

**COLORADO DEPARTMENT OF
LABOR AND EMPLOYMENT**

DIVISION OF OIL AND PUBLIC SAFETY

**RETAIL NATURAL GAS (CNG/LNG)
REGULATIONS**

7 CCR 1101-16

Effective: September 15, 2018



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ARTICLE 1 GENERAL PROVISIONS

Section 1-1 Basis and Purpose

The basis and purpose of these regulations is to set forth minimum standards for the design, construction, location, installation and operation of retail natural gas fueling facilities, including mobile refueling vehicles and equipment, which are reasonably necessary for the protection of the health, welfare and safety of the public and persons using such materials.

Section 1-2 Technical Rationale

The technical requirements of these regulations are based on generally accepted national and international codes and standards governing the minimum levels of acceptability for inspections, specifications, shipment notification, record keeping, labeling of containers, use of meters or mechanical devices for measurement, submittal of installation plans and minimum standards for the design, construction, location, installation and operation of retail natural gas systems, including mobile refueling vehicles and equipment.

Section 1-3 Statutory Authority

These regulations are created pursuant to 8-20-102 and 39-27-123 of the Colorado Revised Statutes.

Section 1-4 Effective Date

These regulations shall be effective on September 15, 2018. The previous version of these regulations was effective January 31, 2014.

Section 1-5 Codes and Standards

Section 1-5-1 Codes incorporated by reference

The following codes are incorporated by reference.

- (a) [NFPA 52, Vehicular Gaseous Fuel Systems Code](#), 2016 edition.
- (b) [NFPA 30-A, Code for Motor Fuel Dispensing Facilities & Repair Garages](#), 2018 edition.
- (c) [NIST Handbook 44 Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices](#), 2018 edition.
- (d) [NIST Handbook 130 Uniform Laws and Regulations in the Areas of Legal Metrology and Engine Fuel Quality](#), 2018 edition.

All NFPA codes incorporated by reference may be purchased from:
National Fire Protection Association
1 Batterymarch Park
Quincy, Massachusetts 02169-7471
1-800-344-3555
www.nfpa.org

All NIST codes incorporated by reference may be purchased from:
National Institute of Standards and Technology
100 Bureau Drive
Gaithersburg, Maryland 20899
303-975-4004
www.nist.gov

For free download: www.nist.gov/pml/weights-and-measures/publications/nist-handbooks

Section 1-5-2 Inspection of incorporated codes

Interested parties may inspect and obtain copies of excerpts of the referenced incorporated materials for a reasonable charge by contacting the Division of Oil and Public Safety at 633 17th Street, Suite 500, Denver, CO 80202 or 303-318-8525.

Section 1-5-3 Later amendments not included

These regulations do not include later amendments to or editions of the incorporated material.

Section 1-6 Definitions

Terms in these regulations shall have the same meaning as those found in Title 8, Article 20 and Title 9, Article 4 of the Colorado Revised Statutes. In addition, unless the context otherwise requires:

ASME International – *ASME International* was formerly the American Society of Mechanical Engineers (ASME).

British Thermal Units or BTU – Means a scientific unit of measurement equal to the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at approximately sixty degrees Fahrenheit.

Compressed Natural Gas (CNG) - Means natural gas which has been compressed and dispensed into fuel storage containers and is suitable for use as an engine fuel.

CNG DGE - 1 CNG DGE is equal to 6.384 lbs (2.895 kg) of CNG.

CNG GGE - 1 CNG GGE is equal to 5.660 lbs (2.567 kg) of CNG.

Condemned – Means a *condemned container assembly and piping system* which is determined by a state inspector to be so unsafe that further use is prohibited until it is satisfactorily repaired or replaced.

Container Assembly – Includes US Department of Transportation (DOT) and ASME containers, commonly known as tanks or cylinders.

CRS – Means the Colorado Revised Statutes.

Division – Means the *Division of Oil and Public Safety*, which is the regulatory agency of the Colorado Department of Labor and Employment having jurisdiction over retail natural gas systems per the provisions of CRS 8-20-102 (3).

Existing Installation – Includes any natural gas container assembly and piping system at a natural gas fueling facility that has been placed into service prior to the effective date of these regulations and/or has received its initial inspection by a state inspector.

Gallon Equivalent – Means either a gallon diesel equivalent or a gallon gasoline equivalent.

Gallon Diesel Equivalent – Also known as **Diesel Gallon Equivalent (DGE)** - Means an amount of a motor fuel that contains an average lower heating value of one hundred twenty-eight thousand (128,000) BTUs but in no case contains a lower heating value of less than one hundred twenty-four thousand (124,000) BTUs. -

Gallon Gasoline Equivalent – Also known as **Gasoline Gallon Equivalent (GGE)** - Means an amount of a motor fuel that contains an average lower heating value of one hundred fourteen thousand (114,000) BTUs, but in no case contains a lower heating value of less than one hundred ten thousand (110,000) BTUs. -

Liquefied Natural Gas (LNG) – Means natural gas that has been liquefied at -259°F (-126.1°C) and stored in insulated cryogenic tanks for use as an engine fuel.

LNG DGE – 1 LNG DGE is equal to 6.059 lbs (2.748 kg) of LNG.

Mobile Refueling – Means the use of a United States DOT-approved vehicle or mobile equipment on-site with tank(s) and/or pump(s) that dispenses natural gas engine fuel directly to vehicles, storage vessels/cylinders or secondary refueling equipment.

Natural Gas – Means compressed natural gas (CNG) or liquefied Natural Gas (LNG) as defined by this regulation.

Natural Gas Fueling Facility – Means a facility that has a natural gas container assembly and piping system, including mobile refueling equipment, which is used for retail motor vehicle fueling.

New Installation – Means any natural gas container assembly and piping system at a natural gas fueling facility that has been placed into service after the effective date of these regulations and/or has not received its initial inspection by a state inspector.

NFPA – Means the National Fire Protection Association.

NIST – Means the National Institute of Standards and Technology.

Piping System – Means pipe, tubing, hose and flexible connectors with valves and fittings made into complete systems for conveying natural gas from one point to another within a retail natural gas fueling facility.

Proved – Means the act of having verified the accuracy of meters used to measure fuel and petroleum products using a “prover”.

Prover – Means a calibrated volumetric receiver or mechanical device traceable to NIST standards.

Registered Serviceperson – Means any individual who for hire, award, commission or any other payment of any kind installs, services, repairs or reconditions a commercial weighing or measuring device and who voluntarily registers with the division.

Registered Service Agency (RSA) – Means any agency, firm, company or corporation that for hire, award, commission or any other payment of any kind installs, services, repairs or reconditions a commercial weighing or measuring device and that voluntarily registers with the division. Under agency registration, identification of individual servicepersons shall be required.

Retail – Means the sale of CNG or LNG from a fixed location or by means of mobile refueling equipment or vehicles, such as at a fueling station, in small or individual quantities for direct consumption by the purchaser.

State Inspector – Means a person who is employed or authorized by the division to perform inspections of retail natural gas fueling facilities.

Section 1-7 Applicability

The regulations contained herein shall apply to the installation and operation of all retail natural gas systems when used for motor vehicle fueling.

Section 1-8 Condemning a Natural Gas Container Assembly and Piping System

- (a) Conditions which a state inspector may determine to be unsafe include: bypassed safety controls, inoperative relief valves, any gas leak from a natural gas container assembly or piping system, missing nameplate or any other condition deemed by a state inspector to be unsafe based on codes adopted by this regulation. A container assembly or piping system that meets any condition

described above may be condemned by a state inspector.

- (b) The owner or user must shut down the condemned natural gas container assembly and piping system as directed by a state inspector. If neither the owner nor user is available, a state inspector will shut the system down.
- (c) A state inspector will affix a notice to a condemned natural gas container assembly and piping system stating that it has been condemned and may not be used until satisfactory repairs are made, as determined by a re-inspection by a state inspector or other person authorized by the division.

ARTICLE 2 INSTALLATION

Section 2-1 General Requirements

- (a) All new retail natural gas installations shall be operated and maintained in accordance with the codes adopted by this regulation, including any retroactive requirements adopted by the division at the time of installation.
 - (1) Unless otherwise specified, the provisions of these regulations are not intended to require upgrading facilities, equipment, structures or installations that existed or were approved for construction or installation prior to the effective date of these regulations. Where specified, the provisions of these regulations shall be retroactive.
 - (2) If after inspection the division determines that an existing situation presents an unacceptable degree of risk, the division shall be permitted to apply retroactively any portion of the applicable codes listed in section 2-1 (a), as deemed appropriate.
- (b) Local Authorities Having Jurisdiction, including Fire Departments and building code officials, may enforce more stringent requirements, including alternate codes and regulations. These requirements may include but are not limited to the following.
 - (1) Plan review and permitting for new natural gas fueling facilities.
 - (2) Access to natural gas fueling facilities for the purpose of conducting inspections.
 - (3) Delivery into containers located at natural gas fueling facilities.

Section 2-2 Installation Permits

- (a) Plans for all new retail natural gas installations, including mobile refueling equipment used for motor vehicle fueling, shall be submitted to and approved by the division before construction of such installations begins.
 - (1) Plans for the installation of new container assembly and piping systems, including mobile refueling equipment, at existing retail natural gas fueling facilities shall be submitted to the division for approval before construction of such installation begins.
 - (2) Modifications to fuel stations including, but not limited to, increases in working pressure or dispensing pressures shall be subject to a complete review in accordance with that required with a new installation to include a notification of any supplying utility.
 - (3) Plans for change of service of existing natural gas fueling facilities from non-retail service shall be submitted to the division for approval before any such change of service occurs.
 - (4) It is not necessary to submit plans for the repair, replacement or upgrade of compression,

drying, or other ancillary equipment.

(b) The permit procedures are as follows.

- (1) The permit application shall be submitted using an application form provided by the division.
- (2) The application shall include a plot plan containing all elements required by the division.
- (3) The division may deny the application if the proposed installation does not conform to division statutes, to regulations or to codes adopted by the division, or if the application is incomplete or determined to be inaccurate.
- (4) Construction and installation of drying, compression, storage, piping, dispensing and all other associated equipment shall conform to the code(s) in effect at time of installation.
- (5) The division may revoke a permit if construction is not performed per the approved permit or if the construction fails to meet operating or fire safety regulations established by the division or by the applicable NFPA Code.
- (6) An installation permit approved by the division is automatically revoked if construction does not begin within 6 months of approval, unless a written request for an extension is submitted to and approved by the division.

Section 2-3 Access Requirements

- (a) The division may inspect a retail natural gas system at any time during its construction. Access shall be provided to the division or its agent for such purpose upon request.
- (b) After a retail natural gas system has been installed, the division may inspect the system to verify compliance with design, construction, location, installation and operation requirements. Natural gas fueling facility owners, tank owners, and owners of locations where a natural gas system is installed shall grant inspection access to the division or its agent for such purpose upon request.

ARTICLE 3 DISPENSING AND FUEL QUALITY

Section 3-1 Retail Dispensing of Natural Gas

All retail dispensing of natural gas used as a motor vehicle fuel from either fixed equipment or mobile refueling equipment, including vehicles, shall be operated and maintained in accordance with the applicable requirements of the codes adopted by this regulation.

Section 3-2 Retail Motor Fuel Dispensers Inspection and Testing

- (a) All retail motor fuel dispensers (RMFDs) shall be suitable for their intended use, properly installed accurate and maintained in that condition by their owner/operator.
- (b) All RMFDs shall have an active National Type Evaluation Program (NTEP) Certificate of Conformance (CC) prior to installation or use for commercial purposes.
- (c) All RMFDs shall be capable of displaying delivered quantity in units of mass for calibration purposes. All adjustments and calibrations of RMFDs shall be made utilizing mass measurement standards.
- (d) The division shall be notified when any new, repaired or remanufactured RMFD is placed in service at a new or existing installation.

- (1) Notification shall be submitted using a placed in service report provided by the division.
- (e) No owner/operator of any RMFD shall use the RMFD for the measurement of natural gas unless it has been proved in a manner acceptable to the division and sealed as correct by a state inspector or registered service agency.
- (1) All RMFDs shall be proved and sealed as correct on an annual basis by either a state inspector or registered service agency.
- (f) Containers used for proving CNG meters shall be manufactured, inspected, marked, tested, retested, equipped and used in accordance with all provisions of NFPA 52 including the following:
- (1) Containers shall be fabricated of steel, aluminum, or composite materials.
 - (2) The container shall be designed for CNG service.
 - (3) The container shall be permanently marked "CNG" by the manufacturer.
 - (4) Containers manufactured prior to the effective date of this code shall be permitted to be used in CNG service if recommended for CNG service by the container manufacturer or if approved by the authority having jurisdiction.
- (g) Cylinders shall be manufactured in accordance with both of the following:
- (1) ANSI NGV 2, *Compressed Natural Gas Vehicle (NGV) Fuel Containers*, specifically for CNG service
 - (2) U.S. Federal Motor Vehicle Safety Standard, 49 CFR 571.304, *Compressed Natural Gas Fuel Container Integrity*
- (h) Cylinders that have reached the labeled expiration date shall be removed from service.
- (i) Composite reinforced cylinders or other cylinders marked with exemption or special permit numbers shall be removed from service.
- (j) Containers used for proving LNG meters shall be designed, fabricated, tested and marked (or stamped) in accordance with all of the provisions of NFPA 52 including the following:
- (1) The Regulations of DOT Specification 4L or the "Rules for the Construction of Unfired Pressure Vessels," ASME *Boiler and Pressure Vessel Code*, applicable at the date of manufacture.
 - (2) LNG containers that are in contact with LNG or cold LNG vapor shall be physically and chemically compatible with LNG and designed for service at -260°F (-162°C).
 - (3) Container appurtenances shall have a rated working pressure not less than the maximum allowable working pressure of the container.
 - (4) For vacuum insulation, the inner tank, outer tank, and internal lines shall be tested for vacuum leaks prior to installation on the vehicle.
 - (5) **Heat Leak.** The manufacturer shall identify the maximum operating design pressure of the container.
 - (6) The construction of the container shall be such that the unrelieved pressure inside the container will not exceed the maximum allowable working pressure of the container within a 72 hour period after the container has been filled to its maximum filling volume with LNG stabilized at the designed operating pressure and temperature equilibrium has been established.
 - (7) The ambient temperature during the 72 hour period shall be 70°F (21°C).

(k) ASME Compliance for CNG and LNG Containers

- (1) Pressure vessels shall be manufactured, inspected, marked, and tested in accordance with ASME *Boiler and Pressure Vessel Code*, Section VIII or Section X.
- (2) Adherence to applicable ASME *Boiler and Pressure Vessel Code* case interpretations and addenda shall be considered as compliant with the ASME *Boiler and Pressure Vessel Code*.
- (3) Pressure vessels manufactured to the requirements of the ASME *Boiler and Pressure Vessel Code* shall be registered with the National Board of Boiler and Pressure Vessel Inspectors.
- (4) The repair or alteration of an ASME pressure vessel shall comply with the requirements of NB-23, *National Board Inspection Code*.
- (5) Other welding or brazing shall be permitted only on saddle plates, lugs, or brackets attached to the pressure vessel by the pressure vessel manufacturer.
- (6) The exchange or interchange of pressure vessel appurtenances intended for the same purpose shall not be considered a repair or alteration.

(l) Means shall be provided at the natural gas fueling facility to return all natural gas product used for proving meters back to the compression and storage equipment or other receiving vessel when proving is completed.

(m) If unable to return product to the compression and storage equipment, and if venting of product to the atmosphere is necessary, the following requirements shall apply.

- (1) The venting shall be performed only by trained personnel using an approved method of atmospheric venting and following written procedures.
- (2) A valve shall be used to control the discharge of gas from the proving container.
- (3) Direct gas venting shall be done through a vent tube that diverts the gas flow to the atmosphere in a safe direction at least 10 feet above grade, clear of personnel, adjacent structures and ignition sources and meeting approval of the authority having jurisdiction.
- (4) Venting at ground level (grade) is not permissible.
- (5) The vent tube shall have a gas-tight connection to the container prior to venting.
- (6) All components of the vent tube shall be grounded.
- (7) The vent tube shall be constructed of Schedule 80 pipe of at least 2 in. diameter.
- (8) The vent tube shall not be provided with any feature that limits or obstructs gas flow.
- (9) The venting function shall be manually controlled.
- (10) Personnel performing venting shall do the following.
 - (A) Use grounding to prevent static electric charge buildup.
 - (B) Limit the rate of gas release from plastic-lined containers to a value not greater than that specified by the container manufacturer.
 - (C) Restrain containers during venting to prevent container movement.

(n) If any RMFD fails to comply with any of the provisions of this regulation, a state inspector shall seal it in such a manner as to prohibit its use, and it shall remain sealed until it complies with all of the provisions of this regulation.

- (1) When an RMFD is brought back into compliance with this regulation, it must be placed back in service by a state inspector or registered service agency.
- (o) All RMFDs shall comply with the minimum standards as prescribed by the applicable sections of the codes adopted by this regulation except as modified or rejected by this regulation or by the division.
- (p) In addition to the requirements of Section 3-2 (a) through (e), all RMFDs dispensing natural gas in terms of gallon equivalents used for motor vehicle fuel shall meet the requirements of CRS 8-20-232.5.
- (q) All measuring devices installed on mobile refueling equipment including vehicles shall meet the requirements of Section 3-2 (a) through (g), Section 3-3, and Section 3-4.

Section 3-3 Retail Dispensers for Compressed Natural Gas (CNG)

- (a) For the purposes of this regulation, compressed natural gas shall be identified by the term "Compressed Natural Gas" or "CNG." This is spelled out in the definition.
- (b) All CNG kept, offered or exposed for sale and sold at retail as a vehicle fuel shall be measured in terms of mass (pounds or kilograms), and indicated in the gasoline gallon equivalent (GGE), diesel gallon equivalent (DGE) units, or mass (pounds or kilograms).
- (c) Each retail dispenser of CNG shall be labeled as "Compressed Natural Gas."
- (d) All retail CNG dispensers shall be labeled with the gallon equivalent conversion factor in terms of pounds or kilograms. The label shall be permanently and conspicuously displayed on the face of the dispenser and shall have either the statement "1 CNG Gasoline Gallon Equivalent (GGE) is equal to 5.660 lbs (2.567 kg) of CNG" or "1 CNG Diesel Gallon Equivalent (DGE) is equal to 6.384 lbs (2.895 kg) of CNG" consistent with the method of sale used.
- (e) CNG shall be dispensed into vehicle fuel containers with working pressures of 3,600 PSI (24,821 kPa). The dispenser shall be labeled 3,000 PSI (20,684 kPa), or 3,600 PSI (24,821 kPa) corresponding to the pressure of the CNG dispensed by each fueling hose.
- (f) NFPA labeling requirements also apply. Refer to NFPA 52.
- (g) CNG fueling nozzles for use with vehicles less than 10,000 lbs (4,500kg) GVWR shall comply with ANSI/AGA/CGA NGV 1.
- (h) Alternate nozzles than those described in Section 3-3 (g) used for fueling larger vehicles such as buses and trucks shall be designed to prevent the connection of a lower service pressure vehicle to a higher service pressure source.

Section 3-4 Retail Dispensers for Liquefied Natural Gas (LNG)

- (a) For the purposes of this regulation, liquefied natural gas shall be identified by the term "Liquefied Natural Gas" or "LNG."
- (b) All LNG kept, offered, or exposed for sale and sold at retail as a vehicle fuel shall be measured in mass (pounds or kilograms) and indicated in diesel gallon equivalent (DGE) units or mass (pounds or kilograms).
- (c) Each retail dispenser of LNG shall be labeled as "Liquefied Natural Gas."
- (d) All retail LNG dispensers shall be labeled with the gallon equivalent conversion factor in terms of pounds or kilograms. The label shall be permanently and conspicuously displayed on the face of the dispenser and shall have the statement "1 LNG Diesel Gallon Equivalent (DGE) is equal to 6.059 lbs (2.748 kg) of LNG."

- (e) LNG automotive fuel shall be labeled with its automotive fuel rating in accordance with 16 CFR Part 306 (e.g. *LNG 95% Methane*).
- (f) NFPA Labeling requirements also apply. Refer to NFPA 52.

Section 3-5 Product Quality

- (a) CNG shall meet the requirements of NFPA 52 Vehicular Gaseous Fuel Systems Code, for product quality and odorization.
- (b) In addition to the requirements of Section 3-5 (a), CNG and LNG shall have a minimum methane content of not less than 80%.
- (c) The BTU content of natural gas gallon equivalents shall meet the following requirements: -
 - (1) A CNG GGE shall contain a lower heating value of not less than 110,000 BTUs.
 - (2) A CNG DGE shall contain a lower heating value of not less than 124,000 BTUs.
 - (3) An LNG DGE shall contain a lower heating value of not less than 124,000 BTUs.
- (d) All equipment, including filters and strainers, used to prevent any foreign material, including compressor oil or water, from being dispensed into a vehicle container, shall be periodically serviced and maintained.
- (e) Any shipper of natural gas products to be used for retail motor fuel,-who ships such product into the state of Colorado or ships natural gas products from one point within the state to another point within the state shall make records of such shipments available to the division upon request.

ARTICLE 4 DELIVERY INTO RETAIL NATURAL GAS SYSTEMS

Section 4-1 Delivery

- (a) No owner/operator of a retail natural gas fueling facility shall allow natural gas to be delivered into the following:
 - (1) An improperly installed container assembly or piping system installed at a natural gas fueling facility.
 - (2) A container installed at a natural gas fueling facility that does not have a proper ASME nameplate.

ARTICLE 5 ACCIDENT REPORTS AND INVESTIGATIONS

Section 5-1 Reportable Accidents

- (a) Accidents, fires, explosions, injuries, damage to property or loss of life resulting from the storage or dispensing of CNG or LNG at retail natural gas fueling facilities shall be reported to the division within 24 hours after their occurrence.

(b) Subsection (a) of this Section includes accidents resulting from the improper use or installation of compression, storage and dispensing equipment or equipment failure at retail natural gas fueling facilities.

(1) The division may investigate such occurrences and shall maintain a written record of findings, which shall be available for public examination.

Section 5-2 Reporting Requirements

(a) The following persons are required to notify the division of an accident that meets any of the criteria of Section 5-1.

(1) Owner/operator or other representative of the retail natural gas fueling facility.

(b) Accidents may be reported by telephone or email using the following information:

(1) Telephone: 303-318-8547

(2) Email: cdle_oil_inspection@state.co.us

(c) The accident report shall include, at minimum, the following information.

(1) The names of the owner/operator and person making the report and their telephone numbers.

(2) The date, time and location of the accident.

(3) The number of fatalities and personal injuries.

(4) All other significant facts known by the person making the report that are relevant to the cause of the accident or extent of the damages.