

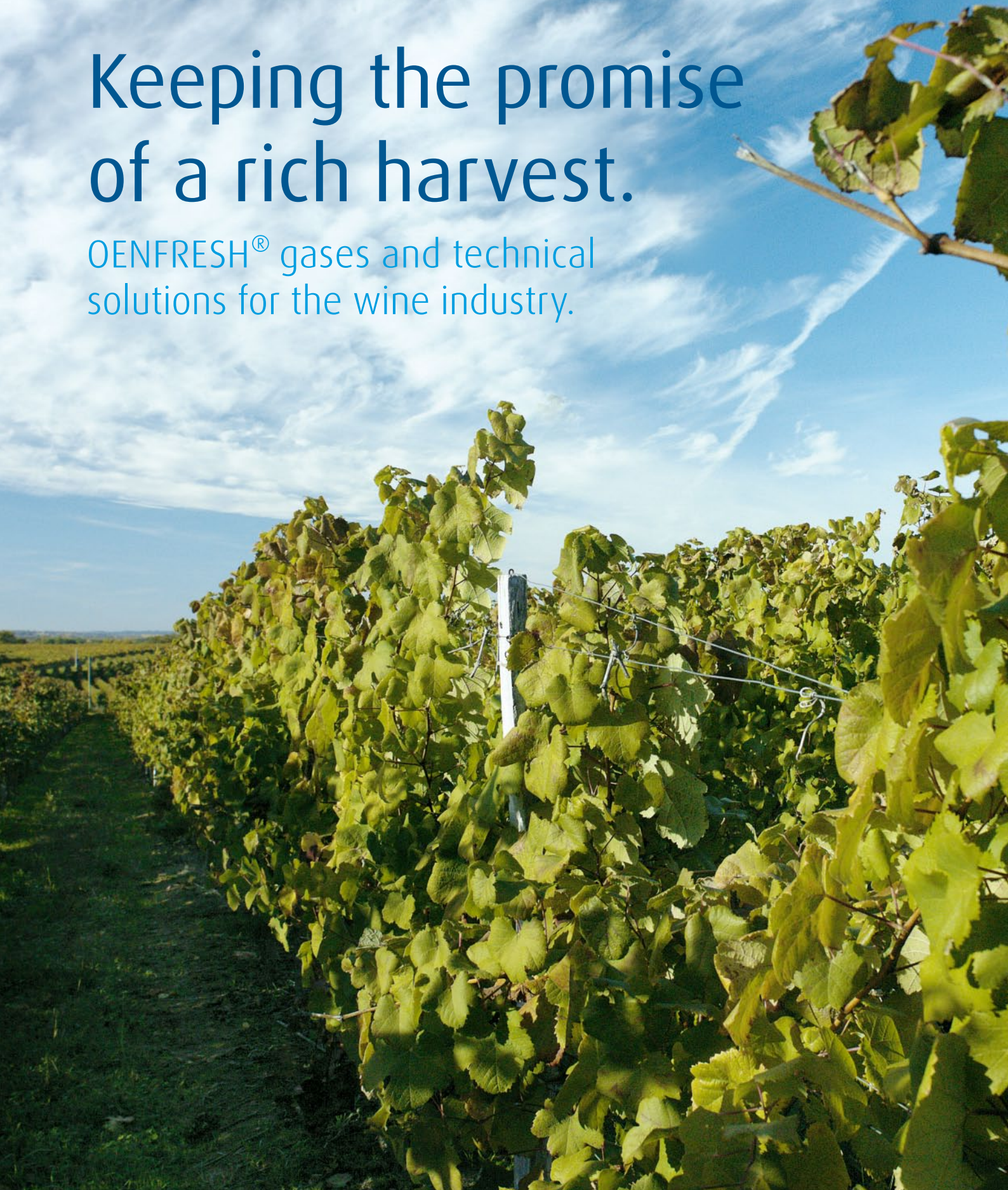
→ OENFRESH®

THE LINDE GROUP

*Linde*

# Keeping the promise of a rich harvest.

OENFRESH® gases and technical  
solutions for the wine industry.





# Tap the full potential of your wine. With OENFRESH® solutions from Linde.

Winemaking is both an art and a science, and it requires a lot of experience and know-how as every single decision affects the quality of the wine. Important decisions, however, should never be made alone. That is why many winemakers appreciate the support of Linde and rely on our efficient technologies to ensure that the hard work they put into harvesting and wine production gives the best possible results. With our OENFRESH range of solutions, which includes oenological gases, technical equipment and in-depth knowledge of the winemaking process, we help you create wines of the finest quality that meet or exceed your high standards.



## A reliable partner for reliable quality

Through dozens of harvests, we have worked side by side with winemakers to optimise the application of oenological gases, maximising quality while containing costs. Our latest innovation, the OENFRESH wine gas panel, offers intelligent control over several gas applications, guaranteeing that the right gas is always used the right way.

## What are oenological gases?

Oenological gases are blends used to protect grapes, must and wine throughout the winemaking process, also balancing their delicate characteristics. They are typically used as soon as the grapes are picked from the vine right up until the cork is put into the bottle. The most common oenological gases are carbon dioxide and nitrogen, which are sometimes mixed in varying proportions.

In addition to safeguarding each wine's particular balance, oenological gases comply with the strict standards of purity for food products. Furthermore, we provide the necessary documentation to meet traceability requirements.

## How do you benefit from oenological gases?

Oenological gases are an effective way to meet this challenge, offering a proven method to improve wine quality at a minimal increase in production cost. In many cases, any added gas cost results in a tenfold increase in the price of the wine.

## Your benefits at a glance

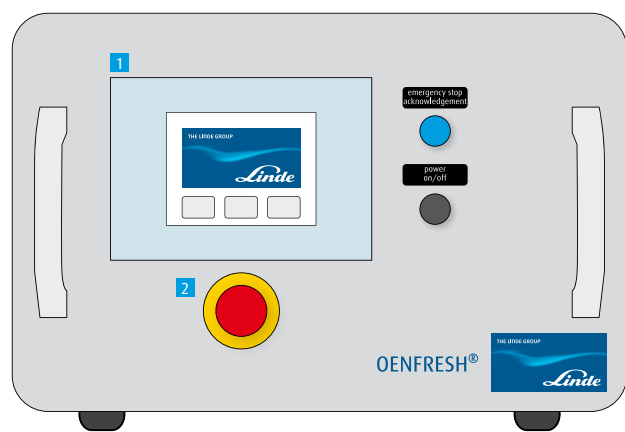
- Temperature control and protection of grapes
- Prevention of premature fermentation
- Protection of must during pressing
- Protection of wine during storage and transfer
- Dissolved gas control throughout the process (O<sub>2</sub> and CO<sub>2</sub>)
- Reduction of sulfite treatment
- Reduction of labour requirements and no special operator training required



All pieces in place. A skilled winemaker transforms each year's harvest into high-quality wines that reflect the terroir's unique characteristics. By partnering with Linde, you get access to a wide range of solutions that help you manage every step of your process, resulting in wines that reach their full potential. A small investment in oenological gases and applications commonly offers exceptional returns by enabling premium wine pricing.

# The smart way to manage your process. The new OENFRESH® wine gas panel.

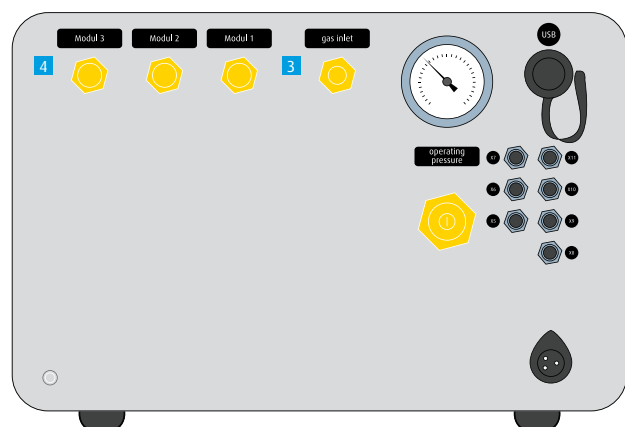
Deciding to apply gases in winemaking is the first step towards excellent taste and freshness. However, gases have to be used properly in order to achieve the desired results. Using too much or too little gas are just two of the common mistakes that can increase costs or reduce quality. Linde can now offer the perfect remedy for problems such as these: the OENFRESH wine gas panel, which ensures optimum process control and highly efficient gas consumption.



## Rest assured with our unique solution

The OENFRESH wine gas panel is a ground-breaking innovation that we developed in close consultation with various winemakers and has yet to find its equal on the market. Based on our proprietary algorithm, it automatically regulates a number of processes, enabling you to use gases in the best possible way.

After the user has entered the process variables, the most suitable oenological gas, flow rate and other parameters are displayed and/or controlled to obtain maximum effectiveness. All processes are automated, allowing for unattended operation and consequently reduced labour costs. The recommended values are calculated with our proprietary algorithm, which is the result of decades of experience in wineries all over the world. However, we are aware that no one knows your processes better than yourself and therefore give you the possibility to adjust the settings according to your individual requirements.



- 1 Touch-screen interface
- 2 Emergency stop
- 3 Gas inlet
- 4 Gas outlets to processes



## Benefits

- Assurance that the right gas type and the right amount of gas is used at all times
- Optimal gas consumption
- Reduced labour requirements
- Choice between automatic and manual control
- Step-by-step guidance for operators

## Applications

- Vessel purging
- Dissolved gas control (O<sub>2</sub> and CO<sub>2</sub>)/ Protection of wine during transfers
- Pressure transfer with inert gases
- Lance remontage plus blending and mixing

## Process variables

- Application
- Wine type
- Wine temperature
- Wine flow rate
- Existing and desired CO<sub>2</sub> concentration

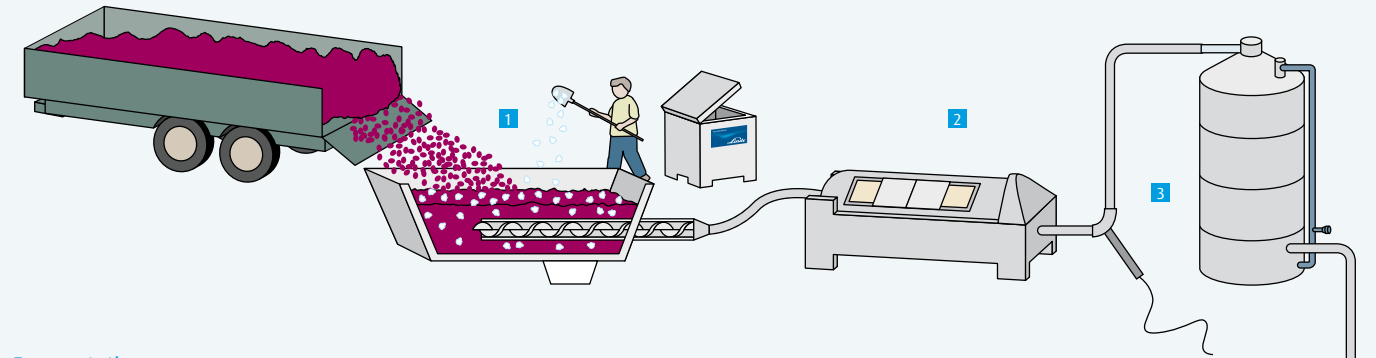


# From the vine to the bottle. Linde can help you in many ways.

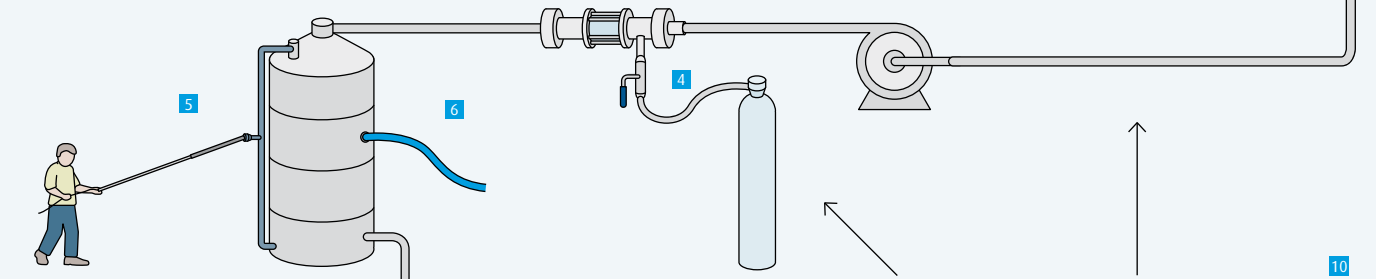
Oenological gases are of great use throughout the entire winemaking process – from protecting the grapes after harvest to improving the quality of the wine. With our OENFRESH solutions, you are well equipped at all times. We provide you with the complete range of high-quality oenological gases and offer effective chilling and inerting processes that will give your wine exceptional character and enduring appeal.



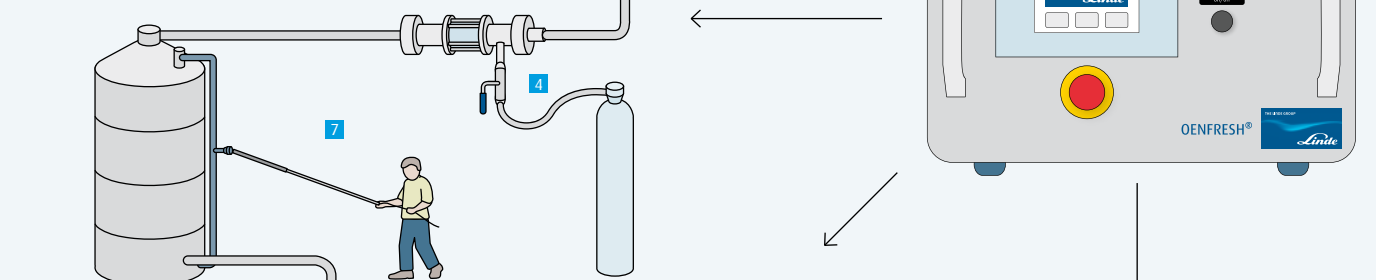
## Harvest



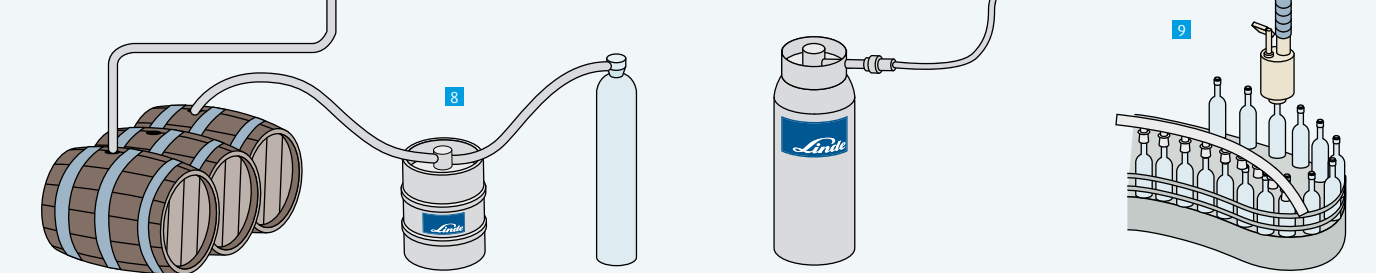
## Fermentation



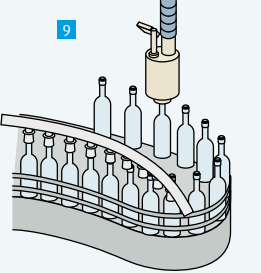
## Treatment



## Ageing



## Filling



The OENFRESH range of solutions covers every step of the winemaking process:

- |  |  |
|--|--|
| 1 Grape protection   | 6 Purging of vessels before storage*     |
| 2 Pressing   | 7 Cold stabilisation                     |
| 3 Grape chilling for cold maceration   | 8 Pressure transfer*/topping off         |
| 4 Wine sparging for protection during transfer and control of dissolved CO <sub>2</sub> concentration* | 9 Purging of wine bottles before filling |
| 5 Lance remontage for punching down/pumping over the cap*  | 10 OENFRESH wine gas panel               |

\* Automated applications supported by the OENFRESH wine gas panel



# OENFRESH® solutions. Harvest and fermentation.



## Grape protection

The use of oenological gases begins with the harvest. Oxygen and premature fermentation can impact a wine's quality if the grapes are not properly protected. Therefore, many vineyards and wineries use dry ice or CO<sub>2</sub> snow to create a protective blanket around harvested grapes. CO<sub>2</sub> snow is gentler on grapes than dry ice pellets as it sublimates more quickly, offering rapid protection. With the OENFRESH snowmaking system, we offer a simple and efficient on-demand solution, which reduces waste to a minimum by producing the exact amount of CO<sub>2</sub> you need, when you need it.

## Pressing

Oenological gases are used to protect grapes as they are being pressed. During pressing, the juice is at risk of oxidation, which can cause browning or loss of aromatics. With our inert press application, you have the means to regulate the environment in the press during this sensitive process so the juice is adequately protected.



## Grape chilling

Cold maceration is an important step to improve the extraction of aromas. Our OENFRESH grape chilling system is used to cool and protect the grapes as they are transferred to the maceration tank. The system injects pure, beverage-grade CO<sub>2</sub> snow directly into the grape transfer piping, providing instant cooling. While some CO<sub>2</sub> is dissolved in the grapes and releases desirable flavours and aromas, a portion of the gas sublimates in the transfer piping and produces a protective blanket around the grapes.



## Remontage

During the fermentation of red wines, the cap must be punched or pumped over frequently to ensure proper extraction of tannins, anthocyanins and polyphenols. Our OENFRESH lance remontage system is quicker and more effective than traditional methods. A specially designed lance is utilised to inject gas into the bottom or top of the vessel, creating large bubbles that allow the wine to mix with the skins and seeds in the cap. The same lance allows the injection of appropriate doses of sulfur dioxide without the risk of introducing oxygen to the wine. It can also be used to blend wines. The OENFRESH lance remontage system can be regulated by our new wine gas panel (see page 4).



# OENFRESH® solutions.

## Treatment, ageing and filling.



### Storage

Wine must always be stored under conditions that protect it from exposure to oxygen. Purging a vessel with inert gases is an efficient way to displace oxygen before filling in the wine. It helps preserve the wine's character and prevent the development of undesirable taste and aromas (maderisation, premature ageing, acetic drifts). In addition, our blanketing equipment maintains an inert environment in the ullage during storage. Vessel purging can be easily managed with our OENFRESH wine gas panel (see page 4).



### Transfer and O<sub>2</sub>/CO<sub>2</sub> control

During the transfer of wine from one vessel to another, oxygen can infiltrate the transfer lines and damage the wine. This can be prevented by sparging the wine, which can also be controlled by our OENFRESH wine gas panel (see page 4). During sparging, an inert gas is introduced into the wine in the form of very fine bubbles. When the bubbles are dispersed, a partial pressure difference develops between the inert gas and the dissolved oxygen, causing the oxygen to leave the wine. Wine sparging is also very effective in managing the proper balance of dissolved CO<sub>2</sub>, as it can reduce or increase the CO<sub>2</sub> concentration in the wine depending on individual requirements.



### Topping off

During ageing, the natural absorption of wine into oak barrels combined with evaporation lowers the wine levels. Barrels must therefore be topped off periodically to avoid the introduction of air. For topping off, we offer a trolley that uses gas pressure to transfer additional wine into barrels. As inert gases are used for the pressure, the wine is fully protected during the process.



### Cold stabilisation

In order to quickly cool the wine for cold stabilisation, we have developed a special lance that injects liquid nitrogen. Our OENFRESH cold stabilisation system is suitable for wineries that prefer not to invest in expensive mechanical cooling equipment or want to use liquid nitrogen as a supplement to speed up the process. In locations where electrical power is unreliable, the system is also a good option to maintain the cooling process when power is interrupted.



### Filling

All efforts to protect wine from oxygen can be defeated during the filling process unless proper measures are taken. We offer several solutions to ensure that oxygen does not get into bottles or containers in the final moments. Our pre-purging technology, for example, injects a stream of liquid nitrogen into empty bottles just before filling. As the liquid nitrogen evaporates, it pushes air out of the bottle from the bottom up, removing virtually all oxygen and thus providing ideal conditions for filling.

# Getting ahead through innovation.

With its innovative concepts, Linde is playing a pioneering role in the global market. As a technology leader, it is our task to constantly raise the bar. Traditionally driven by entrepreneurship, we are working steadily on new high-quality products and innovative processes.

Linde offers more. We create added value, clearly discernible competitive advantages, and greater profitability. Each concept is tailored specifically to meet our customers' requirements – offering standardised as well as customised solutions. This applies to all industries and all companies regardless of their size.

If you want to keep pace with tomorrow's competition, you need a partner by your side for whom top quality, process optimisation, and enhanced productivity are part of daily business. However, we define partnership not merely as being there for you but being with you. After all, joint activities form the core of commercial success.

Linde – ideas become solutions.