



LPG CONSUMER & SAFETY TIPS

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What is LPG?



What is LPG?

LPG stands for Liquefied Petroleum Gas, either propane or butane or a mixture of both. These gases occur naturally in crude petroleum or natural gas.

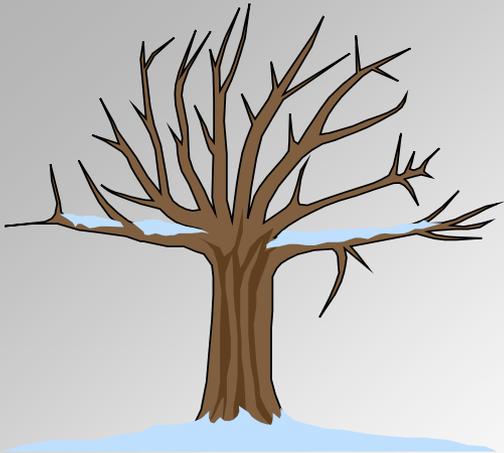
In the Philippines, LPG is essentially a mixture of butane and propane.



What is LPG?

PROPANE vs. BUTANE

- Propane evaporates at a lower temperature as compared to Butane.



Propane evaporates at **-42°C**.

Ideal for cold climates.

Butane evaporates at **0°C**.
Ideal for tropical climates.



Sources

1. Field Gas

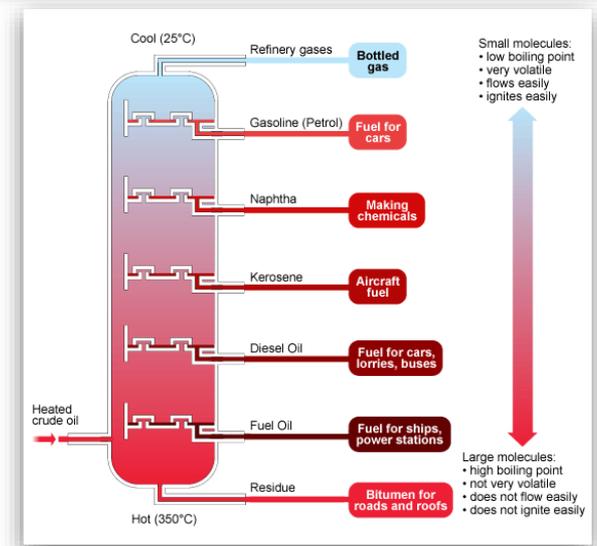
Associated Gas (w/ crude petroleum)

Unassociated Gas (mixed w/ natural gas)

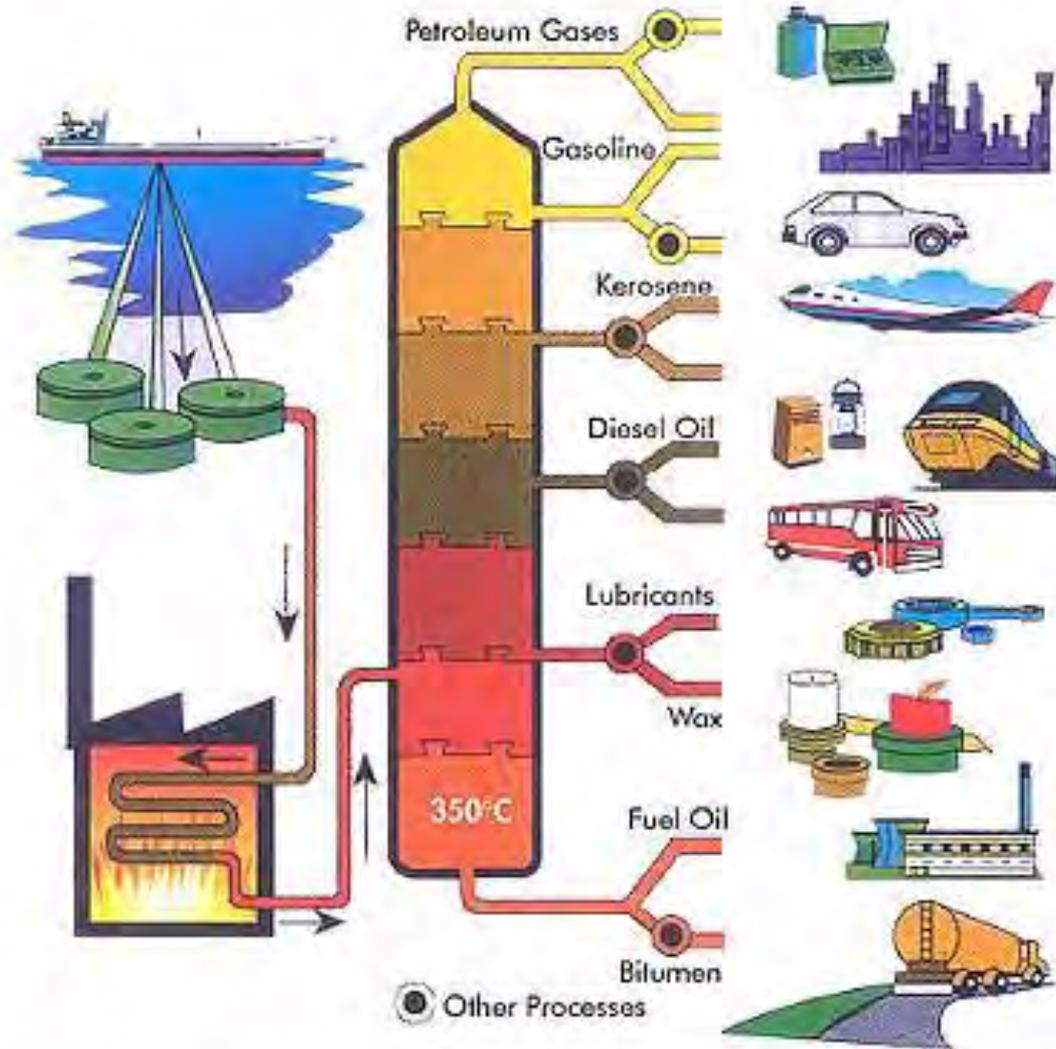


2. Refinery Gas

The result of processing crude oil by distillation, in the same manner that other liquid fuels, such as kerosene, gasoline and diesel, are extracted.

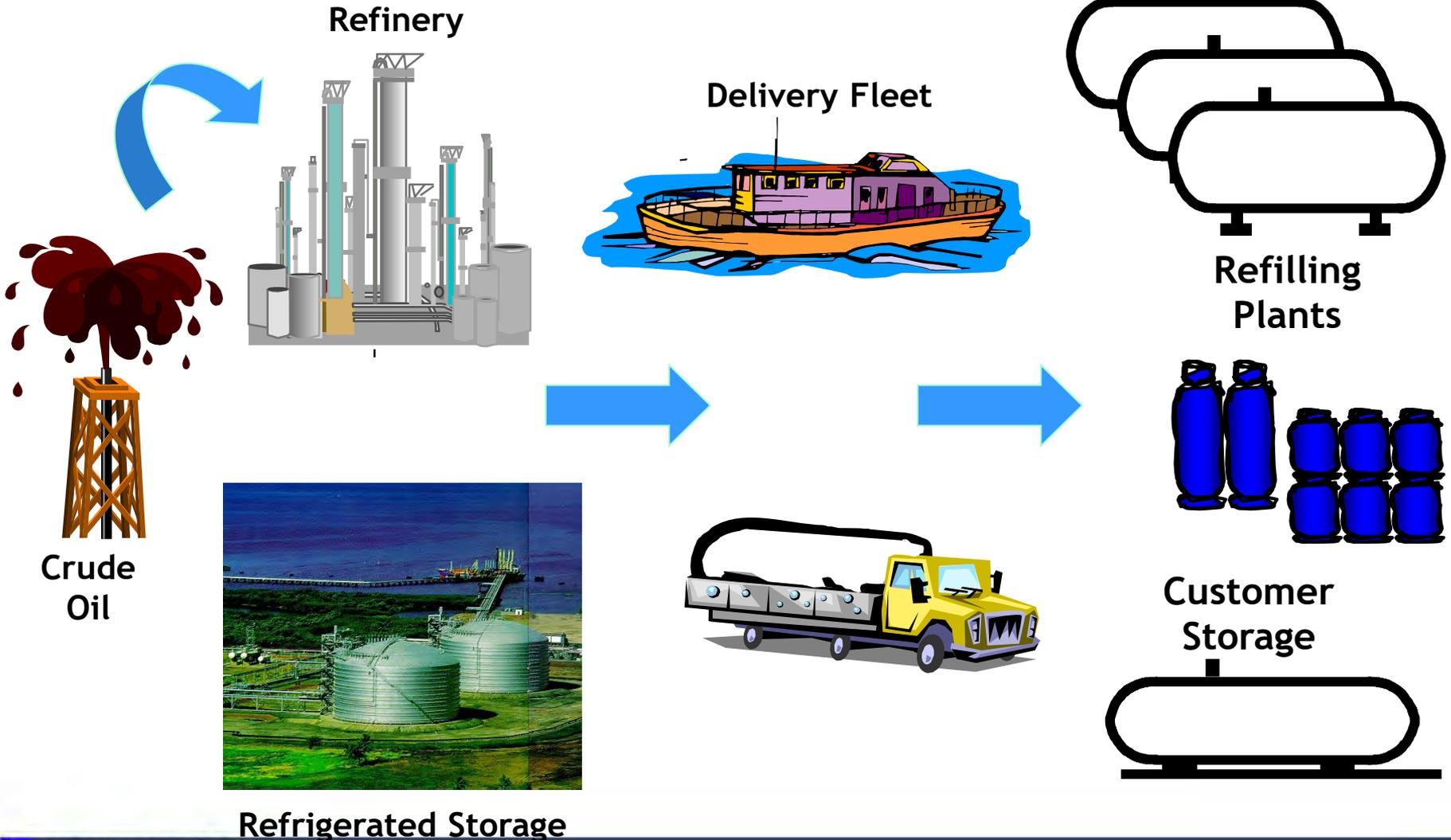


LPG in REFINING PROCESS



Supply & Distribution

LPG TECHNICAL



Refrigerated Storage



LPG APPLICATIONS - few of an estimated 2000 uses

LPG TECHNICAL



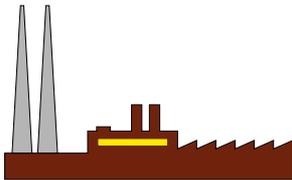
At home

- Cooking, Heating, Airconditioning, Water heating, Refrigeration, Incinerating



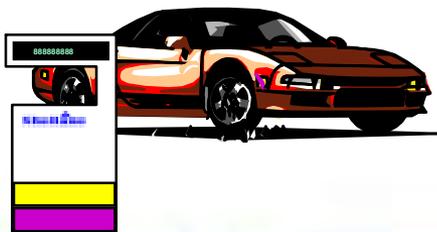
On the farm

- Chicken Brooders, Incubators, Crop Drying, Tobacco curing, Greenhouse heating, Rice Threshers



Industrial Applications

- Brazing, Soldering, Ceramic firing, Clothes pressing die casting, drop forging, Annealing, Hardening.



Auto LPG

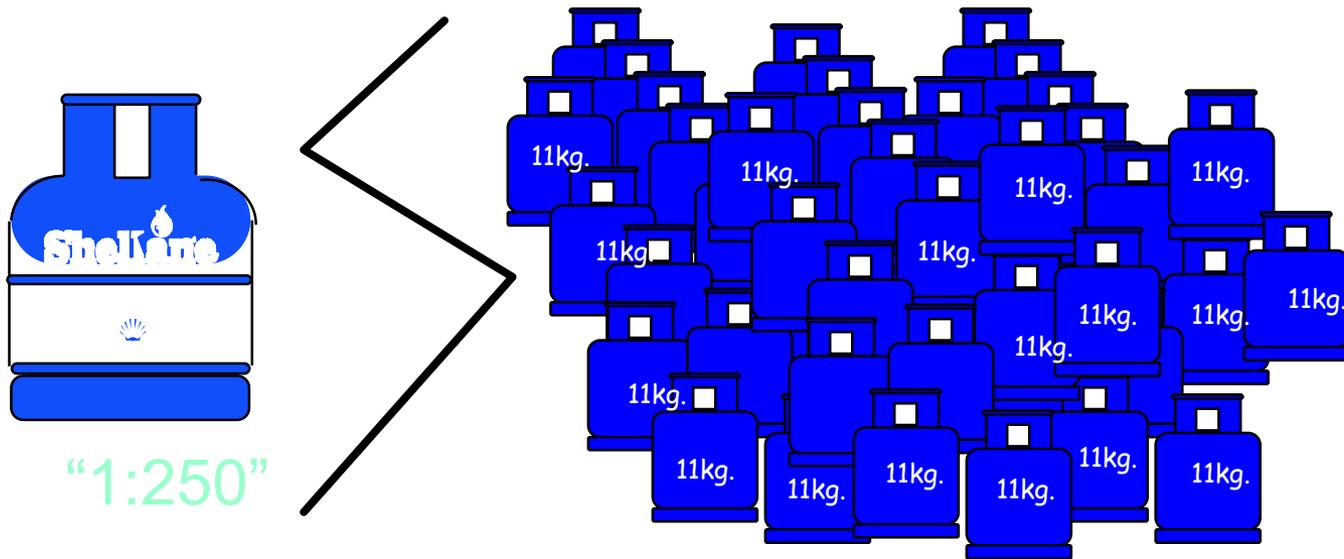
- LPG for vehicles such as taxis, buses, forklifts



Characteristics of LPG

LIQUID TO VAPOR EXPANSION

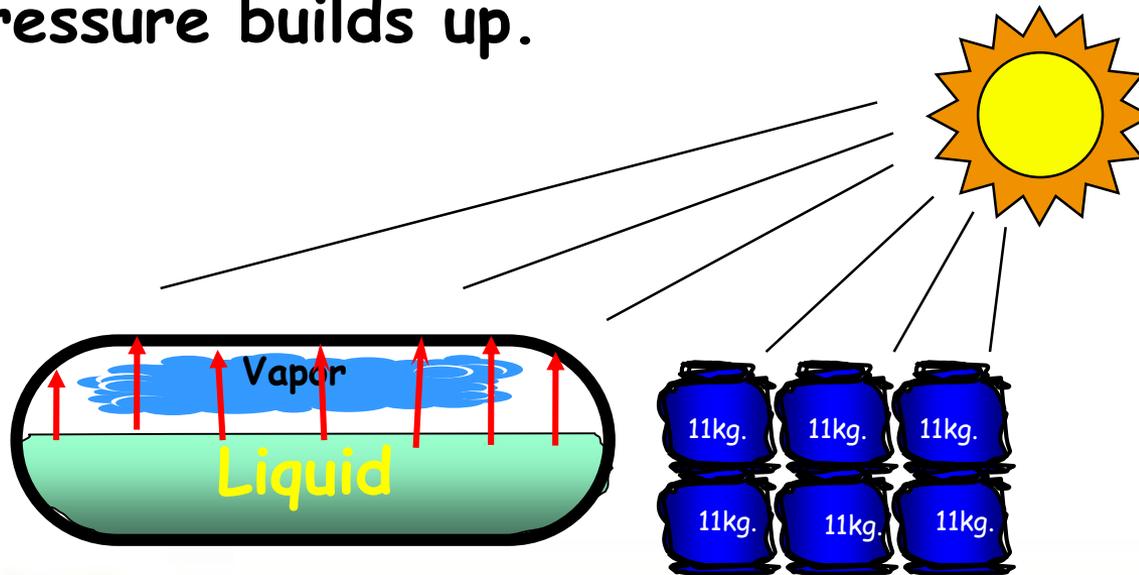
One tankfull of liquid LPG is equivalent to 250 tanks of vapor LPG.



Characteristics of LPG

Liquid Expansion

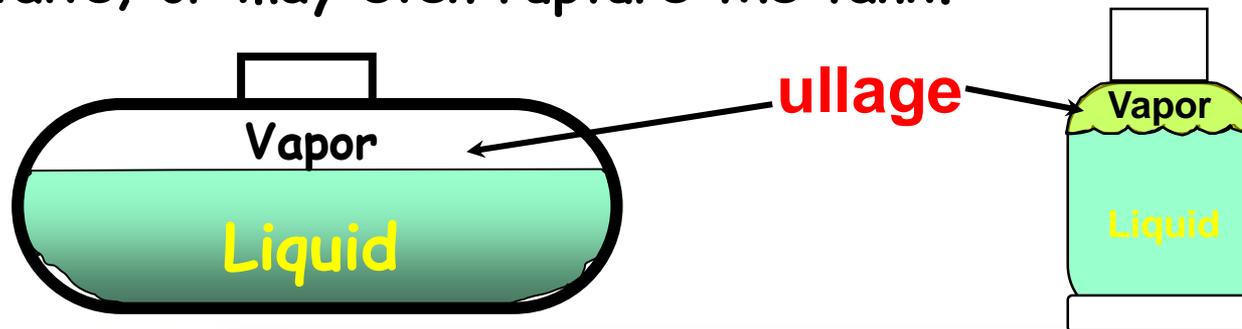
LPG in the liquid phase expands due to any increase in temperature. The liquid inside the tank tries to evaporate, but, since it is trapped inside the confines of the tank, pressure builds up.



Liquid Expansion

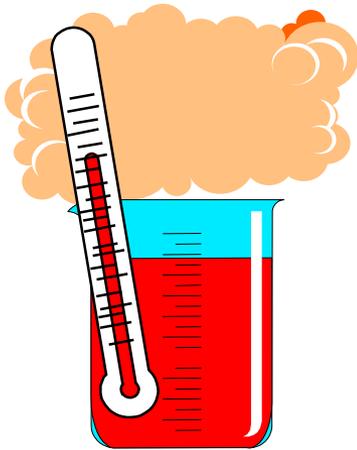
Because of liquid expansion, we never fill the tank to its maximum capacity. Filling is done only up to 85% capacity.

The 15% “free space” is called **ullage**. Overfilling the tank may result to dangerous hydraulic pressures which may cause the discharge of liquid out of the pressure relief valve, or may even rupture the tank.

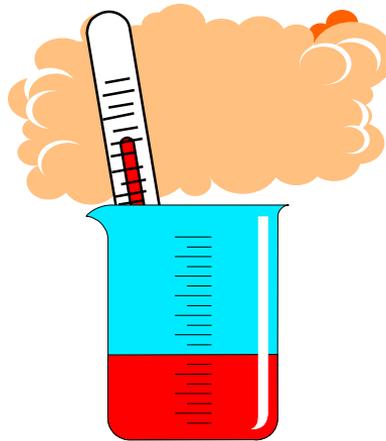


Characteristics of LPG

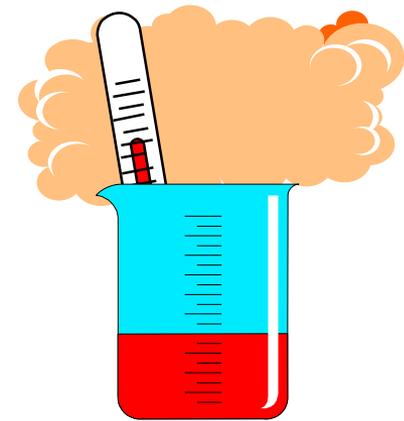
Boiling Points of Three Liquids



Water @ 100 °C



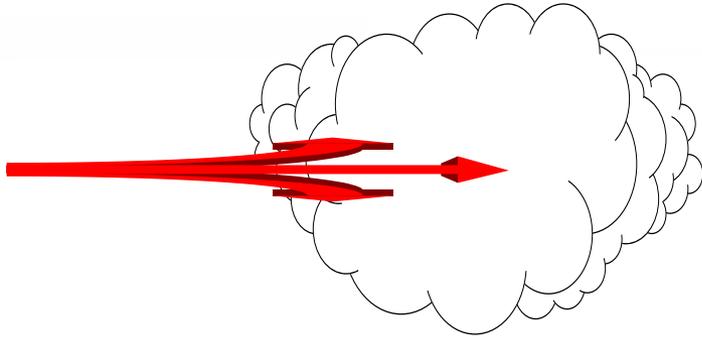
Butane @ 0 °C



Propane @ -42 °C



Characteristics of LPG



When LPG is released, it rapidly vaporizes and mixes with the air.



If the released gas is not properly dissipated, it will readily ignite upon contact with sparks, open flame, or any other source of ignition.



Characteristics of LPG

The fire, however, may not be serious unless the gas is confined; in which cases, an explosion may occur, the intensity of which will depend on the degree of confinement.

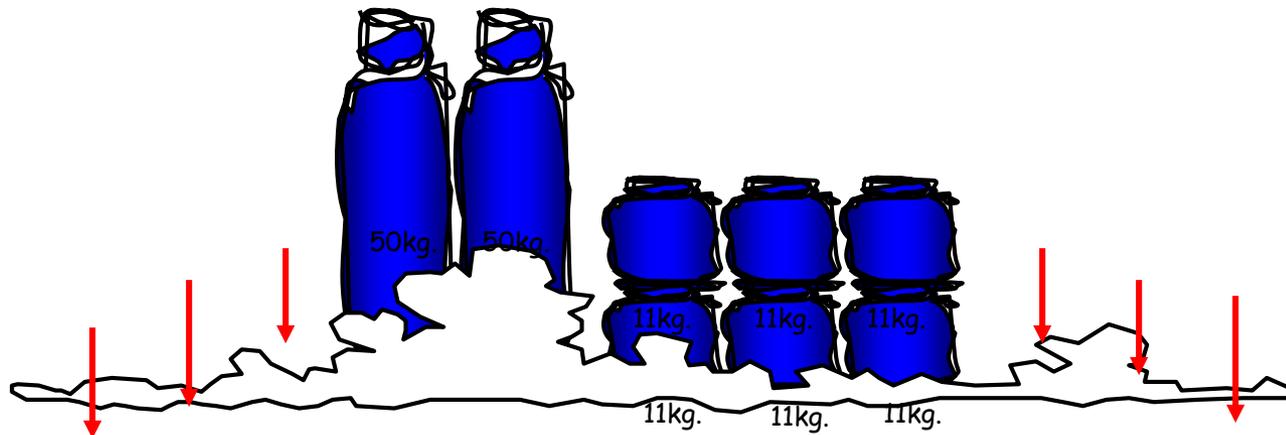
In the open air, flaming LPG vapors travel at about 15 feet per second, depending on the atmospheric conditions and the concentration of the gas.



Characteristics of LPG

LPG VAPOR is HEAVIER than AIR

LPG vapor, when released to the atmosphere is heavier than air. LPG vapor will then tend to deposit itself on the lowest portion in the area.



Characteristics of LPG

PURE LPG IS COLORLESS AND ODORLESS

LPG is as clear as water in the liquid form. As LPG evaporates, it looks like steam, but quickly becomes invisible.

Pure LPG has no smell. For safety purposes, **ethyl mercapthan** is added so any leaks can be detected by scent.



Characteristics of LPG



LPG is non-poisonous and environment friendly.

LPG dissolves natural rubber.



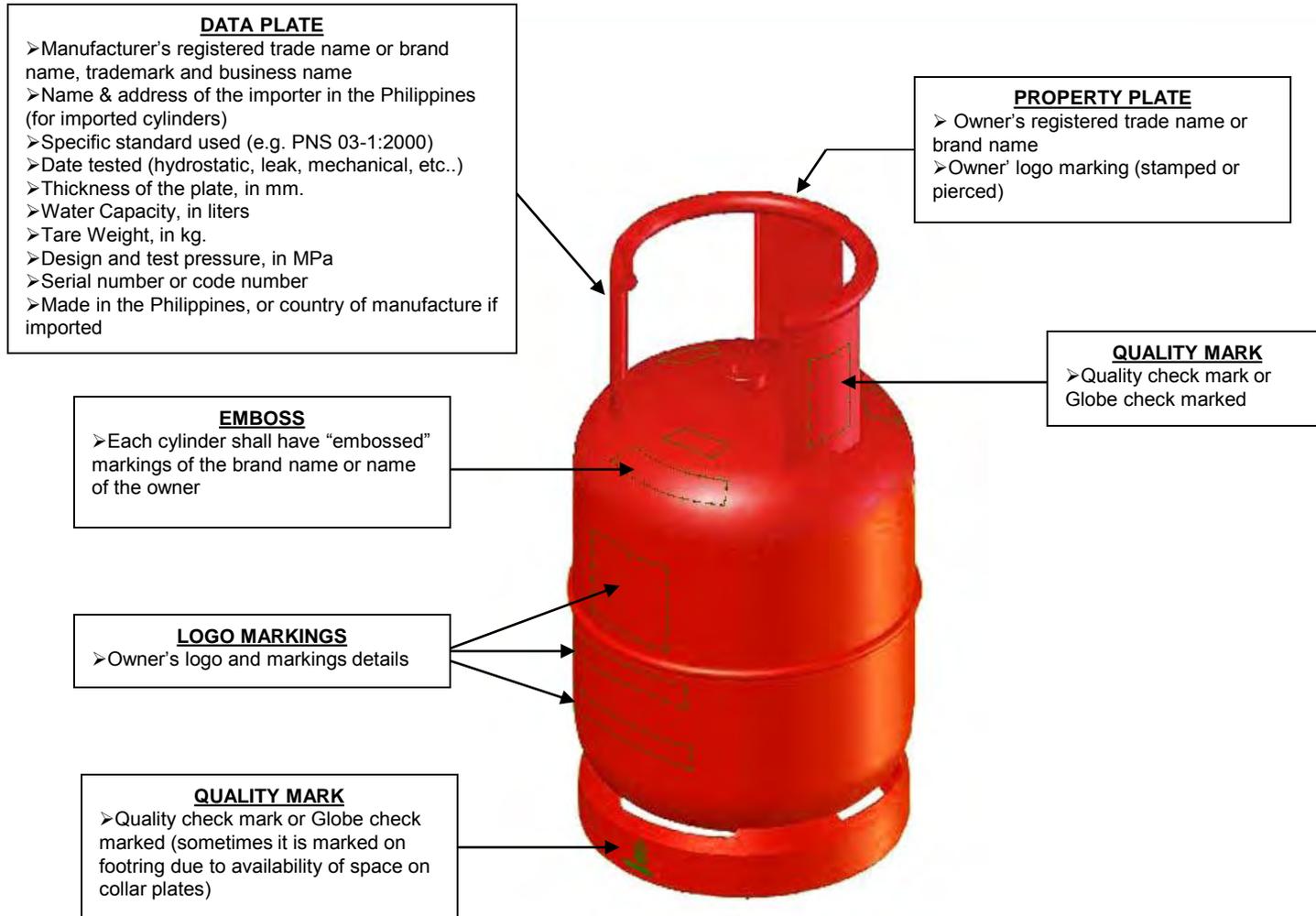
CONSUMER TIPS



Parts of an LPG Cylinder



LPG Cylinder Marking



Consumer Tips

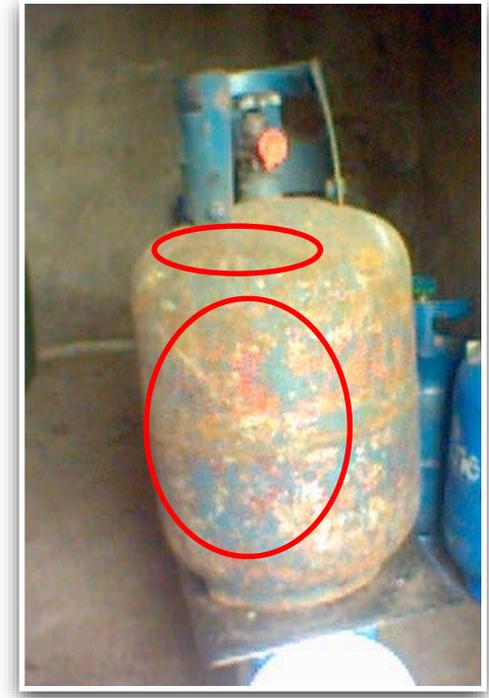
In purchasing LPG:

- Be sure that the cylinder is in good condition.



Consumer Tips

Buy cylinders with proper markings, e.g., brand name, tare weight



Consumer Tips



Buy LPG cylinders with Tare Weight (TW) markings



Consumer Tips



Look for a **DOE-required** weighing scale.



Consumer Tips

Determine the gross weight of LPG in filled cylinders by adding the Tare Weight (T.W.) and net weight of 11.0 kgs.



$$\begin{array}{r} 12.3 \\ + \\ 11.0 \\ \hline \end{array}$$

Gross weight **23.3**



Consumer Tips

Underfilling



Net weight $+$ 11.0 kg.

Gross Weight **23.0 kg.**

22.4 kg.

-0.6 kg.



Consumer Tips

- Check if the security seal is intact and firmly affixed to the valve.



The brand name/logo in the cylinder and the seal must be the same



LPG Cylinder Defects



LPG Cylinder Defects

1. Corrosion



General Corrosion



Line Corrosion



LPG Cylinder Defects

2. Leak



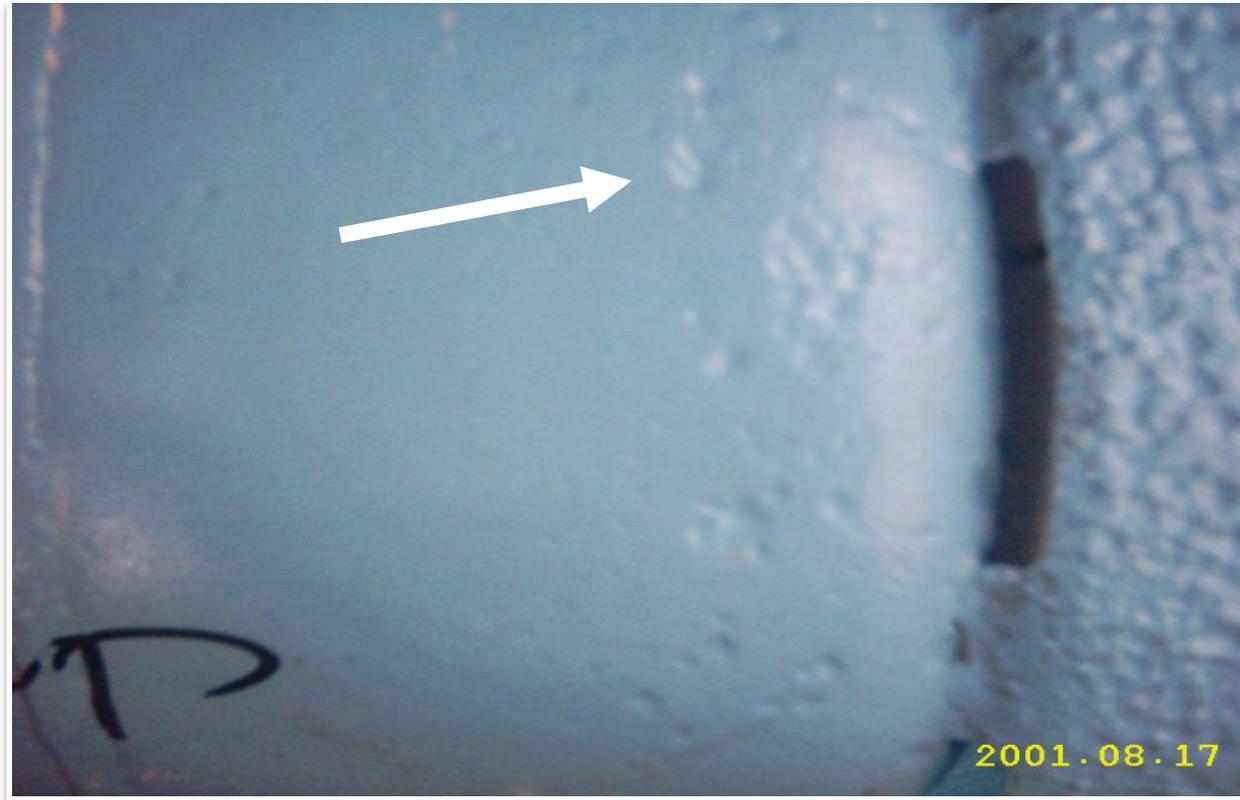
Body Leak



Weld Leak



LPG Cylinder Defects



Isolated Pits



3. Chop-chop Cylinders

- Backyard fabricated cylinder
- Assembled condemned cylinder



LPG Cylinder Defects

4. Deformed Collar/Footing



LPG Cylinder Defects

5. No Emboss



6. Bulging



LPG Cylinder Defects

7. Deformed/Defective Valve



8. Burned Cylinder



LPG Cylinder Defects

9. Incompatibility of Valve to Neck Ring



LPG Cylinder Defects



Genuine



Fake



Important Reminder

Outdoor use only

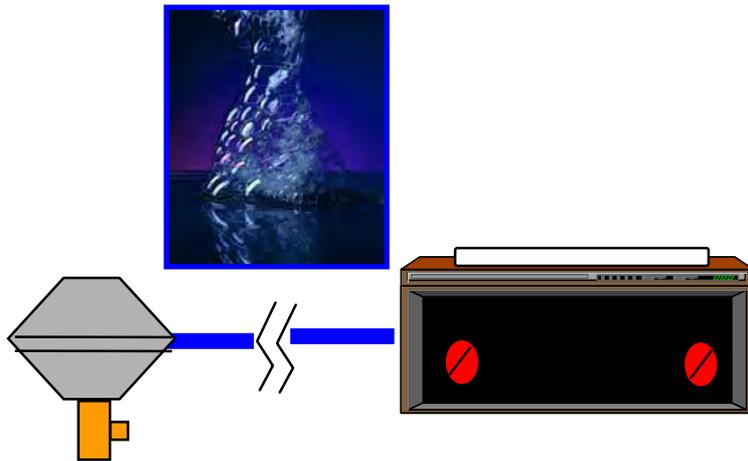


SAFETY TIPS



Safety Tips

- Do not invert LPG cylinders or let it lie horizontally on the floor

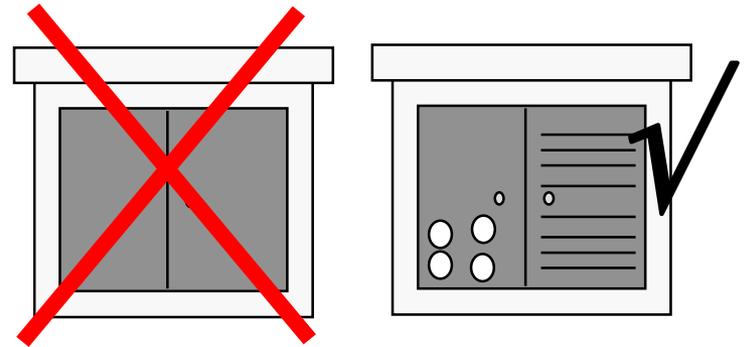


- Use only LPG resistant rubber hoses with clamps and regularly check for wear, cracks and leaks using soapy and water



Safety Tips

- Do not store LPG cylinders in enclosed kitchen cabinets

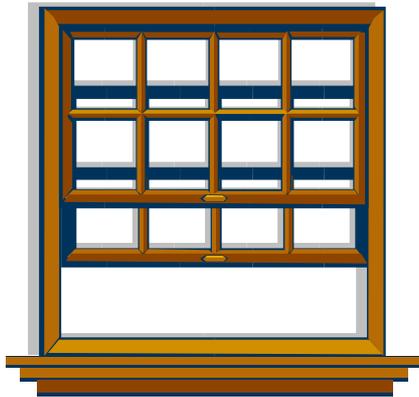


- Keep LPG cylinders away from electrical points and other sources of fire/ignition



Important Reminder

IF YOU SMELL GAS IN YOUR KITCHEN:

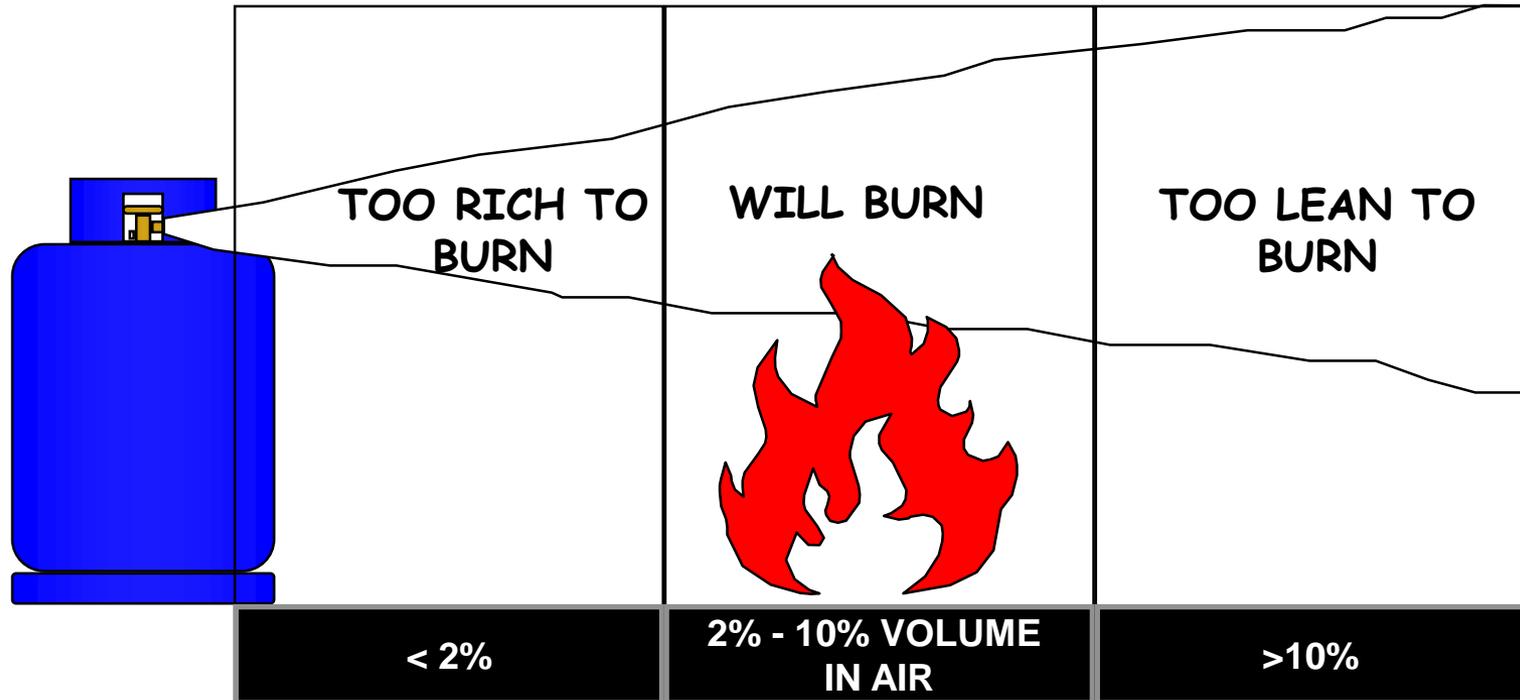


- Open all doors and windows to improve ventilation.

- Do not switch on/off electrical switches or connect/disconnect electrical plugs.

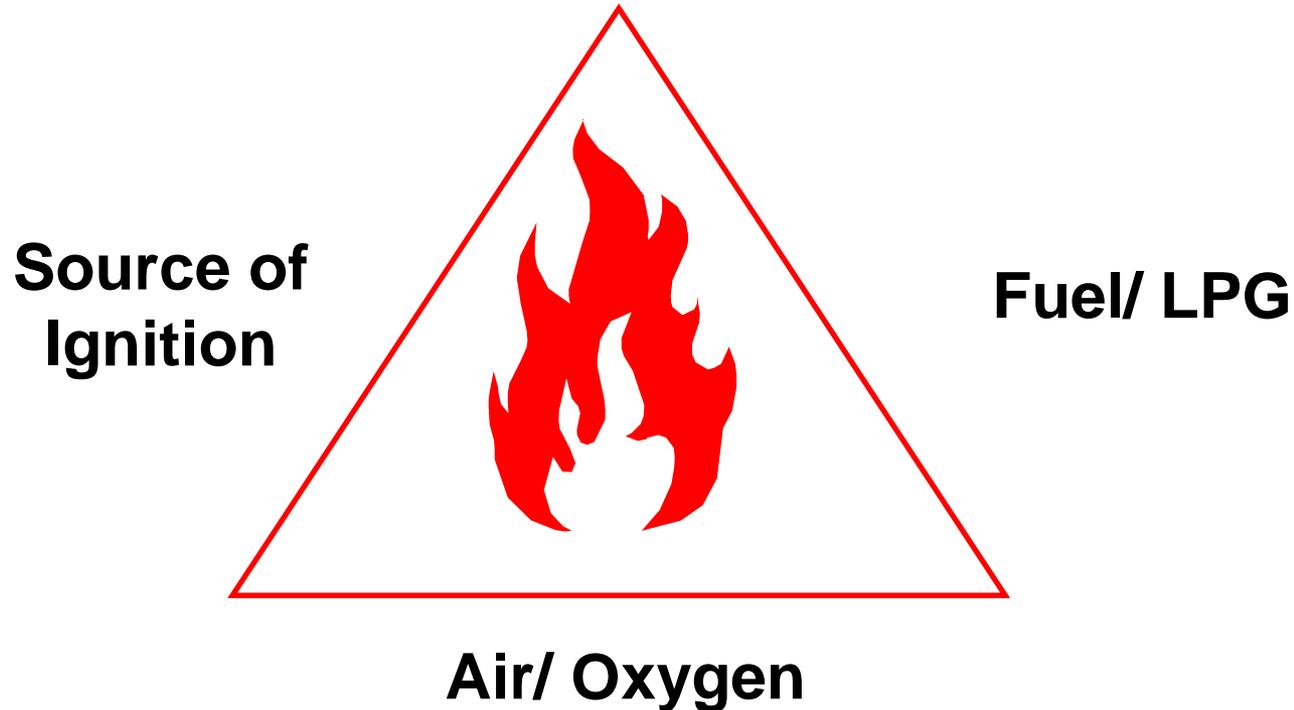


LIMITS OF FLAMMABILITY (Air/Fuel mixture)



Important Reminder

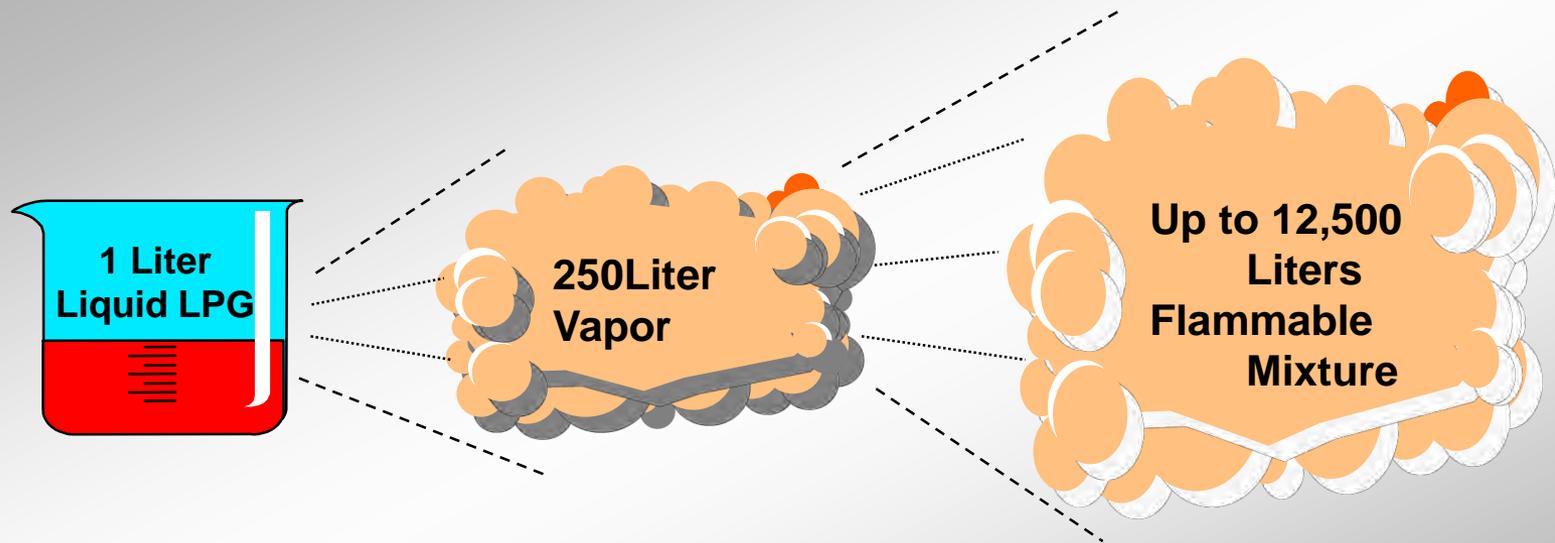
Triangle of Fire



***LPG will burn either in the liquid or vapor phase.
Combustion will require the three elements
represented by each side.***



Air / Gas Flammable Mixture



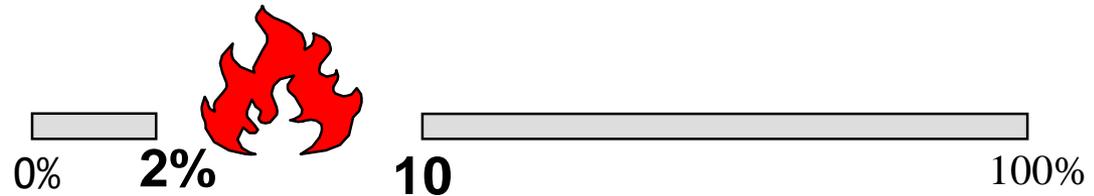
The LFL (Lower Flammable Limit) is around 2% mixture of LPG in air - this means that 1 liter of liquid LPG, when mixed with air will give 12,500 liters of flammable mixtures.



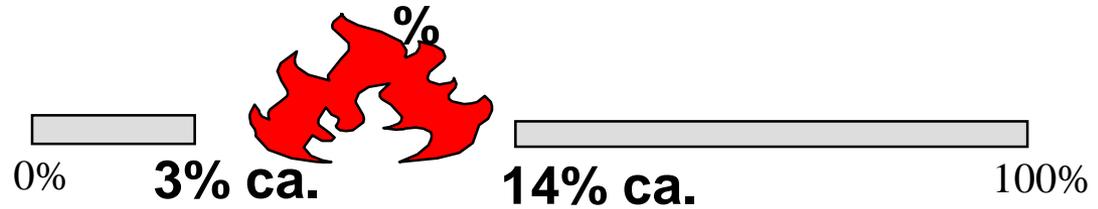
FLAMMABILITY LIMIT

FUEL

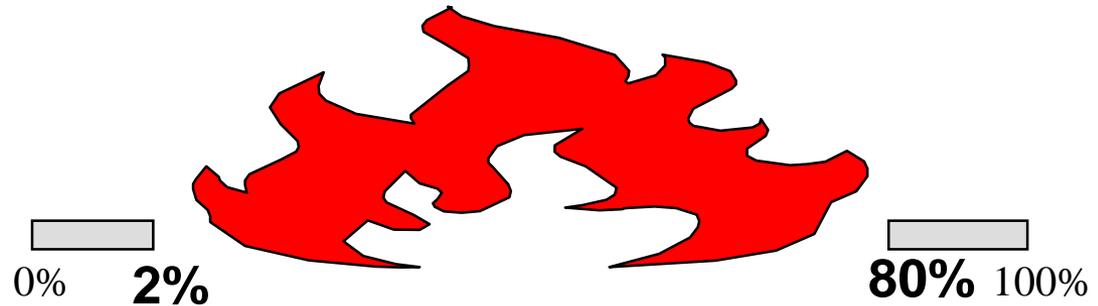
LPG



NATURAL GAS



ACETYLENE



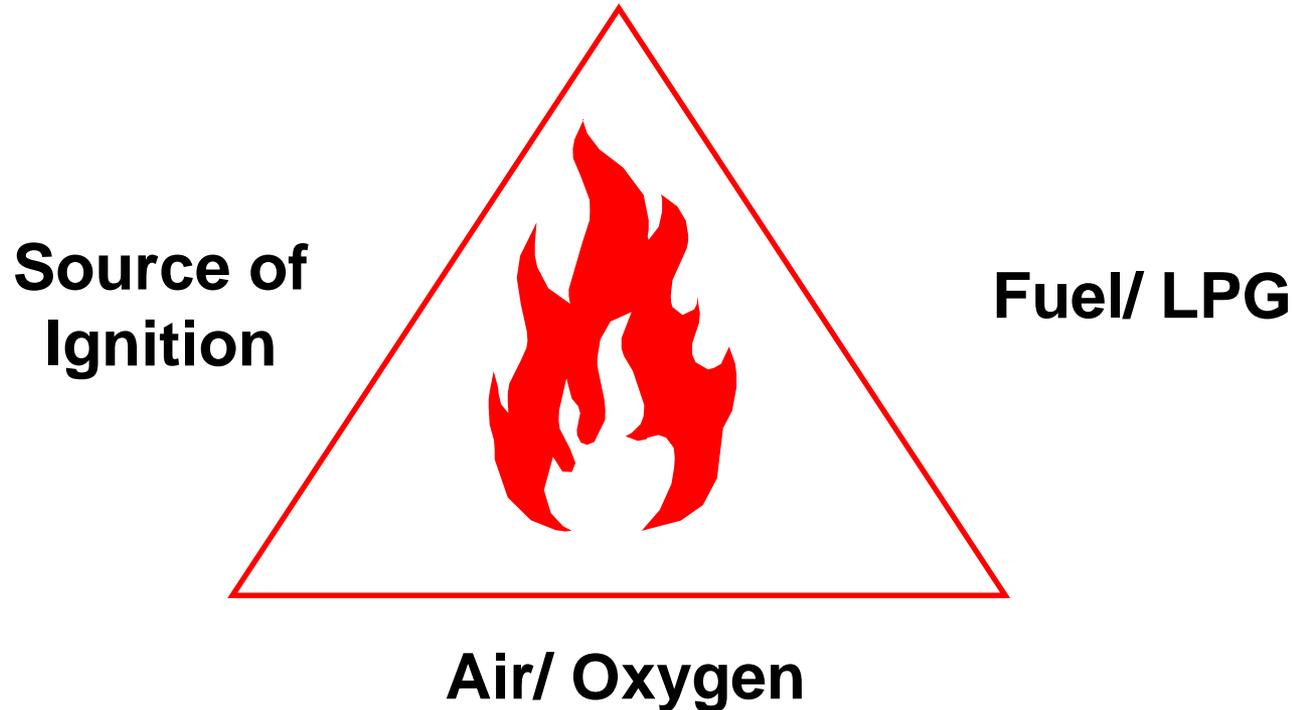
Important Reminder

- If leak is on cylinder, move cylinder out to open and ventilated place.
- Seek help from retail outlet where LPG was purchased or call the proper authorities



Important Reminder

Triangle of Fire



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represented by each side.***



Important Reminder

LPG ANTI-LEAK DEVICE



Important Reminder

The so-called LPG anti-leak device is actually a mechanically operated gadget technically termed “excess flow limiter”. A steel ball automatically blocks off the passage of gas when there is a sudden surge thru the regulator, about 40% to 50% of the normal flow. It does not activate in the presence of pinholes and small cracks on your LPG hose.

The use of this device on household installation can even result in complete disregard for the most basic and simplest safety practices.



***“The more informed a consumer or buyer is,
the more difficult it is to sell them.”***

***- Joe Pulizzi in “Get Content,
Get Customers”***



Thank You!



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