### Code Requirements for ASTs at Motor Vehicle-Dispensing Stations

This table compares aboveground storage tank requirements in the 2008 edition of NFPA 30A, and the 2009 International Fire Code (IFC). Please note that the 2006 NFPA 1 references the 2003 NFPA 30A for all its requirements relating to ASTs at Motor Fuel Dispensing Stations. These are the three (NFPA 30A, NFPA 1 (UFC) & IFC) most referenced national fire code requirements for aboveground storage tanks at motor vehicle fuel dispensing facilities. This table is a partial list of the differences and similarities between these Codes, and is not intended to be a replacement for these Codes.

<table>
<thead>
<tr>
<th>Approval/General Provisions</th>
<th><strong>NFPA 30A 2008 EDITION</strong></th>
<th><strong>IFC 2009 EDITION</strong></th>
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<td>● The use of aboveground storage tanks at motor fuel dispensing facilities, fleet vehicle motor fuel dispensing facilities, and marine motor fuel dispensing facilities shall be permitted when installed in accordance with the requirements of Section 4.3 and with all applicable requirements of Chapters 21 through 23 and 27 of 2008 NFPA 30, and when the specific installation has been approved by the Authority Having Jurisdiction (AHJ) (30A, 4.3.2.1)</td>
<td>● When approved, aboveground tanks used for outside aboveground storage of motor fuels classified as Class I, II or III-A liquids shall be in accordance with Chapter 34 (Flammable and Combustible Liquids Chapter) and as provided by Section 2206.2.3.</td>
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<td>Terminology</td>
<td>● Fire-Resistant Tank. An atmospheric aboveground storage tank with thermal insulation that has been evaluated for resistance to physical damage and for limiting the heat transferred to the primary tank when exposed to a hydrocarbon pool fire and is listed in accordance with UL 2080 or an equivalent test procedure. (30, 3.3.47.3 &amp; 30A,3.3.15.2)</td>
<td>● Protected Aboveground Tank: A listed tank system consisting of a primary tank provided with protection from physical damage and fire resistive protection from a high intensity liquid pool fire exposure. The tank system may provide these protection elements as a unit or may be an assembly of components or a combination thereof. (IFC,3404.2.1)</td>
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<td>● Protected Aboveground Tank. An atmospheric aboveground storage tank with integral secondary containment and thermal insulation that has been evaluated for resistance to physical damage and for limiting the heat transferred to the primary tank when exposed to a hydrocarbon pool fire and is listed in accordance with ANSI/UL 2085, or an equivalent test procedure. (30, 3.3.47.1.1 &amp; 30A,3.3.15.4)</td>
<td>● Special Enclosures: Enclosures constructed in accordance with Section 2206.2.62</td>
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<td>● Vault: The vault must be liquid tight and designed to withstand loading from soil, water, traffic, etc. Vaults shall be provided with approved vapor &amp; liquid detection systems, including on-site audible &amp; visual warning devices with battery backup (30A,4.3.3. through 4.3.3.9) Vaults with Class I liquids require exhaust ventilation. (30A,4.3.3.5)³</td>
<td>● Vaulted Tank: Vaults shall be listed in accordance with UL 2245 or, when approved, constructed on-site in accordance with the International Building Code, Section 1707. The design shall bear the stamp of a Professional Engineer. Special inspections are required. IFC Section 3404.2.8.2 sets out 17 conditions of vaulted tank compliance. Vaults with Class I liquids require exhaust ventilation. ³</td>
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<td>Installation</td>
<td>See Approval/General Provisions. NFPA 30 provides additional requirements on aboveground tank systems for the control of spillage, normal and emergency venting, corrosion control, tank construction, supports and foundation, flooding, and testing and maintenance.</td>
<td>Fuel dispensing systems are to be installed in accordance with Chapter 22, which incorporates all the motor fuel dispensing facilities controls. Tank installations are to be in accordance with Chapter 34 as modified by Chapter 22.</td>
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### Maximum Capacities

- Tanks storing Class I and Class II liquids at an individual site: 12,000 gal individual and 48,000 gal aggregate (30A,4.3.2.3)¹
- Tanks storing Class II and Class III liquids at fleet vehicle motor fuel dispensing facilities: 20,000 gallon individual and 80,000 gallon aggregate (30A,4.3.2.5)
- Individual tanks in vaults may store up to 15,000 gallons (30A,4.3.2.3)
- Protected Aboveground Steel Tanks: (Gallons) 6,000 individual for Class I liquids, with reduced separation requirements (IFC, Table 2206.2.3); 12,000 individual, 48,000 aggregate for Class I, II or III-A liquids. (IFC,2206.2.3 (3))
- Vaults at Public Motor Fuel Dispensing Facilities: 15,000 individual, 48,000 aggregate. (IFC,2206.2.4.1)
- Vaults at Fleet Vehicle Motor Fuel Dispensing Facilities: 20,000 individual, 80,000 aggregate. (IFC,2206.2.4.2)
- Special Enclosures: 6,000 individual, 18,000 aggregate.(IFC,2206.2.6(6))
- Other Aboveground Tanks: When approved by the AHJ, tanks shall comply with Chapter 34. Capacities same as for protected tanks noted above (IFC,2208.2.3 (2) & (3))

### Overfill/Spill Prevention

- Overfill - alarm at 90% capacity, automatic shut-off at 98% or restricted flow at 95% capacity (30A,4.3.6.3)⁴
- Means to determine liquid level shall be accessible to delivery operator (30A,4.3.6.2)
- Spill Containers, 5 gallons (IFC,2206.6.2.6)
- Protected and Vaulted Tanks: Overfill: Alarm at 90%. Shut-off at 95%, or reduce flow rate to not overfill for 30 minutes and provide auto-shut-off prior to wetting tank top fittings (IFC, 3404.2.9.6.6)
- Aboveground Steel Tanks: Overfill: an approved means or method shall be provided (such as Section IFC, 3404.2.9.6.8)

### Physical Protection

- 6' high security fence located at least 10' from tank and a gate properly secured against unauthorized entry (30A,4.3.7.1)
- When required, provide protection against vehicular collision by suitable barriers, such as 4" diameter steel pipe filled with concrete set 3' deep in a concrete footing and spaced no more than 4' apart (30A,4.3.7.1 through 4.3.7.2)
- ASTs shall be safeguarded from public access in an approved manner (IFC,2206.3)
- Impact protection required by system design, barriers or posts. Steel posts of 4" diameter, concrete filled, spaced 4’ on centers, 3’ deep in concrete, protruding 3’ above grade, set 3’ from the protected object. Barriers a minimum of 3’ high, resisting 12,000 pounds of force. (IFC, 3404.2.9.6.5 & 312)

### Secondary Containment

- Secondary containment tanks may be used to provide spill control, in addition to diking or remote impounding. Section 22.11.4.1 of 2008 NFPA 30 limits such a tank to a max. of 12,000 gallons for Class I liquids, and to a max. of 20,000 gallons for Class II & IIIA liquids.
- Means shall be provided to prevent release of liquid by siphon flow (30A, 4.3.6.4 & 30,22.11.4.3)
- All pipe connections shall be made above the normal maximum liquid level (30A,4.3.6.1)
- Means to determine the level of liquid during deliveries (30, 22.11.4.2 through 22.11.4.4) and to meet spill prevention requirements are noted herein
- Enclosed secondary containment shall be provided with emergency vents ⁵ (30, 22.11.4.8)
- The interstitial space shall be tested with air pressure or vacuum to assure integrity (30, 21.5.2)
- Aboveground Tanks: Section 2206.5 refers to Chapter 34 for drainage control or diking. Not required for listed secondary containment tanks. Enclosed secondary containment required to have emergency venting.
- Drainage and Diking: Section 3404.2.10 Required around a tank or group of tanks to prevent accidental discharge from endangering adjacent tanks, adjoining property or waterways. Waivers allowed for special features.
- Protected Tanks: Section 3404.2.9.6.4 Protected aboveground tanks shall be provided with secondary containment, drainage control or diking. A means shall be provided to establish the integrity of the secondary containment in accordance with NFPA 30.
### Separation Distance
- **Protected Tank, less than 6000 gallons:**
  - 15' from property line
  - 5' from building or public way
  - 3' between each tank
  - 0' from fuel dispensers
- **Protected Tank, more than 6000 gallons:**
  - 25' from property line
  - 15' from building or public way
  - 3' between each tank
  - 0' from fuel dispensers
- **Vaulted Tank:** 0-15,000 gal. Individual tank capacity
- **Fire-Resistant Tank:**
  - 50' from property line
  - 25' from building or public way
  - 3' between each tank
  - 25' from fuel dispensers
- **Other tanks meeting the requirements of NFPA 30:**
  - 100' from property line
  - 50' from building or public way
  - 3' between each tank, except that for vaulted tanks, each vaulted tank is required to be in a separate compartment.
  - 50' from fuel dispensers

### Piping
- Openings in tank shall be located above the maximum liquid level (30A, 4.3.6.1)
- Provide means to prevent release of liquid by siphon flow (30A, 4.3.6.4)
- Shut-off and check valves require pressure relief devices generated by thermal expansion (30A, 4.3.6.5)
- Pipe shall be protected from physical damage (30A, 5.2.2)

### Dispensers
- Unless all piping is visible, listed pressure pump shall have a listed leak detection device installed on its discharge side (30A, 6.4.1 & 6.4.2)
- Fuel shall not be dispensed from the tank by either gravity flow or pressurization of the tank (30A, 4.3.6.6)
- With pressurized systems, a listed, rigidly anchored emergency shut-off valve, incorporating a fusible link or other thermally actuated devise, shall be installed (30A, 6.3.9)
- With suction systems where a gravity head is produced on the dispensing device, a listed vacuum-actuated shut-off valve with a shear section or equivalent valve, shall be installed directly under dispensing device (30A, 6.3.10)
- All Aboveground Tanks (IFC, 2206.6):
  - Openings in tank top only (IFC, 2206.6.2.1)
  - Anti-siphon device required (IFC, 2206.6.2.4)
  - Corrosion and galvanic protection (IFC, 3403.6.5)
  - Piping supports (IFC, 3403.6.8)
  - Pipe joints (IFC, 3403.6.10)

### Tank Filling Operations
- Separation of delivery vehicle by 25' for Class I and 15' for Class II or Class III liquids
- No minimum separation required for tanks that are filled by gravity
- Liquid tight connections required
- Delivery must meet applicable requirements of NFPA 385 (30A, 9.2.2.1, 9.2.2.2 & 9.2.2.5 through 9.2.2.5.2)
- Fill pipe provided with a means of direct, closed connection (IFC, 2205.1.3, 3404.2.9.6.7 & 3406.6.1.10)
- Delivery vehicles positioned a minimum of 25' from the receiving tank during delivery of Class I liquids and 15' for Class II or III-A Liquids (IFC, 2205.1.1).
Miscellaneous

- Requirements for fuel dispensing devices (30A, Chapter 6), electrical equipment (30A, Chapter 8), vapor recovery and processing systems (30A, 5.7 & Chapter 10), and operational requirements (30A, Chapter 9)
- Testing provisions for all piping and secondary containment piping (30A, 5.4)
- Listed automatic-close nozzles required (30A.6.6)
- Accurate inventory control records shall be maintained and reconciled (30A, 9.2.1)
- Periodic testing, maintenance, inspection, and repair of aboveground storage tanks (30, 21.5, 21.8, & 22.17)
- At each entry point into the vault, a warning sign indicating the need for procedures for safe entry into confined spaces shall be posted. Each entry point shall be secured against unauthorized entry and vandalism (30, 25.3.1.9)

- Detailed construction documents and site plan required. Requirements for listed pumps, fuel dispenser, installment, nozzle, hose length, emergency disconnect switch and valves, breakaway devices, vapor recovery and electrical equipment, operational requirements and signage. Corrosion protection requirements for tanks and piping subject to external corrosion.
- Requirements for the design, construction and maintenance of motor vehicle fuel-dispensing stations dispensing alcohol blended fuels (2206.8)

Footnotes:

1. Section 4-3.2.7 of NFPA 30A enables existing tanks up to 6,000 gallons to be used at private fleet facilities, provided the tank complies with NFPA 30. New installations must follow Section 4.3 of NFPA 30A.
2. Special enclosures maximum capacities are 6,000 gallons individual and 18,000 gallons aggregate.
3. Vaults with Class I liquid storage shall be ventilated at a rate greater than 1 cfm per square foot of floor area, but not less than 150 cfm.
4. This provision is required on ASTs dispensing fuels and on secondary containment type tanks when provisions of 22.11.4 through 22.11.4.10 (Alarm at 90% & stop flow at 95%) of 2008 NFPA 30 are met for control of spillage.
5. Emergency vents are also required for each a) tank compartment, b) an enclosed space of a closed top dike construction, and c) other spaces or enclosed volumes, such as those intended for insulation, membranes or weather shields that can contain liquid because of a leak from the primary vessel and can inhibit venting during exposure. (30, 22.7.1.1 through 22.7.1.1.3)
6. At fleet vehicle motor fuel dispensing facilities, no minimum separation is required between the dispensing device and protected tank or fire-resistant tank. (30A.4.3.2.6)
7. 0’ separation distances for vaults. Separate vaulted compartments are required for each tank. Adjacent vaults are permitted to share a common wall. (30A,Table 4.3.2.4 & Sec. 4.3.3.3.1.3)

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<tbody>
<tr>
<td>IFC</td>
<td>International Fire Code, 2009 Edition</td>
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Table was compiled by STI with the help and guidance from:
- Jeff Shapiro of International Code Consultants, Austin, TX

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