vector ongas

bottle swap
safety manual

Printed: March 2021

contents

Whether it's for the bach, the barbeque or the outdoor heater, New Zealanders love the convenience and responsiveness of gas.

Vector Ongas Bottle Swap provides a quick, safe and convenient alternative to traditional methods of refilling LPG bottles.

And it's easy... consumers simply swap their empty 9kg cylinder for a full one* that's safety checked and ready to go.

As with many fuels, LPG must be treated with respect. This manual provides information on best practice for retailers and consumers.

** Subject to the swap criteria listed on page 8. Also review the separate Acceptance Checklist supplied with this Manual or available on our website.*

what is LPG?

- Liquefied Petroleum Gas (LPG) is a blend of two gases – butane and propane.
- LPG vapour is about 1½ times heavier than air. This means that leaking LPG will fall to the ground and travel to low lying areas, for example, drains and pits.
- A smell is added to LPG to help leak detection (gas is normally odourless).
- LPG is colourless.
- One litre of liquid is approximately 250 litres of vapour.
- When LPG evaporates, it becomes very cold.
- LPG exists in liquid form when under pressure.

on-site cylinder management

Swap cylinder criteria

Cylinders acceptable for swap

- Any brand of 9kg LPG cylinder with a protective collar and a foot ring that is not severely rusted or damaged.
- Bottles showing a test date older than 10 years are also accepted.

Cylinders not acceptable

Due to safety concerns, cylinders will not be accepted for swap if they have:

- Damaged or no foot ring.
- Damaged or no valve protection ring.
- A damaged gas valve.
- Dents, rust or holes.
- Only 9kg LPG cylinders may be accepted for swap.

Please note: If you accept cylinders that do not meet the acceptance criteria, your site may be charged the full price of a replacement cylinder.

On request from the site operator, Vector Ongas will remove all abandoned cylinders, if any are left by consumers.

See page 8 for 'Cylinders not accepted for swap' descriptions.

It is the Bottle Swap Retailers responsibility to check 9kg cylinders are acceptable. Handing the cage keys to customers increases your risk of incorrect bottle acceptance and/or theft. Please contact Vector Ongas for clarification.

If a customer returns a faulty Vector Ongas cylinder

1. Check the cylinder has been recently sold through the Vector Ongas Bottle Swap network e.g. there should be no LPG filling stickers or any other branded labels attached to the cylinder.
   *Note: Faulty cylinders that **are not** Vector Ongas branded, must be accepted as per a normal swap, so long as they meet the acceptance criteria.*
2. Check the cylinder is full.
3. If full, replace the suspected faulty cylinder **free of charge** for the customer. *Note: a receipt is not required for a faulty cylinder. There is no charge to the site for replacing a faulty cylinder. This will be swapped free of charge on your next delivery.*
4. If not full, call Vector Ongas for advice.
5. If a smell of gas is detected, then check if the valve is tightly closed and carry out a leak test with soapy water to determine the location of the leak.
6. If you can still smell gas, refer to emergency procedures and first aid.
7. Tag the faulty cylinder and put it back into the Bottle Swap cage. If you are unable to stop the leak, mark the cylinder as faulty and either place it inside the Bottle Swap cage, or isolate it in an open location and away from any sources of ignition.

Storage on-site

As a general guide, cages must be located outdoors and stored:*

- At least 2 metres (horizontally) from any opening into a building.
- With 2 metres of suitable fire resistant material either side if stored against a building.
- At least 1 metre from the hose reach of a fuel dispenser.
- At least 1.5 metres (horizontally) and/or 0.5 metre (vertically) from any ignition source.
- At least 1 metre from drains and pits.
- At least 5 metres from any tank containing LPG.
- At least 3 metres from LPG tanks remote fill point.
- At least 3 metres from most hazardous substances other than LPG.
- At least 0.5 metres from any combustible materials, for example, firewood.
- Clear on at least two sides from walls, solid displays or obstacles that may restrict airflow.
- Protective bollards may be installed around a cage if located in a trafficable area.
- Must not hinder or endanger the means of escape from the premises or adjoining premises.
- At least 2 metres from public roadways, footpaths and other public areas if there is more than 500kgs of LPG.

For safety reasons, cylinders must not be stored upside down, or on their side.

- Once the storage cage(s) has been installed on-site, it must not be relocated without the permission of Vector Ongas and/or your Compliance Certifier.

** Additional compliance measures may be applicable.*

emergency procedures and first aid

What to do if there's a leak

Gas leak

- Close the valve on the leaking cylinder (if safe to do so).
- Personnel must be fully equipped with protective clothing, gloves and safety glasses.
- If the leak continues, keep your hands and face away from the escaping LPG and try to move the cylinder to an open space away from buildings, people, drains and sources of ignition.
- Stand the cylinder upright with the valve at the top.
- Disperse the leaking LPG by spraying with water.
- Once empty, mark the cylinder as faulty and either place it inside the Bottle Swap cage, or isolate it in an open location and away from any sources of ignition.
- Advise your manager of the incident, who will arrange for the safe collection and/or disposal of the cylinder by calling Vector Ongas: **0800 123 427.** If required, call Fire and Emergency: **Dial 111.**

Gas leak with a fire

- Call Fire and Emergency: Dial 111.
- Evacuate the area and remove ignition sources.
- Close the valve on the leaking cylinder (if safe to do so).
- DO NOT endanger life.
- DO NOT attempt to extinguish the fire - allow gas to burn out. If safe to do so, follow these control measures:
  - Keep the cylinder and fittings cool with a water spray.
  - Keep the cylinder upright with the valve at the top.
  - Remove any other cylinders and/or flammable material from the area.
- If it is absolutely necessary to extinguish the fire, use a dry powder extinguisher.
- Once the fire is extinguished, mark the cylinder as faulty and isolate it from other cylinders.
- Immediately advise your manager of the incident.

First aid for LPG cold burns

LPG is extremely cold and if it comes into contact with your skin, it can produce visible effects on the skin similar to frostbite, or at the very least cause skin irritation. Frozen tissue is painless and appears waxy with a pallid, yellowish colour. Treatment should be as follows:

1. Remove any clothing splashed by LPG and, if appropriate, move the patient to a warm area as soon as possible.
2. Bathe the affected area(s), preferably with luke warm water (35˚C maximum), to thaw the frozen tissue. Immersion of the affected area is preferred, if possible.

   Never use dry heat to thaw the tissue.
   The thawing process is painful and may induce shock; the skin will turn to a pinky-red colour when thawing is complete.
3. Loosely cover the affected area with dry, sterile dressings.
4. If necessary, call a doctor.
5. Advise the doctor that the burn was caused by liquefied petroleum gas.
6. Follow any further instructions from the doctor.

Fire and Emergency: Dial 111

customer information and gas use safety

Transport

- Ensure the valve is closed.
- Do not transport cylinders loose or lying down. Devices for keeping cylinders upright are available in many stores selling LPG cylinders.
- It is recommended that you transport your cylinder inside your boot rather than inside the car. If transporting inside a passenger compartment of a vehicle, use the seatbelt to restrain the cylinder.
- Do not leave cylinders stored in an enclosed vehicle.

Leak test your connections

- Securely connect the cylinder to your appliance.
- Spread plenty of soapy water around the cylinder valve and regulator connections with a sponge. If bubbles appear, you have a leak, do not use the appliance.
- Never use a match or flame to leak test.

Fresh air

- Keep a window open when you use an LPG heater to help disperse emissions and keep air fresh.
- Never use LPG heaters in bedrooms or bathrooms.
- If LPG is inhaled, move to fresh air and seek medical attention.

Gas appliance use

- Check the connection on the gas cylinder is correct for your gas appliance and that connections are gas tight.
- Always ensure control knobs on the gas appliance and valve on the LPG cylinder are turned off when not being used. Check your gas appliance before each use for wear and tear. Do not use appliance if parts are damaged or missing.
- Have portable LPG cabinet heaters serviced regularly, to ensure all parts are leak free and operating properly.
- Never move a gas appliance when in use.
- Keep a clear zone around LPG heaters of at least 1 metre when in use and keep it away from combustible materials such as curtains and furniture.

IN EMERGENCY DIAL 111

Why can I sometimes hear a ticking or sloshing sound when I move the cylinder?

- LPG is stored as a liquid form and like the sound of water, you may hear the liquid LPG sloshing inside the cylinder. When you open the cylinder valve, the liquid LPG vaporises and turns into a flammable gas.
- Vapour space is allowed for in cylinders to allow for thermal expansion if the temperature of the container should increase.
- LPG is very sensitive to temperature and will expand substantially when subjected to an external heat source.
- When released, one volume of liquid will expand 250 times when reverting to gas.
- If you can hear a ticking sound coming from the inside of some cylinders, this noise will be the overfill protection float, that is connected to the bottom of the valve and inside the cylinder. It works by the float rising and stopping the cylinder from being overfilled; much like the float in a toilet cistern.

Maximum of two 9kg bottles in an enclosed vehicle

Do NOT leave cylinders lying down

Keep away from heat, flames and sparks

Turn valve off firmly when not in use

Do not transport in passenger compartment or leave in vehicle unnecessarily

cylinders not accepted for swap

Defect

Excessive dents

Bottle with dents or gouges.

Defect

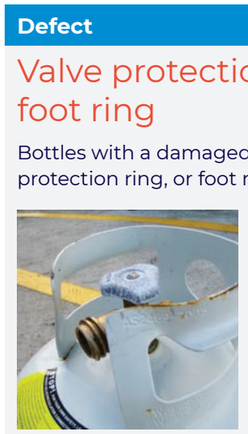
Cut (gouge)

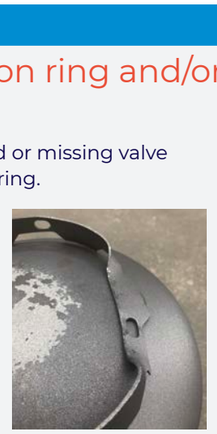
A sharp impression where the surface material has been penetrated.

Defect

Valve protection ring and/or foot ring

Bottles with a damaged or missing valve protection ring, or foot ring.

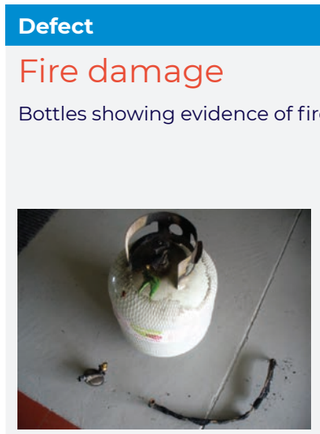




Defect

Fire damage

Bottles showing evidence of fire damage.



Defect

Excessive rust

Bottles with flaking rust or rust pitting e.g. rust that can be easily pulled off or removed.

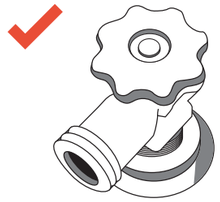
Defect

Damaged valve or no valve

Cylinders with no valve attached to the cylinder or has a damaged valve.

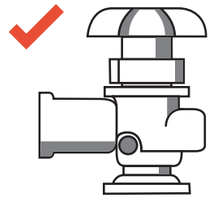
acceptable valve types

We accept 9kg bottles with the following valve types:



9kg QCC valve

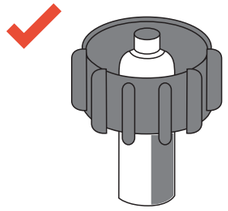
Important: for safety reasons we recommend connecting appliances to the **external thread only.**



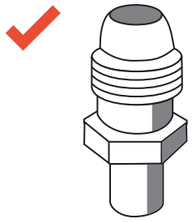
9kg POL valve

9kg KOSAN (clip-on) valve

Vector Ongas Bottle Swap connects to:



QCC connector



POL connector

Check if the valve on the customer's cylinder is the same valve type as the Bottle Swap cylinder. Vector Ongas supplies 9kg QCC valves only. If the customer's valve type is not the same, the customer will need to check if our valve will connect to their appliance.

What to do in the event of a leaking bottle

- Keep away from all sources of ignition.
- Check valve is turned off. Hose with water.
- If leaking does not stop, return the cylinder to the Bottle Swap cage, or isolate to a well-ventilated location and away from sources of ignition.
- Call Vector Ongas for further advice on **0800 123 427.**
- **In an emergency dial 111.**

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1. Identification of the material and supplier

Product name	Liquefied Petroleum Gas (LPG)
Product use	Residential and Commercial fuel
Supplier	On Gas Limited 101 Carlton Gore Road Newmarket Auckland 1023 Phone 0800 84 12 12
EMERGENCY NUMBERS	**FIRE AND EMERGENCY: 111** **Vector OnGas:** **0800 84 12 12** **(24 Hour number)** **0800 123 427**

2. Hazards identification

UN Number	LPG 1075 Propane 1978 Butane 1011
HSNO Class	2.1.1A
Hazchem Number	2YE
IMO/MDG: Class	2.1 Chemical family hydrocarbon
IATA Class	2(d)
GHS Category	Flammable Gas Category 1
Signal Word	Danger
Hazard Statement	Extremely flammable gas
Precautionary Statement	Keep away from heat / open flames. No Smoking. Leaking gas fire: Do not extinguish, unless leak can be safely stopped. Eliminate all ignition sources if safe to do so. Store in well ventilated place.
Health hazards	LPG acts as a simple asphyxiant and a central nervous system depressant. It can affect the body if it is inhaled or if it comes into contact with the eyes or skin. Over exposure to LPG can cause light headedness and drowsiness. Greater exposure may also cause unconsciousness. Contact with liquid may also cause frostbite as well as skin irritation.

Effects and symptoms:

· Eye contact	Tissue damage due to low temperature, redness, pain, blurred vision.
· Skin contact	Frostbite, tissue damage due to low temperature, redness, pain, blisters, wounds.
· Inhalation	Possible tissue damage due to low temperature, asphyxiation, headaches, dizziness, drowsiness.
· Ingestion	LPG is not toxic but is unpleasant and may cause nausea if ingested in large quantities.

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3. Composition/information on ingredients

Product	**Ingredient**	**CAS No.**	**Concentration**
	LPG	68476-85-7	100%
Composition	Propane	74-98-6	50 – 100%
	Butane	106-97-8	0 – 30%
	Isobutane	75-28-5	0 – 30%
	Ethane	74-84-0	5%
	Pentane	109-66-0	<2%
	Ethyl Mercaptan (odorant)	75-08-1	<0.02%
Information	LPG is supplied in various grades to suit the application. The most common grade is 'LPG Mix' being a mixture of normally 60% propane and 40% butane. LPG may also be supplied as straight propane or butane. LPG contains traces of other hydrocarbons and substances that naturally occur in the LPG. Composition is in accordance with NZS 5435: 1996 'Liquefied Petroleum Gas'.		

4. First-aid measures

Eye contact	Do not delay. Flush eye gently with fresh water. Continue washing for at least 15 minutes. Obtain medical aid as soon as possible.
Skin contact	Do not delay. Handle patient gently. Remove contaminated clothing. Immerse affected area in luke warm water. Obtain medical aid as soon as possible.
Inhalation	Remove victim to fresh air. If breathing has stopped or irregular apply artificial respiration. Give oxygen. Seek medical attention immediately.
Ingestion	Remove victim to fresh air. Seek medical attention immediately.

5. Fire-fighting measures

Flammability	Highly flammable gas that collects at floor level and readily forms an explosive mixture with air. Concentration of 2 to 10% approximately in air can be ignited and the flame will readily spread back to the source of the leak. For handling of LPG, a closed transfer system is required with ventilation at high and low level, explosive or flameproof electrical equipment and lighting, earth connections and no open flames, sparks and no smoking.
Fire explosion/ hazard	Evacuate area. Remove ignition sources. Cut off gas supply if safe to do so – Do NOT endanger life. Do NOT extinguish fire – allow gas to burn out. Use water to cool cylinders and vessels exposed to fire. Spray onto upper surface.
Extinguishing	If safe, stop the flow of gas by closing valves or by activating Emergency Shutdown Systems. If the gas source cannot be isolated, do not extinguish the flame as re-ignition and explosion could occur. Await arrival of emergency services. Cool cylinders or vessels with water spray. If it is absolutely necessary to extinguish the flame, use only a dry chemical powder extinguisher. Do not move cylinders for at least 24 hours. Avoid shock and bumps to cylinders. Evacuate the area of persons not fighting the fire. Carbon oxides (CO, CO2) fumes may be produced should burning occur especially within an enclosed space (i.e. causing a deficiency of oxygen).
Fire fighter protection	Fire fighters should wear full protective clothing and may need self-contained breathing apparatus. Be aware of the risk of possible explosion (especially in a confined space).

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6. Accidental release measures

Spills	Fire explosion hazard.
For all emergencies	No smoking or naked lights within 50 meters. Move people from immediate area, keep upwind. Contact Fire and Emergency.
Spill or leaks, with **no fire**	Carry out action “for all emergencies”. Stop flow of gas/liquid if possible. Spray water to disperse gas cloud but avoid spraying water directly on leaking container.
Fire	Carry out action “for all emergencies”. Shut off supply of gas rather than put out fire. If available, spray water on containers to keep cool. Dry chemical or BCF extinguishers can be used.

7. Handling and storage

Ignition sources	Use only intrinsically safe equipment and non-sparking tools. Usage: All cylinders should be used in the upright position (with the exception of forklift cylinders) and are approved for use in New Zealand. Installations must be in accordance with AS/NZS 1596: 2014, Health and Safety at Work (Hazardous Substances) Regulations 2017, and any relevant LPGA Codes of Practice.
Handling	Details contained in the 2.1.1A Controls under Hazardous Substances and New Organisms Act 1996, NZS 5433: 2012 Transport of Dangerous Goods on Land, and Health and Safety at Work (Hazardous Substances) Regulations 2017, Code of Practice for the Transport of Hazardous Substances on Land, and AS/NZS 1596: 2014 Storage and Handling of LPG. Keep containers in an upright position, keep away from heat sources, and keep valves closed when not in use.
Storage	Store in well ventilated areas away from heat and sources of ignition. Cylinders and vessels must be correctly labelled. Do not remove warning labels. LPG cylinders shall be stored in accordance with the requirements of Health and Safety at Work (Hazardous Substances) Regulations 2017, AS/NZS 1596: 2014, and any relevant LPGA Codes of Practice. Do not store in basements where vapour may collect. Store cylinders securely in an upright position and keep valves closed.
Disposal	Do not move damaged cylinders until made safe. Empty contents by decant into alternative cylinder or tank. Vapour may be vented under controlled conditions, or disposed by controlled burning. Disposal of cylinders shall be in accordance with EPA Hazardous Substances (Disposal) Notice 2017.

8. Exposure controls / personal protection

Exposure limits	Workplace Exposure Standards and Biological Exposure Indices 2018, Health and Safety at Work Act 2015 (HSWA) and Health and Safety at Work (General Risk and Workplace Management) Regulations 2016 Simple asphyxiant Butane: TWA 800ppm, 1900mg/m^3 LPG: TWA 1000ppm, 1800mg/m^3 Propane: Simple asphyxiant – may present an explosion hazard
Personal protective equipment	Wear thermal insulated gloves and full body cover to prevent cold burns and frostbite. In filling operations wear protective clothing including gloves, safety goggles or face shield. All clothing should be anti-static, low flame type. When handling cylinders wear protective footwear.

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9. Physical and chemical properties

		Propane (C3H8)	Butane (C4H10)	Mix (60/40)
Appearance	Colourless gas with an unpleasant odour			
Odour	Odourised with Ethyl Mercaptan – strong odour like rotten eggs or cabbage.			
Odour threshold	N/A			
pH		N/A	N/A	N/A
Melting point / freezing point		-189.7˚C	-138.4˚C	N/A
Boiling point (atmospheric pressure)		-42˚C	0.5˚C	N/A
Flash point		-105˚C	-60˚C	-81˚C
Flammability	Highly flammable			
Upper / lower flammability or explosive limits		2.2 – 9.5%	1.5 – 9.0%	2.0 – 10%
Vapour pressure at	0˚C	388 kPa	40 kPa	292 kPa
	10˚C	552 kPa	95 kPa	424 kPa
	30˚C	1004 kPa	266 kPa	796 kPa
Vapour density (air=1)		1.58	2.06	1.73
Specific gravity		0.508	0.573	0.537
Solubility (ies)		Slightly	Immiscible	Immiscible
Partition coefficient: n-octanol/water		N/A	N/A	N/A
Auto ignition temperature		468˚C	430˚C	450˚C
Decomposition temperature		N/A	N/A	N/A
Kinematic viscosity		N/A	N/A	N/A

10. Stability and reactivity

Stability	The product is stable.
Reactivity	Incompatible with strong oxidizing agents like nitric acid.

11. Toxicological information

Eye	Liquid in eyes will cause tissue damage. Vapour may cause irritation.
Inhalation	May cause headaches, drowsiness and dizziness. Excessive exposure may cause unconsciousness or even death, due to asphyxiation (refers to vapour not liquid).
Skin	Liquid may cause frostbite, tissue damage, blisters and wounds.
Ingestion	Due to product form, ingestion is considered highly unlikely.

12. Ecological information

LPG will vaporise rapidly when released to atmosphere. There are no known adverse ecological effects.

Toxicity	LPG is not known to be toxic to aquatic or terrestrial organisms.		
Persistence and degradability	**Ingredient:** Propane Butane Isobutane Ethane Pentane Ethyl Mercaptan	**Persistence: Water/Soil** Low Low High Low	**Persistence: Air** Low Low High Low
Bioaccumulative potential	**Ingredient:** Propane Butane Isobutane Ethane Pentane Ethyl Mercaptan	**Bioaccumulation** Low (LogKOW = 2.36) Low (LogKOW = 2.89) Low (BCF = 1.97) Low (LogKOW = 1.2673)	
Mobility in soil	**Ingredient:** Propane Butane Isobutane Ethane Pentane Ethyl Mercaptan	**Mobility** Low (KOC = 23.74) Low (KOC = 43.79) Low (KOC = 35.04) Low (KOC = 23.74)	

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13. Disposal considerations

Waste disposal	Cylinders should be returned to the LPG supplier for disposal. Hazard warning labels should not be removed. Do not puncture or incinerate cylinder. Disposal of material must be carried out in accordance with Hazardous Substances (Disposal) Regulations 2001.

14. Transport information

Transport	Transport of LPG is controlled in accordance with the requirements of NZS 5433: 2012.
Pictogram	
UN number	LPG 1075, Propane 1978, Butane 1011
UN proper shipping name	LIQUEFIED PETROLEUM GAS
HSNO class	2.1.1A
UN dangerous goods class	Class: 2.1 Subrisk: N/A
Hazchem number	2YE
IMDG: Class	2.1 Chemical family hydrocarbon
IATA class	2 (d)

15. Regulatory information

EPA Approval Numbers	LPG – HSR001009 Butane – HSR000989 Propane – HSR001010
HSNO Group Standard	LPG Liquefied Petroleum Gas

16. Other information

Date of issue	February 2021	
Date of last review	February 2021	
Version no.	2	
Acronyms	BCF	Bioconcentration factor
	CAS	Chemical Abstract Service
	EPA	Environmental Protection Authority
	GHS	Globally Harmonized System
	HSNO	Hazardous Substances and New Organisms
	IATA	International Air Transport Association
	IMDG	International Maritime Dangerous Goods
	KOC	Adsorption coefficient
	LogKOW	Octanol-water partition coefficient
	TWA	Time-weighted average
Standards	AS/NZ 1596	The Storage and Handling of LPG
	NZ 5433	Transport of Dangerous Goods on Land
	NZS 5435	Specification for Liquefied Petroleum Gas (LPG)

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site training register
template

The employees listed below are trained site operators to train other employees in Vector Ongas Bottle Swap cylinder management.

Employee name	Training date	Employee signature	Site manager signature

SITE COPY

Notes

FOR EMERGENCIES DIAL 111
Vector Ongas dial
0800 123 427

0800 123 427

vectorongas.co.nz/bottle-swap