

Code Requirements for ASTs at Motor Vehicle-Dispensing Stations

This table compares aboveground storage tank requirements in the 2015 edition of NFPA 30A, to the 2015 International Fire Code (IFC). Please note that 2015 NFPA 1 references the 2015 NFPA 30A for all its requirements relating to ASTs at Motor Fuel Dispensing Stations. These are the three (NFPA 30A, NFPA 1, and 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 2015 EDITION	IFC 2015 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 21, 22 and 27 of 2015 NFPA 30, and for tanks other than tanks in vaults, 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 liquids shall be in accordance with Chapter 57 (Flammable and Combustible Liquids Chapter) and as provided by Section 2306.2.3. Outside storage of Class I liquid fuels shall be in Protected aboveground tanks with required listing and labeling of tanks (IFC: 2306.2.3(1)). Outside storage of Class II or IIIA liquid fuels shall be in Protected aboveground tanks or, when approved by the AHJ, other aboveground tanks that comply with Chapter 57 (IFC: 2306.2.3(2)). Outside storage of Class IIIB liquid fuels shall be in listed UL 142 or protected aboveground tanks that comply with Chapter 57 (IFC: 2306.2.3(5)). Protected aboveground tank separation requirements are listed in Table 2306.2.3. Aboveground tanks are allowed in vaults aboveground or below grade (IFC: 2306.2.4). Special enclosures for tanks are allowed, in order to overcome impractical conditions (IFC: 2306.2.6).
Terminology	<ul style="list-style-type: none"> Fire-Resistant Tank: An atmospheric aboveground storage tank with thermal insulation that has been evaluated for resistance to physical damage; 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: 22.2.1 and 30A: 3.3.15.2). Protected Aboveground Tank. An atmospheric aboveground storage tank with integral secondary containment and thermal insulation that has been evaluated for resistance to physical damage; 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: 22.2.3 and 30A:3.3.15.3). 	<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: 202). Special Enclosures: Enclosures constructed in accordance with Section 2306.2.6². Vaulted Tank: Vaults shall be listed in accordance with UL 2245 or, when approved, constructed on-site in accordance with the International

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Terminology (cont.)	<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 and liquid detection systems, including onsite audible and visual warning devices with battery backup (30A:4.3.3. through 4.3.3.9). Vaults with Class I liquids require exhaust ventilation (30: 25.10 thru 25.10.6; 30A: 4.3.3.6 thru 4.3.3.6.6) ³. 	<ul style="list-style-type: none"> Building Code, Section 1707. The design shall bear the stamp of a Professional Engineer. Special inspections are required. IFC Section 5704.2.8.2 sets out 18 conditions for vaulted tank compliance. Vaults with Class I liquids require exhaust ventilation.³
Installation	<ul style="list-style-type: none"> See the Approval/General Provisions row in this Table for additional information. NFPA 30 provides additional requirements for aboveground tank systems spillage control, normal and emergency venting, corrosion control, tank construction, supports and foundation, flooding, and testing and 	<ul style="list-style-type: none"> Fuel dispensing systems are to be installed in accordance with Chapter 23, which incorporates all the motor fuel dispensing facilities controls. Tank installations are to be in accordance with Chapter 57, as modified by Chapter 23.
Maximum Capacities	<ul style="list-style-type: none"> Tanks storing liquid motor fuels 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 liquids. (IFC: 2306.2.3(3)). Vaults at Public Motor Fuel- Dispensing Facilities: (Gallons) For tanks storing Class I and Class II liquids: 15,000 individual, 48,000 aggregate (IFC: 2306.2.4.1). Vaults at Fleet Vehicle Motor Fuel-Dispensing Facilities: (Gallons) For tanks storing Class II and Class IIIA liquids: 20,000 individual, 80,000 aggregate (IFC: 2306.2.4.2). Special Enclosures: (Gallons) 6,000 individual, 18,000 aggregate (IFC: 2306.2.6(6)). Other Aboveground Tanks: When approved by the AHJ, tanks shall comply with Chapter 57 at the same capacities as for protected tanks noted above (IFC: 2306.2.3(2) and (3)).
Overfill/Spill Prevention	<ul style="list-style-type: none"> Overfill: Alarm at 90% capacity; automatic shut-off at 98% capacity; 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: Min. 5 gallons (IFC,2306.6.2.6). 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: 5704.2.9.7.5). Aboveground Steel Tanks: Overfill: an approved means or method shall be provided (such as Section 5704.2.9.7.7).

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Physical Protection	<ul style="list-style-type: none"> 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 through 4.3.7.2). 	<ul style="list-style-type: none"> ASTs shall be safeguarded from public access in an approved manner (IFC: 2306.3). 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: 5704.2.9.7.4 and 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 22.11.4.1 of 2015 NFPA 30 limits such a tank to a max. of 50,000 gallons. Means shall be provided to prevent release of liquid by siphon flow (30A: 4.3.6.4 and 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 vents⁵ (30: 22.11.4.8). The interstitial space shall be tested with air pressure, vacuum, or hydrostatics at the specified limits. This tightness testing shall not be required for tanks that continue to maintain a factory-applied vacuum (30: 21.5.2). Tightness testing with air pressure shall not be allowed on tanks that contain flammable or combustible liquids or vapors (30:21.5.2.2). 	<ul style="list-style-type: none"> Aboveground Tanks: Section 2306.5 refers to Chapter 57 for drainage control or diking. Not required for listed secondary containment tanks. Enclosed secondary containment required to have emergency venting. Drainage and Diking: Section 5704.2.10 - 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 5704.2.9.7.3 - 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.
Emergency Venting	<ul style="list-style-type: none"> Tanks shall be permitted to operate at pressures from atmospheric to a gauge pressure of 1.0 psi and shall be limited to a gauge pressure of 2.5 psi under emergency venting conditions. (30: 21.4.2.1.4). Every aboveground storage tank shall have emergency relief venting in the form of construction or a device or devices that will relieve excessive internal pressure caused by an exposure fire (30: 22.7.1.1). Applies to: <ul style="list-style-type: none"> Each compartment of a compartmented tank, the interstitial space (annulus) of a secondary containment-type tank, and the enclosed space of tanks of closed-top dike construction (30: 22.7.1.1.1) 	<ul style="list-style-type: none"> Emergency venting shall be installed and maintained in accordance with Section 22.7 of 2015 NFPA 30 (IFC, 5704.2.7.4): <ul style="list-style-type: none"> Tanks storing Class IIIB liquids and that are larger than 12,000 gallons (45,420 L) in capacity which are not within the diked area or the drainage path of Class I or II liquids do not require emergency relief venting (IFC: 5704.2.7.4 Exception #1). Emergency vents for Class I, II and IIIA liquids shall not discharge inside buildings (IFC: 5704.2.7.4): <ul style="list-style-type: none"> Emergency vents on Protected above-ground tanks complying with UL 2085 containing Class II or IIIA liquids are allowed to discharge inside the building (IFC: 5704.2.7.4 Exception #2).

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Emergency Venting (cont.)	<ul style="list-style-type: none"> Spaces or enclosed volumes, such as those intended for insulation, membranes, or weather shields, that are capable of containing liquid due to a leak from the primary vessel. The insulation, membrane, or weather shield shall not interfere with emergency venting (30: 22.7.1.1.2). <p>Tanks storing Class IIIB liquids and that are larger than 12,000 gal (45,400 L) capacity and are not within the diked area or the drainage path of tanks storing Class I or Class II liquids shall not be required to meet the requirements of 2015 NFPA 30 Section 22.7.1.1 (30: 22.7.1.1.3).</p> <ul style="list-style-type: none"> Except as provided for in 2015 NFPA 30 Sections 22.7.3.5, 22.7.3.6 and 22.7.3.7, the total emergency relief venting capacity of both normal and emergency venting devices shall be not less than that determined in Table 22.7.3.2 (30: 22.7.3.2). Weak roof-to-shell seams are no longer allowed as a means of emergency venting for shop-fabricated atmospheric tanks, such as tanks built to UL 142 (30: 22.7.2).⁸ For tanks in vaults, emergency vents shall be vapor-tight and shall be permitted to discharge inside the vault. Long-bolt manhole covers shall not be permitted for this purpose (30A: 4.3.3.5.2). For Fire-Resistant tanks and Protected tanks, reduction in sizing of the emergency vents in accordance with Section 22.7.3.5 of 2015 NFPA30 shall not be permitted (30A: 4.3.4(2) and 4.3.5.1(2); 30: 22.9.2(2) and 22.10.2(2)). Emergency venting devices shall have the flow capacity at the pressure at which the valve reaches the full open position either stamped or cast into the metal body of the device or included on a metal nameplate permanently affixed to it. (30: 22.7.3.10) 	<ul style="list-style-type: none"> For tanks in vaults, emergency vents shall be vapor-tight and shall be allowed to discharge inside the vault. Long-bolt manhole covers shall not be allowed for this purpose (IFC: 5704.2.8.14). For Protected tanks, emergency venting shall be provided in accordance with Section 5704.2.7.4. The vent capacity reduction factor shall not be allowed (IFC: 5704.2.9.7.2). <p>For Protected tanks, flame arresters or pressure-vacuum breather valves are required only for tanks storing Class I flammable liquids (IFC: 5704.2.9.7.3).</p>
Separation Distance	<ul style="list-style-type: none"> Protected Tank, less than 6,000 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 Tank⁷: 0-15,000 gal. Individual tank capacity 	<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 0' to fuel dispenser for Class IIIB liquids

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Separation Distance (cont.)	<ul style="list-style-type: none"> • Fire-Resistant Tank: 50' from property line 25' from building or public way 3' between each tank 25' from fuel dispensers⁶ • 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 (30A: Table 4.3.2.4) 	<ul style="list-style-type: none"> • Protected Tank, greater than 6,000 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 0' to fuel dispenser for Class IIIB liquids • 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: 2306.2.3(3)).
Piping	<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 to relieve pressure generated by thermal expansion (30A: 4.3.6.5). • Pipe shall be protected from physical damage (30A:5.2.2). 	All Aboveground Tanks (IFC,2306.6): <ul style="list-style-type: none"> • Openings in tank top only (IFC: 2306.6.2.1) • Anti-siphon device required (IFC: 2306.6.2.4) • Corrosion and galvanic protection (IFC: 5703.6.5). • Piping supports (IFC: 5703.6.8). • Pipe joints (IFC: 5703.6.10).
Dispensers	<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 and 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). • For 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). • For suction systems where a gravity head is present 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). • Requirements for listing of fuel dispensing systems for alcohol-blended motor fuels (30A: 6.2.3). 	<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: 2306.7.7.1). • Fuel shall not be dispensed from the tank by either gravity flow or pressurization of the tank (IFC: 2306.7.8). • Provide an approved automatic emergency shutoff valve in the liquid supply line at the base of each dispenser supplied by a remote pump, to close in the event of a fire or impact (IFC: 2306.7.4). • Requirements for the design, construction and maintenance of motor vehicle fuel-dispensing stations dispensing alcohol blended fuels (IFC: 2306.8).
Tank Filling Operations	Minimum separation of delivery vehicle by 25' for Class I and 15' for Class II or Class III liquids. No minimum separation required for tanks filled by gravity. Liquid-tight connections required. Delivery must meet applicable requirements of NFPA 385 (30A: 9.2.2.1, 9.2.2.2 and 9.2.2.5 through 9.2.2.5.2).	<ul style="list-style-type: none"> • Fill pipe provided with a means of direct, closed connection (IFC: 2305.1.3, 5704.2.9.7.7 and 5706.6.1.10). • 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: 2305.1.1).

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Miscellaneous	<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: 5.7 and 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, and 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). 	<ul style="list-style-type: none"> Detailed construction documents and site plan required. Requirements for listed pumps, fuel dispenser, installation, 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.

Footnotes

- Section 4.3.2.7 of NFPA 30A permits **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.
- For tanks containing Class I, II or III liquids, special enclosure maximum capacities are 6,000 gallons individual and 18,000 gallons aggregate (IFC: 2306.2.6(6)).
- Vaults with Class I liquid storage shall be ventilated at a rate not less than one cfm per square foot of floor area, but not more than 150 cfm. (30A: 4.3.3.6.1; IFC: 5704.2.8.9).
- 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% and stop flow at 95%) of 2015 NFPA 30 are met for control of spillage.
- Emergency vents are also required for each a) tank compartment, b) 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 due to a leak from the primary vessel and can inhibit venting during exposure (see the Emergency Venting row in the Table for additional information).
- 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).
- 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 and Sec. 4.3.3.3.1.3; IFC: 5704.2.8.7).
- Tanks designed to UL142 after December 2006 are not permitted to use "weak shell to roof design" for emergency venting.

NFPA 30A	National Fire Protection Association Standard 30A, 2015 Edition, Code for Motor Fuel Dispensing Facilities and Repair Garages
NFPA 30	National Fire Protection Association Standard 30, 2015 Edition, Flammable and Combustible Liquids Code
NFPA 1	National Fire Protection Association Standard 1, 2015 Edition, Fire Code™ . Note that this edition refers to the 2015 NFPA 30A for all its requirements relating to ASTs at Motor Fuel Dispensing Stations
IFC	International Fire Code , 2015 Edition. Note that this edition references the 2015 NFPA 30A and the 2012 NFPA 30 (not the 2015 edition) under IFC Chapter 80, "Referenced Standards".

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