

Code Requirements for ASTs at Motor Vehicle-Dispensing Stations

This table compares the aboveground storage tank requirements in the 2003 edition of NFPA 30A, and the 2006 International Fire Code (IFC). Please note that the 2006 NFPA 1 references the 2003 NFPA 30A for all its requirements relating to AST 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.

	NFPA 30A 2003 EDITION	IFC 2006 EDITION
Approval/ General Provisions	<ul style="list-style-type: none"> 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 4 and 5 of 2003 NFPA 30, and when the specific installation has been approved by the AHJ (30A, 4.3.2.1) 	<ul style="list-style-type: none"> 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. Outside storage of Class I liquid fuels shall be in Protected aboveground tanks. Requires listing and labeling for tanks(IFC,2206.2.3(1)). Outside storage of Class II or IIIA liquid fuels shall be in Protected aboveground tanks, or when approved by the AHJ, other above-ground tanks that comply with Chapter 34 (IFC,2206.2.3(2)). Protected aboveground tank separation requirements are listed in Table 2206.2.3. Above-ground tanks are allowed in vaults aboveground or below grade (IFC,2206.2.4). Special enclosures for tanks are allowed to overcome impractical conditions (IFC,2206.2.6).
Terminology	<ul style="list-style-type: none"> Fire-Resistant Tank. The listed construction that provides the required fire-resistive protection, prevents release of liquid, failure of the primary tank, failure of the supporting structure, and impairment of venting for not less than 2 hours when tested using a fire exposure that simulates a high-intensity pool fire, such as UL 2080 or equivalent.(30A,3.3.15.2) Protected Aboveground Tank. The listed construction that provides the required fire-resistive protection, prevents the release of liquid, failure of the primary tank, failure of the supporting structure, and impairment of venting for not 	<ul style="list-style-type: none"> 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) Special Enclosures: Enclosures constructed in accordance with Section 2206.2.6² 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

	<p>less than 2 hours, and shall limit the increase in temperature of liquid inside the tank when tested using the fire exposure specified in UL 2085. (30A,3.3.15.4)</p> <ul style="list-style-type: none"> • Vault. The vault must be liquid tight and designed to withstand loading from soil, water, traffic, etc. Vaults shall be provided with approved vapor & liquid detection systems, including on-site audible & visual warning devices with battery backup.(30A,4.3.3.2) Vaults with Class I liquids require exhaust ventilation.(30A,4.3.3.5)³ 	<p>3404.2.8.2 sets out 17 conditions of vaulted tank compliance. Vaults with Class I liquids require exhaust ventilation. ³</p>
Installation	<p>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 exposure, and testing and maintenance.</p>	<p>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.</p>
Maximum Capacities	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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 fire official, tanks shall comply with Chapter 34. Capacities same as for protected tanks noted above (IFC,2208.2.3(2) & (3))
Overfill/Spill Prevention	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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

		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. 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)	<ul style="list-style-type: none"> • 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 5' 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	<ul style="list-style-type: none"> • Secondary containment tanks may be used to provide spill control, in addition to diking or remote impounding. Section 4.3.2.3.3 of 2003 NFPA 30 limits such tanks to 12,000 gallons or less. • Means shall be provided to prevent release of liquid by siphon flow, and 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, 4.3.2.3.3 (2) (3) (4)) and to meet spill prevention requirements are noted herein. • Enclosed secondary containment shall be provided with emergency vents. ⁵ (30, 4.3.2.3.3 (8) The interstitial space shall be tested with air pressure or vacuum to assure integrity. (30, 4.4.2) 	<ul style="list-style-type: none"> • 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. • Section 3404.2.10 Drainage and Diking: 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.

<p>Separation ,Distance</p>	<ul style="list-style-type: none"> • 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 6,000 gallons: 25' from property line 15' from building or public way 3' between each tank 0' from fuel dispensers • Vaulted Tank: ⁷ 0-15000 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 ⁶ • 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 <p>(30A, Table 4.3.2.4)</p>	<ul style="list-style-type: none"> • Aboveground Tank: 100' to property line which can be built upon; 50' to building on same property, dispenser, or nearest side of public way. • Protected Tank, less than or equal to 6,000 gallons: 5' to building on same property, or public way; 15' to property line which can be built upon; 25' to fuel dispenser; 0' to fuel dispenser at fleet vehicle station. • Protected Tank, greater than 6000 gallons: 15' to building on same property, or public way; 25' to property line which can be built upon, or to fuel dispenser; 0' to fuel dispenser at fleet vehicle station. • Vaulted Tanks⁷: 0-20,000 gal. Individual tank capacity • All tanks: 3' between tanks, except that for vaulted tanks, each vaulted tank is required to be in a separate compartment, 100' between maximum allowable aggregate capacity groups.(IFC, 2206.2.3(3)) <p>(IFC, Table 2206.2.3)</p>
<p>Piping</p>	<ul style="list-style-type: none"> • 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) 	<p>All Aboveground Tanks (IFC,2206.6):</p> <ul style="list-style-type: none"> • 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) • Supports (IFC,3403.6.8), joints IFC,3403.6.10), FRP provisions

<p>Dispensers</p>	<ul style="list-style-type: none"> • 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 shutoff valve, incorporating a fusible link or other thermally actuated device, shall be installed. (30A 6.3.9) • With suction systems where a gravity head is produced on the dispensing device, a listed vacuum-actuated shutoff valve with a shear section or equivalent valve, shall be installed directly under dispensing device (30A 6.3.10) 	<ul style="list-style-type: none"> • Unless all piping is visible, listed pressure pump shall have a listed leak detection device installed on its discharge side (IFC,2206.7.7.1) • Fuel shall not be dispensed from the tank by either gravity flow or pressurization of the tank. (IFC,2206.7.8) • Provide an approved automatic emergency shutoff valve to close in the event of a fire or impact in the liquid supply line at the base of each dispenser supplied by a remote pump.(IFC,2206.7.4)
<p>Tank Filling Operations</p>	<p>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)</p>	<ul style="list-style-type: none"> • 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).
<p>Miscellaneous</p>	<ul style="list-style-type: none"> • Requirements for fuel dispensing devices (30A, Chapter 6), electrical equipment (30A,Chapter 8), vapor recovery and processing systems (30A, 5.6 & Chapter 10), and operational requirements (30A,Chapter 9). • Testing provisions for secondary containment are given. (30A,5.4) • Listed automatic-close nozzles required.(30A,6.6) • Accurate inventory control records shall be maintained and reconciled. (30A,9.2.1) 	<p>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.</p>

Footnotes

1. Section 4-3.2.7 of NFPA 30A enables existing tanks up to 6,000 gallon 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 4.3.2.3.3 (Alarm at 90% & stop flow at 95%) of 2003 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, 4.2.5.2.1)
 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 & 4.3.3.2(5))

NFPA 30A	National Fire Protection Association Standard 30A, 2003 Edition, Code for Motor Fuel Dispensing Facilities and Repair Garages
NFPA 30	National Fire Protection Association Standard 30, 2003 Edition, Flammable and Combustible Liquids Code
NFPA 1	National Fire Protection Association Standard 1, 2006 Edition, Uniform Fire Code™ . Please note that this edition refers to the 2003 NFPA 30A for all its requirements relating to ASTs at Motor Fuel Dispensing Stations
IFC	International Fire Code , 2006 Edition

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