 Security</b> .....	28
<b>Bulk Transfer</b> .....	29
<b>5706.5.2 Bulk transfer</b> .....	29
<b>5706.5.2.1 Vehicle motor</b> .....	29
<b>Process Transfer</b> .....	29
<b>5706.5.3 Process transfer</b> .....	29
<b>5706.5.3.1 Piping, valves, hoses and fittings</b> .....	29
<b>5706.5.3.1.1 Shutoff valves</b> .....	29
<b>Operation of Tank Vehicle</b> .....	29
<b>5706.6.1 Operation of tank vehicles</b> .....	29
<b>5706.6.1.1 Vehicle maintenance</b> .....	29
<b>5706.6.1.2 Leaving vehicle unattended</b> .....	29

**5706.6.1.3 Vehicle motor shutdown. .... 29**

# CHAPTER 57 FROM THE INTERNATIONAL FIRE CODE 2021

## FLAMMABLE AND COMBUSTIBLE LIQUIDS

### *User note:*

*About this chapter: Chapter 57 provides requirements that are intended to reduce the likelihood of fires involving the storage, handling, use or transportation of flammable and combustible liquids. Adherence to these practices may also limit damage in the event of an accidental fire involving these materials. These liquids are used for fuel, lubricants, cleaners, solvents, medicine and even drinking. The danger associated with flammable and combustible liquids is that the vapors from these liquids, when combined with air in their flammable range, will burn or explode at temperatures near normal living and working environments. The regulations herein are intended to prevent the flammable and combustible liquids from being ignited and provide mitigating requirements for when a fire does occur.*

## Leaks

### **5703.6.3.1 Existing piping.**

Existing piping shall be tested in accordance with this section where the *fire code official* has reasonable cause to believe that a leak exists. Piping that could contain flammable or *combustible liquids* shall not be tested pneumatically. Such tests shall be at the expense of the *owner* or operator.

**Exception:** Vapor-recovery piping is allowed to be tested using an inert gas.

### **5704.2.7.1 Materials used in tank construction.**

The materials used in tank construction shall be in accordance with NEPA 30. The materials of construction for tanks and their appurtenances shall be compatible with the liquids to be stored.

### **5706.6.1.1 Vehicle maintenance.**

Tank vehicles shall not be operated unless they are in proper state of repair and free from accumulation of grease, oil or other flammable substance, and leaks.

## Tank Storage

### **5704.2 Tank storage.**

The provisions of this section shall apply to:

1. The storage of *flammable* and *combustible liquids* in fixed above-ground and underground tanks.
2. The storage of *flammable* and *combustible liquids* in fixed above-ground tanks inside of buildings.
3. The storage of *flammable* and *combustible liquids* in portable tanks whose capacity exceeds 660 gallons (2498 L).
4. The installation of such tanks and portable tanks.



### **5706.1 General.**

This section shall cover the provisions for special operations that include, but are not limited to, storage, use, dispensing, mixing or handling of *flammable* and *combustible liquids*. The following special operations shall be in accordance with Sections 5701, 5703, 5704 and 5705, except as provided in Section 5706.

1. Storage and dispensing of *flammable* and *combustible liquids* on farms and construction sites.
2. Well drilling and operating.
3. Bulk plants or terminals.
4. Bulk transfer and process transfer operations utilizing tank vehicles and tank cars.
5. Tank vehicles and tank vehicle operation.
6. Refineries.
7. Vapor recovery and vapor-processing systems.

### **5706.2 Storage and dispensing of flammable and combustible liquids on farms and construction sites.**

Permanent and temporary storage and dispensing of Class I and II liquids for private use on farms and rural areas and at construction sites, earth-moving projects, gravel pits or borrow pits shall be in accordance with Sections 5706.2.1 through 5706.2.8.1.

**Exception:** Storage and use of fuel oil and containers connected with oil-burning equipment regulated by Section 605 and the *International Mechanical Code*.

#### **5706.2.1 Combustibles and open flames near tanks.**

Storage areas shall be kept free from weeds and extraneous combustible material. Open flames and smoking are prohibited in *flammable* or *combustible liquid* storage areas.

#### **5706.2.2 Marking of tanks and containers.**

Tanks and containers for the storage of liquids above ground shall be conspicuously marked with the name of the product that they contain and the words: "FLAMMABLE—KEEP FIRE AND FLAME AWAY." Tanks shall bear the additional marking: "KEEP 50 FEET FROM BUILDINGS."

#### **5706.2.3 Containers for storage and use.**

Metal containers used for storage of Class I or II liquids shall be in accordance with DOTn requirements or shall be of an *approved* design.

Discharge devices shall be of a type that do not develop an internal pressure on the container. Pumping devices or *approved* self-closing faucets used for dispensing liquids shall not leak and shall be well-maintained. Individual containers shall not be interconnected and shall be kept closed when not in use.

Containers stored outside of buildings shall be in accordance with Section 5704 and the *International Building Code*.

#### **5706.2.4 Permanent and temporary tanks.**

The capacity of permanent above-ground tanks containing Class I or II liquids shall not exceed 1,100 gallons (4164 L). The capacity of temporary above-ground tanks containing Class I or II liquids shall not exceed 10,000 gallons (37 854 L). Tanks shall be of the single-compartment design.

**Exception:** Permanent above-ground tanks of greater capacity that meet the requirements of Section 5704.2.

##### **5706.2.4.1 Fill-opening security.**

Fill openings shall be equipped with a locking closure device. Fill openings shall be separate from vent openings.

##### **5706.2.4.2 Vents.**

Tanks shall be provided with a method of normal and emergency venting. Normal vents shall be in accordance with Section 5704.2.7.3.

Emergency vents shall be in accordance with Section 5704.2.7.4. Emergency vents shall be arranged to discharge in a manner that prevents localized overheating or flame impingement on any part of the tank in the event that vapors from such vents are ignited.

##### **5706.2.4.3 Location.**

Tanks containing Class I or II liquids shall be kept outside and not less than 50 feet (15 240 mm) from buildings and combustible storage. Additional distance shall be provided where necessary to ensure that vehicles, equipment and containers being filled directly from such tanks will not be less than 50 feet (15 240 mm) from structures, haystacks or other combustible storage.

##### **5706.2.4.4 Locations where above-ground tanks are prohibited.**

The storage of Class I and II liquids in above-ground tanks is prohibited within the limits established by law as the limits of districts in which such storage is prohibited **[JURISDICTION TO SPECIFY]**.

##### **5706.2.5 Type of tank.**

Tanks shall be provided with top openings only or shall be elevated for gravity discharge.

##### **5706.2.5.1 Tanks with top openings only.**

Tanks with top openings shall be mounted in accordance with either of the following:

1. On well-constructed metal legs connected to shoes or runners designed so that the tank is stabilized and the entire tank and its supports can be moved as a unit.
2. For stationary tanks, on a stable base of timbers or blocks approximately 6 inches (152 mm) in height that prevents the tank from contacting the ground.

#### **5706.2.5.1.1 Pumps and fittings.**

Tanks with top openings only shall be equipped with a tightly and permanently attached, *approved* pumping device having an *approved* hose of sufficient length for filling vehicles, equipment or containers to be served from the tank. Either the pump or the hose shall be equipped with a padlock to its hanger to prevent tampering. An effective antisiphoning device shall be included in the pump discharge unless a self-closing nozzle is provided. Siphons or internal pressure discharge devices shall not be used.

#### **5706.2.5.2 Tanks for gravity discharge.**

Tanks with a connection in the bottom or the end for gravity-dispensing liquids shall be mounted and equipped as follows:

1. Supports to elevate the tank for gravity discharge shall be designed to carry all required loads and provide stability.
2. Bottom or end openings for gravity discharge shall be equipped with a valve located adjacent to the tank shell that will close automatically in the event of fire through the operation of an effective heat-activated releasing device. Where this valve cannot be operated manually, it shall be supplemented by a second, manually operated valve.

The gravity discharge outlet shall be provided with an *approved* hose equipped with a self-closing valve at the discharge end of a type that can be padlocked to its hanger.

#### **5706.2.6 Spill control drainage control and diking.**

Indoor storage and dispensing areas shall be provided with spill control and drainage control as set forth in Section 5703.4. Outdoor storage areas shall be provided with drainage control or diking as set forth in Section 5704.2.10.

#### **5706.2.7 Portable fire extinguishers.**

Portable fire extinguishers with a minimum rating of 20-B:C and complying with Section 906 shall be provided where required by the *fire code official*.

#### **5706.2.8 Dispensing from tank vehicles.**

Where *approved*, liquids used as fuels are allowed to be transferred from tank vehicles into the tanks of motor vehicles or special equipment, provided that:

1. The tank vehicle's specific function is that of supplying fuel to motor vehicle fuel tanks.
2. The dispensing hose does not exceed 100 feet (30 480 mm) in length.
3. The dispensing nozzle is an *approved* type.
4. The dispensing hose is properly placed on an *approved* reel or in a compartment provided before the tank vehicle is moved.
5. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the vehicle or the point of refueling are prominently posted on the tank vehicle.
6. Electrical devices and wiring in areas where fuel dispensing is conducted are in accordance with NFPA 70.
7. Tank vehicle-dispensing equipment is operated only by designated personnel who are trained to handle and dispense motor fuels.

8. Provisions are made for controlling and mitigating unauthorized discharges.

**5706.2.8.1 Location.**

Dispensing from tank vehicles shall be conducted not less than 50 feet (15 240 mm) from structures or combustible storage.

**5706.3 Well drilling and operating.**

Wells for oil and natural gas shall be drilled and operated in accordance with Sections 5706.3.1 through 5706.3.8.

**5706.3.1 Location.**

The location of wells shall comply with Sections 5706.3.1.1 through 5706.3.1.3.2.

**5706.3.1.1 Storage tanks and sources of ignition.**

Storage tanks or boilers, fired heaters, open-flame devices or other sources of ignition shall not be located within 25 feet (7620 mm) of well heads. Smoking is prohibited at wells or tank locations except as designated and in *approved* posted areas.

**Exception:** Engines used in the drilling, production and serving of wells.

**5706.3.1.2 Streets and railways.**

Wells shall not be drilled within 75 feet (22 860 mm) of any dedicated public street, highway or nearest rail of an operating railway.

**5706.3.1.3 Buildings.**

Wells shall not be drilled within 100 feet (30 480 mm) of buildings not necessary to the operation of the well.

**5706.3.1.3.1 Group A, E or I buildings.**

Wells shall not be drilled within 300 feet (91 440 mm) of buildings with an occupancy in Group A, E or I.

**5706.3.1.3.2 Existing wells.**

Where wells are existing, buildings shall not be constructed within the distances set forth in Section 5706.3.1 for separation of wells or buildings.

**5706.3.2 Waste control.**

Control of waste materials associated with wells shall comply with Sections 5706.3.2.1 and 5706.3.2.2.

**5706.3.2.1 Discharge on a street or water channel.**

Liquids containing crude petroleum or its products shall not be discharged into or on streets, highways, drainage canals or ditches, storm drains or flood control channels.

#### **5706.3.2.2 Discharge and combustible materials on ground.**

The surface of the ground under, around or near wells, pumps, boilers, oil storage tanks or buildings shall be kept free from oil, waste oil, refuse or waste material.

#### **5706.3.3 Sumps.**

Sumps associated with wells shall comply with Sections 5706.3.3.1 through 5706.3.3.3.

##### **5706.3.3.1 Maximum width.**

Sumps or other basins for the retention of oil or petroleum products shall not exceed 12 feet (3658 mm) in width.

##### **5706.3.3.2 Backfilling.**

Sumps or other basins for the retention of oil or petroleum products larger than 6 feet by 6 feet by 6 feet (1829 mm by 1829 mm by 1829 mm) shall not be maintained longer than 60 days after the cessation of drilling operations.

##### **5706.3.3.3 Security.**

Sumps, diversion ditches and depressions used as sumps shall be securely fenced or covered.

#### **5706.3.4 Prevention of blowouts.**

Protection shall be provided to control and prevent the blowout of a well. Protection equipment shall meet federal, state and other applicable jurisdiction requirements.

#### **5706.3.5 Storage tanks.**

Storage of *flammable or combustible liquids* in tanks shall be in accordance with Section 5704. Oil storage tanks or groups of tanks shall have posted in a conspicuous place, on or near such tank or tanks, an *approved* sign with the name of the *owner* or operator, or the lease number and the telephone number where a responsible person can be reached at any time.

#### **5706.3.6 Soundproofing.**

Where soundproofing material is required during oil field operations, such material shall be noncombustible.

#### **5706.3.7 Signs.**

Well locations shall have posted in a conspicuous place on or near such tank or tanks an *approved* sign with the name of the *owner* or operator, name of the leasee or the lease number, the well number and the telephone number where a responsible person can be reached at any time. Such signs shall be maintained on the premises from the time materials are delivered for drilling purposes until the well is abandoned.

#### **5706.3.8 Field-loading racks.**

Field-loading racks shall be in accordance with Section 5706.5.

#### **5706.4 Bulk plants or terminals.**

Portions of properties where *flammable* and *combustible liquids* are received by tank vessels, pipelines, tank cars or tank vehicles and stored or blended in bulk for the purpose of distribution by tank vessels, pipelines, tanks cars, tank vehicles or containers shall be in accordance with Sections 5706.4.1 through 5706.4.10.4.

##### **5706.4.1 Building construction.**

Buildings shall be constructed in accordance with the *International Building Code*.

##### **5706.4.2 Means of egress.**

Rooms in which liquids are stored, used or transferred by pumps shall have *means of egress* arranged to prevent occupants from being trapped in the event of fire.

##### **5706.4.3 Heating.**

Rooms in which Class I liquids are stored or used shall be heated only by means not constituting a source of ignition, such as steam or hot water. Rooms containing heating appliances involving sources of ignition shall be located and arranged to prevent entry of flammable vapors.

##### **5706.4.4 Ventilation.**

Ventilation shall be provided for rooms, buildings and enclosures in which Class I liquids are pumped, used or transferred. Design of ventilation systems shall consider the relatively high specific gravity of the vapors. Where natural ventilation is used, adequate openings in outside walls at floor level, unobstructed except by louvers or coarse screens, shall be provided. Where natural ventilation is inadequate, mechanical ventilation shall be provided in accordance with the *International Mechanical Code*.

###### **5706.4.4.1 Basements and pits.**

Class I liquids shall not be stored or used within a building having a *basement* or pit into which flammable vapors can travel, unless such area is provided with ventilation designed to prevent the accumulation of flammable vapors therein.

###### **5706.4.4.2 Dispensing of Class I liquids.**

Containers of Class I liquids shall not be drawn from or filled within buildings unless a provision is made to prevent the accumulation of flammable vapors in hazardous concentrations. Where mechanical ventilation is required, it shall be kept in operation while flammable vapors could be present.

##### **5706.4.5 Storage.**

Storage of Class I, II and IIIA liquids in bulk plants shall be in accordance with the applicable provisions of Section 5704.

##### **5706.4.6 Overfill protection of Class I and II liquids.**

Manual and automatic systems shall be provided to prevent overfill during the transfer of Class I and II liquids from mainline pipelines and marine vessels in accordance with API 2350.

#### **5706.4.7 Wharves.**

This section shall apply to all wharves, piers, bulkheads and other structures over or contiguous to navigable water having a primary function of transferring liquid cargo in bulk between shore installations and tank vessels, ships, barges, lighter boats or other mobile floating craft.

**Exception:** Marine motor fuel-dispensing facilities in accordance with Chapter 23.

##### **5706.4.7.1 Transferring approvals.**

Handling packaged cargo of liquids, including full and empty drums, bulk fuel and stores, over a wharf during cargo transfer shall be subject to the approval of the wharf supervisor and the senior deck officer on duty.

##### **5706.4.7.2 Transferring location.**

Wharves at which liquid cargoes are to be transferred in bulk quantities to or from tank vessels shall be not less than 100 feet (30 480 mm) from any bridge over a navigable waterway; or from an entrance to, or superstructure of, any vehicular or railroad tunnel under a waterway. The termination of the fixed piping used for loading or unloading at a wharf shall be not less than 200 feet (60 960 mm) from a bridge or from an entrance to, or superstructures of, a tunnel.

##### **5706.4.7.3 Superstructure and decking material.**

Superstructure and decking shall be designed for the intended use. Decking shall be constructed of materials that will afford the desired combination of flexibility, resistance to shock, durability, strength and *fire resistance*.

##### **5706.4.7.4 Tanks allowed.**

Tanks used exclusively for ballast water or Class II or III liquids are allowed to be installed on suitably designed wharves.

##### **5706.4.7.5 Transferring equipment.**

Loading pumps capable of building up pressures in excess of the safe working pressure of cargo hose or loading arms shall be provided with bypasses, relief valves or other arrangements to protect the loading facilities against excessive pressure. Relief devices shall be tested not less than annually to determine that they function satisfactorily at their set pressure.

##### **5706.4.7.6 Piping, valves and fittings.**

Piping valves and fittings shall be in accordance with Section 5703.6 except as modified by the following:

1. Flexibility of piping shall be ensured by appropriate layout and arrangement of piping supports so that motion of the wharf structure resulting from wave action, currents, tides or the mooring of vessels will not subject the pipe to repeated excessive strain.
2. Pipe joints that depend on the friction characteristics of combustible materials or on the grooving of pipe ends for mechanical continuity of piping shall not be used.

3. Swivel joints are allowed in piping to which hoses are connected and for articulated, swivel-joint transfer systems, provided that the design is such that the mechanical strength of the joint will not be impaired if the packing materials fail such as by exposure to fire.
4. Each line conveying Class I or II liquids leading to a wharf shall be provided with a block valve that has *ready access* and that is on shore, near the approach to the wharf and outside of any diked area. Where more than one line is involved, the valves shall be grouped in one location.
5. Means shall be provided for easy access to cargo line valves located below the wharf deck.
6. Piping systems shall contain a sufficient number of valves to operate the system properly and to control the flow of liquid in normal operation and in the event of physical damage.
7. Piping on wharves shall be bonded and grounded where Class I and II liquids are transported. Where excessive stray currents are encountered, insulating joints shall be installed. Bonding and grounding connections on piping shall be located on the wharf side of hose riser insulating flanges, where used, and shall be in a location provided with *ready access* for inspection.
8. Hose or articulated swivel-joint pipe connections used for cargo transfer shall be capable of accommodating the combined effects of change in draft and maximum tidal range, and mooring lines shall be kept adjusted to prevent surge of the vessel from placing stress on the cargo transfer system.
9. Hoses shall be supported to avoid kinking and damage from chafing.

#### **5706.4.7.7 Loading and unloading.**

Loading or discharging shall not commence until the wharf superintendent and officer in charge of the tank vessel agree that the tank vessel is properly moored and connections are properly made.

#### **5706.4.7.8 Mechanical work.**

Mechanical work shall not be performed on the wharf during cargo transfer, except under special authorization by the *fire code official* based on a review of the area involved, methods to be employed and precautions necessary.

#### **5706.4.8 Sources of ignition.**

Class I, II or IIIA liquids shall not be used, drawn or dispensed where flammable vapors can reach a source of ignition. Smoking shall be prohibited except in designated locations. "No Smoking" signs complying with Section 310 shall be conspicuously posted where a hazard from flammable vapors is normally present.

#### **5706.4.9 Drainage control.**

Loading and unloading areas shall be provided with drainage control in accordance with Section 5704.2.10.



#### **5706.4.10 Fire protection.**

Fire protection shall be in accordance with Chapter 9 and Sections 5706.4.10.1 through 5706.4.10.4.

##### **5706.4.10.1 Portable fire extinguishers.**

Portable fire extinguishers with a rating of not less than 20-B and complying with Section 906 shall be located within 75 feet (22 860 mm) of hose connections, pumps and separator tanks.

##### **5706.4.10.2 Fire hoses.**

Where piped water is available, ready-connected fire hose in a size appropriate for the water supply shall be provided in accordance with Section 905 so that manifolds where connections are made and broken can be reached by not less than one hose stream.

##### **5706.4.10.3 Obstruction of equipment.**

Material shall not be placed on wharves in such a manner that would obstruct access to fire-fighting equipment or important pipeline control valves.

##### **5706.4.10.4 Fire apparatus access.**

Where the wharf is designed for vehicular traffic, an unobstructed fire apparatus access road to the shore end of the wharf shall be maintained in accordance with Chapter 5.

#### **5706.5 Bulk transfer and process transfer operations.**

Bulk transfer and process transfer operations shall be *approved* and be in accordance with Sections 5706.5.1 through 5706.5.4.5. Motor fuel-dispensing facilities shall comply with Chapter 23.

##### **5706.5.1 General.**

The provisions of Sections 5706.5.1.1 through 5706.5.1.18 shall apply to bulk transfer and process transfer operations; Sections 5706.5.2 and 5706.5.2.1 shall apply to bulk transfer operations; Sections 5706.5.3 through 5706.5.3.3 shall apply to process transfer operations and Sections 5706.5.4 through 5706.5.4.5 shall apply to dispensing from tank vehicles and tank cars.

##### **5706.5.1.1 Location.**

Bulk transfer and process transfer operations shall be conducted in *approved* locations. Tank cars shall be unloaded only on private sidings or railroad-siding facilities equipped for transferring *flammable* or *combustible liquids*. Tank vehicles and tank cars engaged in bulk transfer or process transfer operations shall be separated from buildings, above-ground tanks, combustible materials, *lot lines*, public streets, public alleys or *public ways* by a distance of 25 feet (7620 mm) for Class I liquids and 15 feet (4572 mm) for Class II and IIIA liquids measured from the nearest loading or unloading valve on the tank vehicle or tank car.

**Exception:** Buildings for pumps and shelters for personnel supporting transfer operations shall not be required to be separated from tank vehicles and tank cars engaged in bulk transfer or process transfer operations.

#### **5706.5.1.2 Weather protection canopies.**

Where weather protection canopies are provided, they shall be constructed in accordance with Section 5004.13. Weather protection canopies shall not be located within 15 feet (4572 mm) of a building or combustible material or within 25 feet (7620 mm) of building openings, *lot lines*, public streets, public alleys or *public ways*.

#### **5706.5.1.3 Ventilation.**

Ventilation shall be provided to prevent accumulation of vapors in accordance with Section 5705.3.7.5.1.

#### **5706.5.1.4 Sources of ignition.**

Sources of ignition shall be controlled or eliminated in accordance with Section 5003.7.

#### **5706.5.1.5 Spill control and secondary containment.**

Areas where transfer operations are located shall be provided with spill control and secondary containment in accordance with Section 5703.4. The spill control and secondary containment system shall have a design capacity capable of containing the capacity of the largest tank compartment located in the area where transfer operations are conducted. Containment of the rainfall volume specified in Section 5004.2.2.6 is not required.

#### **5706.5.1.6 Fire protection.**

Fire protection shall be in accordance with Section 5703.2.

#### **5706.5.1.7 Static protection.**

Static protection shall be provided to prevent the accumulation of static charges during transfer operations. Bonding facilities shall be provided during the transfer through open domes where Class I liquids are transferred, or where Class II and III liquids are transferred into tank vehicles or tank cars that could contain vapors from previous cargoes of Class I liquids.

Protection shall consist of a metallic bond wire permanently electrically connected to the fill stem. The fill pipe assembly shall form a continuous electrically conductive path downstream from the point of bonding. The free end of such bond wire shall be provided with a clamp or equivalent device for convenient attachment to a metallic part in electrical contact with the cargo tank of the tank vehicle or tank car. For tank vehicles, protection shall consist of a flexible bond wire of adequate strength for the intended service and the electrical resistance shall not exceed 1 megohm. For tank cars, bonding shall be provided where the resistance of a tank car to ground through the rails is 25 ohms or greater.

Such bonding connection shall be fastened to the vehicle, car or tank before dome covers are raised and shall remain in place until filling is complete and all dome covers have been closed and secured.

**Exceptions:**

1. Where vehicles and cars are loaded exclusively with products not having a static-accumulating tendency, such as asphalt, cutback asphalt, most crude oils, residual oils and water-miscible liquids.
2. Where Class I liquids are not handled at the transfer facility and the tank vehicles are used exclusively for Class II and III liquids.
3. Where vehicles and cars are loaded or unloaded through closed top or bottom connections whether the hose is conductive or nonconductive.

Filling through open domes into the tanks of tank vehicles or tank cars that contain vapor-air mixtures within the flammable range, or where the liquid being filled can form such a mixture, shall be by means of a downspout that extends to near the bottom of the tank.

**5706.5.1.8 Stray current protection.**

Tank car loading facilities where Class I, II or IIIA liquids are transferred through open domes shall be protected against stray currents by permanently bonding the pipe to not less than one rail and to the transfer apparatus. Multiple pipes entering the transfer areas shall be permanently electrically bonded together. In areas where excessive stray currents are known to exist, all pipes entering the transfer area shall be provided with insulating sections to isolate electrically the transfer apparatus from the pipelines.

**5706.5.1.9 Top loading.**

When top loading a tank vehicle with Class I and II liquids without vapor control, valves used for the final control of flow shall be of the self-closing type and shall be manually held open except where automatic means are provided for shutting off the flow when the tank is full. Where used, automatic shutoff systems shall be provided with a manual shutoff valve located at a safe distance from the loading nozzle to stop the flow if the automatic system fails.

When top loading a tank vehicle with vapor control, flow control shall be in accordance with [Section 5706.5.1.10](#). Self-closing valves shall not be tied or locked in the open position.

**5706.5.1.10 Bottom loading.**

When bottom loading a tank vehicle or tank car with or without vapor control, a positive means shall be provided for loading a predetermined quantity of liquid, together with an automatic secondary shutoff control to prevent overflow. The connecting components between the transfer equipment and the tank vehicle or tank car required to operate the secondary control shall be functionally compatible.

**5706.5.1.10.1 Dry disconnect coupling.**

When bottom loading a tank vehicle, the coupling between the liquid loading hose or pipe and the truck piping shall be a dry disconnect coupling.

**5706.5.1.10.2 Venting.**

When bottom loading a tank vehicle or tank car that is equipped for vapor control and vapor control is not used, the tank shall be vented to the atmosphere to prevent pressurization of the tank. Such venting shall be at a height equal to or greater than the top of the cargo tank.

#### **5706.5.1.10.3 Vapor-tight connection.**

Connections to the plant vapor control system shall be designed to prevent the escape of vapor to the atmosphere when not connected to a tank vehicle or tank car.

#### **5706.5.1.10.4 Vapor-processing equipment.**

Vapor-processing equipment shall be separated from above-ground tanks, warehouses, other plant buildings, transfer facilities or nearest *lot line* of adjoining property that can be built on by a distance of not less than 25 feet (7620 mm). Vapor-processing equipment shall be protected from physical damage by remote location, guard rails, curbs or fencing.

#### **5706.5.1.11 Switch loading.**

Tank vehicles or tank cars that have previously contained Class I liquids shall not be loaded with Class II or III liquids until such vehicles and all piping, pumps, hoses and meters connected thereto have been completely drained and flushed.

#### **5706.5.1.12 Loading racks.**

Where provided, loading racks, *stairways* or platforms shall be constructed of noncombustible materials. Buildings for pumps or for shelter of loading personnel are allowed to be part of the loading rack. Wiring and electrical equipment located within 25 feet (7620 mm) of any portion of the loading rack shall be in accordance with Section 5703.1.1.

#### **5706.5.1.13 Transfer apparatus.**

Bulk and process transfer apparatus shall be of an *approved* type.

#### **5706.5.1.14 Inside buildings.**

Tank vehicles and tank cars shall not be located inside a building while transferring Class I, II or IIIA liquids, unless *approved* by the *fire code official*.

**Exception:** Tank vehicles are allowed under weather protection canopies and canopies of automobile motor vehicle fuel-dispensing stations.

#### **5706.5.1.15 Tank vehicle and tank car certification.**

Certification shall be maintained for tank vehicles and tank cars in accordance with DOTn 49 CFR Parts 100–185.

#### **5706.5.1.16 Tank vehicle and tank car stability.**

Tank vehicles and tank cars shall be stabilized against movement during loading and unloading in accordance with Sections 5706.5.1.16.1 through 5706.5.1.16.3.

##### **5706.5.1.16.1 Tank vehicles.**

When the vehicle is parked for loading or unloading, the cargo trailer portion of the tank vehicle shall be secured in a manner that will prevent unintentional movement.

##### **5706.5.1.16.2 Chock blocks.**

Not less than two chock blocks not less than 5 inches by 5 inches by 12 inches (127 mm by 127 mm by 305 mm) in size and dished to fit the contour of the tires shall be used during transfer operations of tank vehicles.

#### **5706.5.1.16.3 Tank cars.**

Brakes shall be set and the wheels shall be blocked to prevent rolling.

#### **5706.5.1.17 Monitoring.**

Transfer operations shall be monitored by an *approved* monitoring system or by an attendant. Where monitoring is by an attendant, the operator or other competent person shall be present at all times.

#### **5706.5.1.18 Security.**

Transfer operations shall be surrounded by a noncombustible fence not less than 5 feet (1524 mm) in height. Tank vehicles and tank cars shall not be loaded or unloaded unless such vehicles are entirely within the fenced area.

#### **Exceptions:**

1. Motor fuel-dispensing facilities complying with Chapter 23.
2. Installations where adequate public safety exists because of isolation, natural barriers or other factors as determined appropriate by the *fire code official*.
3. Facilities or properties that are entirely enclosed or protected from entry.

#### **5706.5.2 Bulk transfer.**

Bulk transfer shall be in accordance with Sections 5706.5.1 and 5706.5.2.1.

##### **5706.5.2.1 Vehicle motor.**

Motors of tank vehicles or tank cars shall be shut off during the making and breaking of hose connections and during the unloading operation.

**Exception:** Where unloading is performed with a pump deriving its power from the tank vehicle motor.

#### **5706.5.3 Process transfer.**

Process transfer shall be in accordance with Section 5706.5.1 and Sections 5706.5.3.1 through 5706.5.3.3.

##### **5706.5.3.1 Piping, valves, hoses and fittings.**

Piping, valves, hoses and fittings that are not a part of the tank vehicle or tank car shall be in accordance with Section 5703.6. Caps or plugs that prevent leakage or spillage shall be provided at all points of connection to transfer piping.

##### **5706.5.3.1.1 Shutoff valves.**

*Approved* automatically or manually activated shutoff valves shall be provided where the transfer hose connects to the process piping, and on both sides of any exterior *fire-resistance-rated* wall through which the piping passes. Manual shutoff valves shall be arranged so that they are able to be accessed from grade. Valves shall not be locked in the open position.

#### **5706.5.3.1.2 Hydrostatic relief.**

Hydrostatic pressure-limiting or relief devices shall be provided where pressure buildup in trapped sections of the system could exceed the design pressure of the components of the system.

Devices shall relieve to other portions of the system or to another *approved* location.

#### **5706.5.3.1.3 Antisiphon valves.**

Antisiphon valves shall be provided where the system design would allow siphonage.

#### **5706.5.3.2 Vents.**

Normal and emergency vents shall be maintained operable at all times.

#### **5706.5.3.3 Motive power.**

Motors of tank vehicles or tank cars shall be shut off during the making and breaking of hose connections and during the unloading operation.

**Exception:** When unloading is performed with a pump deriving its power from the tank vehicle motor.

#### **5706.5.4 Dispensing from tank vehicles and tank cars.**

Dispensing from tank vehicles and tank cars into the fuel tanks of motor vehicles shall be prohibited unless allowed by and conducted in accordance with Sections 5706.5.4.1 through 5706.5.4.5.

##### **5706.5.4.1 Marine craft and special equipment.**

Liquids intended for use as motor fuels are allowed to be transferred from tank vehicles into the fuel tanks of marine craft and special equipment where *approved* by the *fire code official*, and where:

1. The tank vehicle's specific function is that of supplying fuel to fuel tanks.
2. The operation is not performed where the public has access or where there is unusual exposure to life and property.
3. The dispensing line does not exceed 50 feet (15 240 mm) in length.
4. The dispensing nozzle is *approved*.

##### **5706.5.4.2 Emergency refueling.**

Where *approved* by the *fire code official*, dispensing of motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles is allowed during emergencies. Dispensing from tank vehicles shall be in accordance with Sections 5706.2.8 and 5706.6.

##### **5706.5.4.3 Aircraft fueling.**

Transfer of liquids from tank vehicles to the fuel tanks of aircraft shall be in accordance with Chapter 20.

#### **5706.5.4.4 Fueling of vehicles at farms, construction sites and similar areas.**

Transfer of liquid from tank vehicles to motor vehicles for private use on farms and rural areas and at construction sites, earth-moving projects, gravel pits and borrow pits is allowed in accordance with Section 5706.2.8.

#### **5706.5.4.5 Commercial, industrial, governmental or manufacturing.**

Dispensing of Class II and III motor vehicle fuel from tank vehicles into the fuel tanks of motor vehicles located at commercial, industrial, governmental or manufacturing establishments is allowed where permitted, provided that such dispensing operations are conducted in accordance with the following:

1. Dispensing shall occur only at sites that have been issued a permit to conduct mobile fueling.
2. The *owner* of a mobile fueling operation shall provide to the jurisdiction a written response plan that demonstrates readiness to respond to a fuel spill and carry out appropriate mitigation measures, and describes the process to dispose properly of contaminated materials.
3. A detailed site plan shall be submitted with each application for a permit. The site plan shall indicate: all buildings, structures and appurtenances on site and their use or function; all uses adjacent to the *lot lines* of the site; the locations of all storm drain openings, adjacent waterways or wetlands; information regarding slope, natural drainage, curbing, impounding and how a spill will be retained on the site property; and the scale of the site plan.

Provisions shall be made to prevent liquids spilled during dispensing operations from flowing into buildings or off-site. Acceptable methods include, but shall not be limited to, grading driveways, raising doorsills or other *approved* means.

4. The *fire code official* is allowed to impose limits on the times and days during which mobile fueling operations is allowed to take place, and specific locations on a site where fueling is permitted.
5. Mobile fueling operations shall be conducted in areas not open to the public or shall be limited to times when the public is not present.
6. Mobile fueling shall not take place within 15 feet (4572 mm) of buildings, property lines, combustible storage or storm drains.

#### **Exceptions:**

1. The distance to storm drains shall not apply where an *approved* storm drain cover or an *approved* equivalent that will prevent any fuel from reaching the drain is in place prior to fueling or a fueling hose being placed within 15 feet (4572 mm) of the drain. Where placement of a storm drain cover will cause the accumulation of excessive water or difficulty in conducting the fueling, such cover shall not be used and the fueling shall not take place within 15 feet (4572 mm) of a drain.
2. The distance to storm drains shall not apply for drains that direct influent to *approved* oil interceptors.

7. The tank vehicle shall comply with the requirements of NFPA 385 and local, state and federal requirements. The tank vehicle's specific functions shall include that of supplying fuel to motor vehicle fuel tanks. The vehicle and all its equipment shall be maintained in good repair.
8. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the tank vehicle or the point of fueling shall be prominently posted on three sides of the vehicle including the back and both sides.
9. A portable fire extinguisher with a minimum rating of 40:BC shall be provided on the vehicle with signage clearly indicating its location.
10. The dispensing nozzles and hoses shall be of an *approved* and *listed* type.
11. The dispensing hose shall not be extended from the reel more than 100 feet (30 480 mm) in length.
12. Absorbent materials, nonwater-absorbent pads, a 10-foot-long (3048 mm) containment boom, an *approved* container with lid and a nonmetallic shovel shall be provided to mitigate a minimum 5-gallon (19 L) fuel spill.
13. Tank vehicles shall be equipped with a "fuel limit" switch such as a count-back switch, to limit the amount of a single fueling operation to not more than 500 gallons (1893 L) before resetting the limit switch.

**Exception:** Tank vehicles where the operator carries and can utilize a remote emergency shutoff device that, when activated, immediately causes flow of fuel from the tank vehicle to cease.

14. Persons responsible for dispensing operations shall be trained in the appropriate mitigating actions in the event of a fire, leak or spill. Training records shall be maintained by the dispensing company.
15. Operators of tank vehicles used for mobile fueling operations shall have in their possession at all times an emergency communications device to notify the proper authorities in the event of an emergency.
16. The tank vehicle dispensing equipment shall be constantly attended and operated only by designated personnel who are trained to handle and dispense motor fuels.
17. Fuel dispensing shall be prohibited within 25 feet (7620 mm) of any source of ignition.
18. The engines of vehicles being fueled shall be shut off during dispensing operations.
19. Nighttime fueling operations shall only take place in adequately lighted areas.
20. The tank vehicle shall be positioned with respect to vehicles being fueled to prevent traffic from driving over the delivery hose.
21. During fueling operations, tank vehicle brakes shall be set, chock blocks shall be in place and warning lights shall be in operation.
22. Motor vehicle fuel tanks shall not be topped off.
23. The dispensing hose shall be properly placed on an *approved* reel or in an *approved* compartment prior to moving the tank vehicle.
24. The *fire code official* and other appropriate authorities shall be notified when a reportable spill or unauthorized discharge occurs.



25. Operators shall place a drip pan or an absorbent pillow under each fuel fill opening prior to and during dispensing operations. Drip pans shall be liquid-tight. The pan or absorbent pillow shall have a capacity of not less than 3 gallons (11.36 L). Spills retained in the drip pan or absorbent pillow need not be reported. Operators, when fueling, shall have on their person an absorbent pad capable of capturing diesel fuel overfills. Except during fueling, the nozzle shall face upward and an absorbent pad shall be kept under the nozzle to catch drips. Contaminated absorbent pads or pillows shall be disposed of regularly in accordance with local, state and federal requirements.

#### **5706.6 Tank vehicles and vehicle operation.**

Tank vehicles shall be designed, constructed, equipped and maintained in accordance with NFPA 385 and Sections 5706.6.1 through 5706.6.4.

##### **5706.6.1 Operation of tank vehicles.**

Tank vehicles shall be utilized and operated in accordance with NFPA 385 and Sections 5706.6.1.1 through 5706.6.1.11.

###### **5706.6.1.1 Vehicle maintenance.**

Tank vehicles shall not be operated unless they are in proper state of repair and free from accumulation of grease, oil or other flammable substance, and leaks.

###### **5706.6.1.2 Leaving vehicle unattended.**

The driver, operator or attendant of a tank vehicle shall not remain in the vehicle cab and shall not leave the vehicle while it is being filled or discharged. The delivery hose, when attached to a tank vehicle, shall be considered to be a part of the tank vehicle.

###### **5706.6.1.3 Vehicle motor shutdown.**

Motors of tank vehicles or tractors shall be shut down during the making or breaking of hose connections. If loading or unloading is performed without the use of a power pump, the tank vehicle or tractor motor shall be shut down throughout such operations.

###### **5706.6.1.4 Outage.**

A cargo tank or compartment thereof used for the transportation of *flammable* or *combustible liquids* shall not be loaded to absolute capacity. The vacant space in a cargo tank or compartment thereof used in the transportation of *flammable* or *combustible liquids* shall be not less than 1 percent. Sufficient space shall be left vacant to prevent leakage from or distortion of such tank or compartment by expansion of the contents caused by rise in temperature in transit.

###### **5706.6.1.5 Overfill protection.**

The driver, operator or attendant of a tank vehicle shall, before making delivery to a tank, determine the unfilled capacity of such tank by a suitable gauging device. To prevent overfilling, the driver, operator or attendant shall not deliver in excess of that amount.

#### **5706.6.1.6 Securing hatches.**

During loading, hatch covers shall be secured on all but the receiving compartment.

#### **5706.6.1.7 Liquid temperature.**

Materials shall not be loaded into or transported in a tank vehicle at a temperature above the material's ignition temperature unless safeguarded in an *approved* manner.

#### **5706.6.1.8 Bonding to underground tanks.**

An external bond-wire connection or bond-wire integral with a hose shall be provided for the transferring of flammable liquids through open connections into underground tanks.

#### **5706.6.1.9 Smoking.**

Smoking by tank vehicle drivers, helpers or other personnel is prohibited while they are driving, making deliveries, filling or making repairs to tank vehicles.

#### **5706.6.1.10 Hose connections.**

Delivery of *flammable liquids* to underground tanks with a capacity of more than 1,000 gallons (3785 L) shall be made by means of *approved* liquid and vapor-tight connections between the delivery hose and tank fill pipe. Where underground tanks are equipped with any type of vapor recovery system, all connections required to be made for the safe and proper functioning of the particular vapor recovery process shall be made. Such connections shall be made liquid and vapor tight and remain connected throughout the unloading process. Vapors shall not be discharged at grade level during delivery.

##### **5706.6.1.10.1 Simultaneous delivery.**

Simultaneous delivery to underground tanks of any capacity from two or more discharge hoses shall be made by means of mechanically tight connections between the hose and fill pipe.

##### **5706.6.1.11 Hose protection.**

Upon arrival at a point of delivery and prior to discharging any *flammable* or *combustible liquids* into underground tanks, the driver, operator or attendant of the tank vehicle shall ensure that all hoses utilized for liquid delivery and vapor recovery, where required, will be protected from physical damage by motor vehicles. Such protection shall be provided by positioning the tank vehicle to prevent motor vehicles from passing through the area or areas occupied by hoses, or by other *approved* equivalent means.

#### **5706.6.2 Parking.**

Parking of tank vehicles shall be in accordance with Sections 5706.6.2.1 through 5706.6.2.3. **Exception:** In cases of accident, breakdown or other emergencies, tank vehicles are allowed to be parked and left unattended at any location while the operator is obtaining assistance.

##### **5706.6.2.1 Parking near residential, educational and institutional occupancies and other high-risk areas.**

Tank vehicles shall not be left unattended at any time on residential streets, or within 500 feet (152 m) of a residential area, apartment or hotel complex, educational facility, hospital

or care facility. Tank vehicles shall not be left unattended at any other place that would, in the opinion of the *fire chief*, pose an extreme life hazard.

#### **5706.6.2.2 Parking on thoroughfares.**

Tank vehicles shall not be left unattended on a public street, highway, public avenue or public alley.

#### **Exceptions:**

1. The necessary absence in connection with loading or unloading the vehicle. During actual fuel transfer, Section 5706.6.1.2 shall apply. The vehicle location shall be in accordance with Section 5706.6.2.1.
2. Stops for meals during the day or night, where the street is well lighted at the point of parking. The vehicle location shall be in accordance with Section 5706.6.2.1.

#### **5706.6.2.3 Duration exceeding 1 hour.**

Tank vehicles parked at one point for longer than 1 hour shall be located off of public streets, highways, public avenues or alleys, and in accordance with either of the following:

1. Inside of a bulk plant and either 25 feet (7620 mm) or more from the nearest *lot line* or within a building *approved* for such use.
2. At other *approved* locations not less than 50 feet (15 240 mm) from the buildings other than those *approved* for the storage or servicing of such vehicles.

#### **5706.6.3 Garaging.**

Tank vehicles shall not be parked or garaged in buildings other than those specifically *approved* for such use by the *fire code official*.

#### **5706.6.4 Portable fire extinguisher.**

Tank vehicles shall be equipped with a portable fire extinguisher complying with Section 906 and having a minimum rating of 2-A:20-B:C.

During unloading of the tank vehicle, the portable fire extinguisher shall be out of the carrying device on the vehicle and shall be 15 feet (4572 mm) or more from the unloading valves.

#### **5706.7 Refineries.**

Plants and portions of plants in which *flammable liquids* are produced on a scale from crude petroleum, natural gasoline or other hydrocarbon sources shall be in accordance with Sections 5706.7.1 through 5706.7.3. Petroleum-processing plants and facilities or portions of plants or facilities in which *flammable* or *combustible liquids* are handled, treated or produced on a commercial scale from crude petroleum, natural gasoline, or other hydrocarbon sources shall also be in accordance with API 651, API 653, API 752, API 1615, API 2001, API 2003, API 2009, API 2015, API 2023, API 2201 and API 2350.

#### **5706.7.1 Corrosion protection.**

Above-ground tanks and piping systems shall be protected against corrosion in accordance with API 651.

### **5706.7.2 Cleaning of tanks.**

The safe entry and cleaning of petroleum storage tanks shall be conducted in accordance with API 2015.

### **5706.7.3 Storage of heated petroleum products.**

Where petroleum-derived asphalts and residues are stored in heated tanks at refineries and bulk storage facilities or in tank vehicles, such products shall be in accordance with API 2023.

### **5706.8 Vapor recovery and vapor-processing systems.**

Vapor-processing systems in which the vapor source operates at pressures from vacuum, up to and including 1 psig (6.9 kPa) or in which a potential exists for vapor mixtures in the flammable range, shall comply with Sections 5706.8.1 through 5706.8.5.

#### **Exceptions:**

1. Marine systems complying with federal transportation waterway regulations such as DOTn 33 CFR Parts 154 through 156, and CGR 46 CFR Parts 30, 32, 35 and 39.
2. Motor fuel-dispensing facility systems complying with Chapter 23.

#### **5706.8.1 Over-pressure/vacuum protection.**

Tanks and equipment shall have independent venting for over-pressure or vacuum conditions that might occur from malfunction of the vapor recovery or processing system.

**Exception:** For tanks, venting shall comply with Section 5704.2.7.3.

#### **5706.8.2 Vent location.**

Vents on vapor-processing equipment shall be not less than 12 feet (3658 mm) from adjacent ground level, with outlets located and directed so that flammable vapors will disperse to below the lower flammable limit (LFL) before reaching locations containing potential ignition sources.

#### **5706.8.3 Vapor collection systems and overflow protection.**

The design and operation of the vapor collection system and overflow protection shall be in accordance with this section and Section 19.5 of NFPA 30.

#### **5706.8.4 Liquid-level monitoring.**

A liquid knock-out vessel used in the vapor collection system shall have means to verify the liquid level and a high-liquid-level sensor that activates an alarm. For unpopulated facilities, the high-liquid-level sensor shall initiate the shutdown of liquid transfer into the vessel and shutdown of vapor recovery or vapor-processing systems.

#### **5706.8.5 Overflow protection.**

Storage tanks served by vapor recovery or processing systems shall be equipped with overflow protection in accordance with Section 5704.2.7.5.8.

## Handling

### 5705.3 Use, dispensing and mixing inside of buildings.

Indoor use, dispensing and mixing of *flammable* and *combustible liquids* shall be in accordance with Section 5705.2 and Sections 5705.3.1 through 5705.3.5.3.

### 5705.3.8 Use, dispensing and handling outside of buildings.

Outside use, dispensing and handling shall be in accordance with Sections 5705.3.8.1 through 5705.3.8.4.

Dispensing of liquids into motor vehicle fuel tanks at motor fuel-dispensing facilities shall be in accordance with Chapter 23.

## Tank Vehicle and Tank Car

### 5706.5.1.16 Tank vehicle and tank car stability.

Tank vehicles and tank cars shall be stabilized against movement during loading and unloading in accordance with Sections 5706.5.1.16.1 through 5706.5.1.16.3.

#### 5706.5.1.16.1 Tank vehicles.

When the vehicle is parked for loading or unloading, the cargo trailer portion of the tank vehicle shall be secured in a manner that will prevent unintentional movement.

#### 5706.5.1.16.2 Chock blocks.

Not less than two chock blocks not less than 5 inches by 5 inches by 12 inches (127 mm by 127 mm by 305 mm) in size and dished to fit the contour of the tires shall be used during transfer operations of tank vehicles.

#### 5706.5.1.16.3 Tank cars.

Brakes shall be set and the wheels shall be blocked to prevent rolling.

## Monitoring

### 5706.5.1.17 Monitoring.

Transfer operations shall be monitored by an *approved* monitoring system or by an attendant. Where monitoring is by an attendant, the operator or other competent person shall be present at all times.

## Security

### 5706.5.1.18 Security.

Transfer operations shall be surrounded by a noncombustible fence not less than 5 feet (1524 mm) in height. Tank vehicles and tank cars shall not be loaded or unloaded unless such vehicles are entirely within the fenced area.

#### Exceptions:

1. Motor fuel-dispensing facilities complying with Chapter 23.
2. Installations where adequate public safety exists because of isolation, natural barriers or other factors as determined appropriate by the *fire code official*.
3. Facilities or properties that are entirely enclosed or protected from entry.

## **Bulk Transfer**

### **5706.5.2 Bulk transfer.**

Bulk transfer shall be in accordance with Sections 5706.5.1 and 5706.5.2.1.

#### **5706.5.2.1 Vehicle motor.**

Motors of tank vehicles or tank cars shall be shut off during the making and breaking of hose connections and during the unloading operation.

**Exception:** Where unloading is performed with a pump deriving its power from the tank vehicle motor.

## **Process Transfer**

### **5706.5.3 Process transfer.**

Process transfer shall be in accordance with Section 5706.5.1 and Sections 5706.5.3.1 through 5706.5.3.3.

#### **5706.5.3.1 Piping, valves, hoses and fittings.**

Piping, valves, hoses and fittings that are not a part of the tank vehicle or tank car shall be in accordance with Section 5703.6. Caps or plugs that prevent leakage or spillage shall be provided at all points of connection to transfer piping.

##### **5706.5.3.1.1 Shutoff valves.**

*Approved* automatically or manually activated shutoff valves shall be provided where the transfer hose connects to the process piping, and on both sides of any exterior *fire-resistance-rated* wall through which the piping passes. Manual shutoff valves shall be arranged so that they are able to be accessed from grade. Valves shall not be locked in the open position.

## **Operation of Tank Vehicle**

### **5706.6.1 Operation of tank vehicles.**

Tank vehicles shall be utilized and operated in accordance with NFPA 385 and Sections 5706.6.1.1 through 5706.6.1.11.

#### **5706.6.1.1 Vehicle maintenance.**

Tank vehicles shall not be operated unless they are in proper state of repair and free from accumulation of grease, oil or other flammable substance, and leaks.

#### **5706.6.1.2 Leaving vehicle unattended.**

The driver, operator or attendant of a tank vehicle shall not remain in the vehicle cab and shall not leave the vehicle while it is being filled or discharged. The delivery hose, when attached to a tank vehicle, shall be considered to be a part of the tank vehicle.

#### **5706.6.1.3 Vehicle motor shutdown.**

Motors of tank vehicles or tractors shall be shut down during the making or breaking of hose connections. If loading or unloading is performed without the use of a power pump, the tank vehicle or tractor motor shall be shut down throughout such operations.

# NFPA 30 FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE

## 22.1 Scope.

This chapter shall apply to the following:

1. The storage of liquids, as defined in **3.3.33** and Chapter **4**, in fixed tanks that exceed 60 gal (230 L) capacity
2. The storage of liquids in portable tanks that exceed 660-gal (2500 L) capacity
3. The storage of liquids in intermediate bulk containers that exceed 793 gal (3000 L)
4. The design, installation, testing, operation, and maintenance of such tanks, portable tanks, and bulk containers

## 22.5 Installation of Aboveground Storage Tanks.

### 22.5.1 Tank Supports.

#### 22.5.1.1

Tank supports shall be designed and constructed in accordance with recognized engineering standards.

#### 22.5.1.2

Tanks shall be supported in a manner that prevents excessive concentration of loads on the supported portion of the shell.

#### 22.5.1.3

In areas subject to earthquakes, tank supports and connections shall be designed to resist damage as a result of such shocks.

### 22.5.2 Foundations for and Anchoring of Aboveground Storage Tanks.

#### 22.5.2.1\*

Tanks shall rest on the ground or on foundations made of concrete, masonry, piling, or steel.

#### 22.5.2.2

Tank foundations shall be designed to minimize the possibility of uneven settling of the tank and to minimize corrosion in any part of the tank resting on the foundation.

#### 22.5.2.3

Where tanks storing Class I, Class II, or Class IIIA liquids [FP < 200°F (93°C)] are supported above their foundations, tank supports shall be of concrete, masonry, or protected steel.

#### **22.5.2.4**

Single wood timber supports (not cribbing), laid horizontally, shall be permitted to be used for outside aboveground tanks if not more than 12 in. (300 mm) high at their lowest point.

#### **22.5.2.5\***

Steel support structures or exposed piling for tanks storing Class I, Class II, or Class IIIA liquids [FP < 200°F (93°C)] shall be protected by materials having a fire resistance rating of not less than 2 hours.

#### **22.5.2.5.1**

Steel saddles less than 12 in. (300 mm) high at their lowest point shall not require fire protection per **22.5.2.5**.

#### **22.5.2.5.2**

At the discretion of the authority having jurisdiction, water spray protection in accordance with NFPA 15 or NFPA 13 shall be permitted to be used.

#### **22.5.2.6**

Where a tank is located in an area subject to flooding, provisions shall be taken to prevent tanks, either full or empty, from floating or sliding during a rise in water level up to the established maximum flood stage. (See **21.7.3**.)

### **22.5.3 Anchoring Tanks.**

Flat bottom, vertical cylindrical tanks constructed in accordance with API 650, *Welded Tanks for Oil Storage*, shall be anchored to a concrete ringwall or other suitable foundation under the following conditions:

1. The tank internal pressure exceeds the equivalent pressure of the weight of the tank shell, roof, and roof framing.
2. The tank must be anchored to comply with the weak roof-to-shell criteria.
3. Under the design criteria for the tank, including all applicable load combinations, anchorage is required to prevent overturning due to wind or seismic loads.