

**Temporary Heating Systems For
Buildings Under Construction Or
Renovations**

This program is to help facilitate the use of heaters for temporary heat at construction sites for curing concrete and heat for construction workers.

**Temporary Heating Systems For Buildings
Under Construction Or Renovations**

- **Applicable Connecticut codes all effective January 24, 1997**
- CT OIL BURNING EQUIPMENT CODE
 - includes NFPA 31 Standard for the Installation of Oil Burning Equipment 1992 edition
- CT GAS EQUIPMENT AND PIPING CODE
 - includes NFPA 54 National Fuel Gas Code 1996 edition
- CT LIQUEFIED PETROLEUM GAS AND LIQUEFIED NATURAL GAS CODE
 - includes NFPA 58 Standard for the Storage and Handling of Liquefied Petroleum Gases 1995 edition

NFPA 241- Safeguarding Construction, Alteration & Demolition Operations 2000 ed

Chapter 5 Process and Hazards

5.2 Temporary Heating Equipment

Listed and installed per manufacture instructions

18" chimney clearance for direct-fired heaters

Oil fired – NFPA 31

Gas fired – NFPA 54 & 58

Secured & Monitored

Fuel sources include:

- Natural Gas
- Liquid Propane
- Vapor Propane
- Kerosene
- Fuel Oil
- Electric

Applications:

- Major Construction Projects
- Road Work (curing concrete on bridges)

**CONNECTICUT OIL BURNING
EQUIPMENT CODE**

NFPA 31 - 1992 edition
Standard for the Installation of Oil Burning
Equipment

**CONNECTICUT OIL BURNING
EQUIPMENT CODE**

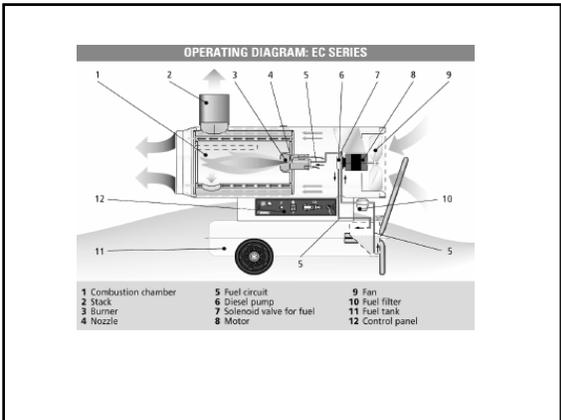
- The Oil Burning Equipment Code applies to
 - Air Heaters
 - Salamanders
 - Portable Kerosene Heaters

Definitions

- **Air Heater** – an indirect-fired appliance intended to supply heated air for space heating and other purposes but not intended for permanent installation. NFPA 31
- **Indirect-Fired Appliance** – a fuel burning appliance in which products of combustion (flue gases) are not mixed in the application with the medium (e.g. air) being heated. NFPA 31











Definitions

- **Direct-Fired Appliance** - a fuel burning appliance in which the products of combustion (flue gases) are mixed with the medium (e.g. air) being heated.
- **Oil Burner** - a device for burning oil in heating appliances such as boilers, furnaces, water heaters, ranges and the like.
- **Oil Burner Equipment** - an oil burner of any type together with its tank, piping, wiring, control, and related devices and including all oil burners...
- **Heating & Cooking Appliance** - An oil-fired appliance not intended for central heating i.e. portable kerosene heaters





Highlights of NFPA 31 Requirements

- Oil Burning Equipment shall be approved.
- Oil burners shall be listed.
- Devices listed for a specific purpose shall be considered as meeting the requirements of NFPA 31.
 - Approved = Acceptable to the AHJ = YOU
 - Oil burners listed per CGS 29-316

Chapter 2 Tank Storage

- Materials
- Fabrication
- Tanks inside buildings
- Tanks outside buildings
- Distances to Property lines, Important Buildings etc.
- Spacing between tanks
- Normal and emergency Venting
- Supports, foundations and anchorage for tanks
- Testing and Maintenance



Chapter 3 Piping, Pumps, and Valves

- Piping materials
- Fill and return piping
- Supply connections
- Venting Piping
- Oil Gauging
- Testing of piping

Chapter 4 Installation of Oil Burners and Oil-Fired Units

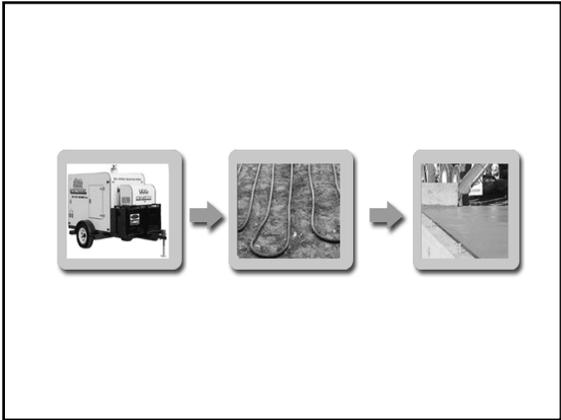
- Posting of instructions
- Controls
- Specific appliance clearance requirements
- Miscellaneous Heaters (air heater, salamanders etc.)
- enclosed spaces
- proximity to combustibles

Heating Appliances - not used for central heating

Chapter 5 Portable Kerosene Heaters

- Instructions furnished by the manufacturer shall be preserved.
- Clearances
- Supply tanks







Additional Requirements for Portable Kerosene heaters

- They must be LISTED
- Placement
- Is a source of ignition
- Labeling affixed to heater
- Adequate ventilation
- Only suitable fuel

Additional Requirements for Portable Kerosene heaters

- Proper manner of fueling
- Placement handling in operation
- Procedures for lighting, flame regulation and extinguishment of unit
- Procedures for handling flare up and spontaneous, uncontrollable flaming
- Accidental tipping/ safety shut off

CONNECTICUT GAS EQUIPMENT AND PIPING CODE

NFPA 54 - 1996 edition
National Fuel Gas Code

Definitions

- **Direct Gas Fired Industrial Air Heater** – a heater in which all of the products of combustion generated by the gas burning device are released into the air stream being heated; whose purpose is to offset the building heat loss by heating incoming outside air inside or a combination of both
- **Direct Gas Fired Make-Up Air Heater** – a heater in which all the products of combustion generated by the fuel gas burning device are released into the outside air stream being heated







Highlights of NFPA 54 requirements

- Particular attention to the type of appliance used and the application of such device shall be kept in mind.
- The equipment and associated appurtenances shall be installed with respect to all the code requirements applicable and the manufacturer's installation instructions.

Highlights of NFPA 54 requirements

- Approved = Acceptable to the AHJ = YOU
- Listings can be found as "Construction Heaters" and "Direct Fired Heaters"

Direct makeup air heaters and direct fired heaters.

- Installation
- Listings
- Non listed appliance limitations & specific requirements
 - » i.e. certain controls, clearances from combustible materials, input ratings
- Clearance from combustibles
- Applications
- Prohibited installations (sleeping quarters for Direct gas fired heaters)
- Air Supply

CONNECTICUT LIQUEFIED PETROLEUM
GAS AND LIQUEFIED NATURAL GAS
CODE

NFPA 58 - 1995 edition

Standard for the Storage and Handling of
Liquefied Petroleum Gases

NFPA 58 "Standard for the Storage and Handling of
Liquefied Petroleum Gases" 1995,

- provides the requirements for the safe installation of LP-Gas systems which include;
 - containers,
 - pressure relief devices,
 - regulators,
 - piping/hose, and
 - connections to the LP-Gas utilization equipment.

NFPA 58 "Standard for the Storage and Handling of
Liquefied Petroleum Gases" 1995

- Covers the use of LP-Gas for fuel to temporary heating systems in buildings under renovation or under construction.

Highlights of NFPA 58 requirements

- Deals specifically with the LP-gas containers, their appurtenances (those in storage and in use) and the piping materials to the appliance.
- Equipment shall be approved. (Section 1-2.1), or
- Acceptance by AHJ through the use of Section 1-1.4 Alternate Materials Equipment or Procedures

Highlights of NFPA 58 requirements

- Approved means acceptable to AHJ = You
- Listed components/equipment = Approved, not Approved = Listed
- 1-1.4 need technical documentation

In general, Compliance must be achieved with

- Chapter 2 - LP-Gas Equipment and Appliances
- Chapter 3 - Installation of LP-Gas Systems
- Chapter 5 - Storage of Portable Containers

Two additional sets of restrictions:

- 1. Buildings Under Construction or Undergoing Major Renovation
 - Ref Section 3-4.3
 - generally not occupied by the public
 - workers do not constitute the public with respect to NFPA 58
 - prior AHJ approval necessary when partial occupancy by the public

Two additional sets of restrictions:

- 2. Buildings Undergoing Minor Renovation When Frequented by the Public.
 - Ref Section 3-4.4

Chapter 2

- specifically provides the requirements for containers and the features normally associated with container fabrication to safety hold LP-Gas.
 - DOT portable containers versus ASME stationary containers
 - Valves on all containers shall be protected by collars or caps. (2-2.4.1)

PORTABLE DOT CONTAINERS and ASME CONTAINERS

- ASME containers shall be placed on firm level foundations.
- Portable DOT containers shall be marked or stamped in accordance with DOT requirements.

PORTABLE DOT CONTAINERS and ASME CONTAINERS

- ASME tanks shall meet the distance requirements of NFPA 58/1995 Table 3-2.2.2.

PORTABLE DOT CONTAINERS and ASME CONTAINERS

- ASME containers marked in accordance with Section 2-2.6.3.
- ASME containers comply with the requirements of Table 2-3.3.2(a) for container connections and appurtenances.
- Portable DOT cylinders 2LB up to 100LB capacity for vapor service shall have a manual shut off with integral External Pressure relief valve. (2-3.3)

PORTABLE DOT CONTAINERS and ASME CONTAINERS

- Portable DOT cylinders 2LB up to 100LB capacity for vapor and liquid service shall have a manual shut off with
- integral External Pressure relief valve for vapor service and
- manual shut off valve with integral excess flow valve for liquid service. (2-3.3)

PORTABLE DOT CONTAINERS and ASME CONTAINERS

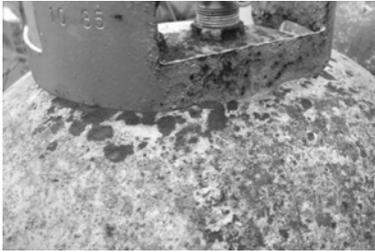
- **Valves on all containers shall be protected by collars or caps. (2-2.4.1)**

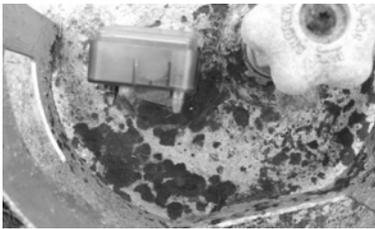




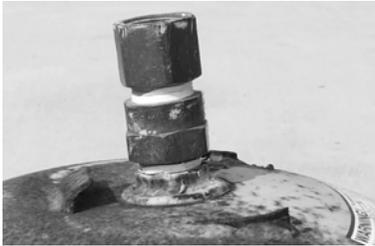














PIPING, TUBING, and HOSE

- **Tubing shall be steel, brass, copper, or polyethylene (Section 2-4).**
- **Hose shall be**
 - approved for use with LP-Gas and
 - designed for a working pressure of 350 psig and
 - be continuously marked
“LP-GAS”, “PROPANE,” “350 PSI WORKING PRESSURE,”
and the manufacturers name.(2-4.6.3)

Chapter 3 Requirements

- Prior to the use of temporary heat in the building, an area where the cylinders are to be located when awaiting use or placed when the containers are empty will need to be determined. (3-4.1.2)

Chapter 3 Requirements

- Portable DOT containers shall be properly secured in place, not placed on their side or upside-down.
- Transportation of containers inside of buildings shall comply with the requirements of NFPA 58/1995 Section 3-4.2.7.
- Piping, hose and Regulators, shall be suitable for use with LP-Gas.

Chapter 3

- specifically provides the requirements which include the container, pressure relief devices, regulators, piping/hose, and connections to the LP-Gas utilization equipment to heating appliance systems.

PIPING, TUBING, and HOSE

- Piping, tubing and hose shall be tested for leaks prior to firing the heaters.(3-2)
- Piping of LIQUID Propane into Buildings or Structures shall comply with all the requirements of NFPA 58/1995 Section 3-4.10.
- Heaters shall be placed for use in a well ventilated area.

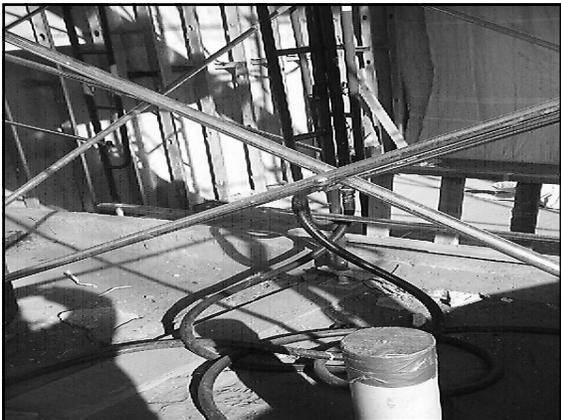
- Regulators, if used, shall be suitable for use with LP-Gas. 3-2.6.1
- Piping shall be approved for use with LP-Gas in accordance with NFPA 58 and where applicable, NFPA 54 "National Fuel Gas Code". 3-2.7





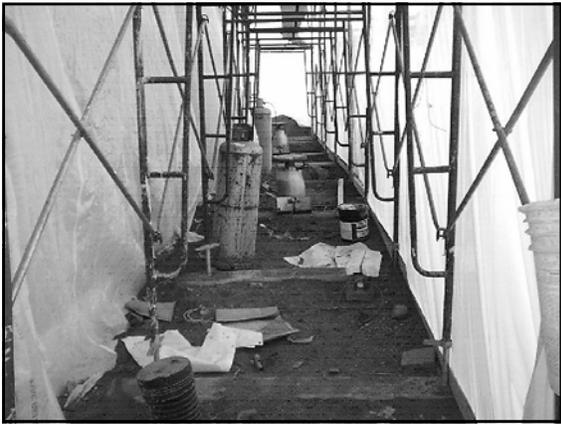
PIPING, TUBING, and HOSE

- **Hose can be used on low pressure side of regulators to connect to other than domestic or commercial appliances when used inside buildings ?**
- **The hose shall be a minimum length of 6 feet however can be increased but be as short as practical and allowing the distance from the container to the heater to not be less than 6 feet. (3-4.2.3)**



Chapter 3 Requirements

- Equipment Listed as Construction heaters may be used as long if the equipment is installed in accordance with their listings and manufacturers recommendations.
- The heater shall be disconnected from service when the heater is moved from one location to another.
- Heat producing equipment shall be located and used to minimize the possibility of the ignition on combustibles.(3-4.2.5)





HEATERS

- Heaters shall be placed for use in a well ventilated area.
- The manufacturers instructions on the installation and operation of the heaters shall be adhered to prior to the installation and operation of the equipment.











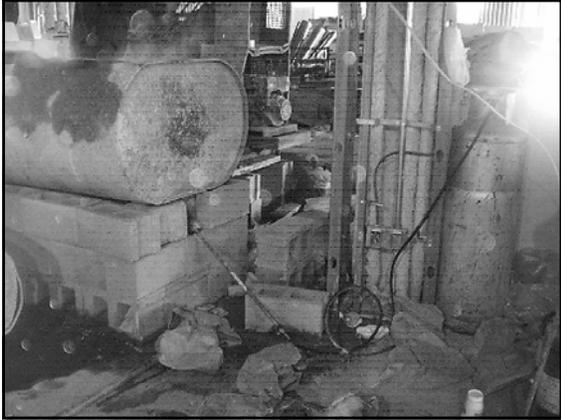
HEATERS

- Equipment shall be approved as required in 58 Section 1-2.1 or the use of Section 1-1.4 shall be used to assist the authority having jurisdiction in determining such approval.

HEATERS

- Located and used to minimize the possibility of the ignition on combustibles.(3-4.2.5)
- For temporary heating, such as curing concrete, drying plaster, and similar applications, heaters shall be located at least 6 ft from any LP-Gas container.(3-4.3.3)





HEATERS

- Integral heater-container units designed for the attachment of the heater to the container are permitted provided that they are designed and installed to prevent direct or radiant application to the container.
- Blower and radiant type shall not be directed toward any LP-Gas container within 20 feet.(3-4.3.4)

HEATERS

- If two or more heater-container units are located in an un-partitioned area on the same floor, the container of each such unit shall be separated from the containers of any other such unit by at least 20 feet.(3-4.3.5)

HEATERS

- If heaters are connected to containers manifolded together in a unpartitioned area on the same floor, the total water capacity of containers manifolded together serving any one heater shall not be greater than 735 LP-Gas capacity and if there is more than one manifold, it shall be separated from any other by at least 20 feet.(3-4.3.6)

HEATERS

- On floors on which no heaters are connected for use, containers are permitted to be manifolded to heater(s) on another floor providing the total water capacity of the containers connected to a manifold is not greater than 1,000 LB capacity and manifolds of more than 735 LB water capacity if located in the same un-partioned area shall be separated from each other by 50 feet.(3-4.3.7)

HEATERS

- **The provisions of this application can be altered by the AHJ if compliance is impracticable. (3-4.3.8)**
- **Portable heaters, including salamanders shall meet the requirements of NFPA 58/1995 Section 3-4.2.8.**

**In Buildings Undergoing Minor Renovation
When Frequented by the Public.**

- Containers shall be permitted to be used and transported for repair or minor renovation in buildings frequented by the public as described in section 3-4.4.
- During the hours the public normally occupies the building, the maximum w.c. of individual containers 20lb nominal capacity and the numbers of containers are not to exceed the numbers of workers.
- Containers shall not be left unattended.

Chapter 3 Requirements

- Chapter 5 deals with the storage of portable containers of 1,000 gallons water capacity or less where not connected for use.



Chapter 5 Requirements

- For outside storage of portable DOT containers while awaiting use, consideration of the nearest important building or group of buildings shall be made (at no time will the containers be placed less than 10 feet from any doorway in a building that will be frequented by the public). The Table in your handout shall also apply: (5-4.1)

Quantity of LP-Gas Stored

Quantity of LP-Gas Stored in LB	Nearest Important Building or Groups of Buildings	Line of adjoining property	Busy thoroughfares or sidewalks	Line of adjoining property occupied by schools, churches, hospitals, athletic fields, or other points of public gathering.
20 or less	0	0	0	0
21 - 2500	0	0	10ft	10ft
2501 - 6000	10ft	10ft	10ft	10ft
6001 - 10,000	20ft	20ft	20ft	20ft
Over 10,000	25ft	25ft	25ft	25ft

Chapter 5 Requirements

- All containers shall be provided with protection against vehicle impact where traffic normally is expected. (5-4.2.2)
- When any of the above conditions are impractical at construction sites, or at buildings and structures undergoing major renovations or repairs, the storage of containers shall be acceptable to the Authority having Jurisdiction.(5-4.3)









Chapter 5 Requirements

- Portable DOT containers shall not be stored in the building empty or full unless they are in use. (Chapter 5 does not allow greater water cap than 2 ½ lb)

PORTABLE DOT CONTAINERS and ASME CONTAINERS

- ASME containers shall be placed on firm level foundations.
- Portable DOT containers shall be marked or stamped in accordance with DOT requirements.

Additional restrictions for Buildings Undergoing Minor Renovation When Frequented by the Public.

Ref Section 3-4.4

- Containers shall be permitted to be used and transported for repair or minor renovation in buildings frequented by the public as described in section 3-4.4.
- During the hours the public normally occupies the building, the maximum w.c. of individual containers 20lb nominal capacity and the numbers of containers are not to exceed the numbers of workers.
- Containers shall not be left unattended.
