



# LPG CONSUMER & SAFETY PRACTICES

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E-Power Mo: Towards An Energy Resilient Philippines

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# What is LPG?

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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.



# Sources of LPG

## 1. Field Gas

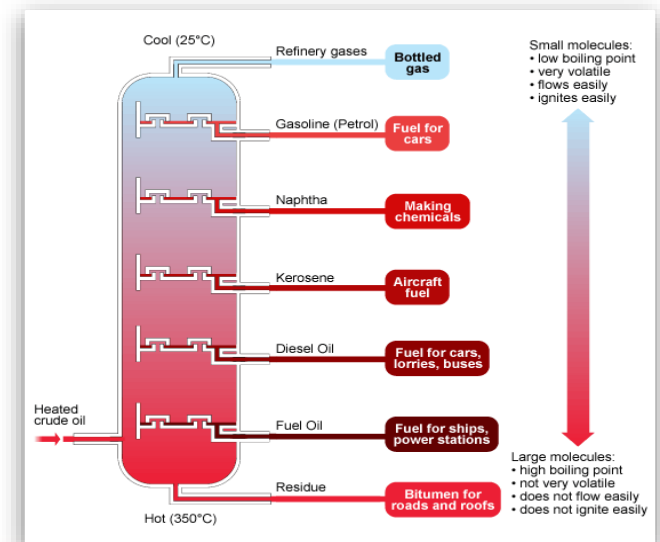
Associated Gas (w/ crude petroleum)

Unassociated Gas (mixed w/ natural gas)

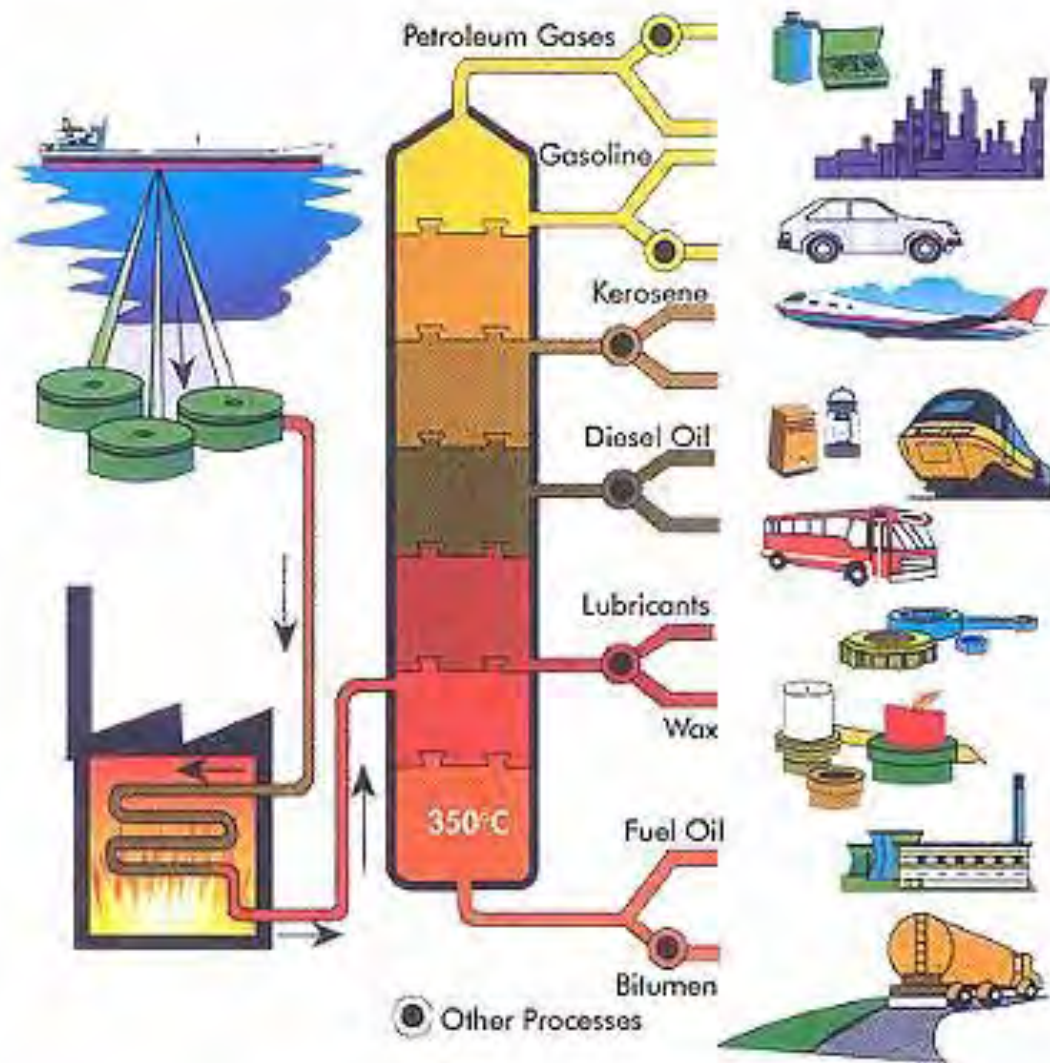


## 2. Refinery Gas

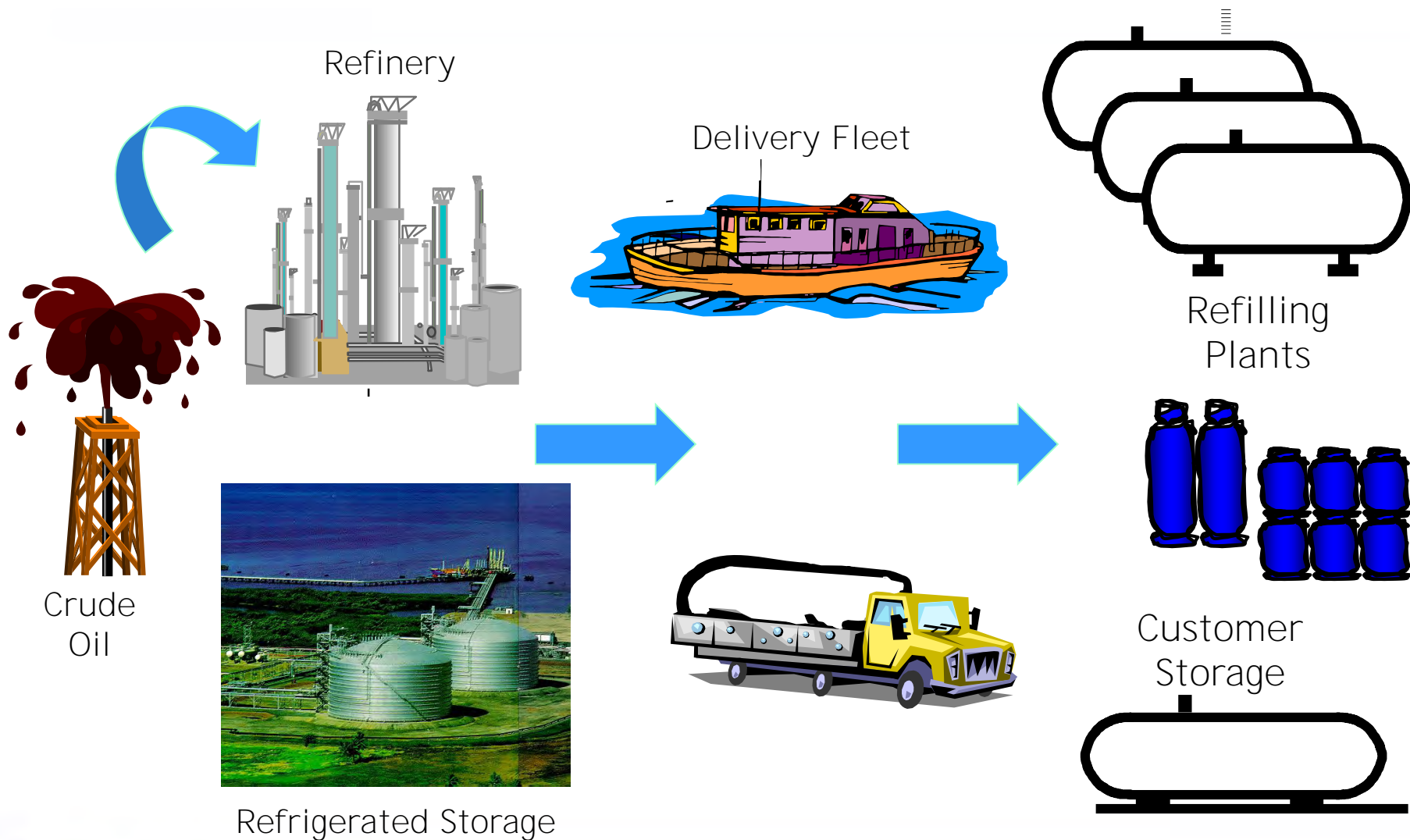
The result of processing crude oil by distillation, in the same manner that other liquid fuels, such as kerosene, gasoline and diesel, are extracted.



# LPG In Refining Process



# LPG Supply And Distribution Chain



# LPG Common Applications



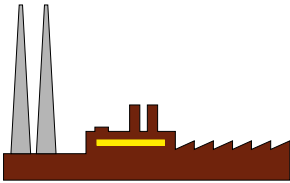
## Residential Applications

- cooking, heating, air-conditioning, water heating, refrigeration, incinerating



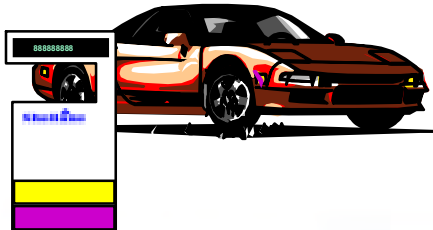
## Agricultural Applications

- 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



## Commercial Applications (Auto LPG Retail Outlets)

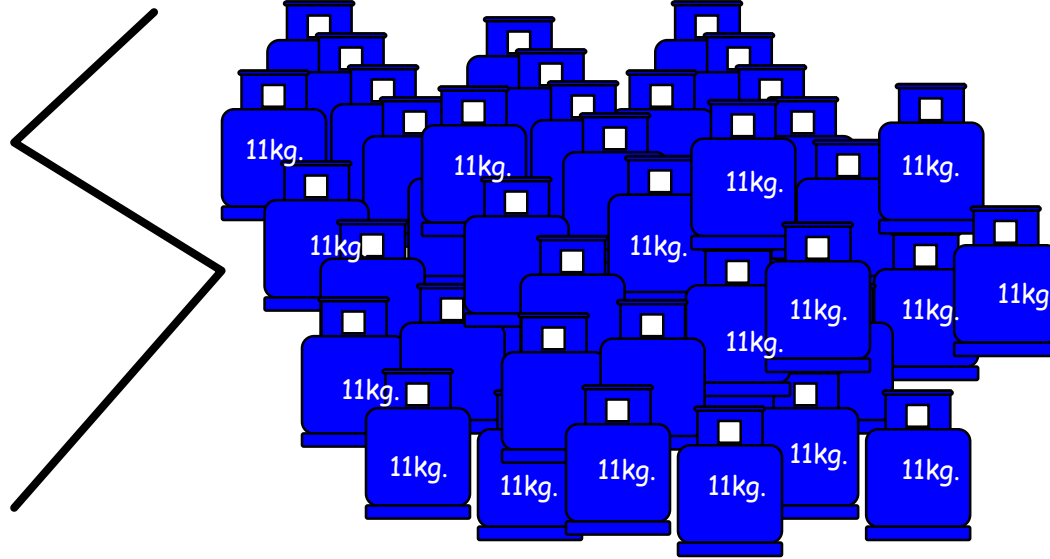
- LPG for vehicles such as taxis, buses, forklifts



# Characteristics of LPG

## Liquid To Vapor Expansion

One cylinder tank of LPG in liquid form is equivalent to 250 tanks of LPG in gas or vapor form.



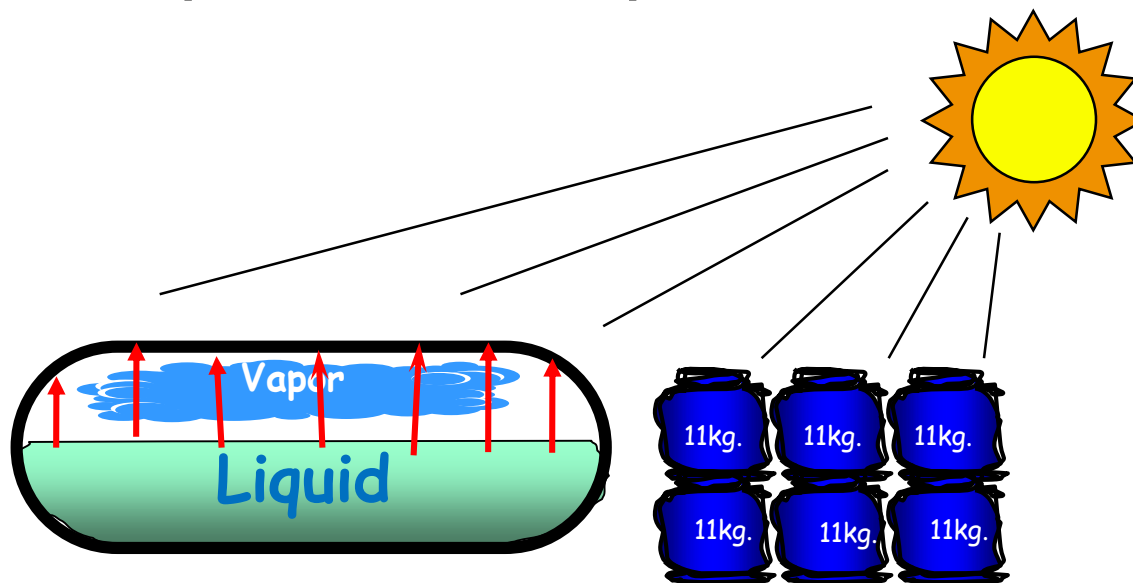
Ratio:1:250



# 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.



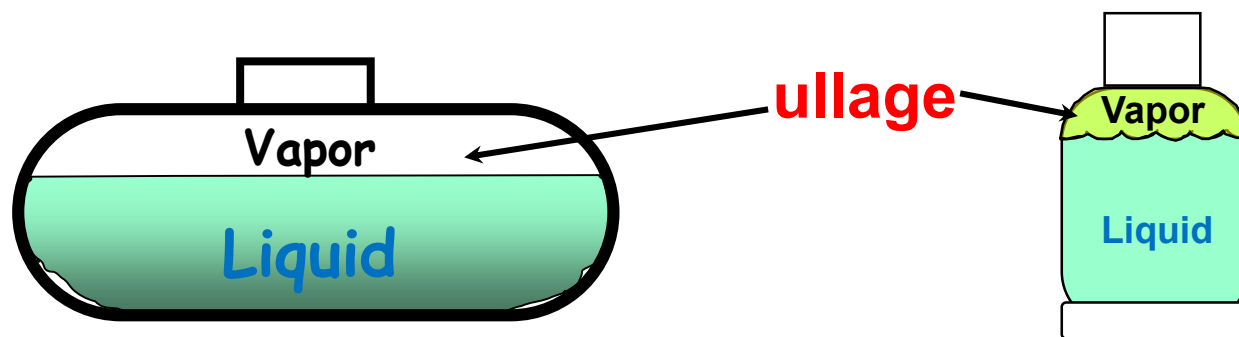


# Characteristics of LPG

## Liquid Expansion

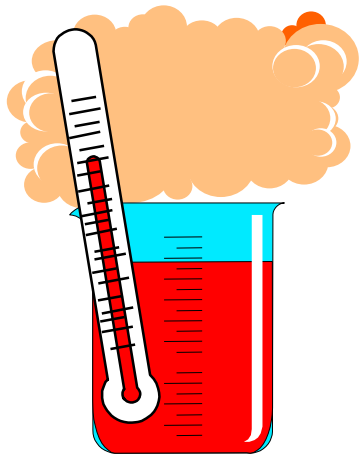
Because of liquid expansion, the tank should not be filled to its maximum volume capacity. Filling is done only up to 85% volume capacity of the tank.

The remaining 15% “free space” is technically termed as **ullage**. Overfilling the tank may result to dangerous hydraulic pressures which may cause the discharge of liquid out of the Pressure Relief Valve (PRV), or may even rupture the tank.

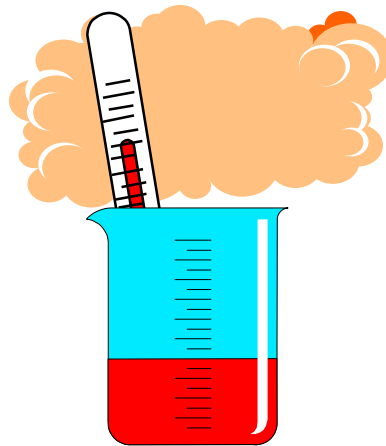


# Characteristics of LPG

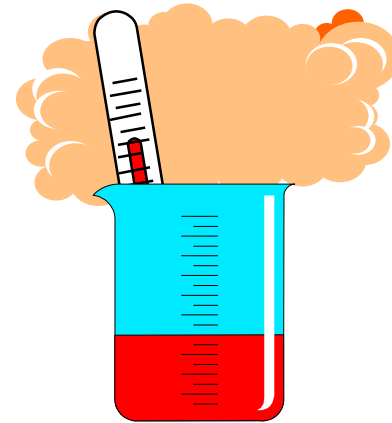
## Comparison of Boiling Points of Three Liquids



**Water @ 100 °C**



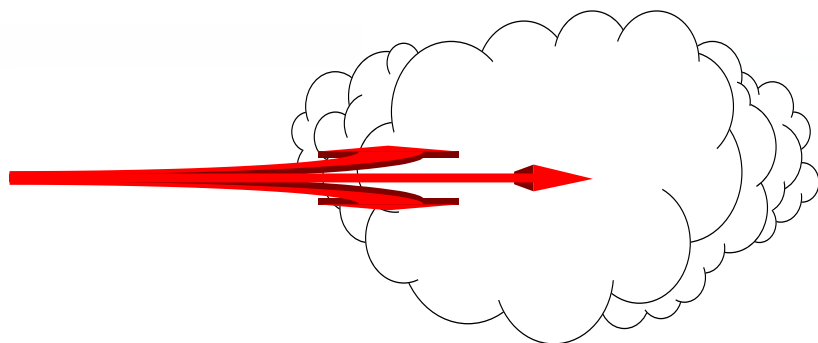
**Butane @ 0 °C**



**Propane @ -42 °C**



# Characteristics of LPG



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



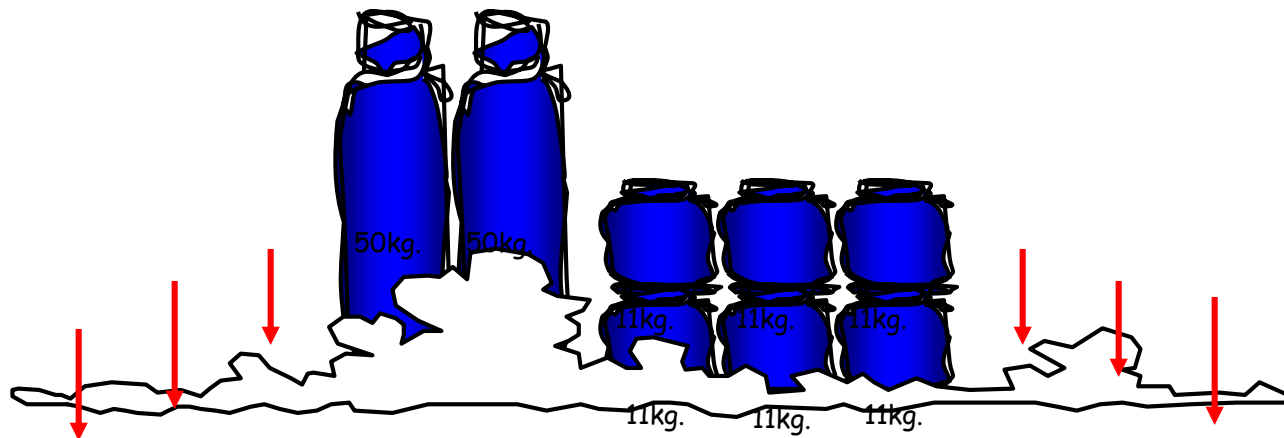
**If the released gas is not properly dissipated, it will readily ignite upon contact with sparks, open flame, or any other source of ignition.**



# Characteristics of LPG

## LPG Vapor is Heavier than Air

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



# Characteristics of LPG

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## LPG in its original form 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 is odorless or has no smell. However, for safety purposes, **Ethyl Mercapthan**, an odorant, is added to LPG so any leaks can be detected by scent.



# Characteristics of LPG

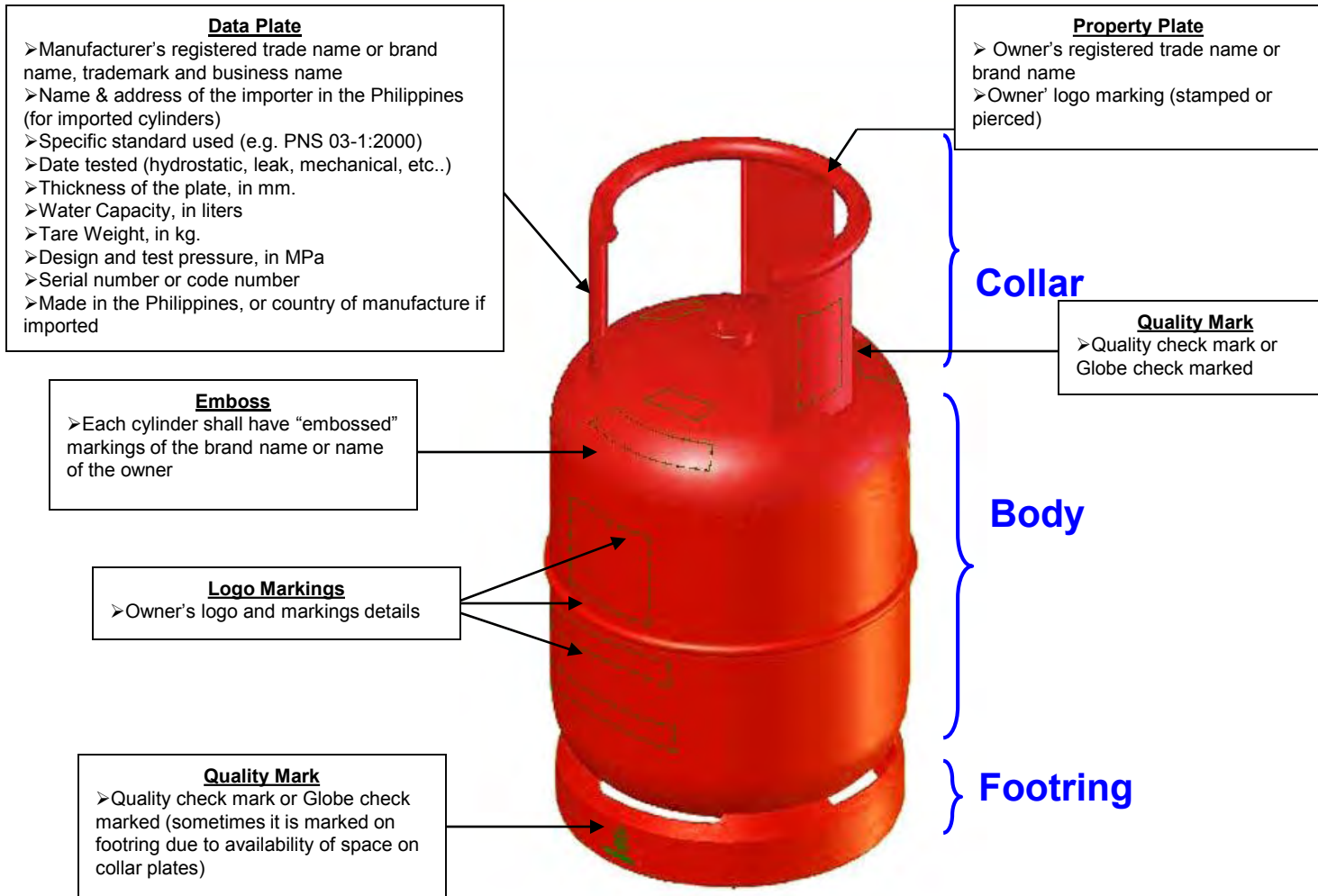


**LPG is non-poisonous and environment friendly.**

**LPG dissolves natural rubber.**



# Parts of LPG Cylinder and Its Markings



# LPG Consumer Tips

**In purchasing LPG:**

- **Be sure that the LPG cylinder is in good visual condition.**





# LPG Consumer Tips

**Purchase LPG cylinders only with appropriate or proper markings (e.g., brand name, product safety and tare weight)**



# LPG Consumer Tips



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



# LPG Consumer Tips

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



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

**Gross weight = 23.3**



# LPG Consumer Tips

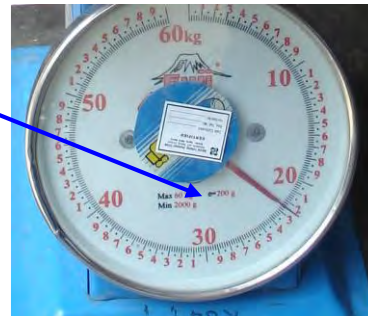
## How to Determine Under-filling of LPG

Net weight + 11.0 kg.

Gross Weight 23.0 kg.

22.4 kg.

**-0.6 kg.**



# LPG Consumer Tips



- Check if the security seal is intact and firmly affixed to the Pressure Relief Valve (PRV).

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



# LPG Consumer “Tipid” Tips

- **Prepare the needed ingredients and condiments to be cooked before lighting up your gas stove or range.**



# LPG Consumer “Tipid” Tips



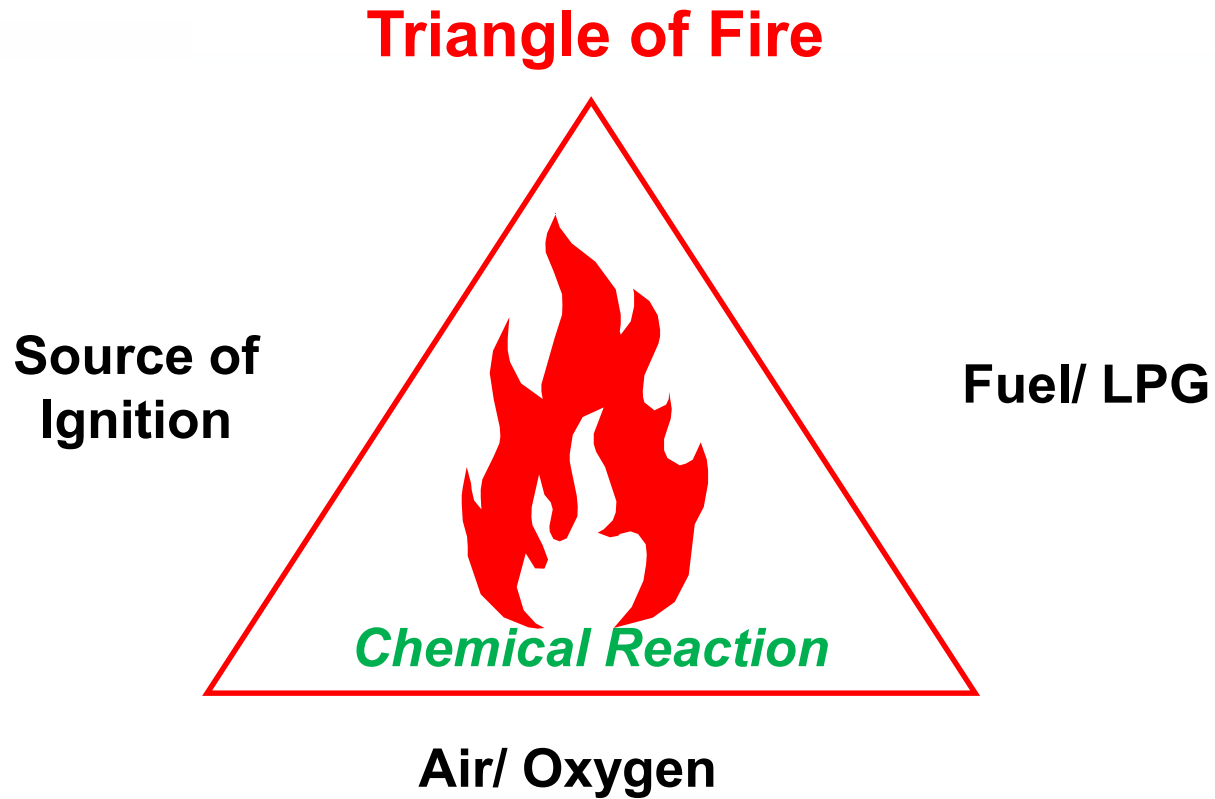
- The gas burner must be clean, free from dirt and other impurities. Remember that a blue flame, unlike a yellowish one, has a greater heating value, thus reducing your gas consumption.



- Match the size of pots/pans to the size of the burner.



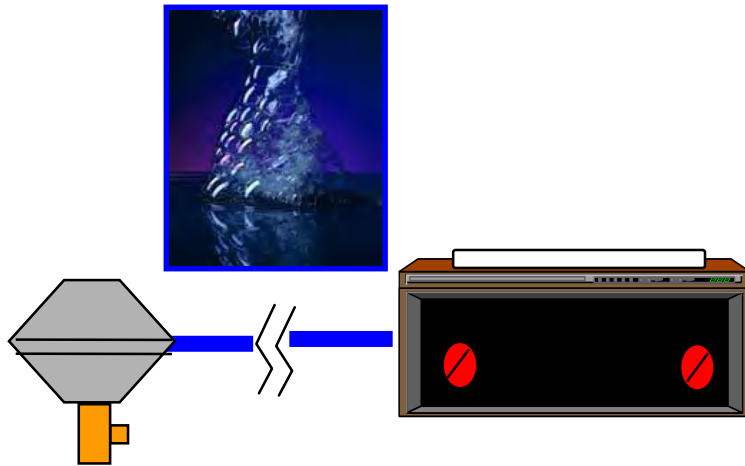
# Important Reminder on Safety





# LPG Safety Tips

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

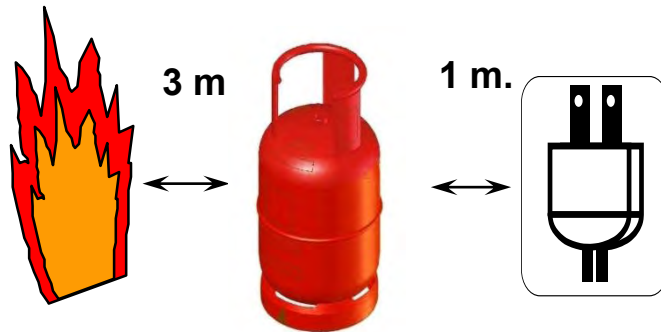
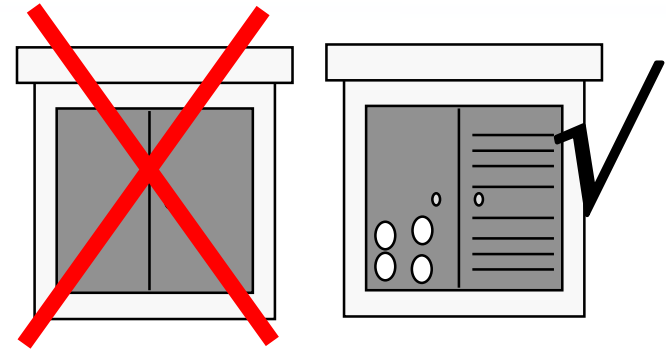


- Use only LPG resistant rubber hoses with clamps and regularly check for wear, cracks and leaks using soapy and water.



# LPG Safety Tips

- Do not store LPG cylinders in enclosed kitchen cabinets.

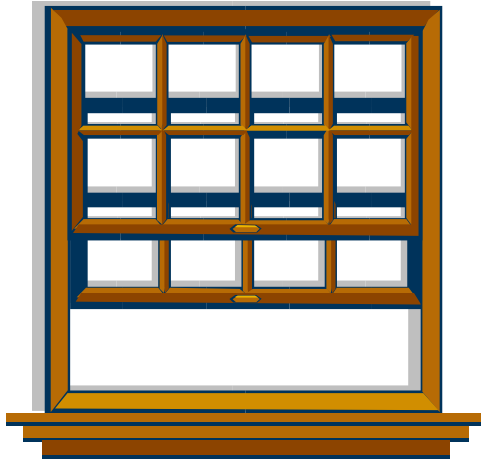


- Keep LPG cylinders away from electrical points and other sources of fire/ignition.



# LPG Safety Precautionary Measures

**If you smell LPG in your house particularly in your kitchen:**



- **Open all doors and windows to improve ventilation.**

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



# LPG Safety Precautionary Measures

- If leak is on LPG cylinder, move cylinder out to open and ventilated place.



- Seek help from LPG retail outlet where it was purchased or call the proper authorities such as the Bureau of Fire Protection (BFP).



# Emerging LPG Unsafe Practices

## “LPG-Refilled Tin Canister”



- Quality of valve material and composition
- Non-presence of pressure relief valve
- LPG has a higher pressure than pure butane

## Fire Accidents!



***Injuries suffered...even loss of lives and damage of properties...***



# Uphold Consumer Safety

***Take immediate action against illegal and unsafe practices.***



**FGaz LPG Store explosion on 03 August 2017 in Calamba City caused by a defective 2.7kg capacity LPG cylinder being repaired.**

***...the danger continues to proliferate***



# Uphold Consumer Safety



***Without any action, casualties from LPG-related accidents will mount and even persist.***



# Remember to keep it safe and sound...

*“A well-informed and vigilant consumer is the best-protected consumer.”*



**Thank you**



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