FIRE DEPARTMENT • CITY OF NEW YORK

STUDY MATERIAL FOR THE EXAMINATION FOR

CERTIFICATE OF FITNESS

FOR

Supervision of Portable Fueled Space Heaters at Construction Sites

S-92

ALSO INCLUDED IN THIS BOOKLET YOU WILL FIND THE FOLLOWING:

NOTICE OF EXAMINATION (NOE)

NOTICE OF EXAMINATION

Title: Examination for Certificate of Fitness for supervision of portable fueled space heaters at construction site.

Date of Test: Written tests are conducted Monday through Friday (except legal holidays) 8:00 AM to 2:30 PM.

QUALIFICATION REQUIREMENTS

1. Applicants must be at least 18 years of age.
2. Applicants must have a reasonable understanding of the English language.
3. Applicants must present a letter of recommendation from his/her employer. The letter must be on official letterhead and must state the applicant's full name, character, physical condition, experience, and address of premises where applicant will be employed.
4. Applicant must provide two forms of government issued photo identification, such as a State-issued Drivers' License or Non Drivers License or a passport.

APPLICATION INFORMATION

Application Fees: $25.00 for originals and $15.00 for renewals. The fee may be paid by credit card (no debit), in cash, money order, or personal check payable to New York City Fire Department. The $25.00 fee must be payable by all applicants prior to taking the Certificate of Fitness test. Application forms are available at the Public Certification Unit, 1st floor, 9 Metro Tech Center, Brooklyn, NY 11201.

TEST INFORMATION

Test: The test will be of the written, multiple choice type. A passing score of at least 70% is required in order to secure a Certificate of Fitness. Call 718-999-1988, or 2504 for additional information and forms.

About The Study Material

These study materials will help you prepare for the written examination for the certificate of fitness for supervision of portable fueled space heaters. The study materials include information taken from the New York City Fire Code and Fire Department rules. The study material does not contain all the information you need to know in order to perform the responsibilities of conducting portable fueled space heaters operations safely. It is your responsibility to become familiar with all applicable laws, rules and regulations of the federal, state and city agencies having jurisdiction, even though such requirements are not included in this study material. You need to be familiar with FC Chapter 3, Fire Code Chapter 14, Section 1403, which regulates portable fueled space heaters and FC Chapter 34, Section 3406.2 - 3406.2.8 which regulates the storage, handling and use of flammable and combustible liquids in order to adequately prepare for the exam. **It is critical that you read and understand this booklet to help increase you chance of passing this exam.**

About the Test

You must pass a multiple choice test to qualify for the certificate of fitness. A score of 70% correct is required in order to pass the test. All questions have four answer options. Only ***one*** answer is correct for each question. If you do not answer a question, or if you mark more than one answer to a single question, your answer to that question will be scored as incorrect. Read each question carefully before marking your answer. There is no penalty for guessing.

Sample Questions

1. Who was the first president of the United States?

(A) George Washington.
(B) Winston Churchill.
(C) Abraham Lincoln.
(D) Barack Obama.

The correct answer is "**A**". You would mark "**A**" on your touch-screen terminal.

2. What sports team plays at Madison Square Garden?

(A) Yankees.
(B) Nets
(C) Cardinals.
(D) Knicks.

The correct answer is "**D**". You would mark "**D**" on your touch-screen terminal.

I. Introduction

This document outlines New York City Fire Department regulations for the use of portable (temporary) fueled space heaters for buildings undergoing construction during cold weather.

Depending on the trade: plaster work, tile work or poured concrete decking, portable fueled heaters of various sizes and fuel sources can be found throughout the construction industry. Portable fueled space heaters include salamanders/heaters fueled by either: LPG, CNG, piped natural gas or solid fuel (coke).

Portable fueled heaters permit temperature sensitive masonry products to cure properly by preventing freezing that can destroy the product's strength and adhesion.

If used safely, portable fueled heaters will allow for the proper curing of masonry products and construction to continue efficiently and on schedule.

TEMPORARY HEATING EQUIPMENT THAT USES GASEOUS, LIQUID AND SOLID FUELS IS PROHIBITED FROM USE FOR PROVIDING HEAT FOR HUMAN COMFORT.

In addition to the supervision of portable fueled space heaters, the certificate of fitness holder may be required to carry out additional levels of competencies relating to: the connecting/disconnecting of LPG, CNG cylinders, the refilling of kerosene heaters and using gas torches to ignite solid fuel (coke).

This booklet incorporates the safety requirements found in the study materials for the following certificate of fitness:

G-94, Use of LPG and Natural Gas at Construction Sites
G-95, Torch use of Flammable Gases for Cutting and Welding
W-14, Handling Motor Fuel Portable Containers

Only those individuals who are certified for Certificate of Fitness S-92 for the Supervision of Portable Fueled Space Heaters at Construction Sites, will be exempt from having to obtain separate certificates of fitness for the Use of LPG and piped Natural Gas at Construction Sites and the Handling Motor Fuel Portable Containers when directly related to the supervision of portable space heaters at construction sites. For example: the connecting and disconnecting of LPG/CNG cylinders for the torch and the handling of kerosene to fuel space heaters.

Torch use of Flammable Gases for Cutting and Welding is only permitted to ignite the coke salmanders.

The use of Solid fuel (Coke) heaters is **only** allowed with written FDNY authorization.

S-92 certificate holders are not certified for the connecting and disconnecting of LPG/CNG cylinders or the handling of kerosene if not part of the supervision of the portable fueled space heater.

S-92 certificate holders are not authorized to perform hot work using flammable gas.

This chart provides clarification as to which previously issued COF will be accepted by the FDNY for the supervision for the **Portable Fueled Space Heaters at Construction Sites**. The COFs must be current. Simply, the old categories remain in effect. The S-92 category is highly preferable since it covers the supervision all types of Portable Space Heaters.

	COKE	KEROSENE	LPG	PIPED NATURAL GAS
C26 or C98 OR W14		X		
G94			X	X
S92	X	X	X	X

If used improperly, portable (temporary) fueled space heaters can lead to: burns, carbon monoxide poisoning, asphyxiation, fire, explosion, delay in construction and millions of dollars in property loss. Of these hazards mentioned carbon monoxide (CO) is the most dangerous. CO is odorless, colorless, tasteless and deadly.

The minimum frequency between readings for carbon monoxide for solid fuel salamanders is 60 minutes.

Recognizing signs of CO poisoning is sometimes difficult because early symptoms of CO exposure (headache, dizziness, and nausea) are nonspecific and may be mistaken for symptoms of other illnesses such as colds, flu, or food poisoning. Moreover, CO

poisoning causes disorientation, confusion and weakness which can inhibit a person's ability to escape the hazardous environment.

NIOSH Recommended Exposure Limit (REL) for carbon monoxide is 35 parts per million (ppm) over an 8 hours periods and a ceiling limit of 200ppm. To help visualize the meaning of ppm: one ppm is equivalent to - one inch in 16 miles.

According to National Fire Protection Association (NFPA), in the United States, temporary heating is the third leading cause of fires in buildings under construction following (1) 'hot work' involving welding and cutting and (2) smoking.

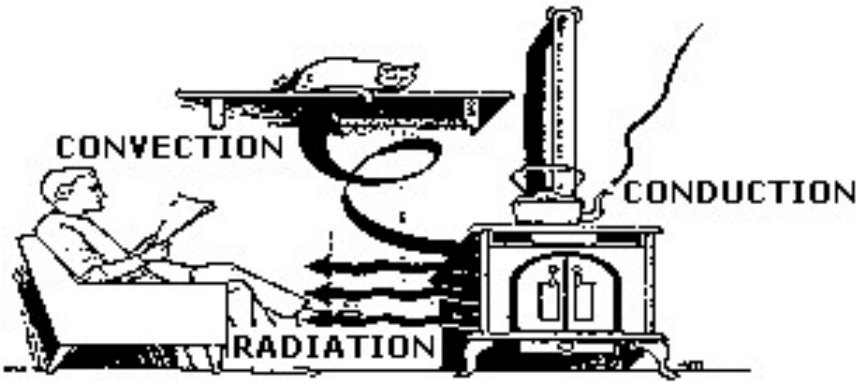
The information contained in this guide will familiarize you with the various types of portable fueled space heaters, and the associated hazards with their use.

These heaters can be further classified by their forms of heat transfer. There are three forms of heat transfer: conduction, convection and radiation.

CONDUCTION is direct heat flow through matter, such as the conduction of heat from the hot surface of a stove to a cooking pot.

CONVECTION is the transport of heat within a gas or liquid caused by the actual flow of the material itself, such as heat traveling upward with the natural upward movement of air.

RADIATION is the transmission of electromagnetic rays through space. These rays have no temperature, only energy. Every material or object with a temperature above absolute zero emits these rays in all directions, in a straight line, until they are deflected or absorbed.



Direct-Fired Heaters

Direct-fired heaters release all of the heat generated by the flame (and the emissions that result) directly into the heated area. They are nearly 100% efficient.

Direct-fired heaters operate like a gas fireplace in your home—but without a chimney to remove combustion products. This type of heater therefore requires openings such as windows and doors to vent emission products outside. This requirement is usually not a problem for a building under construction.

Direct-fired heaters are the most common type of heater found at construction sites. They operate with an open flame (or heated element in the case of infrared heaters). Depending on the fuel burned, the condition of the heater, and the supply of air, the combustion process produces carbon dioxide (CO2), carbon monoxide (CO), other gases, and suspended particles.

Indirect-Fired Heaters

These heaters can be set up in or outside the heated space. The flame is enclosed in a heat exchanger that separates combustion products from the air to be heated.

This system resembles a home furnace where combustion products are directed up a chimney and heat is transferred through a heat exchanger to supply the home with heated air free of emissions.

An indirect-fired heater is commonly located outdoors where combustion emissions vent directly to the atmosphere. No open flame is introduced to the workspace.

Heated air is ducted (or heated liquid is piped) to areas intended for heating. The heat generated by an indirect-fired heater is not captured 100% as it is with a direct-fired heater. But there is no need to ventilate emissions. This allows the building to stay airtight and retain all the heat produced.

II. Definition

CERTIFICATE OF FITNESS: A written statement issued by the NYC Fire Department certifying that the person to whom it is issued has passed an examination as to his or her qualifications or is otherwise deemed qualified to use or supervise the storage, handling and use of a material, conduct or supervise an operation, or supervise a facility for which such certificate is required by this code or the rules. It is valid for 3 years.

CONSTRUCTION SITE: Any location at which a building, structure, premises or facility is under going construction, alteration or demolition.

EXCESS FLOW CONTROL: A fail-safe system or other approved device, equipment or system designed to shut off flow caused by a rupture in a pressurized piping system.

DISPENSING: The pouring or transferring by other means of any material from a container, tank or similar vessel, which would release dusts, fumes, mists, vapors or gases to the atmosphere, unless such release is prevented by a device, equipment or system designed for that purpose.

FLAMMABLE AND COMBUSTIBLE LIQUID STORAGE SYSTEM: A flammable or combustible liquid storage tank and all devices, equipment and systems associated with such tank, including the tank, piping, valves, fill connection, vent lines, pumps and any other ancillary equipment, except liquid motor fuel storage and dispensing systems and flammable and combustible liquid storage systems at a bulk plant or terminal used for bulk transfer operations.

FLAMMABLE LIQUEFIED GAS: A liquefied compressed gas which, under a charged pressure, is partially liquid at a temperature of 68°F (20°C) and which is a flammable gas.

GENERAL SUPERVISION: A method of supervision by the holder who is responsible for performing the duties set forth in the Fire Code Section 113.2 but need not be personally present on the premises at all times.

LIQUID: A material having a melting point that is equal to or less than 68°F (20°C) and a boiling point that is greater than 68°F (20°C) at 14.7 psia (101 kpa). When not otherwise identified, the term "liquid" includes both flammable and combustible liquids.

LOWER EXPLOSIVE LIMIT (LEL): See "Lower flammable limit."

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.

NATURAL GAS: A mixture of hydrocarbon gases and vapors, consisting principally of methane in gaseous form.

NATURAL GAS FIRED HEATER: Any appliance used for the generation of heat that is not permanently installed on the premises under construction and that is connected to, and fueled by, piped natural gas.

PIPED NATURAL GAS: Natural gas supplied by means of piping connected to a public utility.

PROCESS TRANSFER: The transfer of flammable or combustible liquids between cargo tanks or tank cars and containers, tanks piping and other equipment that is to be used in process operations.

PERMIT ISSUANCE: Every permit shall be valid for a period specified therein, not to exceed one year, and shall expire at the end of such period unless the commissioner approves its renewal. **All FDNY original permits shall be on site and available for inspection at all times**. Permits are not transferable and any change in occupancy, operation, tenancy or ownership shall require that a new permit be issued. FDNY

storage and use permits for **temporary heating** purposes shall be issued for a period not to exceed the date listed on the permit.

SUPERVISION: The handling and use of portable fueled space heaters shall be under the personal supervision of a person holding a certificate of fitness. The storage of portable fueled space heaters and the fuel therefore, shall be under the general supervision of a certificate of fitness holder.

PERSONAL SUPERVISION: A method of supervision by the holder who is required to be personally present on the premises, or other proximate location acceptable to the department, while performing the duties for which the certificate is required.

III. Portable Fueled Space Heaters

Portable fueled space heaters can be fueled using gaseous, liquid or solid fuels. There are several types of heating equipment and fuel sources used throughout New York City. Some examples are described below.

1. Solid fueled Salamander

Salamander with coke burning

empty coke salamander

Solid fueled salamanders, also known as coke pots, are common on high rise concrete superstructure sites. Solid fueled salamanders are solid-fuel-open-flame-heaters. These heaters will be found on the floor of the form work. They provide optimal heat transfer via convection to the newly poured concrete floor above. Radiant heat emitted from the solid fueled salamander travels horizontal and heats the vertical wood columns supporting the false-work. Solid fueled salamanders have been used for decades in the construction industry. For heating newly poured floors, they are the most efficient and the most hazardous. Solid fueled salamanders are only permitted for heating newly poured concrete in buildings undergoing construction including form work as well steel structures.

The solid fueled pots are usually ignited 6 to 8 hours before the concrete pour is scheduled. The fires will burn throughout the day and be kept lit into the evening. White, fire rated tarpaulins ringing the floor are used to contain the heat.

A solid fuel coke salamander shall be ignited with an approved liquid petroleum gas (LPG) torch.

When solid fueled salamanders are ignited, the certificate of fitness holder for supervision of portable fueled space heaters at construction sites (S-92) must be personally performing this task.

Liquid Petroleum Gas Torch

Solid fueled fired heaters are required to be kept at least **10** feet from the combustible tarpaulins or other combustible enclosures; they must be on non-combustible platforms. Fire extinguishers must be in place. Records of carbon monoxide readings should be available. An escape hatch must be provided on the floor above passing through the floor that is being heated to the floor below.

One Certificate of Fitness holder for every fifty (50) solid fuel (coke) salamander or fraction thereof must be on the floor where solid fuel heating operation taking place.

A log of such supervision must be maintained for FDNY inspection.

Storage, Handling and use:

Storage of combustible materials in buildings shall be **orderly**. Storage areas shall be separated from heaters. Empty salamanders not being used may be stored on site without a FDNY permit.

Non-combustible Metal Storage Bin

Unsafe (in orderly) stored coke

Not a recommended storage card board bin

The use of Solid fuel (Coke) heaters is **only** allowed with written FDNY authorization. (A **Variance is required from NYC Fire Dept prior to the storage and use of solid fuel (coke).**

2. <u>Kerosene fueled salamander</u>

Kerosene Forced Air Portable heater

Radiant Portable Heater

Kerosene forced air portable heater are a common means of providing heat on masonry construction and for wet trade work such as tile setting and drywall taping. Kerosene storage is regulated and permitted by the FDNY; all kerosene must be stored in a metal, ventilated enclosure that is kept locked when not in use.

Suitable fire extinguishers shall be in place near the kerosene blower at all times. Kerosene is a manned unit, its ignition source is electrical, and it has safety shut-offs; it is only in use when there is a person holding a Certificate of Fitness for the Supervision of Portable Fueled Space Heaters at Construction Sites.

Refueling: Refueling operations shall be conducted in accordance with Fire Code Section 3405. Portable fueled space heaters shall be shut down and cool to the touch before refueling.

Permit:
A FDNY permit is required to store a combustible liquid (i.e. kerosene) in excess of 10 gallons. However, a Fire Department permit is required when there is more than 2 ½

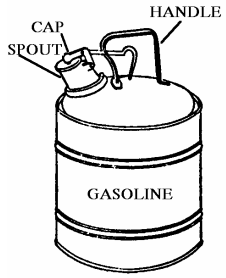
gallons of gasoline on site. In addition to the heater, a separate permit shall be required for storage & use LPG, kerosene etc.

Handling and use:

The handling and use of flammable and combustible liquids, including the dispensing of such liquids, excluding combustible liquids with a flash point over 300°F (149°C), shall be under the **personal supervision** of a certificate of fitness holder when the total quantities stored, handled and used in or upon a premises exceeds 275 gallons (1041L) or in any building or structure classified as Group H occupancy.

Kerosene is brought to the floor then transferred to approved safety cans with a maximum capacity of five gallons. The kerosene heater is approved by the Board of Standards and Appeals or the Underwriters Laboratories.

The Certificate of Fitness holder may pump volatile flammable liquid only into an approved portable container. The maximum capacity of the container is five gallon. The container must be made of metal. The container must have a cap attached. The cap must be fitted with a spout. The spout is designed to allow the volatile flammable liquid to be poured without spilling. The contents of the container must be clearly marked on the side of the container. Never fill a portable container while it is in the trunk of a vehicle. Volatile flammable liquid must never be dispensed into glass or plastic containers. An example of an approved gasoline container is shown below:



APPROVED GASOLINE CONTAINER

Sometimes volatile flammable liquid is pumped into portable storage tanks. These tanks are often installed on small trucks. The maximum capacity of any portable tank is 55 gallons. This type of tank is only used under special circumstances. For example, they may be used to supply motor fuel to industrial machinery on building sites. No volatile flammable liquid should be dispensed into any portable tank that holds more than 55 gallons.

Volatile flammable liquids are easily ignited. Smoking is prohibited on the construction sites.

Signs must be constructed of a durable metal and posted indicating that no smoking is permitted on the premises and must include procedures to be followed in case of a fire emergency. Safety regulations must be posted in visible locations in the

site. The Certificate of Fitness holder must make sure that this sign is visible at all times. An example of a No Smoking sign is shown below:

NO SMOKING SIGN

The Certificate of Fitness holder should pour sand or other absorbing material on a fuel spill. An absorbent material (i.e. like cat litter or sand) is commonly used to contain and soak up fuel spills. The area should then be cleaned. If a large spill or leak occurs, the Fire Department dispatcher must be notified immediately.

3. Liquid petroleum gas (LPG) fueled salamander

LPG salamanders are typically used for drying plaster, and similar wet trade applications. LPG salamanders are prohibited in any occupied building. The use of LPG salamanders must be conducted under the supervision of a person holding an FDNY Certificate of Fitness.

Liquid petroleum gases include: propane, propylene, butane and butylenes. They are naturally colorless and odorless. They are given an odor by mixing foul-smelling additive causing LP gases to smell like rotten eggs. This odor allows leaks to be detected easily. LG gases are extremely flammable and highly explosive if ignited in an enclosed area. LG gases are non-toxic; however, they can cause asphyxiation (suffocation). LP gases are heavier than air and tend to hug the ground and spread outward.

LP gas is stored under pressure inside specially designed cylinder. The LP gas is usually stored inside the cylinder in a liquid state. Greater amounts of LP gas can be stored when it is pressurized to its liquid state. When the gas changes into a vaporous state it expands 269 times its original volume. The expansion rate causes a liquid leak to be a much greater fire than a vapor leak.

The certificate of fitness holder shall inspect the area where the LPG containers and heaters are located at least on an hourly basis. The results of each inspection shall be recorded in the log book which will be maintained on the premises and produced for inspection when requested by FDNY. All storage and use must be approved by FDNY. Fire extinguishers as per applicable code.

The LPG salamanders are similar to the Natural Gas Salamanders in appearance, function and operation.

Propane radiant heaters

Propane Gas: An odor-making agent is added to propane gas. The odor helps you detect a propane gas leak. However, the odor added to propane gas may fade. Propane gas may be present even though no odor exists.

LPG salamanders are typically used for drying plaster, and similar wet trade applications. LPG salamanders are prohibited in any occupied building.

The use of LPG salamanders must be conducted under the supervision of a person holding an FDNY Certificate of Fitness. The certificate of fitness holder shall inspect the area where the LPG containers and heaters are located at least on an hourly basis.

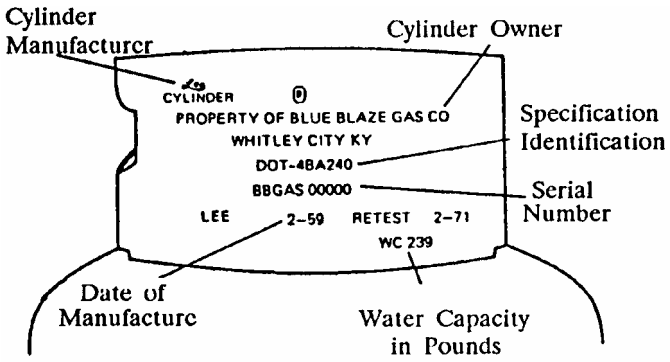
The results of each inspection shall be recorded in the log book which will be maintained on the premises and produced for inspection when requested by FDNY. All storage and use must be approved by FDNY.

Fire extinguishers are required as per applicable code. The LPG salamanders are similar to the natural gas salamanders in appearance, function and operation.

Storage, Handling and use:

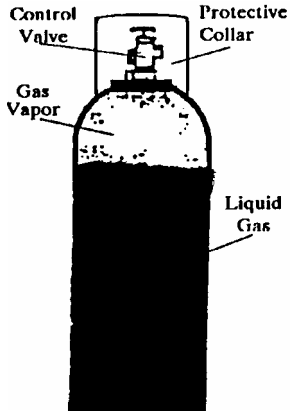
In New York City, LPG gas must be stored in portable cylinders. Cylinders must be approved for use by the Federal Department of Transportation. Cylinders must be re-tested every five years. The Certificate of Fitness holder is responsible for checking the retest date and having the cylinder inspected, on time, by the supplier.

Several markings are stamped on the protective collar or near the control valve on the approved cylinders. A cylinder should not be accepted if it does not meet the time frames set by the Fire Department. Typical markings are shown below.



Typical DOT Cylinder Markings

The cylinders are not filled to capacity with the LP Gas. A vapor space is left in the cylinder to allow for expansion of the LP Gas. This is necessary because LP Gas expands when it becomes warmer. Standard portable LP Gas cylinders may be charged to a maximum of 100 pounds in weight. When portable cylinders are moved they must be secured to a specially designed hand truck. LP Gas cylinders and the related equipment must be protected from extreme temperature and physical damage. High temperatures can cause the pressure inside the cylinder to increase to a dangerous level. Sometimes a cylinder is exposed to hot air blown by a heating appliance. If that is the case, a protective partition must be used to shield the cylinders. An example of a typical LP Gas cylinder is shown below.



A Typical LP Gas Cylinder

The LP Gas is released from the cylinder by opening the control valve. The control valve must be opened by hand. The valve should be opened carefully to make sure that the valve is not damaged. The control valve is opened by turning the valve two full revolutions in a counter-clockwise direction. The valve must never be forced open by using a wrench. The valve must not be forced past the fully open position since that might damage the valve.

There are two types of LP Gas cylinders. One type is known as the STANDARD-type cylinder. A pressure relief valve is installed on the top of the standard LP Gas cylinder. The pressure relief valve opens when the pressure in the tank becomes too great for safe operation. The valve allows the excess pressure to escape into the atmosphere. The relief valve closes when the pressure in the cylinder returns to a safe level. The relief valve will operate properly only if the cylinder is in the upright

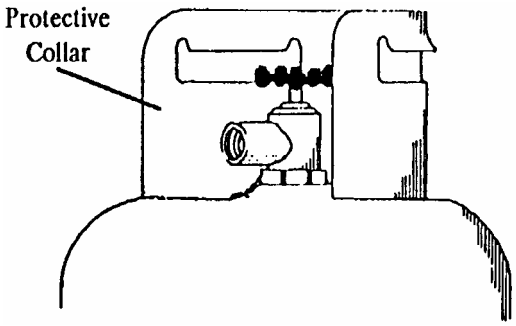
position. If the cylinder is not upright, liquid gas will escape from the cylinder. Therefore the standard type cylinder must be kept in an upright position when it is being used or transported.

Excess Flow Check Valve

If the LP Gas cylinder is not equipped with an internal excess flow check valve, it must be installed by the certificate of fitness holder. The excess flow check valve acts as a safety device when the control valve is open. It also shuts off the gas supply to the heater when the regulator is physically damaged. For example, the excess flow check valve will shut off the gas supply if the cylinder falls and the regulator is damaged in the fall. The excess flow check valve may also shut off the gas supply when the cylinder control valve is opened to quickly.

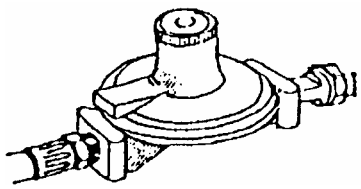
Protective Cap or Collar

Every LP Gas cylinder must have either a protective cap or a collar. These devices protect the cylinder control valve from physical damage. The protective cap is shaped like an inverted cup. It is screwed on top of the cylinder. It must be in place when the cylinder is not in use. The protective collar is welded onto the top of the cylinder. The collar extends above the height of the cylinders control valve. An example of a cylinder with a protective collar installed is shown below.



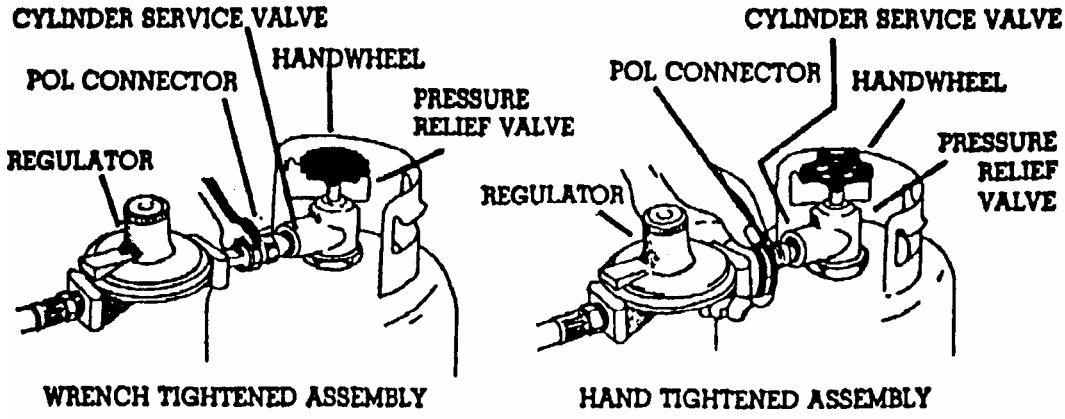
A Typical Protective Collar
USING LP GASES

A regulator must be installed before any LP Gas cylinder is used to fuel any heater. The regulator controls the discharge rate of LP Gas from the cylinder. The discharge rate of the regulator is factory-set and should never be adjusted. An example of a typical regulator is shown below.

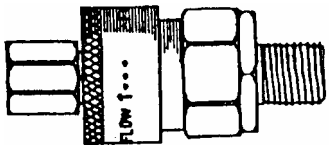


A Typical Regulator

The regulator is threaded into the control valve at the top of the cylinder. These connections have left-handed threads. They are tightened by turning the assembly counter-clockwise. Some connections may be tightened by hand only. Other connections must be tightened with a wrench. An example of each type of connection is shown on the following page.



A third kind of connection may be used to connect the regulator to the control valve. It is called a quick release connection. This allows the user to make the connection without the use of tools. An example of a quick release connection is shown below.



A Quick Release Connection

The regulator is also connected to a hose that supplies the LP Gas appliance. Only approved hoses designed for a working pressure of 350 psi. All regulating equipment, when using LP Gases, must be approved as well. Hoses and related equipment must be protected from wear and physical damage. A leak in the cylinder or related equipment could cause a fire or explosion.

The Certificate of Fitness holder must regularly inspect the cylinders, connections, and heater for leaks. A foul smelling odor may indicate that there is a leak. When a leak is detected the cylinder control valve must be closed immediately. The cylinder must be isolated to a well-ventilated area, tagged, and returned to the supplier. The cylinder may not be used again until the leak is repaired. The damaged cylinder must be repaired and re-tested by an authorized person.

LP Gas is highly explosive when it accumulates in one area. As a precaution LP Gas must only be used in well- ventilated areas. Fans may be used to ventilate a confined space. The LP Gas cylinder must not be placed underground or in a below grade location. The cylinder must remain above ground at all times**.**

Sometimes LP Gas is used to provide heat in buildings under construction. Heaters must only be used in a well- ventilated area and must not be placed on unprotected

wood flooring. All cylinders must be secured in an upright position. Combustible materials must be located at least 10 feet away from any LP Gas appliance or cylinder.

The maximum allowable quantity of LP Gas in any single storage enclosure on construction sites must not exceed 2,500 pounds or a total capacity at any construction site must not exceed 5,000 pounds. The distance between two storage enclosures on a construction site must be at least 50 feet. As per NYC Fire Code all cylinders, full or empty, and which are not in use must be stored in an outdoors storage enclosure located at least 25 feet from the building under construction or as approved by FDNY. The storage enclosure must be kept securely locked when not in use. Flammable and combustible materials must be kept at a safe distance from the enclosure and must be located at least 50 feet from such enclosure.

Safe LPG Cylinder Storage

The Certificate of Fitness holder is responsible for the safe storage and use of the LP Gas cylinders. Only those cylinders in use are permitted inside a building under construction. No extra cylinders may be located in the building while work is in progress. **Absolutely no cylinders may be stored indoors overnight**. Cylinders must be taken outside at the end of each work day. All LP Gas cylinders should be marked **Flammable - LP Gas** or **Flammable - LPG**.

Permit:
A permit is required to store, handle or use LPG in excess of 400 SCF (standard cubic feet); this is equivalent to 47 lbs of liquid petroleum gas.

20 lb LPG Cylinder

4. Natural gas fueled salamander

Natural gas is a gaseous fossil fuel consisting primarily of methane but includes significant quantities of ethane, butane, propane, carbon dioxide, nitrogen, helium and hydrogen sulfide.

Natural Gas salamander

Natural gas is often informally referred to as simply **"gas".** Processed natural gas is tasteless and odorless. However, before gas is distributed to end-users, it is odorized by adding small amounts of odorants to assist in leak detection. 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 is a flammable gas. It can be hazardous to life and property by explosion. Natural gas is lighter than air, and tends to escape into the atmosphere. However, when natural gas is confined, such as within a building or other enclosed space, gas concentrations can reach explosive mixtures and, if ignited, result in blasts that could level and destroy buildings. Methane has a lower explosive limit of 5% in air, and an upper explosive limit of 15%.

Any Natural gas leak shall be regarded as a serious hazard that requires immediate response. Therefore:

- Temporary natural gas piping shall be clearly marked "Natural Gas" at least once every 30 feet, and at least once in each room or other separate area.
- A shut-off valve shall be installed at each natural gas pipe outlet that is to be used for a natural gas fired heater with a flexible hose connection. A maximum of four (4) heaters may be connected to each such shut-off valve. Flexible hoses used for connecting portable fueled space heaters fueled by piped natural gas shall be of a type designed for a working pressure of not less than 350 psi. Flexible hoses used for connecting portable fueled space heaters fueled by piped natural gas shall not exceed 20 ft in length.
- All shut-off valves required by this subdivision shall be hand operable and of the quarter-turn type.
- All valves required by this subdivision shall be installed in unobstructed locations where they are clearly visible and readily accessible. Access shall be provided to any valve located more than seven (7) feet above floor level by means of a fixed or otherwise stable stair, ladder or platform.

Gas Meter

Gas shut-off valve in sidewalk

- The outdoor gas service line shut-off valve shall be clearly marked with metal tags or in another permanent manner.
- Defective gas piping, tubing and fittings (including valves, strainers, and filters) shall be replaced and not repaired. An adequate supply of spare parts and material shall be available on the premises for replacement.
-When curing or drying is taking place within a temporary enclosure, only non-combustible panels, flame-resistant tarpaulins or similar fire-retardant materials shall be used for such enclosure. The enclosure shall be secured from movement by a wind or other causes. Natural gas fired heaters shall not be placed closer than ten (10) feet from any surface of the enclosure.

Storage, Handling and use:

The connecting and disconnecting of compressed natural gas (CNG) containers shall be performed by a person holding a certificate of fitness. The handling and use of CNG containers in quantities requiring a permit, or for the purpose of conducting torch operations, curing concrete, drying plaster and similar applications, shall be under the **personal supervision** of a person holding a certificate of fitness.

Permit:

A permit is required to store, handle or use CNG in excess of 400 SCF (standard cubic feet) equivalent to 47 lbs.

CNG Cylinders

IV. GENERAL SAFETY REGULATIONS

Fire safety manager: Where a site safety manager or site safety coordinator is required by the Building Code, the owner shall designate a person to be the Fire Safety Manager for the construction site. The Fire Safety Manager may be the site safety manager or site safety coordinator required by the Building Code. The fire safety manager shall be responsible for ensuring compliance with the requirements of this code, including this chapter, and the rules.

The Fire Safety Manager shall conduct an inspection of the construction site and all fire safety measures and maintain a record of these inspections in a bound log book or other approved system of recordkeeping. The log book or other approved recordkeeping shall be made available for inspection by any representative of the department. Where fire watch service is provided, the fire safety manager shall be responsible for the general supervision of the fire guards.

The project manager or superintendent should be notified by the person holding the Fire Department C of F for the Supervision of Portable Fueled Space Heaters at Construction Sites.

Certificate of fitness holder's Inspection:

A person responsible for the supervision of portable fueled space heaters at a construction site is prohibited to perform any illegal activities and/or create an unsafe condition, should refuse.

Handling Gas Emergencies:

1. Gas leaks that have not ignited;
    - Minor gas leaks can be mitigated by shutting off the gas valve at the appliance and the area ventilated.

2. Gas leaks that have ignited;
    - If a leak involving natural gas, compressed natural gas or liquefied petroleum gas is burning: Call immediately the Fire Department 911. Allow the gas to burn until the gas supply is shut off. Extinguishing the burning gas before the gas supply is shut off will allow the gas to continue to discharge after extinguishment, an explosion may occur or the leaking gas may suddenly ignite if it comes in contact with a source of ignition. Combustible material near the burning gas should be wet down while waiting for the gas supply to be shut off. Shutting the gas supply is the safest way to extinguish a gas fire.

Notifications:

The person responsible for the supervision of portable fueled space heaters at a construction site should notify immediately call 911 if a fire occurs.

Fire Extinguishers:

At least one (1) portable fire extinguisher having a minimum 20-B: C rating shall be provided on each floor of the construction site at a location not more than 30 feet from where a heater is in use or connected for use. A travel distance of up to 50 feet is allowed if a fire extinguisher having a minimum 40-B: C rating is provided.

According to the ***National Fire Protection Association* and *New York City Fire Department Rule***, fire extinguishers are categorized according to their compatibility with the fuel they are expected to extinguish or the danger of energized electrical equipment. Fuels include four basic groups: wood, liquids, metals, and animal fats; the hazard is electrical conductivity.

Further, extinguishes are designated by alphabetical letters and symbols as shown in the table below.

Classes	Symbol	Material
Class A		ordinary combustibles wood, paper, cloth, rubber
Class B		flammable of combustible liquids
Class C		electrically energized equipment
Class D		Metals
Class K	K	Cooking Media Vegetable or animal fats

Moreover, rooms or areas are generally classified as: (1) Light Hazard, (2) Ordinary Hazard and (3) Extra Hazard.

The New York City Fire Code § 1415 considers buildings undergoing construction, alteration or demolition as **Ordinary Hazard.**

Fire extinguishers should be provided for the protection of **BOTH** the building protection and the occupancy hazards contained therein regardless of the presence of any fixed fire suppression systems.

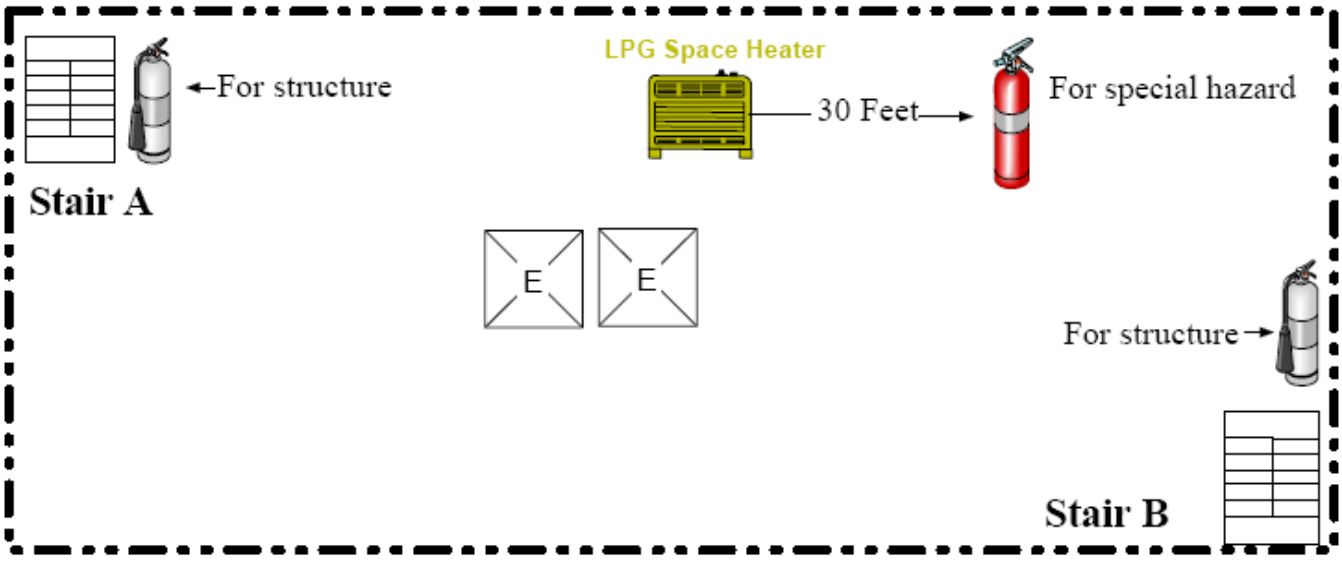
Generally, **building protection** shall be provided for by fire extinguishers for Class A fires. **Occupancy hazard** protection shall be provided by fire extinguishers for such Class A, B, C, D, or K fire potentials as might be present.

Using a building undergoing construction as an example, the requirements for **building protection** under the NYC Fire Code §1451, are: there shall be not less than one approved portable fire extinguisher for ordinary hazard at each stairway on all floor levels where combustible material are being stored and at the entrance of each storage shed.

In addition, Occupancy Hazards (portable fueled space heaters excluding Solid fueled salamanders) shall be protected by at least one 20-B: C rated extinguisher located not more than 30' from the heater. A travel distance of up to 50 feet is allowed if a portable fire extinguisher with at least a
40-B: C rating is provided

Solid fuel (coke) salamanders, are considered an Extra Hazard and require one portable fire extinguisher with a 4-A rating to be provide for each 1000 square feet, or fraction there of and located not more than 75 feet from the furthest salamander on the same floor.

Travel Distance is the actual walking distance from any point to the nearest fire extinguisher.



Portable Heaters	Fire Extinguisher Requirements
 Coke Salamander	Fire Code Section 906.3 Table 906.3(1): Portable Fire Extinguisher with a 4-A rating per 1000 square feet with a travel distance not exceeding 75 feet
 Kerosene Portable Heater	Fire Code 3406.2.7 Portable fire extinguishers with a minimum rating of 20-B;C and complying with the requirements of Section 906
 Compressed Natural gas portable heater	RCNY3, Section 3507-01(j)(H)(6) CNG/heaters assemblies shall be provided with a portable fire extinguisher with at least a 20-B;C rating located not more than 30 feet away. A travel distance of up to 50 feet is allowed if a portable fire extinguisher with at least a 40-B:C rating is provided
 Liquefied Petroleum Gas LPG Portable Heater	RCNY3 Section 3809(H)(5) LPG/heater assemblies shall be provided with a portable fire extinguisher with at least a 20-B:C rating located not more than 30' away. A travel distance of up to 50' may be allowed if a Portable fire extinguisher with at least a 40-B:C rating is provided
 Natural Gas Portable Heater	RCNY3 1403-01(h) At least one 20 B:C rated located not more than 30' from heater. A travel distance of up to 50 feet is allowed if 40 B:C rated

Dangerous areas: In areas where special danger to the public exists, such as at vehicle entrances and exits, hoisting areas, points of storage of explosives or highly flammable material, or discharge ends of chutes, descriptive warning signs shall be provided. Such waning signs shall contain the word "**DANGER**" in prominent letters and, where in, or adjacent to, a public way, shall be illuminated from sunset to sunrise. Barricades and /or designated personnel shall be provided to the extent necessary to keep the public away from such areas or to guide them around the areas.

Hoist in Readiness:
The exterior hoist for personnel and material is required whenever the building reaches 75 feet in height. The hoist is always within 75 feet of the working deck for permits filed at NYC after July 1, 2008. For permits filed on or before June 30, 2008, the hoist must be within 40 feet of the working deck.

During off hours the hoist is locked. The lock can be broken to allow the power feed for the cars. For the hoist to operate, the gates must be closed, engaging the safety switch, the power switch must be in the on position, and the start button must be pressed.

The project manager, superintendent or site safety manager / coordinator is responsible to ensuring that when the hoist reaches the designated floor, the hoist gates separate top and bottom to allow access to the floor. There is a locked hoist gate at the floor. Before leaving the floor, the hoist gate must be closed to secure the shaft. The hoist platform cannot run above the uppermost floor.

During heating operations, the hoist in readiness must:

- have at least one car parked at the hoist platform for FDNY use at all times.
- be clear of all debris, debris containers, and materials etc for clear access by the FDNY.
- be labeled as to what is the top floor is where the hoist can travel and must stop.

Portable fueled space heaters fueled by natural gas supplied from a public utility may be stored, handled and used for outdoor use when designed, installed, operated and

maintained in accordance with this code, the rules and the construction codes, including the Building Code.

Standpipe:

Standpipe risers are large vertical pipes usually installed in stairways. They are used for firefighting by providing water to manually controlled outlet valves located in the stairways where risers are found. Standpipe risers are required when construction reaches a height greater than 75 feet. Depending upon the stage of construction, standpipe rises may be maintained dry. In such case, the Fire Department would have to supply water to the system using a siamese connection located at street level on the exterior of the building. Heating operations are prohibited when standpipe systems are not operational. The project manager, superintendent or site safety manger/coordinator is responsible for ensuring that the standpipe system meets the code and shall be maintained in service one floor below the stripping floor in reinforced concrete or one floor below the upper most poured concrete floor in steel structures.

Business name: _____ **Address:** _____ **City & State:** _____ **Phone** #:_____	***Quick Checklist for Port. Fueled Space Heaters*** **Company Name** **Address** **City, ST, Zip Code**	**Date:** _____ **C of F Holder's Name:** _____ **Signature:** _____ **C of F #:**_____ **Exp Date:** _____

SECTION A.		
General Requirements	**Responses**	**Recommended action**
1. What type of space heater is being used?	☐ Coke ☐ Kerosene/Diesel ☐ LPG ☐ Compress Natural Gas ☐ Piped Natural gas	
2. Is there a valid FDNY permit for the portable fueled space heater?	☐ Yes ☐ No	If No, discontinue use and remove from site and obtain a permit. (Call District Office at 718-999-2457, 2458)
3. Is there a storage and/or use permit?	☐ Yes ☐ No	☐ Kerosene/Diesel ☐ LPG ☐ Compress Natural Gas ☐ Piped Natural gas If No, discontinue use and remove from site obtain Permit.
4. Is there any additional Certificate of Fitness (C of F) for handling the type of fuel being use?	☐ Yes ☐ No	☐ Kerosene/Diesel ☐ LPG ☐ Compress Natural Gas ☐ Piped Natural gas If No: correct and comply.
5. Is there any item that may require an FDNY modification (variance)? i.e. ***Coke***	☐ Yes ☐ No	If Yes, discontinue use and remove from site and obtain FDNY Variance.
6. Are there Certificate of Fitness holders (C of F) for portable fueled space heater coverage?	☐ Yes ☐ No	If No: correct and comply.
7. Is there a copy of manufacture's operating and maintenance instructions for the heaters?	☐ Yes ☐ No	If No: correct and comply.
8. If the building is at 75 ft, the standpipe system is operating to code?	☐ Yes ☐ No	If No: correct and comply.
9. If the building is at 75 ft, is the elevator in readiness?	☐ Yes ☐ No	If No: correct and comply.
10. Have you discontinued heating operation due to safety concerns (see answers above)?	☐ Yes ☐ No	If Yes, Notify the project manager, superintendent or site safety manager / coordinator.
SECTION B.		
Pre-Operation check	**Responses**	**Recommended action**
1. Have you calculated how many extinguishers are required for each floor?	☐ Yes ☐ No	If Yes, Amount #_____ If No: correct and comply.
2. Are the extinguishers properly placed and easily accessible?	☐ Yes ☐ No	If No: correct and comply.
3. Have you calculated how many C of F holders are required for each floor? (Solid fuel only)	☐ Yes ☐ No	One (1) C of F holder for every 50 solid fuel (coke) salamanders or fraction thereof. If No: correct and comply.
4. Are all signs properly posted?	☐ Yes ☐ No	If No: correct and comply.
5. Are the tarps being used rated by a recognized laboratory?	☐ Yes ☐ No	If No: correct and comply.
6. Are the tarps secured?	☐ Yes ☐ No	If No: correct and comply.
7. Are carbon monoxide detectors available for readings? (For coke salamanders only)	☐ Yes ☐ No	If No: correct and comply.
8. Is there adequate ventilation to allow any build up of gases to escape?	☐ Yes ☐ No	If No: correct and comply.
9. Is there a log book available for required entries?	☐ Yes ☐ No	If No: correct and comply.

10. Is there escape hatch in place as required?	☐ Yes ☐ No	If No: correct and comply.
11.A portable combustible gas leak detector maintained and readily Available in the premises for Natural Gas (NG) heaters **ONLY?**	☐ Yes ☐ No	If No: correct and comply.
12.Has lighting been provided on the heating floor?	☐ Yes ☐ No	If No: correct and comply.
13. Is temporary lighting equipped with heavy duty electrical cords?	☐ Yes ☐ No	If No: correct and comply.
14. Have you discovered any items that would prevent the starting of heating operations?	☐ Yes ☐ No	If Yes, Notify the project manager, superintendent or site safety manager / coordinator.
SECTION C.		
Heating Operations other than Curing Concrete Check	**Responses**	**Recommended action**
1. What type of heating operation is occurring?	☐ Yes ☐ No	If Yes: ☐Kerosene/Diesel ☐ LPG ☐ Piped Natural gas ☐ Compress Natural Gas
2. How many heaters are connected for use?	☐ Quantity	
3. Is the proper distance of 10 Ft maintained from all combustibles?	☐ Yes ☐ No	If No: discontinue heating operation.
4. I**s** the heating area supervised and maintained by a C of F (S-92) holder?	☐ Yes ☐ No	If No: discontinue heating operation.
5. How many C of F's are there on the premise?	☐ Quantity	
6. How many floors are being heated?	☐ Quantity	
7. Is the log book on site and available?	☐ Yes ☐ No	If No: discontinue heating operation.
8. Have heating operations been discontinued due to safety concerns?	☐ Yes ☐ No	If Yes, Notify the project manager, superintendent or site safety manager / coordinator.
SECTION D.		
Use of Coke Salamanders Check	**Responses**	**Recommended action**
1. Are the hourly reading of carbon monoxide taking places?	☐ Yes ☐ No	If Yes: how many times per day ☐ Quantity If No: discontinue heating operation.
2. Have heating operations been discontinued due to safety concerns?	☐ Yes ☐ No	If Yes, Notify the project manager, superintendent or site safety manager / coordinator.
SECTION E.		
End of Shift – Inspection	**Responses**	**recommended action**
1. Will heating operations continue after the end of the work day?	☐ Yes ☐ No	If Yes: answer the following question (#2).
2. Is there a C of F holder on the premise to provide supervision in order for the operations to continue?	☐ Yes ☐ No	If No: discontinue heating operation.
3. Have heating operations been discontinued due to safety concerns?	☐ Yes ☐ No	If Yes, Notify the project manager, superintendent or site safety manager / coordinator.