



Think Safety!

A Publication Of The West Virginia Propane Gas Association

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Cylinder Filling And Transportation



In light of a recent accident involving a 100-pound cylinder at a Walmart in London, Ky, this appears to be a good time to address the safe filling, transportation and use of the cylinders.

A man pulled around back

into what appeared to be propane vapor to apparently close the valve of the tank.

The vapor immediately ignited and produced a large fire in the back of his truck. Subsequently, the fire flared as the

man reached his hand

to the auto-

motive center of the store. The surveillance camera appears to show that the cylinder was lying in the back of his pickup. The man reached

his hand

relief valve attempted to relieve the pressure from the heated cylinder.

Eventually, the heat appeared to overcome the cylinder relief valve. It exploded with such force that it shook the entire Walmart and surrounding businesses. Two clerks were injured in a drug store nearly a quarter mile away when a light fixture fell from the ceiling.

The situation could have been much worse. The truck could have been parked in the much busier front park-

ing lot. Also, a local festival was going on in downtown London. The festival drew a reported 200,000 people for the weekend.

This edition of *Think Safety* will outline the basic requirements and safety precautions that should be taken with the cylinders.



Refilling:

According to 49 CFR 173.301 each cylinder must be built according to all DOT qualifications.

Each cylinder must pass a visual inspection. The cylinder should be observed for any

crack, leak, bulge, defective valve, a leaking or defective pressure relief device, evidence of physical abuse, fire or heat damage, or detrimental rust-

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ing or corrosion.

The cylinder must be equipped with a properly sized and installed pressure relief valve. The valve must also be tested for leaks using proper testing methods.

If the cylinder fails the visual inspection for any of the above reasons, it cannot be filled. It must be repaired, requalified, or condemned.

The cylinder can only be requalified by someone with a valid RIN. When applying for a RIN the training and qualifications of the persons who perform the inspection must be stated in the application.

Cylinders may be requalified by one of three methods:

Visual inspections – must be requalified every five years.

Simple hydrostatic test – must be repeated every seven years after the cylinder has undergone the first 12-year water jacket test.

Water jacket hydrostatic test – must be requalified every 12 years.

Most dispenser operators who requalify cylinders use the visual inspection method. It permits requalification of cylinders by a complete external inspection in accordance with Compressed Gas Association Pamphlet C-6 or C-6.3. However, the visual inspection method is permitted only by persons holding a current US DOT requalifier identification number (RIN) and the results must be recorded and maintained in accordance with CFR 49 180.215.

CFR 49 180.215 requires that daily records of visual inspections be kept by the person who performs the inspection until either

the expiration of the requalification period or until the cylinder is again requalified, whichever comes first. The records must include the date of inspection, DOT specification number, cylinder identification, type of cylinder protective coating, conditions checked, and disposition of cylinder. Other record-



keeping requirements can be found in section 107.803-805.

The requalified cylinder must be marked in accordance with 49 CFR 180.213. The markings must be made by stamping, engraving, scribing, the use of durable pressure adhesive label or any other method that produces a legible, durable mark.

Transporting:

When transporting 100-pound cylinders, measures must be taken to protect the valves. The cylinder should be equipped with either a collar or metal cap strong enough to protect the valve.

The vehicle used to transport

the cylinders should have an essentially flat surface or suitable rack. The cylinder or cylinders should be loaded in an upright position and secured so as to prevent movement during transportation. This applies both to a vehicle un-

der control of the propane dealer and/or a vehicle under control of a customer or any other party transporting 100-pound cylinders.

Any vehicle carrying more than 1,001 pounds gross weight, including the weight of the container, is required by the U.S. DOT to display hazardous material placards. The

placards are to be placed on the front, rear and two sides of the vehicle.

When displaying placards, keep in mind that each placard must be:

- Easily seen from the direction it faces.
- Placed at least 3 inches away from other markings.
- Positioned so that the

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words and numbers are horizontal.

- Located away from attachments and devices (such as ladders, doors, and tarps).

- Clean and free from damage.

- Within the prescribed color tolerances (not faded) and able to withstand a 30-day exposure to open weather conditions.

Remember to remove the placards when the vehicle has been emptied.

If the vehicle requires placards, then the driver of the vehicle is required to have a CDL and the proper hazmat

endorsement.

Each cylinder must also be marked with the correct hazardous material identification and all applicable warning in-

formation. All of the required information may be incorporated into one label provided enough space is provided be-

tween the identification information and the warnings. The labeling is required on two sides of the cylinder.

Transporting In Closed Vehicles:

The amount of propane that can be carried within a closed bodied vehicle is restricted. According to section 9.3.2.5 (B) in the 2008 edition of NFPA 58, 90 pounds total of propane can be transported in the closed vehicle.

However, no more than 45 pounds of propane can be contained in one cylinder which limits the transportation

of propane to two 40-pound cylinders, four 20-pound cylinders, eight 11-pound cylinders or two 33.5-pound cylinders.

No matter the number of pounds of propane, the consumer should be instructed to never leave the cylinders in a

closed vehicle for an extended time.



Vaporization Rate:

As is the case with any other tank installation, it is very important that the container be sized correctly for the load. Undersizing the installation cre-

ates potential operating problems for connected appliances.

The worst condition for vaporization occurs when both the temperature and volume

in the tank are low.

The chart below shows the various vaporization rates for different sized cylinders at

varying temperatures. It may be determined that a larger container would be more appropriate than cylinders.

Lbs. of Propane In Cyl.	Maximum Continuous Draw In BTU Per Hour At Various Temperatures In Degrees F.				
	0 Degrees	20 Degrees	40 Degrees	60 Degrees	70 Degrees
100	113,000	167,000	214,000	277,000	300,000
90	104,000	152,000	200,000	247,000	277,000
80	94,000	137,000	180,000	214,000	236,000
70	83,000	122,000	160,000	199,000	214,000
60	75,000	109,000	140,000	176,000	192,000
50	64,000	94,000	125,000	154,000	167,000
40	55,000	79,000	105,000	131,000	141,000
30	45,000	66,000	85,000	107,000	118,000
20	36,000	51,000	68,000	83,000	92,000
10	28,000	38,000	49,000	60,000	66,000

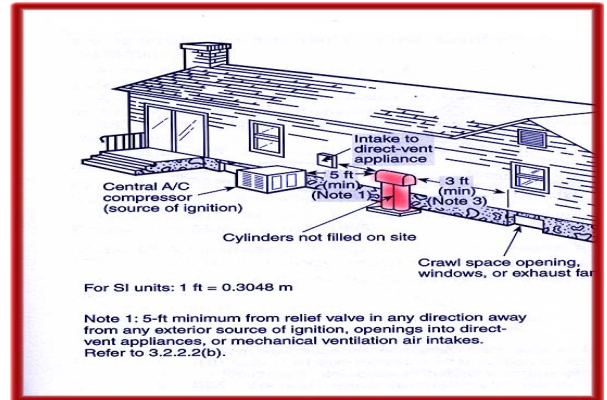
Placement:

After you have determined the number of cylinders needed for the installation, the next step is to determine where you are going to place them.

Several factors weigh on the placement of the cylinders such as the customer's wishes, ease of delivery and exchange for you, and of course code compliance.

Of course it is always important to please the customer but never at the expense of violating codes. d o w o r c r a w l space.

Cylinders (filled offsite) can be placed against the house but should be placed five feet from either a source of ignition such as an air conditioner, direct vent, or mechanical ventilation system. They should be placed three feet from a win-



Does This Look Strange?

The picture at the right should look very abnormal to you, but it can be just as dangerous to lay a 100-pound cylinder in the back of a pickup or leave grill cylinders inside an automobile for extended times. This issue of *Think Safety* will address some cylinder safety issues.



Training Quiz

Name _____ Social Security Number _____

- Each cylinder filled must pass a visual inspection.
A. True B. False
- The cylinder should be observed for any crack, leak, bulge, defective valve, a leaking or defective pressure relief device, evidence of physical abuse, fire or heat damage, or detrimental rusting or corrosion.
A. True B. False
- The cylinder must be equipped with a properly sized and installed pressure relief valve.
A. True B. False
- The valve must also be tested for leaks using proper testing methods.
A. True B. False
- If the cylinder fails the visual inspection for any reason, it cannot be filled. It must be _____.
A. Repaired B. Requalified C. Condemned. D. A,B, or C
- The cylinder can only be requalified by someone with a valid RIN.
A. True B. False
- Cylinders may be requalified by _____.
A. Visual Inspection B. Simple hydrostatic test C. Water jacket hydrostatic test D. A,B, or C
- Visual inspections are good for ___ years.
A. 3 B. 5 C. 10 D. 15
- The visual inspection method is permitted only by persons holding a current US DOT requalifier identification number (RIN) and the results must be recorded and maintained.
A. True B. False
- When transporting 100-pound cylinders, the cylinder should be equipped with either a collar or metal cap strong enough to protect the valve.
A. True B. False
- The vehicle used to transport 100-pound cylinders should have an essentially flat surface or suitable rack.
A. True B. False
- The cylinder or cylinders should be loaded in an upright position and secured so as to prevent movement during transportation.
A. True B. False
- The transportation requirements for 100-pound cylinders should be applied differently for vehicles not under the control of the propane dealer or dispensing business.
A. True B. False
- Any vehicle carrying more than _____ gross weight, including the weight of the container, is required by the U.S. DOT to display hazardous material placards.
A. 1 ton B. 5,000 pounds C. 1,001 pounds D. 101 pounds
- If the vehicle requires placards, then the driver of the vehicle is required to have a CDL and the proper hazmat endorsement.
A. True B. False
- No more than ___ pounds total of propane can be transported in a closed vehicle, and no more than ___ pounds of propane can be contained in one cylinder.
A. 90, 30 B. 45, 25 C. 90, 45 D. 80, 45

Training Quiz Answers

Name _____ Social Security Number _____

1. Each cylinder filled must pass a visual inspection.
 A. True B. False
2. The cylinder should be observed for any crack, leak, bulge, defective valve, a leaking or defective pressure relief device, evidence of physical abuse, fire or heat damage, or detrimental rusting or corrosion.
 A. True B. False
3. The cylinder must be equipped with a properly sized and installed pressure relief valve.
 A. True B. False
4. The valve must also be tested for leaks using proper testing methods.
 A. True B. False
5. If the cylinder fails the visual inspection for any reason, it cannot be filled. It must be _____.
 A. Repaired B. Requalified C. Condemned D. A, B, or C
6. The cylinder can only be requalified by someone with a valid RIN.
 A. True B. False
7. Cylinders may be requalified by _____.
 A. Visual Inspection B. Simple hydrostatic test C. Water jacket hydrostatic test D. A, B, or C
8. Visual inspections are good for _____ years.
 A. 3 B. 5 C. 10 D. 15
9. The visual inspection method is permitted only by persons holding a current US DOT requalifier identification number (RIN) and the results must be recorded and maintained.
 A. True B. False
10. When transporting 100-pound cylinders, the cylinder should be equipped with either a collar or metal cap strong enough to protect the valve.
 A. True B. False
11. The vehicle used to transport 100-pound cylinders should have an essentially flat surface or suitable rack.
 A. True B. False
12. The cylinder or cylinders should be loaded in an upright position and secured so as to prevent movement during transportation.
 A. True B. False
13. The transportation requirements for 100-pound cylinders should be applied differently for vehicles not under the control of the propane dealer or dispensing business.
 A. True B. False
14. Any vehicle carrying more than _____ gross weight, including the weight of the container, is required by the U.S. DOT to display hazardous material placards.
 A. 1 ton B. 5,000 pounds C. 1,001 pounds D. 101 pounds
15. If the vehicle requires placards, then the driver of the vehicle is required to have a CDL and the proper hazmat endorsement.
 A. True B. False
16. No more than _____ pounds total of propane can be transported in a closed vehicle, and no more than _____ pounds of propane can be contained in one cylinder.
 A. 90, 30 B. 45, 25 C. 90, 45 D. 80, 45