FIRE DEPARTMENT • CITY OF NEW YORK

STUDY MATERIAL FOR THE EXAMINATION FOR CERTIFICATE OF FITNESS FOR

G-29

SUPERVISION OF PIPED COMPRESSED FLAMMABLE GAS SYSTEM (CITYWIDE)

This book is provided to the public for free by the FDNY.

- THIS IS A SUPPLEMENTAL STUDY GUIDE FOR CERTIFICATE OF FITNESS G-91 (SUPERVISION OF NATURAL GAS CO-GENERATION SYSTEM) AND SHOULD BE REGARDED AS PART OF G-91 STUDY MATERIAL.

- FOR THOSE INDIVIDUALS WHO ARE WORKING OR ARE SEEKING TO WORK IN A COGENERATION PLANT, THIS IS A SUPPLEMENTAL STUDY GUIDE AND SHOULD BE REGARDED AS PART OF G-91 STUDY MATERIAL.

Contents

EXAM SPECIFIC INFORMATION FOR G-29 CERTIFICATE OF FITNESS

Save time and submit application online!

Applicants who submitted and paid online for an exam before arriving at the FDNY will not need to wait in line to enter the FDNY.

It can take about 30 minutes to complete. Completing application and paying online will eliminate waiting outside in the long lines.

Simplified instructions for online application and payment can be found here:
http://www1.nyc.gov/assets/fdny/downloads/pdf/business/fdny-business-cof-individuals-short.pdf

Create an Account and Log in to:
https://fires.fdnycloud.org/CitizenAccess/SAML/NYCIDLogin.aspx

REQUIREMENTS FOR CERTIFICATE OF FITNESS APPLICATION

General requirements:
Review the General Notice of Exam:
http://www1.nyc.gov/assets/fdny/downloads/pdf/business/general-notice-of-exam-cof.pdf

Special requirements for the G-29 Certificate of Fitness:

If you currently hold G-29 Certificates of Fitness AND work in COGENERATION Plant, these certificates are no longer renewable. You must pass the new G-91 C of F exam to obtain the G-91 C of F for Supervision of Natural Gas Co-generation System.

Application fee (Cash is NO LONGER ACCEPTED):
Pay the **$25** application fee online or in person by one of the following methods:

- Credit card (*American Express, Discover, MasterCard, or Visa*)
- Debit card (*MasterCard or Visa*)
- In person: Personal or company check or money order (*made payable to the New York City Fire Department)*

A convenience fee of 2% will be applied to all credit card payments.

For fee waivers submit: ***(Only government employees who will use their COF for their work- related responsibilities are eligible for fee waivers.)***

- A letter requesting fee waiver on the Agency's official letterhead stating applicant full name, exam type and address of premises; ***AND***
- Copy of identification card issued by the agency

REQUIREMENTS FOR ALTERNATIVE ISSUANCE PROCEDURE (AIP)

No AIP available. This certificate of fitness can only be obtained by passing the computer exam at the FDNY Headquarters.

EXAM INFORMATION

The **G-29** exam will consist of **35** multiple-choice questions, administered on a "touch screen" computer monitor. It is a time-limit exam. Based on the amount of the questions, you will have 60 minutes to complete the test. A passing score of at least 70% is required in order to secure a Certificate of Fitness.

Call (718) 999-1988 for additional information and forms.

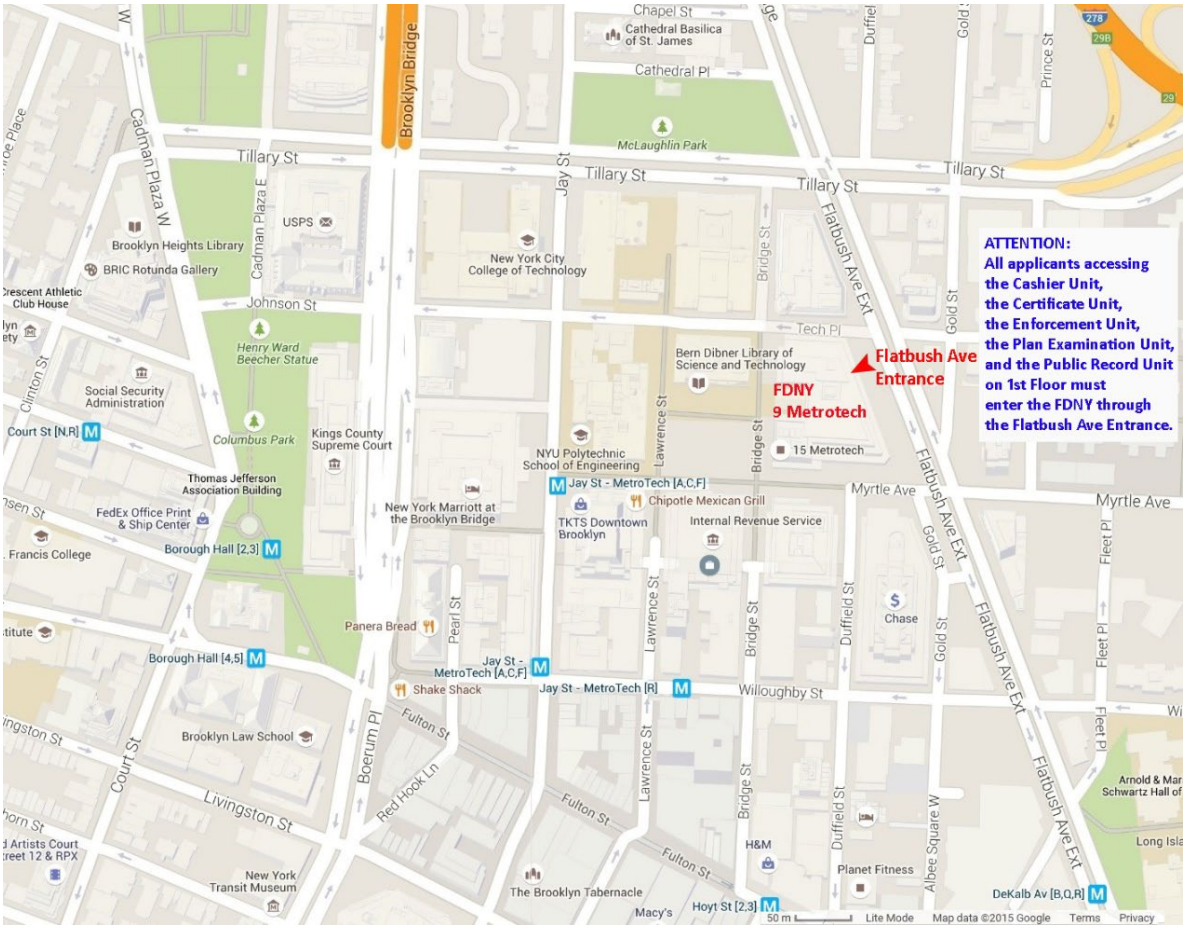
Special material provided during the test:

The following 2 materials will be provided to you as a reference material when you take the test at Metro Tech, however, the booklet will not be provided to you during the test.

1. Table on indoor storage limits
2. Table on distances of outdoor storage to flammable gases

Please always check for the latest revised booklet at FDNY website before you take the exam.
http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-g29-noe-study-materials.pdf

Exam site: **FDNY Headquarters,** 9 MetroTech Center, Brooklyn, NY. Enter through the **Flatbush Avenue entrance (between Myrtle Avenue and Tech Place)**.



RENEWAL REQUIREMENTS

General renewal requirements:
Review the General Notice of Exam:
http://www1.nyc.gov/assets/fdny/downloads/pdf/business/general-notice-of-exam-cof.pdf

Special renewal requirements for G-29 COF: None

The FDNY strongly recommends the G-29 COF holders to renew the COF on-line. To learn the simplified on-line renewal:
http://www1.nyc.gov/assets/fdny/downloads/pdf/business/cof-simplified-renewal-short.pdf

QUESTIONS?

FDNY Business Support Team: For questions, call 311 and ask for the FDNY Customer Service Center or send an email to FDNY.BusinessSupport@fdny.nyc.gov

1. INTRODUCTION

This document outlines New York City Fire Department regulations for the **safe use**, **handling**, **storage** and **compression** of flammable gases with pressure above 6 PSI (pounds per square inch). The Certificate of Fitness holders are responsible for ensuring that all Fire Department regulations related to the safe usage, handling and storage of compressed flammable gases are obeyed on the premises **at all times**. Majority of necessary regulations on installation, use, inspection and testing are described in detail in the 2008 NYC Fire Code Chapters 30 and 35, NYC Fire Rules and NYC Fuel Gas Code.

This booklet DOES cover information on:

1) Fuel-gas piping systems
2) Fuel-gas utilization equipment
3) Other related accessories

This G-29 booklet DOES NOT cover information on:

1) Industrial gas applications using gases such as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen and nitrogen.
2) Integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by, or used in, chemical reactions.
3) Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms and natural gas processing plants.
4) LPG installations at utility gas plants.
5) LNG installations.
6) Fuel gas piping in power and atomic energy plants.
7) Installation of hydrogen gas, LPG and compressed natural gas systems on vehicles.
8) Piping systems for mixtures of gas and air within the flammable range with an operating pressure greater than 10 PSIG.
9) Portable fuel cell appliances that are neither connected to a fixed piping system nor interconnected to a power grid.

Pre-existing and New Installations

A former Fire Code was adopted in New York City in July of 2008. Unlike the older code, this 2008 Fire Code set forth specific regulations regarding the storage, use, handling and compression of flammable gases. The NYC Fuel Gas Code further details specific regulations and requirements when dealing with flammable gases.

1.1 FDNY PERMITS

An FDNY permit is required to compress gases to a pressure exceeding 6 psig.

Exception: Outdoor air compressing at other than a fair or festival.

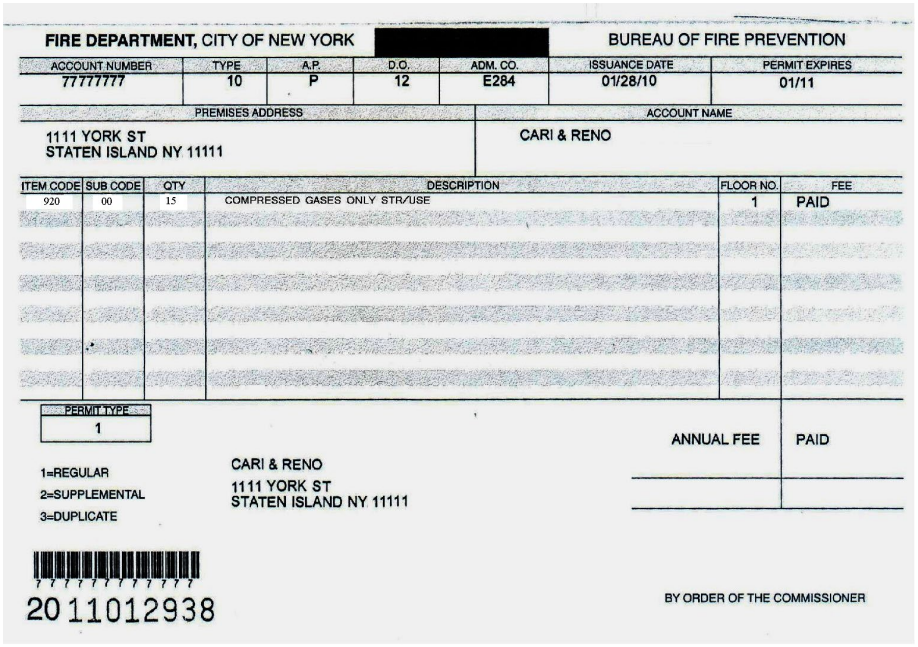
Enforcement action may be taken against the Certificate of Fitness holder when the required permits are not secured and posted. The actions may include fines and/or the revocation of the Certificate of Fitness.

1.2 TYPES OF PERMITS

(1) Premises related permits

Such permit authorizes the permit holder to store, handle, compress and use flammable gas at a specific premises or location. A site-specific permit may be a permanent permit or a temporary permit. FDNY premises related permits for compression, storage and use of compressed flammable gases are valid for 12 months only. Initial and renewed permits shall require an inspection and shall expire after twelve months. Temporary permits may be valid from one day to 12 months depending on the operating needs.

An example of FDNY Site-Specific Permit



FIRE DEPARTMENT, CITY OF NEW YORK [redacted] BUREAU OF FIRE PREVENTION

ACCOUNT NUMBER	TYPE	A.P.	D.O.	ADM. CO.	ISSUANCE DATE	PERMIT EXPIRES
77777777	10	P	12	E284	01/28/10	01/11

PREMISES ADDRESS	ACCOUNT NAME
1111 YORK ST STATEN ISLAND NY 11111	CARI & RENO

ITEM CODE	SUB CODE	QTY	DESCRIPTION	FLOOR NO.	FEE
920	00	15	COMPRESSED GASES ONLY STR/USE	1	PAID

PERMIT TYPE: 1

1=REGULAR
2=SUPPLEMENTAL
3=DUPLICATE

CARI & RENO
1111 YORK ST
STATEN ISLAND NY 11111

ANNUAL FEE PAID

2011012938

BY ORDER OF THE COMMISSIONER

(2) Citywide permit

Such permit authorizes the permit holder to store, handle, compress and use flammable gas on citywide basis, for which a permit is required by Fire Department. A citywide permit is valid to store, handle, compress and use flammable gas at one or more locations provided the duration of such activity at an individual location does not exceed 30 days. Periods of activity in excess of 30 days at any one location shall require a site-specific permit.

Permits are not transferable and any change in occupancy, operation, tenancy or ownership must require that a new permit be issued.

1.3 CERTIFICATE OF FITNESS

A G-29 Certificate of Fitness holder is required to operate a facility where flammable gases are stored, handled, used or compressed to pressure exceeding 6 psi. Each Certificate of Fitness is valid for up-to **(3) three years**. The Certificate of Fitness holder is responsible for ensuring that all the required permits are secured and posted in visible locations on the premises. The storage, handling, and use of flammable gases compressed to a pressures exceeding 6 PSI shall be supervised by the G-29 Certificate of Fitness holder.

(1) Handling and use: The handling and use of compressed flammable gases in quantities requiring a permit, shall be under the personal supervision of a person holding a G-29 certificate of fitness.
(2) Storage: The storage of compressed gases in quantities requiring a permit shall be under the general supervision of a person holding a G-29 certificate of fitness.

The Certificate of Fitness holders are responsible for ensuring that all Fire Department regulations related to the safe using, handling and storage of flammable compressed gases are obeyed on the premises. The G-29 Certificate of Fitness is valid for 3 years. C of F holders must maintain their Certificates of Fitness cards throughout the entire term of their employment.

***G-61 Certificate of Fitness shall ALSO be obtained for individuals interested in using torches for the manufacture of jewelry.**

The storage, handling, compression and use of compressed flammable gases with pressures of 6 PSI or less **DOES NOT** require a G-29 Certificate of Fitness holder on premises.

G-29 Certificate of Fitness may be revoked if Certificate of Fitness holder fails to fulfill their duties.

2. DEFINITIONS

AIR EXHAUST. Air being removed from any space or piece of equipment and conveyed directly to the atmosphere by means of openings or ducts.

AUTO-IGNITION. Ignition of a substance, such as oily rags or hay, caused by a localized heat-increasing reaction between the oxidant and the fuel and not involving addition of heat from an outside source.

COMPRESSED GAS. A material, or mixture of materials, that is a gas at 68 degrees F or less at 14.7 psia of pressure, has a boiling point of 68 degrees F or less at 14.7 psia and can be liquefied, nonliquefied or in solution at that temperature and pressure, except that gases which have no other health- or physical-hazard properties are not considered to be compressed until the pressure in the packaging exceeds 41 psia at 68 degrees F. Compressed gases shall be classified as follows:

Nonliquefied compressed gases. Gases, other than those in solution, that are in a packaging under the charged pressure and are entirely gaseous at a temperature of 68 degrees F.

Liquefied compressed gases. Gases that, in a packaging under the charged pressure, are partially liquid at a temperature of 68 degrees F.

Compressed gases in solution. Nonliquefied gases that are dissolved in a solvent.

Compressed gas mixtures. A mixture of two or more compressed gases contained in a single packaging, the hazard properties of which are represented by the properties of the mixture as a whole.

COMPRESSED GAS CONTAINER. A pressure container designed to hold compressed gases at pressures greater than one atmosphere at 68 degrees F.

Compressed gas containers can present a variety of hazards because of their pressure, exposure to extreme temperatures and/or content. Depending on the particular gas, there is a potential for simultaneous exposure to both mechanical and chemical hazards.

Without proper use and care, compressed gas containers can explode, injuring or even killing workers and destroying equipment.

COMPRESSED GAS SYSTEM. An assembly of components, such as containers, reactors, pumps, compressors and connecting piping and tubing, designed to contain, distribute or transport compressed gases.

DUCT SYSTEM. A continuous passageway for the transmission air that, in addition to ducts, includes duct fittings, dampers, plenums, fans and accessory air-handling equipment, and appliances.

ENGINEER. A person licensed and registered to practice the profession of engineering under the Education Law of the State of New York.

FUEL GAS. Fuel gases include: a natural gas, manufactured gas, liquefied petroleum gas, hydrogen gas and mixtures of these gases.

FLAMMABLE GAS. A material which is a gas at 68°F or less at 14.7 pounds per square inch absolute of pressure which:

1. Is ignitable at 14.7 psia when in a mixture of 13 percent or less by volume with air, in accordance with testing procedures set forth in ASTM E 681; or
2. Has a flammable range at 14.7 psia with air of at least 12 percent, regardless of the lower limit, in accordance with testing procedures set forth in ASTM E 681.

FLAMMABLE LIQUEFIED GAS. A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F and which is a flammable gas.

GAS ROOM. A separately ventilated, fully enclosed room in which only compressed gases and associated equipment and supplies are stored or used.

INCOMPATIBLE MATERIALS. Materials that, if mixed or combined, could explode, generate heat, gases or other byproducts, or react in a way hazardous to life or property.

LOWER FLAMMABLE LIMIT (LFL). The minimum concentration of vapor in air at which propagation of flame will occur in the presence of an ignition source. The LFL is sometimes referred to as LEL or lower explosive limit.

NESTING. A method of securing flat-bottomed compressed gas containers upright in a tight mass using a contiguous three-point contact system whereby all containers within a group have a minimum of three points of contact with other containers, walls or bracing (see image on the right).

POINT OF DELIVERY. The point of delivery for natural gas systems is the outlet of the service meter assembly, or the outlet of the service regulator or service shutoff valve where a meter is not provided. Where a valve is provided at the outlet of the service meter assembly, such valve shall be considered to be downstream of the point of delivery. The point of delivery for undiluted liquefied petroleum gas systems shall be considered the outlet of the first-stage pressure regulator that provides utilization pressure, exclusive of line gas regulators.

REGULATOR, PRESSURE. A device placed in a gas line for reducing, controlling and maintaining the pressure in that portion of the piping system downstream of the device.

SYSTEM. An assembly of devices, equipment, containers, appurtenances, pumps, compressors and connecting piping that is designed to perform a complex and/or complete function.

VALVE. A device used in piping to control the gas supply to any section of a system of piping or to an appliance.

Automatic. An automatic or semiautomatic device consisting essentially of a valve and operator that control the gas supply to the burner(s) during operation of an appliance. The operator shall be actuated by application of gas pressure on a flexible diaphragm, by electrical means, by mechanical means, or by other approved means.

Automatic gas shutoff. A valve used in conjunction with an automatic gas shutoff device to shut off the gas supply to a water-heating system. It shall be constructed integrally with the gas shutoff device or shall be a separate assembly.

Equipment shutoff. A valve located in the piping system, used to isolate individual equipment for purposes such as service or replacement.

Individual main burner. A valve that controls the gas supply to an individual main burner.

Main burner control. A valve that controls the gas supply to the main burner manifold.

Manual main gas-control. A manually operated valve in the gas line for the purpose of completely turning on or shutting off the gas supply to the appliance, except to pilot or pilots that are provided with independent shutoff.

Manual reset. An automatic shutoff valve installed in the gas supply piping and set to shut off when unsafe conditions occur. The device remains closed until manually reopened.

Service shutoff. A valve, installed by the serving gas supplier between the service meter or source of supply and the customer piping system, to shut off the entire piping system.

3. PROPERTIES OF FUEL GASES

Natural Gas is a gaseous fossil fuel consisting primarily of methane. It also includes a significant quantities of ethane, butane, propane, carbon dioxide, nitrogen, helium, and hydrogen sulfide. The methane content can range from 87%-96% with ethane, propane and other hydrocarbon gases making up the remainder. Processed natural gas is tasteless and odorless. Breathing natural gas in trace amounts is harmless, however, natural gas is a simple asphyxiant and can kill if it displaces air to the point where the oxygen content will not support life. Natural gas auto ignition temperature in air is 998 degrees Fahrenheit, or 537 degrees Celsius.

Manufactured Gas or artificial gas, is produced from coal, coal and oil mixtures, or from petroleum. Almost without exception, in the US it is produced by means of three processes: Coal Carbonization, Carburetted Water Gas, and Oil Gas.

Hydrogen Gas is a colorless, odorless, tasteless and non-toxic flammable gas. It is the lightest gas known, and it exists in a gaseous state at atmospheric temperatures and pressures. Once ignited, hydrogen burns in air with an almost invisible pale blue flame. Hydrogen may be used as a compressed gas or a liquefied compressed gas to supply bulk distribution systems.

Methane Gas is a colorless, odorless, and tasteless flammable gas. Methane can be produced commercially from natural gas and petroleum using various methods. When ignited in an enclosed area, it may explode. Methane is widely used as a fuel gas in chemical and manufacturing applications.

Acetylene Gas is odorless, colorless, flammable and slightly lighter than air; however, the acetylene used in standard manufacturing applications and chemical synthesis is not 100% pure, and it has a distinctive, garlic-like odor. Acetylene is also referred to as ethine or ethyne in the field. Acetylene burns in air with an intensely hot, luminous and smoky flame. The ignition temperatures of acetylene-air and acetylene-oxygen mixtures are affected by pressure, temperature and water vapor content. For example, an air mixture containing 30 percent acetylene by volume at atmospheric pressure can be ignited at about 581° Fahrenheit. It is unlawful to generate, manufacture, transport or sell liquefied acetylene in New York City.

The Certificate of Fitness holder must know the properties of each of these gases and their handling, compression and storage requirements.

4. HANDLING AND USE OF INSTALLATIONS

The Certificate of Fitness holder must ensure that any installation equipment is handled as **recommended by the manufacturer**.

Upon installation, all automatic safety devices intended to cause equipment shutdown shall be tested at the owner's risk by his or her representative before a representative of the NYC Fire Department. Gas utilization equipment shall be permitted to be placed in operation after the piping system has been tested and determined to be free of leakage and purging.

4.1 Construction Plans and Records

Installations of 15 PSI or higher, shall have their plans filled and approved by the NYC Fire Department. Records of required inspections and testing shall be kept in a bound log book or other approved recordkeeping. **The records shall be maintained on the premises for a minimum of 3 years* and remain available for inspection by any representative of the Fire Department.**
*For fuel gas installations 4 years, otherwise its 3 years.

Prior to Placing Equipment into Operation the Facility shall have:

(1) required fire protections systems (sprinkler or standpipe) completed, inspected and ready for service.
(2) such equipment and related gas pipings are to be inspected by the Fire Department.
(3) any associated fire suppression system must be inspected and approved by the Fire Department.

4.2 Gas Compressors

There are several different types of gas compressors such as:
centrifugal, diagonal or mixed-flow, axial-flow, reciprocating, rotary screw compressors, rotary vane, and scroll compressors.

Gas compressors come in open, hermetic or semi-hermetic variances.

Open gas compressors rely on either a natural leather or a synthetic rubber seals to retain the internal pressure, and these seals require a lubricant such as oil to retain their sealing properties. Open gas compressors can leak their operating gases, if they are not operated frequently enough. An advantage of open compressors is that they can be driven by non-electric power sources, such as an internal combustion engine or turbine. Open gas compressors cannot be repaired by the Certificate of Fitness holder.

Hermetic gas compressors use a one-piece welded steel casing that cannot be opened for repair, only the manufacturer can perform repairs. If it fails, it is replaced with an entire new unit. It has no route for the gas to leak out of the system. A hermetic system can sit unused for years, and can usually be started up again at any time without requiring maintenance or experiencing any loss of system pressure. The disadvantage of hermetic compressors is that the motor drive cannot be repaired or maintained, and the entire compressor must be removed if a motor fails. A further disadvantage is that burnt out windings can contaminate the whole system, requiring the system to be entirely pumped down and the gas replaced. A hermetic systems are used in a low-cost factory-assembled consumer goods where the cost of repair is high compared to the value of the device, and it would be more economical to just purchase a new device.

Semi-Hermetic system uses a large cast metal steel with a gasket covers that can be opened to replace motor and pump components. Semi-hermetic has no route for the gas to leak out of the system.

4.3 Gas Meter Room and its Guidelines

(1) When meters are located inside the building, they shall be located as close as possible to the point of entrance and where possible the meters shall be located in the cellar or basement unless otherwise permitted by the commissioner.
(2) The meter location shall be clean, dry, and free of refuse, steam or chemical fumes. Meters shall be adequately protected against extreme cold or heat and shall be readily accessible for reading and inspection.
(3) Notwithstanding the foregoing, outside meter installation shall be permitted in areas where the utility company certifies that dry gas is being distributed.
(4) Gas meter rooms, when provided shall be kept clear of all rubbish; and shall not be used in any way for storage purposes, including material or equipment of any type.
(5) A legible sign reading "**Gas meter room - No storage permitted**" shall be permanently and conspicuously posted on the exterior of the meter room door. The lettering of such signs shall be of bold type **at *least one inch in height*** and shall be properly spaced to provide good legibility. **The lettering and background shall be of contrasting colors.**

Where gas meters and related equipment are not located in a separate room but are located in an open floor area, **no combustible material** shall be placed and stored within ***5 feet*** of such equipment; nor shall the gas meter be within ***3 feet*** of any heating boiler or sources of ignition.

4.4 Natural Fuel Gas Piping System

All fuel piping, valves and fittings **from** the point of delivery to the connections of the equipment are considered the piping system and shall be operated under strict supervision of G-29 Certificate of Fitness holder. **Prior** point of delivery equipment, such as piping and fittings are considered to be **providers** responsibility. Piping, including tubing, valves, fittings and pressure regulators, shall comply with the requirements of the **NYC Fire Code Chapter 30 and Chapter 27**. Piping, tubing, pressure regulators, valves and other apparatus shall be kept gas tight to prevent leakage.

4.4.1 Natural Fuel Gas Pipe Labeling

Markings used for piping systems shall consist of the name of the contents and include an arrow indicating direction of flow (see image below). Markings shall be provided at each valve; at wall, floor or ceiling penetrations; at each change of direction; and at a minimum of every 20 feet or fraction thereof throughout the piping run.

Exceptions:

1. Piping that is designed or intended to carry more than one compressed gas at various times shall have appropriate signs or markings posted at the manifold.
2. Piping within gas-manufacturing plants, gas-processing plants and similar occupancies shall be marked in an approved manner.

Labeled pipes, indicating the direction of the flow

4.4.2 Hose Guidelines:

- Examine hoses regularly for leaks and for proper hose connections.
- Set up an inspection schedule.
- Do not use unnecessarily long hoses.
- Keep hoses free from kinks and away from high traffic areas.
- Repair leaks promptly and properly.
- Store hoses in a cool place, and protect them from hot objects, and sparks.

***Do not use a single hose having more than one gas passage.**
***PLASTIC PIPING <u>CANNOT</u> BE USED FOR TRANSPORTATION OF GASES INSIDE THE PREMISES!**

4.4.3 Fuel Gas Pipe Size

Piping systems shall be of such size and so installed as to provide a supply of gas sufficient to meet the **maximum** demand without **undue loss of pressure** between the point of delivery and the gas utilization equipment. The volume of gas to be provided, in cubic feet per hour, shall be determined directly from the manufacturer's input ratings of the gas utilization equipment served.

No gas distribution piping containing gas at a pressure in excess of ½ psig shall be run within a building, except if pressure not exceeding 3 psig is permitted for the following uses:

- **commercial**
- **industrial**
- **where fuel requirements for boiler room equipment exceed 4,000 cubic feet per hour and such large volume use is supplied through separate gas distribution piping to the boiler room.**

Gas pressure not exceeding 15 PSI is permitted for boiler room equipment in excess of 100,000 cubic feet per hour provided the gas distribution piping is installed in accordance to section 404 of the NYC Fuel Gas Code. **The use of pressure in excess of 15 psig shall be permitted for distribution piping provided all of the requirements of Section 406 of Fuel Gas Code are met.**

4.4.4 Natural Fuel Gas Piping Material

Only a qualified engineer can design the piping system, and only qualified licensed plumber can install it or repair it. Materials used for piping systems shall be new. **Used pipe, fittings, valves and other materials shall not be reused.**

System piping cannot be made from:

- Plastic

Piping shall be constructed of CARBON STEEL and **WROUGHT-IRON PIPE** and shall comply with any of the following standards:

- ASME B 36.10, 10M
- ASTM A 53; or
- ASTM A 106.

4.4.5 Natural Fuel Gas Pipe Maintenance

Metallic pipe exposed to corrosive action, from soil condition or moisture, shall be protected in a proper manner. Zinc coatings **shall not** be deemed adequate protection for gas piping underground. Ferrous metal exposed in exterior locations shall be protected from corrosion. **Zinc coatings** shall be deemed adequate protection for gas piping exposed in exterior locations. Where dissimilar metals are joined underground, an insulating coupling or fitting shall be used. Piping shall not be laid in contact with containers.

4.4.6 Inspection, Testing and Purging

Prior to usage, all piping installations shall be inspected and pressure tested to determine that the materials, design, fabrication, and installation practices comply with the requirements of the NYC Fuel Gas Code.

Inspection shall consist of visual examination, during or after assembly and pressure tests as appropriate. In the event repairs or additions are made after the pressure test, the affected piping shall be **tested again.**

Connections between the new piping and the existing piping shall be tested with a **noncorrosive leak-detecting fluid** or other **approved leak-detecting methods.** A piping system shall be permitted to be tested as a complete unit or in sections.

Under no circumstances shall a valve in a line be used as a bulkhead between gas in one section of the piping system and the test medium in an adjacent section, unless two valves are installed in series with a valved "telltale" located between these valves. A valve shall not be subjected to the test pressure unless it can be determined that the valve, including the valve-closing mechanism, is designed to safely withstand the test pressure.

Regulator and valve assemblies manufactured independently of the piping system in which they are to be installed shall be permitted to be tested with gas or air at the time of manufacture.

The **testing medium** shall be either**:**

- **Air**
- **Nitrogen**
- **Carbon dioxide**
- **Inert gas.**

*Oxygen shall **NOT BE** used**.**

***NOTE:** Fresh water may be used as the test medium only where the required test pressure **exceeds 100 psig.**

Purging
Where gas piping is to be opened for servicing, addition, or modification, the section to be worked on shall be turned off from the gas supply at the nearest convenient point, and the line pressure vented to the outdoors, or to ventilated areas of sufficient size to prevent accumulation of flammable mixtures.

4.4.7 Pipe Testing Precautions

***ALL TESTING OF PIPING SYSTEMS SHALL BE CONDUCTED WITH DUE REGARD FOR THE SAFETY OF EMPLOYEES AND THE PUBLIC.**

Prior to testing, the interior of the pipe shall be purged to flush out all foreign material including weld splatter, dirt, rags, and other debris left inside the pipe during welding operations and piping installation.

Upon **COMPLETION OF THE INSTALLATION** of a section of a gas system or of the entire gas system gas distribution piping shall comply with the following:

- **Distribution pressures up to ½ psig:** The completed piping is to be tested with a non-mercury gauge at a pressure of 3 psig for a minimum of 30 minutes.
- **Distribution pressures over ½ psig through 3 psig.** The completed piping is to be tested at 50 psig for a minimum of 30 minutes.
- **Distribution pressures over 3 psig through 15 psig:** The completed piping is to be tested at 100 psig for a minimum of 1 hour.
- **Distribution pressures above 15 psig:** The completed piping is to be tested to twice the maximum allowable operating pressure, but not less than 100 psig, for a minimum of 1 hour.

- **Where the test pressure exceeds 125 psig**, the test pressure shall not exceed a value that produces a hoop stress in the piping greater that 50 percent of the specified minimum yield strength of the pipe.

All factory applied coated and wrapped pipe shall be **pressure tested at a minimum of 90 psig.**

For testing; the piping shall be filled with air or an inert gas, and the source of pressure shall be isolated before the pressure readings are made.

Gas outlets that do not connect to appliances shall be capped gas tight.
Exception: Listed and labeled flush-mounted-type quick disconnect devices and listed and labeled gas convenience outlets shall be installed in accordance with the manufacturer's installation instructions. A device shall not be placed inside the piping or fittings that will reduce the cross-sectional area or otherwise obstruct the free flow of gas.
Exception: Approved gas filters.

4.4.8 Natural Fuel Gas Pipe Leak Check

Before the gas is introduced into a system of new gas piping, the entire system shall be inspected to determine that there are no open fittings or ends, and that all valves at unused outlets are closed and plugged or capped.

Immediately after the gas is turned on into a new system or into a system that has been initially restored after an interruption of service, the piping system shall be tested for leakage. Where leakage is indicated, the gas supply shall be **shut off** until the necessary repairs are performed.

The piping system shall withstand the test pressure specified without showing any evidence of leakage or other defects. Any reduction of test pressures as indicated by pressure gauges shall be deemed to indicate the presence of a leak unless such reduction can be readily attributed to some other cause. The leakage shall be located by means of an approved gas detector, a noncorrosive leak detection fluid, or other approved leak detection methods – such as using soap and water.

***MATCHES, CANDLES, OPEN FLAMES, OR OTHER METHODS THAT COULD PROVIDE A SOURCE OF IGNITION SHALL NOT BE USED.**

Where leakage or other defects are located, the affected portion of the piping system shall be **repaired or replaced and retested.**

5. RELATED INSTALLATION EQUIPMENT

5.1 Shutoff Valves

Shutoff valves shall be constructed of materials compatible with the piping. They must be located conveniently to provide access for operation and at the same time they shall be installed in a way that they are protected from damage. Every meter shall be equipped with a shutoff valve located on the supply side of the meter. An **automatic shut-off valve** connected to the gas piping system shall be installed on the installations to automatically cut off the gas supply in case of an emergency. The valve must be positioned upstream of the confined high pressure gas piping. The valve must be installed underground or otherwise protected from exposure to fire and physical damage in a manner acceptable to the Fire Commissioner.

5.2 Remote Manual Shut-Off Switch

A **manual shut-off valve**, designed to cut off the gas supply to the installation in case of an emergency, must be installed in the gas feed line. The Certificate of Fitness holder must make sure that the valve is protected against physical damage and is kept accessible at all times.

***This valve is required in addition to any automatically operated shut-off valves.**

5.3 Pressure Regulating Devices

Compressed gas containers may be used only when an approved pressure regulating device is installed to control the gas flow from the container or distribution outlet station**.** The Certificate of Fitness holder is responsible for ensuring that compressed gas containers are never used without a pressure regulating device.

Key points to remember:

- The Certificate of Fitness holder must know how to operate all pressure regulation devices.
- Regulators must not be modified or used where they were not intended to be used.
- Each regulator should be labeled in a manner that identifies the type of system where the regulator should be used.
- Regulators, gauges, valves, and piping used in technical establishments must be cleaned to industry standards prior to being placed into service.

***The Certificate of Fitness holder must keep a supply of clean replacement regulators, gauges, and flow meters available in case of emergency at the facility. Defective regulation devices must be replaced immediately and**

arrangements must be made to have them repaired by the supplier or the manufacturer.

A regulator must be inspected before the gas installation can be used. A regulator is one of the most important parts of a compressed gas system. The purpose of the regulator is to control the flow of gas and lower the pressure from the container to the appliance. The regulator not only acts as a control regarding the flow and distribution of gas, but also as a safety barrier between the high pressure of the gas container and the end use appliance. Always select the regulators recommended by the manufacturer. Do not interchange regulators in installations. A regulator must be completely free of dirt, dust, oil, and grease.

5.4 Pressure Relief Devices

According to DOT regulations, and the ASME unfired pressure vessel code, all storage tanks must have a pressure relief device installed. These devices are designed to release the gas from the container or containers when the pressure inside reaches dangerous levels. For example, the pressure relief device may open and vent the gas to the atmosphere when the pressure is exceeded or exposed to extreme temperatures. Typical pressure relief devices consist of rupture disks, fusible plugs, combination rupture disks fusible plugs, and pressure relief valves. The position of the pressure relief device and its pressure rating must be labeled. The Certificate of Fitness holder must ensure that the pressure relief devices are protected against tampering and physical damage. If any adjustment to these devices is required it must be performed by an authorized individual.

5.5 Pressure-Limiting Devices

An automatic pressure-limiting device is designed to automatically shut down the system when the gas discharge pressure reaches dangerous levels. This prevents overcharge and rupturing.

Minimum standards for non-mercury TEST PRESSURE GAUGES:

- The gauge shall be used in accordance with ASME B 40.100, which incorporates ASME B 40.1 and ASME B 40.7
- The manufacturer shall provide with the gauge a written statement that the gauge is manufactured in accordance with such ASME standard;
- The gauge shall be labeled with the name of the manufacturer;
- The gauge shall be kept in a padded, separate, rigid box and there must be full compliance with the manufacturer's instructions for use and protection of the gauge.
- The units of measurement "psi" shall appear on the face of the gauge; and
- The gauge shall be kept in good working order.

6. SAFETY LABELING AND SIGNS

Several types of safety signs may be posted at various locations at the gas installation. These signs must indicate:

- The general fire safety procedures to be followed during a fire emergency.
- How to sound the fire alarm.
- The location of the manual shut-off switch.
- The location of fire extinguishers.
- How to use the fire extinguishers and related fire fighting equipment **(see image on the right)**.
- That smoking and open flames are prohibited within 10 feet of the installation.

The Certificate of Fitness holder must ensure that required fire safety signs are posted and clearly visible at all times. (See on the left)

A no smoking sign must be posted stating that: **"DANGER-FLAMMABLE GAS KEEP FIRE OR FLAME AWAY--NO SMOKING"**

No Smoking sign(s) should be 10 inches high and 14 inches wide or 14 inches high and 10 inches wide. The word **DANGER** shall be on a red oval bordered in white which shall be on a black background at the upper part of the sign. The other required wording should be in black on a white background in the lower part of the sign. Smoking is never permitted in areas where flammable gas containers are stored and/or used.

6.1 Hazards

Many compressed gases are toxic and can cause asphyxia. They could also cause various health problems depending on the specific gas, its concentration, the length of exposure and the route of exposure (inhalation, eye or skin contact). Contact between the skin or eye and liquefied gases in liquid form can freeze tissue and result in a burn-like injury.

6.2 Safety Data Sheets (SDS)

The material safety data sheet (SDS) contains specific information about the health and physical hazards of the material used, as well as safe work practices and required protective equipment. It may also describe the material's physical characteristics and procedures that should be followed in case of an emergency. For example, the SDS may list appropriate and inappropriate extinguishing agents. The Certificate of Fitness holder must refer to the SDS when questions arise about how to handle, use, or store hazardous chemicals or materials.

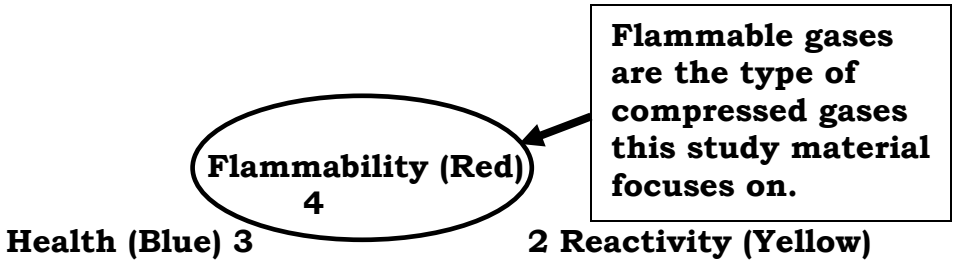
6.3 Hazard Signal Arrangements

Flammable gases are primarily classified as physical hazards. A simple hazard classification system has been developed by the National Fire Protection Association in its NFPA 704 standard. It is used to quickly identify the flammability, reactivity, and health hazards associated with a material. This system uses the term "material" to represent all liquids, gases and solids. Under the classification system, each material is given three ratings that represent the material's **flammability**, **health**, and **reactivity** hazards (in that order). Each rating ranges from 0 to 4.

***The higher the hazard signal number, the greater the degree of hazard associated with the material.**

The hazard signals are also color-coded: **red for flammability**, **blue for health**, and **yellow for reactivity**. A hazard classification sign may be posted on shipping and storage containers. The classification numbers are always arranged in triangular fashion, as shown below.

The diamond figure classifies the hazards that are seen on the previous page. It is used to identify the hazards pertaining to the material(s). The quadrants in the image are often referred to by the clock locations. For instance, at the nine o'clock position would be material's health hazard rating, on twelve o'clock, its flammability hazard rating and so forth.



***The last quadrant, at the bottom, is white in color and serves to convey "special" information such as "OX" for oxidizer and "W" for water-reactive material (see image on previous page).**

6.4 Flammability Hazard

The flammability signal describes the conditions under which the material will **burn**. Brief descriptions of the degrees of flammability hazard are as follow:

- **4** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature.
- **3** Materials that can be ignited under almost all ambient temperature conditions.
- **2** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.
- **1** Materials that must be preheated before ignition can occur.
- **0** Materials that will not burn.

6.5 Understanding Flammable Gases

The Certificate of Fitness holder must know the properties of flammable gases and their handling and storage requirements. He or she must also know the procedures that must be followed when dealing with fire or leak emergencies for these gases.

7. FIRE PROTECTION

Fire protection and fire prevention systems are required in all storage areas when flammable gases are stored. **The Certificate of Fitness holder must ensure that these systems are constantly maintained and are in good working order at all times.**

7.1 Sources of Ignition

Open flames and high-temperature devices shall not be used in a manner that creates a hazardous condition.

7.2 Sprinkler systems

Sprinkler systems are designed such that water is automatically discharged when a fire occurs. The system consists of an arrangement of piping connected to a reliable water supply. Sprinkler heads are installed at intervals along the piping.

Under normal conditions, the sprinkler heads are kept in the closed position by a fusible link. The fusible link is designed to melt when the temperature in the room reaches an unsafe level. When the fusible link melts, water is forcefully discharged at a controlled rate onto the fire. The discharge of the water suppresses the fire and prevents it from spreading. The design of any sprinkler system shall not be less than that required for Ordinary Hazard, Group 2, with a minimum design area of 3,000 square feet. Where the materials or storage arrangement are required by other regulations to be provided with a higher level of sprinkler system protection, the higher level of sprinkler system protection shall be provided (for instance, at sites where flammable gases are stored).

7.3 Emergency Fire Alarm System

An approved manual emergency fire alarm system shall be provided where storage and use of flammable gases pose a high hazard condition. Emergency fire alarm-initiating devices shall be installed outside of each interior exit or exit access door of storage buildings, rooms or areas. Activation of an emergency fire alarm-initiating device shall sound a local alarm to alert occupants of an emergency situation involving hazardous materials. Emergency fire alarm detection and fire extinguishing systems required by the NYC Fire Code shall be supervised by an FDNY approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

Indoor rooms or areas in which hazardous materials are handled or used shall be protected by a fire extinguishing system in accordance with NYC Fire Code Chapter 9 and the construction codes, including the NYC Building Code.

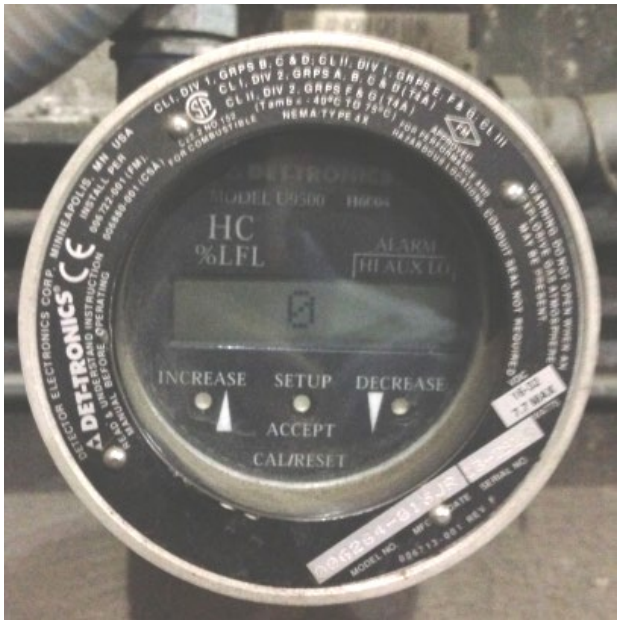
7.4 Safety Devices

Several safety devices are required by the Fire Department in the gas installation. The Certificate of Fitness holder must know and understand how these devices operate. Generally, smoke and/or heat detectors are used as fire alarm devices. They are designed to automatically sound the alarm when a fire is detected. An fire alarm will sound on the premises and a signal may also be sent to a central monitoring station. The personnel at the central monitoring station will then notify the Fire Department.

***A motion detector is not a fire protection device.**

7.5 Gas Detection Systems

A combustible gas detection alarm system, meeting the standards established in the New York City Building Code, must be installed in all gas installations stations or compressor enclosures. This system is typically designed to automatically activate an audible and/or visual fire alarm when the concentration in the atmosphere exceeds 20% of its lower explosive level (LEL). The system will automatically cut off the gas



supply at 50% of the LEL and simultaneously transmit the alarm to the Fire Department via an approved Central Office Connection.

7.6 Heat Detection Systems

Closed circuit detection devices designed to detect the heat generated by a fire must be installed in each installation, or compressor enclosure. Heat detection systems for installations, buildings and compressor enclosures must automatically activate the facility's extinguishing systems and an audible and/or visual alarm when a fire is detected. They must also shut off the gas supply to the compressor and transmit a fire alarm to the Fire Department via a central monitoring station when a fire is detected.

7.7 Inspections and Testing

The smoke and heat detectors must be tested annually. These inspections must be conducted by a person holding a Certificate of Fitness for the maintenance and testing of smoke and heat detectors. During these inspections, the Certificate of Fitness holder will adjust the smoke and heat detectors where necessary. Any defective detectors that are discovered must be replaced immediately.

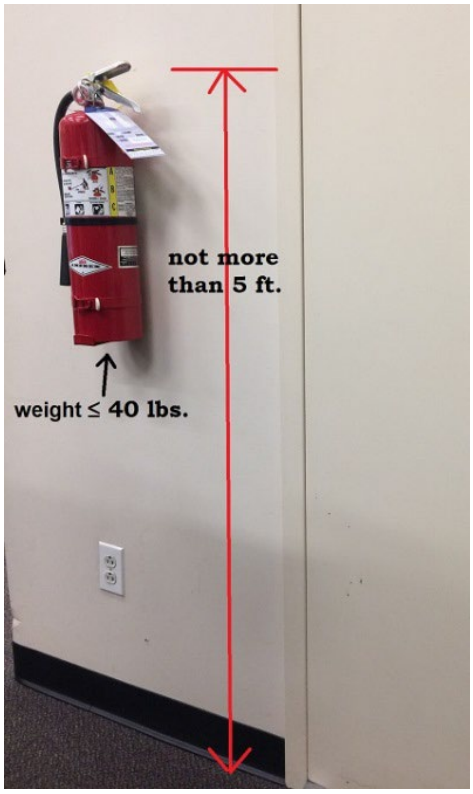
7.8 Authorized Access

Certain parts of the gas service installation shall be physically protected from tempering by installing a locking device (see image below) on the outside gas service line valve.

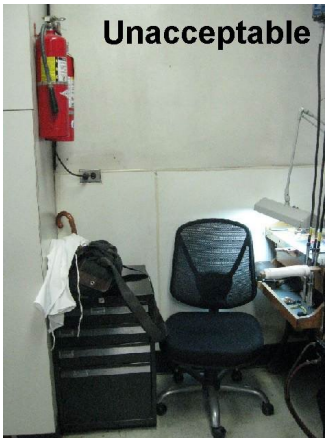
The lock shall not be removed unless deemed necessary by the G-29 Certificate of Fitness holder, or as required by the Fire Department.

7.9 Fire Extinguishers

The Certificate of Fitness holder should ensure that all required extinguishers are installed and maintained in good working order at all times. Portable fire extinguishers weighing 40 lbs. or less must be installed so that the top of the extinguisher is not more than 5 ft. above the floor. Hand-held portable fire extinguishers weighing more than 40 lbs. must be installed so that the top of the extinguisher is not more than 3.5 feet above the floor. The clearance between the bottom of the extinguisher and the floor must not be less than 4 inches. In other words, **no fire extinguisher is allowed to be on the floor.**



Fire extinguishers must be located in conspicuous locations where they will be readily accessible and immediately available for use. These locations must be along normal paths of travel.



(1) For the fire extinguisher having 40 pounds or less, its top must not be more than 5 ft. above the floor

(2) The fire extinguishers must be accessible and unobstructed.

(1) The bottom of the fire extinguisher must be at least 4 in. above the floor.

(2) The fire extinguisher must be properly mounted.

The Certificate of Fitness holder must be familiar with the different types of fire extinguishers that are at the facility. They must know the difference between the various types of extinguishers and when they should be used.

The Certificate of Fitness holder shall know how to operate the extinguishers in a safe and efficient manner. In the event that a fire extinguisher has been discharged, it must be fully recharged or replaced prior to being used again. Portable fire extinguishers are important in preventing a small fire from growing into a catastrophic fire; however, they are not intended to fight large or spreading fires.

By the time the fire has spread, fire extinguishers, even if used properly, will not be adequate to extinguish the fire. Such fires should only be extinguished by the building fire extinguishing systems or trained firefighters.

911 must be called in case of any fire. Fire extinguishers must be used in accordance with the instructions painted on the side of the extinguisher. They

clearly describe how to use the extinguisher in case of an emergency. The Certificate of Fitness holder should be familiar with the use of portable fire extinguishers.

7.9.1 Types of Fire Extinguishers

Class A fires are caused by ordinary combustible materials (such as wood, paper, and cloth). The appropriate fire extinguisher for a class A fire utilizes either the heat-absorbing effects of water or the coating effects of certain dry chemicals.

Class B fires are caused by flammable or combustible liquids and gases such as oil, gasoline, etc. An extinguisher for Class B fire uses blanketing-smothering effect of oxygen-excluding media such as CO_2, dry chemical or foam.

Class C fires involve electrical equipment. These fires must be fought with fire extinguishers that do not conduct electricity. Foam and water type extinguishers must not be used to extinguish electrical fires. After the power has been isolated from the electrical equipment, extinguishers for Class A or B fires may be used.

Class D fires are caused by ignitable metals, such as magnesium, titanium, and metallic sodium, or metals that are combustible under certain conditions, such as calcium, zinc, and aluminum.

Example of Fire Extinguishers

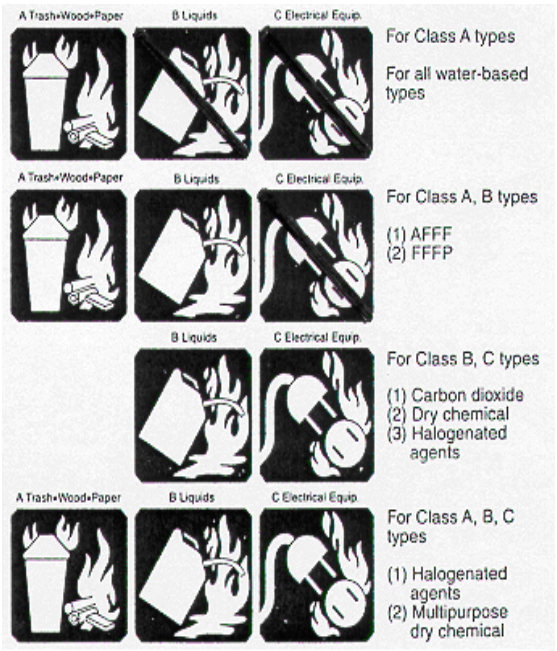
10-B:C (10BC)	3-A:40-B:C(3A40BC)
	

Symbols may also be painted on the extinguisher. The symbols indicate what kind of fires the extinguisher may be used on.

7.9.2 Fire Extinguisher Identification Symbols

CLASSES OF FIRES	TYPES OF FIRES	PICTURE SYMBOL
A	Wood, paper, cloth, trash & other ordinary materials.	
B	Gasoline, oil, paint and other flammable liquids.	
C	May be used on fires involving live electrical equipment without danger to the operator.	
D	Combustible metals and combustible metal alloys.	

The symbol with the slash across it indicates when the extinguisher must NOT be used. The Certificate of Fitness holder must understand these symbols. All fire extinguishers should be kept in good working order at all times.



7.9.3 Fire Extinguishing Inspections

MONTHLY

The portable fire extinguishers are required to be checked monthly. The owner of the business is responsible to select a person to do a monthly inspection. This monthly inspection is called a "quick check".

The **QUICK CHECK** should check if:
(1) the fire extinguisher is fully charged;
(2) it is in its designated place;
(3) it has not been actuated or tampered with;
(4) there is no obvious or physical damage or condition to prevent its operation.

The information of the monthly inspection record must include the date of the inspection, the name/initials of the person who did the inspection. This monthly quick check record must be kept on the back of the PFE tag or by an approved electronic method that provides a permanent record.

ANNUALLY

At least annually all Portable Fire Extinguishers must be checked by a W-96 Certificate of Fitness holder from FDNY approved company. After each annual inspection W-96 COF holder will replace the PFE tag. The information of the annual inspection record must be indicated on the new PFE tag.

7.9.4 Portable Fire Extinguisher Tags

Installed portable fire extinguishers must have an FDNY standard PFE tag affixed. This tag will have important information about the extinguisher. By November 15, 2019, all portable fire extinguishers must have the new PFE tags. The FDNY will only recognize new PFE tags and will be issuing violations to business that have PFE installed without a proper tag.

The color of the fire extinguishers may be changed by the FDNY every few years. The FDNY recommends two ways to verify the tag's legitimacy:

1. Hologram:

A real hologram strip shown on the tag is 3 inches long by ¼ inch wide. Counterfeit tags will NOT have a high quality silver hologram. The hologram on a counterfeit tag will NOT change color as it is moved against the light.

2. QR code

IF you scan the QR code, it should direct you to the updated FDNY approved fire extinguisher company list. You can use the company list to verify if the company printed on the list is currently approved by the FDNY.

If your PFE tags cannot be verified via these two methods, contact your supervisor. If you suspect your PFE is a counterfeit, contact FDNY immediately by e-mail: Tags.Decal@fdny.nyc.gov

PFE tag (This tag is released for 2021-2023)

Fire Department also issues standard outdoor fire extinguisher tags. If the fire extinguishers may be placed outdoors, the COF holder should ask the fire extinguisher suppliers to provide the outdoor fire extinguisher tags for the fire extinguishers.

The special features of the outdoor tags:

1. The material is durable and tear-resistant
2. Different printings:
    - On the back of the tag, the series number will contain a “D” letter; AND/OR
    - On the front of the tag, an “O” is printed on the top of the tag (this feature may not be on ALL outdoor tags)

Outdoor PFE tags

8. EMERGENCY PROCEDURES

The Certificate of Fitness holder must know the locations of and how to operate all required fire extinguishing devices, control devices, and fire alarm stations at his or her installation. In case of a fire, explosion, major leak or other emergency, the Certificate of Fitness holder must notify the Fire Department by phone immediately and activate the alarm system.

The Certificate of Fitness holder must know the telephone number of the Fire Department Borough Communication Office. The borough phone numbers are listed below. These phone numbers must be posted near the phones most likely to be used in case of an emergency.

Manhattan (212) 999-2222
Bronx (718) 999-3333
Brooklyn (718) 999-4444
Queens (718) 999-5555
Staten Island (718) 999-6666

- The Certificate of Fitness holder must answer any questions asked by the fire fighters when they arrive.
- The Bureau of Fire Prevention must be notified as soon as possible after an explosion or fire has occurred.
- The Bureau of Fire Prevention may require a detailed report on the causes and the consequences of the explosion or fire. Generally, this report must be filed within ten days after the incident.

8.1 In Case of Fire

If fire occurs, it is Certificate of Fitness holder's responsibility to take necessary actions to control the fire. **When possible, the gas supply should be shut off immediately.** Large quantities of water should be sprayed on materials surrounding the fire to cool them down. This will reduce the likelihood of heat radiating from the heated materials re-igniting the flame after the fire has been extinguished. Combination fog and solid stream nozzles are preferable to permit widest adaptability in fire control. Small gas flames can be extinguished using dry chemical, halogenated or carbon dioxide fire extinguishers; however, these methods may not be effective when attempting to extinguish large fires. If a compressed gas leak has not ignited, use water spray to direct gas-air mixture away from sources of ignition. If it is desirable to evaporate a spill quickly, water spray may be used to increase the rate of evaporation, if the increased vapor evolution can be controlled. Do not discharge solid streams into liquid.

When a fire occurs, the best way to bring it under control is to shut off its supply source and allow the fire to burn itself out; however, it may not be possible to shut off the supply source in many situations. The fire should be allowed to burn itself out and a water spray should be discharged onto the installation, dispensing units, compressors, and related equipment in such cases. The water spray will have a cooling effect and will help prevent an explosion. The water spray should also be discharged onto storage containers and flammable materials located near the fire.

8.2 Extinguishing Agents

When attempting to extinguish fires involving materials other than gas installations, care must be taken to make sure that only appropriate extinguishing agents are used. For example, only non water-based foam extinguishers should be used on fires involving water soluble flammable liquids. Water based foam extinguishers are ineffective on these fires because the flammable liquid destroys the foam blanket. The Certificate of Fitness holder must contact the manufacturer when there is some doubt about when or how a particular extinguisher should be used.

9. FDNY INSPECTIONS

Fire Department inspectors will conduct periodic inspections of the premises being supervised by the Certificate of Fitness holder to make sure that all Fire Department regulations are obeyed. Enforcement actions may be taken against the Certificate of Fitness holder when Fire Department regulations are not obeyed. These actions may include fines and the revocation of the Certificate of Fitness.

9.1 Recommended Inspection Procedures

The Certificate of Fitness holder is required to make regular inspections and patrols of the assigned area of responsibility to make sure that fire protection systems, storage containers, and related equipment are in good condition. The Certificate of Fitness holder must notify his/her supervisor when major defects are discovered. For example, the Fire Department must be notified when a major leak is discovered in the distribution system. Although the inspections will vary depending on the location, the following general guidelines will apply for all locations.

- The entire premises must be checked daily for potential ignition sources. Any potential ignition sources that are discovered must be corrected or removed immediately.
- Trash and garbage must not to be allowed to accumulate anywhere inside the storage areas. All trash and garbage must be removed from the premises.
- Interior fire alarm systems, when installed, must be tested daily by a Certificate of Fitness holder. It is not necessary to test all fire alarm boxes. Instead, one fire alarm box of each type should be tested daily. **All required Fire Department permits and certificates must be secured and posted.** These permits are valid for a period of one year from the date they were issued. The results of all tests and inspections must be recorded in the inspection log and kept on file for at least 3 years. The logbook, permits, and certificates must be made available to Fire Department representatives upon request.

9.2 Maintenance

Regular inspections should be conducted to ensure that the entire distribution gas system and related equipment are working properly. The Certificate of Fitness holder must visually inspect and record the settings and conditions of all gauges to the gas distribution system. Defective components in the system shall be replaced immediately. When alterations, extensions or repairs to existing gas meter piping or gas distribution piping requires the shut-off of gas flow to a building, the utility shall be notified by the owner or his or her authorized representative.

10. Lithium-Ion Battery Safety

Lithium-ion safety

Lithium-ion batteries are rechargeable batteries found in electric bikes, scooters, cars, laptops, tablets, phones, and many other common household devices.

Lithium-ion battery fires have caused deaths, serious injuries, and devastating damage to property around the city. It's important to follow rules for safe storage, charging, and disposal for these types of batteries.

If you own a lithium-ion powered device or plan to buy one, the FDNY has important safety tips that you should follow. These tips apply to all devices powered by lithium-ion batteries, including phones, tablets, laptops, e-cigarettes, toys, high-tech luggage, and even robotic vacuum cleaners.

Immediately stop using or charging battery and call 911 if you notice:

- **Fire or Smoke**
- **Overheating**
- **Change in color or shape**
- **Odd noises**
- **Leaking**
- **Strange smell**

ALWAYS:

- purchase and use devices certified by a Nationally Recognized Testing Laboratory (NRTL).
- follow the manufacturer's instructions for:
  - charging and storage.
  - correct battery, cord, and power adapter
- keep exit path clear at all times.
- plug directly into a wall electrical outlet for charging.
- keep batteries and devices at room temperature.
- store and/or charge batteries away from anything flammable.
- keep away from heat sources.
- bring batteries to a **NYC Battery Recycling Center.** Visit nyc.gov/batteries for more information.

NEVER:

- use aftermarket batteries or chargers.
- use damaged or altered batteries
- plug into a power strip or overload an outlet.
- overcharge or leave battery charging overnight.
- charge a battery or device under your pillow, on your bed, or near a couch.
- leave e-bikes or e-scooters unattended while charging.
- block your primary way in or out of a room/space with e-bikes, e-scooters, wheelchairs, etc.
- place batteries in Trash or Recycling bin. **It is ILLEGAL.** Visit nyc.gov/batteries for disposal locations and information.

In the event of a Fire,
Leave and CLOSE the door.
Call 911 once you are
in a safe location.

Charging Lithium Ion

Lithium-ion batteries do not have to be fully charged; partial charge is the most suitable.

When **charging more than five (5)** personal mobility devices or their removable batteries, it must be in a **dedicated room with ventilation** and a self-closing door.

For a total battery capacity of 20 kilowatt-hours (kWh), a 2-foot separation between charging batteries is required. For a total battery capacity up to 50 kWh, a 3-foot separation is needed.

Chargers must only be used with a compatible battery pack. The original equipment manufacturer (OEM) charger interplays with the battery pack using the battery management system (BMS). The wrong battery/charger combination may not work safely. For example, the 100% cutoff to prevent overcharging, which damages batteries, may not work which can easily create hazardous conditions such as fires, explosions and/or injuries.

Always check with the manufacturer or retailer of the personal mobility device, an authorized repair shop or a testing laboratory such as Underwrites Laboratories (UL) to see if replacement is recommended or listed and safe for use with that device. Using unauthorized parts, including batteries and/or chargers, may cause damage, fire and possibly void your warranty.

Extinguishing Lithium-ion

Water may not prevent a battery from burning and spreading. Battery cells are known to explode and quickly spread to another battery. It can spread to another devices.

Fire Extinguishers
do not work
on lithium-ion batteries fires.

Unexpected Re-ignition.

Reignition is common. Lithium-Ion Batteries are known to unexpectedly re-ignite (without warning) minutes, hours and even days after all visible fire has been put out.

Lithium-ion batteries can enter an uncontrollable, self-heating state. This can result in the release of gas, cause fire and possible explosion.

These batteries may continue to generate heat even when there is no visible sign of fire. Once heat reaches a certain level fire may reignite on the battery and surrounding area.