Propane Tank Use Safety Talk



WHAT'S AT STAKE?

PROPANE GAS

Propane gas is one of the gases that fits the definition of LPG – Liquefied Petroleum Gas. Propane is a flammable hydrocarbon gas that is liquefied through pressurization and commonly used for fuel in heating, cooking, hot water and vehicles. Propane can also be used for refrigerants, aerosol propellants and petrochemical feedstock.

Propane gas can be compressed into liquid at relatively low pressures. Propane is generally stored, as a liquid, in steel vessels ranging from small BBQ gas bottles to larger gas cylinders and LPG storage tanks.

Storage

Propane, whether burned as a gas or liquid, is stored in liquid form in a portable or stationary tank. Small portable tanks are used with gas grills and similar appliances, while stationary tanks are either mounted on legs and typically placed in the backyard of a home or business or buried underground. Stationary liquid propane tanks require care in installation, filling and maintenance.

Valves

All propane tanks approved for use must be equipped with a standard series of valves. These include a fill valve for attaching a delivery hose from a truck; a vapor return valve to keep pressure within limits during delivery; a service valve, which converts the liquid gas to vapor; a relief valve to bleed off excess pressure in emergency situations; and a liquid withdrawal valve, which governs the amount of LP gas withdrawn from the tank. Two types of gauges must also be operative: a float gauge that shows the amount of propane in the tank and a fixed liquid level gauge that warns when the level is about to exceed the maximum allowable 80-percent fill.

WHAT’S THE DANGER?

Propane under Pressure

The key to propane’s portability, and what packs so much energy into a relatively small volume of space, is pressure. In its natural state, propane is a vaporous gas. Under pressure, however, that vapor is converted to a form that is easier to transport and store. Liquified Petroleum Gas, or LPG, is the result of pressurizing propane gas, which causes it to drop below its boiling point of -44 degrees Fahrenheit.

At this temperature or below, propane remains in a liquid state, which condenses a large amount of energy into a small volume of fluid. When the propane’s temperature increases, it begins to “boil” off and this vapor is the usable form of propane that is converted to flame and heat your appliances. In this state, propane gas has a natural reaction to expand until it reaches equilibrium, or where it has normalized with atmospheric pressure.

SAFETY CONSIDERATIONS

Excessive Heat

If a propane tank is in contact with extreme heat, such as a garage fire, the external heat can cause the temperature inside the tank to increase, creating a **BLEVE** –or **boiling liquid expanding vapor explosion.** As the heat raises the temperature of the propane, the vapor expands and increases the pressure inside the tank, which can lead to a rupture.

Cold Temperatures

On the other extreme, propane itself is unlikely to freeze –that would require a temperature below -306 degrees Fahrenheit. However, trace amounts of water in supply lines can freeze inside fuel ports and fittings in extremely cold conditions.

HOW TO PROTECT YOURSELF

Propane Gas is very helpful to our society infrastructure. But propane gas can be very destructive. If propane leaks and you smell gas, take the following steps:

- Immediately put out all open flames and smoking materials
- Do not operate any electronic devices, lights, telephones, or cell phones
- Immediately get everyone out of the building
- If safe to do so, turn off the main gas supply valve on the propane tank
- Report the leak to your propane retailer or dial 911 or your local fire department (do this in an area away from the building)
- Do not return to the building until your propane retailer, a service technician, or an emergency responder deems it is safe to do so
- Have your system checked before you attempt to use the system again

PRESSURE

The “How” to check pressure in propane tank

1. Use a pressure gauge. This device can be installed between the shutoff valve and the initial regulator and is particularly common on larger residential systems.
2. Release full tank pressure to the gauge, allowing enough gas to pass through to lower the pressure gauge reading by 10 psi.
3. Close the shut-off valve and allow the system to stand for three minutes without showing an increase or decrease in pressure. Any increase in pressure indicates a faulty valve, while a decrease indicates a leak.

The Range – Propane Tank's Pressure

Generally, propane pressure **should be between 100 and 200 psi to ensure that the liquid propane gas remains in a liquid state**.

Normally, the pressure inside a propane tank fluctuates based on the outside temperature. For example, a standard 20-pound propane tank at 70 degrees will have 145 psi internal pressure. That same tank on a 100-degree day will have 172 psi of pressure.

Propane pressure levels exceeding 200 psi are likely to trigger a release from the safety relief valve commonly installed on propane storage tanks. This device allows propane gas to safely vent out of the tank if there's excessive pressure.

KEY SAFETY POINTS

- Do not transport tanks inside a vehicle and do not transport more than 5 tanks at one time. Be sure to secure the load to prevent movement.
- Damaged tanks or tanks older than five years should be taken to **local regulatory** disposal sites.
- Before using the tank, check the service life date stamp. Do not smoke in the storage area or within 15 meters of a propane unit that is in use.
- Always inspect valves and hoses prior to use.
- Propane must be stored in a designated weather protected area. Temperature protection (i.e. from freezing) is not necessary in our climate for an undamaged tank.
- Use the appropriate wrench when tightening the hose to the tank. Do not use pliers

PROPANE SAFETY

- Don't enter an area where you suspect a gas leak. If you are in such an area, leave immediately! Don't allow others to enter the area.
- Do not try to judge for yourself the level of danger of a gas leak by trying to determine if one smell of gas is weak or strong. All gas leaks pose a risk.
- Be alert for propane odor when working in areas where propane is used. Even a faint odor may indicate a hazardous situation.
- Repeated pilot light outages could indicate a hazardous condition. Don't attempt to re-light the pilot, or service your equipment.
- Don't tamper with or use tools to operate controls. If controls are difficult to operate by hand. Keep combustible products like gasoline, kerosene, or cleaners in a separate room from propane appliances. Your appliance pilot lights could ignite fumes from these combustibles.
- Contact with propane vapours can cause surface burns to your skin. Wear gloves when there is a possibility of danger of contact with the vapours.

PROPANE GENERAL SAFETY TIPS

- Store propane tanks outside and above ground
- Keep portable propane tanks away from electrical sources.
- Paint your propane storage tank.
- Keep your face away from valves on tanks or cylinders
- Cap or plug non-connected gas lines and valves.

FINAL WORD

Understand the power of propane. Its potential for harm is obvious to most. The protocols /practices of large scale propane gas operations have many safety considerations, including installation and use and refilling and maintenance issues.