

A great wine takes
much more than just
a bunch of grapes.



“Wine is one of the most civilised things in the world and one of the most natural things of the world that has been brought to the greatest perfection, and it offers a greater range for enjoyment and appreciation than, possibly, any other purely sensory thing.”

Ernest Hemingway.



Who is BOC?

BOC is a member of The Linde Group which supplies compressed and bulk gases, chemicals and equipment around the globe. The company develops safe, sustainable and innovative solutions for customers in many specialty sectors, heavy industry and medical environments.

For more than a century the company's gases and expertise have contributed to advances in industry and everyday life, including food and beverage processing, steelmaking, refining, chemical processing, environmental protection, wastewater treatment, welding and cutting, glass production, electronics and health care.

BOC understand the effort, expertise and processes needed to create a successful vintage. Therefore you can expect the following:

- Support from our Sales team and Customer Engineering Services (CES) working with you to design, install and maintain a gas system.
- Customer Engagement Centre available to take your order, enquiry or provide technical support Monday-Friday between 7.30 am-5 pm.
- Extensive gas distribution network with flexible delivery options catering to any winery, irrespective of its size.
- Customer Engineering Services (CES) provide a 24 hour, 7 day maintenance and service offer to ensure you can continue focusing on your customers.
- A large network of Gas & Gear stores and Distributor Partner outlets to provide you with product and equipment advice, support or your choice of picking up cylinders.
- BOC website with online ordering, product, equipment, industry, safety and quality information at www.boc.co.nz

Carbon Dioxide and Nitrogen.

Carbon dioxide (CO₂) and nitrogen (N₂) are used to help protect your product during the winemaking process. Commencing with chilling grapes from harvest to 'must transfer', continuing with displacement of oxygen during the different winemaking stages through blanketing and sparging to inerting during bottling, overall allowing the winemaker to preserve the natural qualities of the wine.

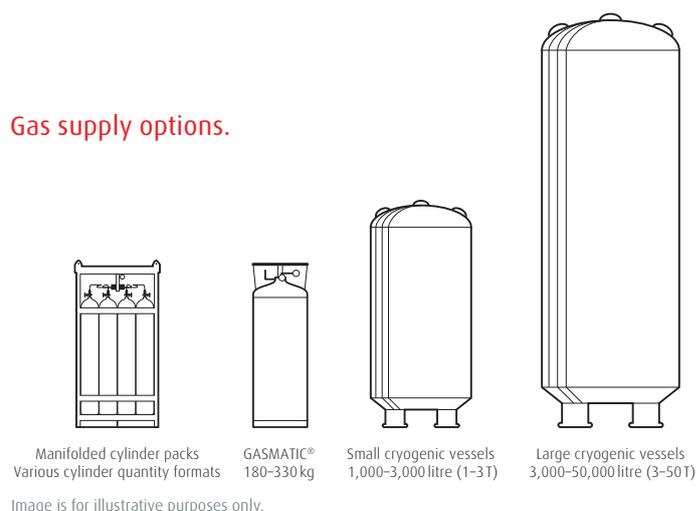
BOC has developed a comprehensive range of gas supply packages to suit all users. When determining the most appropriate and cost effective package, pressure, volume, usage and flow rate are factors which need to be considered.

The following range of CO₂ and N₂ supply options are available to suit your needs:

- Manifolged cylinder packs of various cylinder quantity formats
- GASMATIC® vessels ranging between 180 kg and 330 kg
- Small cryogenic vessels ranging between 1,000 litres (1 tonne) and 3,000 litres (3 tonnes)
- Large cryogenic vessels ranging between 3,000 litres (3 tonnes) and 50,000 litres (50 tonnes)

Alternatively, CO₂ snow is available through the use of an on site snow horn, or dry ice which can be delivered directly from BOC. Our snow horns have a low velocity, high efficiency design and can be purchased or facilitated.

Gas supply options.



Dry ice.



Snow horn.

Sulphur Dioxide.

Sulphur dioxide (SO₂) is typically used as a preservative for wine. It is a sensitive chemical and therefore comes under the Product Stewardship program. Through this BOC complies with all relevant regulatory requirements and standards. Ensuring our customers can produce the best quality product using our sulphur dioxide is what we value the most and are committed to delivering. A quality system is in place that meets the requirements of ISO 9001:2008 Certificate (Quality Management Systems).



Sulphur dioxide supply.

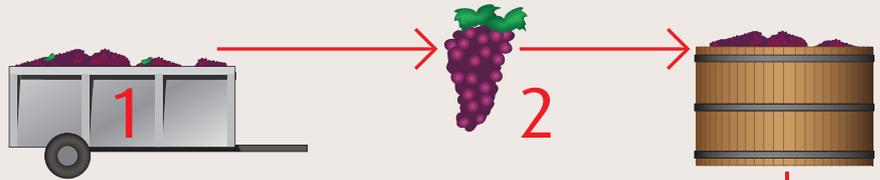
Wine applications.

Application		Recommended Product/Equipment	Image Reference
Harvesting	Adding carbon dioxide gas or CO ₂ snow to the harvesting container, if left for more than 12 hours, greatly reduces any potential mould and yeast fermentation due to the expulsion of oxygen, and rapid reduction in temperature. Using approximately 70 kg of CO ₂ snow per tonne of grapes, will result in an approximate 10°C drop in temperature. The ideal grape temperature is 8–16°C.	Carbon dioxide Liquid CO ₂ (snow) Dry ice pellets Sulphur dioxide	1, 2
Crushing, De-stemming, Pressing, Draining	To prevent oxidation of flavour and aromatics, must can be treated with sulphur dioxide. This inhibits wild yeasts and bacteria which can result in poor wine flavour and low alcohol content due to the incomplete fermentation of grape sugars. Carbon dioxide gas or CO ₂ snow can be applied as an inert gas cover during this process. Carbon dioxide gas, CO ₂ snow or nitrogen, are often used in grape drainers by winemakers who believe that as the wine drains through the grape skin it entrains air, which can lead to oxidation of the juice causing browning, loss of aroma and flavour.	Carbon dioxide Liquid CO ₂ (snow) Nitrogen or on-site nitrogen generation	3
Fermentation	Macro oxygenation controls the supply of oxygen during fermentation and racking, preventing the fermentation from being too slow or incomplete. It is also helpful at the end of fermentation, when racking, to drop yeast out of suspension, using nitrogen at the rate of 10–30 litres/minute. Sulphur dioxide can be added at this stage to maintain the desired levels.	Nitrogen or on-site nitrogen generation Oxygen Sulphur dioxide	4, 5
Treatments	Selected gas mixtures can be used during sparging to reduce dissolved oxygen levels and to maintain carbon dioxide at a natural level.	Nitrogen or on-site nitrogen generation Carbon dioxide Gas mixer Carbon dioxide and nitrogen mixtures	6
	<p>During storage, wine blanketing and inerting is used to reduce the absorption of dissolved oxygen into the wine. Oxidative degradation, causes ageing of wine, flatness in flavour and bouquet, and can taste and smell oxidised. It can turn the wine brown in colour. To protect wine with ullage, three gases can be used:</p> <p>Nitrogen</p> <p>Not an effective blanketing gas, as it is lighter than air. However various methods can be used to keep the tank under constant positive pressure, enabling nitrogen with its low solubility benefits to be used. To reduce the oxygen concentration from 20% to 1%, the ullage space will need to be purged multiple times.</p> <p>Carbon dioxide, CO₂ snow and dry ice pellets</p> <p>The fact that these products are 1.5 times heavier than air means that they are most commonly used by winemakers as a blanketing gas. However, they are both quite soluble in liquids, and when using these products, the ullage space should be recharged every 2–3 days. For open top tanks, carbon dioxide is the preferred gas.</p> <p>Argon</p> <p>Argon is the premium gas to keep wine at its peak prior to bottling. It has all the benefits of carbon dioxide, but is 38% less soluble. Argon will last longer as a blanketing gas, and is totally inert.</p> <p>Micro oxygenation is used to simulate the absorption of oxygen into the wine when stored in stainless steel tanks. This process occurs naturally in wines that have matured in barrels, particularly red wines.</p>		
Maturation		Carbon dioxide Liquid CO ₂ (snow) Dry ice pellets Nitrogen or on-site nitrogen generation Argon Oxygen Carbon dioxide and nitrogen mixtures	7
Filling Barrels, Pressure Transfer	Nitrogen, carbon dioxide and nitrogen mixtures, can be used to transfer wines without the risk of oxygen pickup.	Nitrogen or on-site nitrogen generation Argon Carbon dioxide and nitrogen mixtures Sulphur dioxide barrel sterilising	8, 9
Bottle Inerting	If the wine is splashed when filling into bottles, it exposes the wine to significant air contact. To reduce the amount of contact with air, the bottles are evacuated and flushed with nitrogen or carbon dioxide gas or liquids.	Liquid nitrogen Liquid CO ₂ (snow) Carbon dioxide	10
Safety Equipment	From harvesting to bottling, let BOC help you meet your occupational health and safety requirements. With a comprehensive range of personal protective equipment and safety products you can ensure your workplace is safe for both you and your workers.		

Winemaking process.

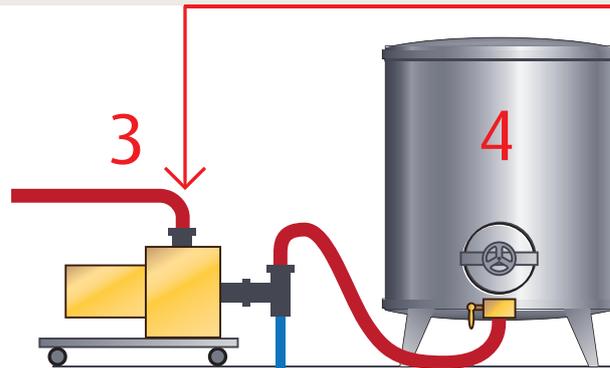
Harvesting

- 1 Grapes protection
CO₂ snow, dry ice or sulphur dioxide
- 2 Chilling grapes with carbon dioxide
CO₂ snow



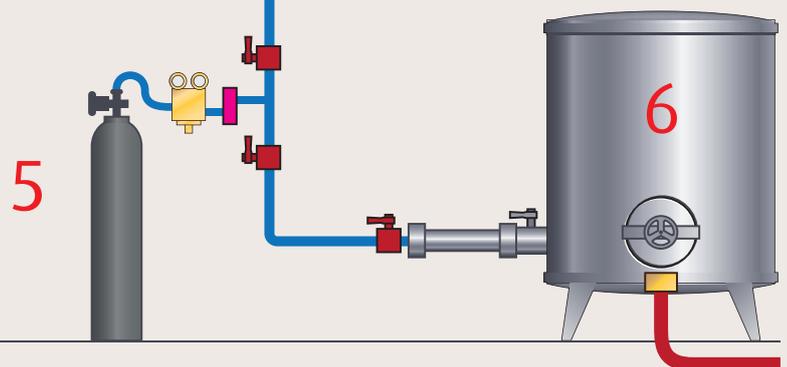
Fermentation

- 3 Transport protection
Carbon dioxide or nitrogen
- 4 Control fermentation
Oxygen
Protection
Sulphur dioxide



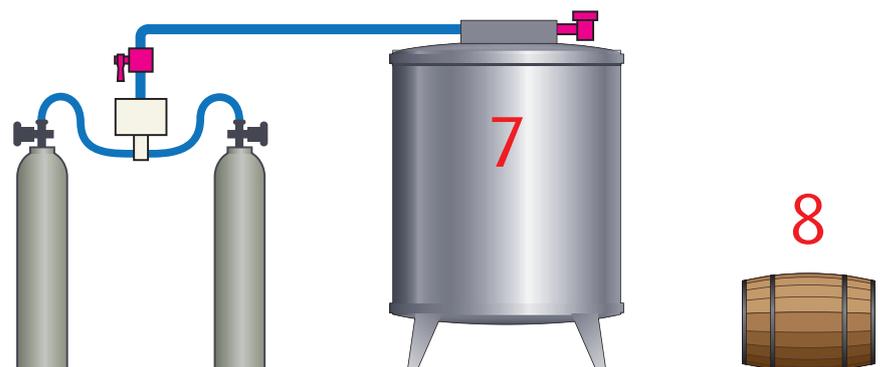
Treatments

- 5 Stop fermentation
Nitrogen
- 6 Maintain natural level of carbon dioxide in wine
Carbon dioxide, nitrogen or
carbon dioxide/nitrogen mixtures



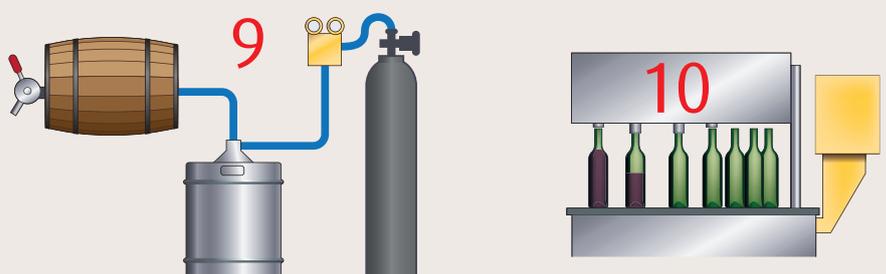
Maturation

- 7 Blanketing gas
Nitrogen, carbon dioxide, argon
- 8 Refilling barrels
Nitrogen or
carbon dioxide/nitrogen mixtures
Protection
Sulphur dioxide



Filling/bottling

- 9 Pressure Transfer
Carbon dioxide, nitrogen or
carbon dioxide/nitrogen mixtures
- 10 Bottling protection
Nitrogen or carbon dioxide



Compressed Gases.

Description	Gas Composition	Package Size*	Package Content	Package Diameter**	Package Height**	Gauge Pressure	Outlet Connection
 <p>Carbon Dioxide Food Grade Gas Code: 214</p> <p>Food grade quality gas used in pressure beverage dispensing or to protect grapes during the winemaking process.</p>	Carbon Dioxide 99.8%	D	6.8 kg	178 mm	605 mm	5,723 kPa	AS 2473 Type 30
		F	17.0 kg	215 mm	955 mm		
		G	33.0 kg	232 mm	1400 mm		
 <p>Nitrogen Gas Code: 157</p> <p>Beverage gas used to protect grapes during the winemaking process.</p>	Nitrogen 99.99%	D	1.8 sm ³	178 mm	605 mm	20,000 kPa	AS 2473 Type 50
		G	8.7 sm ³	232 mm	1400 mm		
 <p>Oxygen Gas Code: 101</p> <p>Beverage gas used to speed up fermentation and age wines as well as to form yeast in breweries.</p>	Oxygen 99.5%	D	1.4 sm ³	178 mm	605 mm	15,200 kPa	AS 2473 Type 10
		G	8.1 sm ³	232 mm	1400 mm	17,200 kPa	
 <p>Argon Gas Code: 274</p> <p>Beverage gas typically used to preserve and dispense wine.</p>	Argon 99.99%	G	9.93 sm ³	232 mm	1400 mm	20,000 kPa	AS 2473 Type 10
 <p>Sulphur Dioxide Gas Code: 172</p> <p>Used as a preservative for wine, beer and food. Wineries also use it to sterilise the inside of wine barrels.</p>	Sulphur Dioxide 99.9%	P	27 kg	310 mm	510 mm [#]	235 kPa	AS 2473 Type 32
		R	70 kg	375 mm	840 mm [#]		
 <p>CELLAMIX® 20 Gas Code: 320</p> <p>Beverage gas.</p>	Carbon Dioxide 20%, Nitrogen 80%	E	2.43 sm ³	216 mm	630 mm	15,200 kPa	AS 2473 Type 50
		G	7.3 sm ³	232 mm	1400 mm		
 <p>CELLAMIX® 30 Gas Code: 093</p> <p>Beverage gas.</p>	Carbon Dioxide 30%, Nitrogen 70%	E	2.5 sm ³	216 mm	630 mm	14,600 kPa	AS 2473 Type 50
		G	7.5 sm ³	232 mm	1400 mm		
 <p>CELLAMIX® 60 Gas Code: 096</p> <p>Beverage gas.</p>	Carbon Dioxide 60%, Nitrogen 40%	E	3.09 sm ³	216 mm	630 mm	13,000 kPa	AS 2473 Type 10
		G	9.42 sm ³	232 mm	1400 mm		
 <p>CELLAMIX® 80 Gas Code: 138</p> <p>Beverage gas.</p>	Carbon Dioxide 80%, Nitrogen 20%	E	3.8 sm ³	216 mm	630 mm	10,000 kPa	AS 2473 Type 10
G	11.6 sm ³	232 mm	1400 mm				

*Availability of package sizes will vary across the areas. **Based on aluminium cylinders without a valve. #Includes valve protection ring.

Gas cylinder safety.

For anyone using compressed gas cylinders, knowledge and understanding of the Do's and Don'ts is essential. Please refer to the Guidelines for Gas Cylinder Safety available at www.boc.co.nz for detailed information relating to safe handling of gas cylinders.

Equipment.

Equipment

- Wine bottle inerting kits
- SO₂ barrel sterilising gun kits
- Mini snow horns
- Portable gas detection instruments
- CELLAGUARD® carbon dioxide or carbon dioxide and oxygen monitors
- CO₂ heaters
- LPG vineyard heaters
- Flow meters
- Floating gas dispensers
- Gas timers and mixers
- Gas manifolds
- Regulators
- Welding machines and consumables
- PESTIGAS® spray gun kits
- Dry ice machines

Safety equipment

- Outdoor clothing for use in vineyards and wineries
- High visibility protective clothing
- Safety spectacles/goggles
- Gloves and hand protection
- Overalls
- Safety shoes and boots
- Earplugs and earmuffs
- Respiratory protection
- First aid kits
- Safety signage

Workshop gases & LPG

- Industrial oxygen
- Industrial acetylene
- Industrial argon
- Industrial shielding gases
- LPG

Specialty gases

- PESTIGAS®
- Scientific calibration gases



CELLAGUARD® Carbon dioxide (CO₂) monitor and repeater.

For more information contact the BOC Customer Engagement Centre on 0800 111 333

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