



Think Safety!

A Publication Of The West Virginia Propane Gas Association

Fall 2009

Properly Flaring Propane

This is the third and final topic in our series related to the transportation and evacuation of propane from tanks and cylinders. The first topic explained the regulations and procedures for transporting tanks which fall under the greater than five percent exemption.

Our second topic discussed the correct procedures and equipment needed to evacuate those tanks once they were relocated safely back to the plant.

In this issue, we will discuss “flaring” tanks. This is usually the safest way to

complete the evacuation process.

NFPA 58 requires that LP-gas be burned at least 25 feet from combustibles.

Although some marketers flare the entire contents of small cylinders and tanks (under 120 gallons W.C.), many propane companies remove most of the propane liquid by pump or compressor, thus reducing the length of time of the flaring operation. Once the majority of the liquid has been removed, the remaining propane is usually burned away.



We will discuss three types of flaring burners. Appropriate procedure for you. Company policy will dictate the

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Articles in this publication are for information only. Nothing in this publication is to be construed as setting standards or requirements. Please consult with appropriate regulatory and rulemaking bodies for all legal requirements.

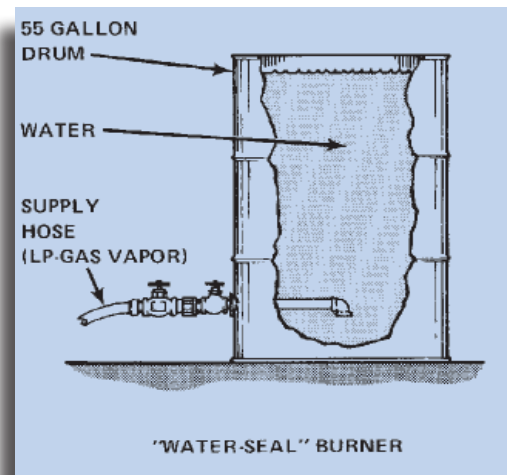
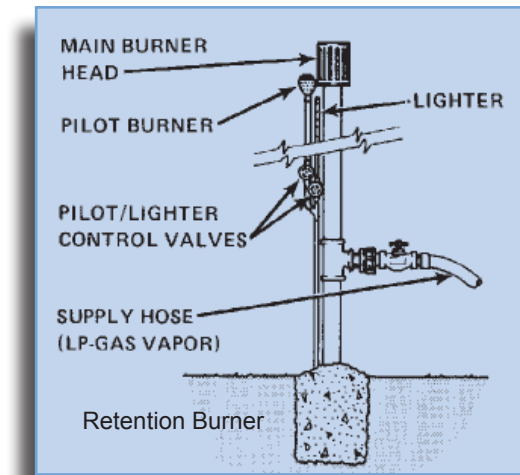
Types Of Burners:

The industrial “retention-type” burner is similar to those used by petroleum refineries to burn off waste gases. This type of burner is usually installed at a bulk plant. It consists of supply piping, a shutoff valve, orifice, a 15 to 20-foot stand pipe, and a pilot burner.

The “water-seal” burner is another common burner used by propane dealers. The burner consists of a 55-gallon drum filled with water.

Vapor from the container being evacuated is piped down near the bottom of the drum. The propane vapor is allowed to bubble up to the water surface where it is ignited.

Portable burners are also used for flaring. Weed burners and torches are both used by many dealers throughout the country. Because of their portability, these burners can be used to flare containers both at the



plant and at the customer site.

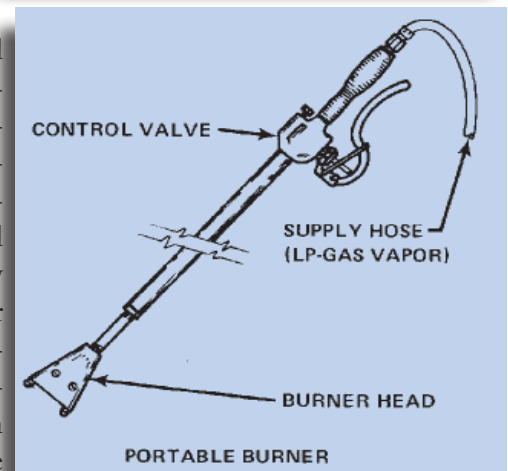
Regardless of the style burner used, it should have the following features:

- o An orifice or other gas flow controlling device
- o A built-in shutoff valve
- o Designed for vapor service
- o An approximate input rating of 500,000 BTU/hr. or less
- o Should incorporate a method for adjustment of the output of the burner and to prevent any exces-

sive withdrawal from the cylinder or tank being flared. Remember, excessive withdrawal could easily cause the tank or cylinder to temporarily stop vaporizing enough gas to supply the burner.

This condition may be noticed when a frost line appears on the container, yet sufficient liquid may

remain to repressurize the container when it regains heat from surrounding air.



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Other Equipment:

Supply Line. A propane hose is the easiest and most economical supply line to use.

The propane hose selected should meet the following requirements:

- o Be an approved propane hose (350 psig working pressure; 1,750 psig bursting pressure)
- o Be at least 20 feet long

(15 feet for safety distance with 5 feet of “slack”). If the container is leaking, the burner may have to be located more than 15 feet from the container being flared {3.7.6.5}

- o Be no smaller than 3/8” in diameter
- o Have an excess-flow

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Other Equipment:

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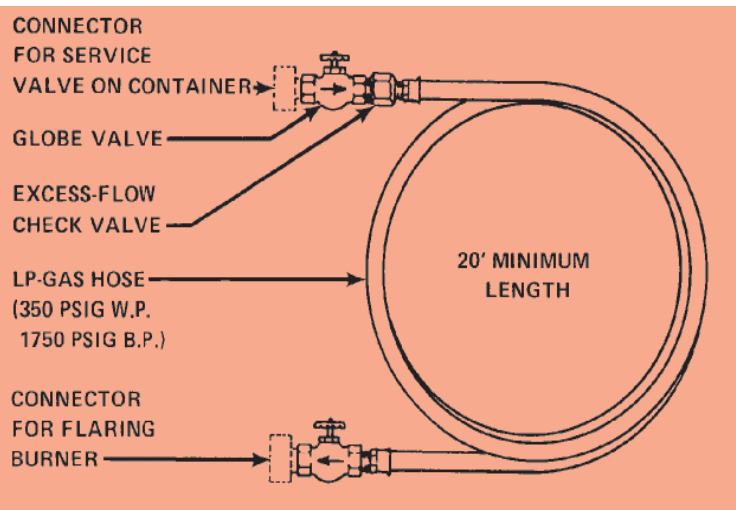
check valve installed on the inlet (container end) of the hose to limit the volume of gas released if the supply line breaks during the flaring operation.

o A shutoff valve should be installed on each end of the hose (snap-action globe valves, handwheel-operated globe valves or ball valves are all excellent valves for the purpose)

o Proper adaptor fittings should be used to connect the hose to the container being flared, as well as to the burner assembly

Burner Support. Because of the length of time required to flare larger containers, many propane companies use a burner support to hold the burner in place during the flaring operation. The most common device used as a burner support is a metal tripod. Regardless of the support used, it should meet the following requirements:

- o Be at least 3 feet high.
- o Be sturdy and manufactured from nonflammable materials.
- o Have some type of



device to attach the burner to the support in a vertical position (i.e., clamps, etc.).

- o Have an anchored extension to raise the burner

to a safe distance above the ground (i.e. an 10'-15' pole) when the container to be flared is leaking.

Burn Procedures:

The following procedures are limited to:

___ All cylinders and any ASME tank with a water capacity under 2,000 gallons.

___ Removing most of the liquid in the container with a pump or compressor before the flaring operation begins.

___ Using a portable burner to flare the remaining propane in the container.

___ Flaring the propane at the plant.

Step 1: Evacuate as much propane from the container as possible.

Step 2: Position the burner. The flaring burner should be located at least 15 feet from the container being flared, any transport point, important building or any external source of ignition. If the container being flared is leaking, it may be necessary to increase the

distance to the burner.

Step 3: Select the necessary equipment for flaring the remaining propane in the container.

Step 4: Assemble and connect all necessary hoses, fittings, burner, etc., to flare the remaining propane in the container.

___ In order to complete this procedure, obtain the portable burner, supply line with necessary fittings and valves, the burner support, soft-setting thread sealing compound, and a recently inspected fire extinguisher (minimum 18 B:C or A:B:C).

___ Using appropriate wrenches, assemble the supply line and all applicable fittings and valves. Be sure to use thread sealing compound on all pipe threaded valves and fittings in the

supply line.

___ Carefully move the container to the flaring area and set it on flat ground or a firm level foundation.

___ Check the service valve in the container to determine if there is a pressure gauge installed. If a gauge is not installed, obtain and install a purging adaptor on the service valve outlet.

___ If applicable, attach the burner regulator to the service valve outlet.

___ Carefully lay out the supply hose between the container and the burner area. Using the proper adaptor fittings, connect one end of the supply line to the service valve outlet on the container. Use the adjustable wrench to properly tighten the connection. Connect the burner assembly to the outlet of the shutoff valve

on the other end of the hose.

___ Close all valves in the burner assembly and the supply line and be sure the service valve in the container is closed.

___ If appropriate, attach the burner assembly to an anchored pole or other extension to raise the burner to a safe height.

Note: This is only necessary if the container is leaking.

Step 5: Pressure test the flaring assembly.

___ Before the burner is ignited, all connections in the entire system must be checked to ensure that they are gastight.

To do this, open all valves in the supply line (exclud-

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ing the service valve and the shutoff on the burner). Then quickly open and close the service valve to pressurize the line.

___ Once the line is pressurized, check the pressure gauge. If the pressure in the line drops, there is a leak in the system.

To locate the leak, re-pressurize the line and check each connection with an approved propane leak detector. When you find the problem, immediately repair the leak and retest until you have a gas tight system. Again, do not ignite the flaring burner until you are sure the supply is gastight.

Step 6: Flare the remaining propane in the container.

In order to properly flare the remaining propane in the container, perform the following:

___ Place the fire extinguisher (or water hose connected to a water source) close enough to the burner support that you can

easily access it but not so close that an uncontrolled fire would impede your access.

___ Inform your supervisor, as well as the other employees at the location, that the container is about to be flared. NOTE: In certain areas, local fire codes or company policies require you to contact the local fire department and notify them that the container is to be flared.

___ It is a common safety practice at many companies to utilize two employees during the flaring operation - one at the burner and one at the container in the event a leak or fire develops.

___ Following the manufacturer's instructions, ignite the burner. CAUTION: If an accidental fire develops during the flaring operation, immediately close all shutoff valves (including the container service valve) to extinguish the fire.

___ Observe the pressure gauge on the service valve (or purging adaptor). When

the pressure drops below 15 psig, temporarily shut down the burner and allow the pressures in the tank or cylinder to increase. (Because of the high demand of the burner, the container may refrigerate during the flaring operation. If a frost line develops on the container, temporarily shut down the burner and allow the pressure in the container to increase.) When the vapor pressure no longer increases above 15 psig, flare the remaining vapor until the burner extinguishes.

Step 7: Bleed down the lines by shutting off the container valve and letting the propane burn off through the flare. Then disconnect the flaring equipment. In order to complete this step, perform the following:

___ While wearing vinyl safety gloves, carefully disconnect the hose from both the service valve outlet and the burner.

CAUTION: Propane vapor may vent through the

connections when they are loosened.

___ Roll up the supply line.

___ Disassemble, clean, and store valves and fittings from the supply line.

___ Disassemble and store the burner assembly and the burner support.

___ If applicable, remove and store the regulator (or purging adaptor) from the service valve.

___ Store any fire extinguishers or fire hoses.

Flaring operations should incorporate the following safety practices and recommendations:

___ Flaring operations should never be left unattended and qualified personnel should continuously monitor flaring equipment and conditions.

___ If qualified personnel must leave the flaring operation for any reason, the operation should be shut down and the valve(s) on the container being flared should be closed.

Training Quiz

Name _____ Social Security Number _____

1. A retention burner consists of supply piping, a shutoff valve, orifice, a 15 to 20-foot stand pipe, and a pilot burner.
A. True B. False
2. The water seal burner includes a 55-gallon drum filled with water.
A. True B. False
3. Portable burners are also used for flaring.
A. True B. False
4. A flaring burner should have the following features:
A. A device to control gas flow B. A built-in shutoff valve C. Designed for vapor service. D. A,B, and C
5. A flaring burner must have an approximate input rating of _____ BTU/hr. or less.
A. 300,000 B. 500,000 C. 200,000 D. 100,000
6. A Flaring burner should incorporate a method for adjustment of the output of the burner.
A. True B. False
5. Excessive withdrawal could easily cause a frost line to appear on the container indicating the tank has temporarily stopped vaporizing.
A. True B. False
6. An approved propane hose must have _____ psig working pressure; _____ psig bursting pressure.
A. 350 1,750 B. 450 1,000 C. 500 2,000 D. 600 2,500
7. A propane hose must be at least _____ feet long.
A. 25 B. 15 C. 30 D. 20
8. The propane hose must be no smaller than _____ inches in diameter.
A. 3/8 B. 3/4 C. 4/5 D. 1/2
9. A shutoff valve should be installed on each end of the hose.
A. True B. False
10. The flaring burner should be located at least _____ feet from the container being flared any transport point, important building or any external source of ignition.
A. 10 B. 20 C. 30 D. 15
11. If a pressure gauge is not installed, obtain and install a purging adaptor on the service valve outlet.
A. True B. False
12. When the pressure drops below 15 psig, temporarily shut down the burner and allow the pressures in the tank or cylinder to increase.
A. 20 B. 15 C. 25 D. 30
13. Before the burner is ignited, all connections in the entire system must be checked to ensure that they are gas tight.
A. True B. False

Training Quiz Answers

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