

Atlas Copco

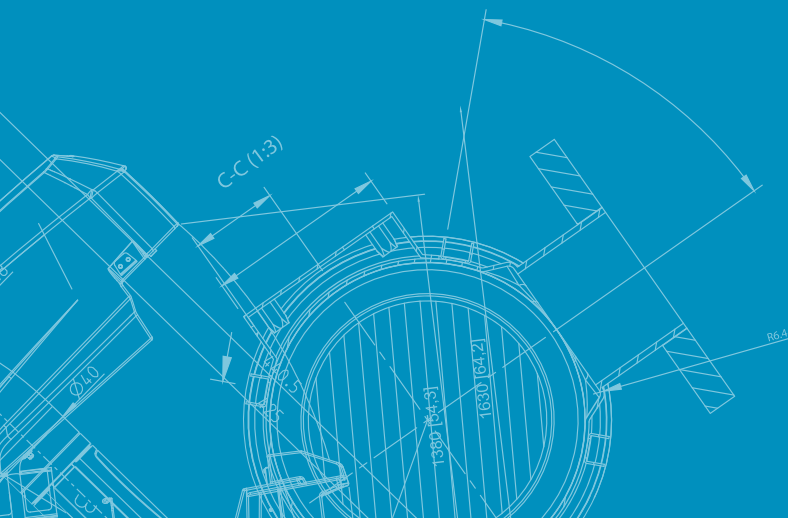
Considering the Switch from CO₂ to Nitrogen?



N₂ or?
CO₂!

Considering the Switch from CO₂ to Nitrogen?

Breweries of all shapes and sizes, from 5,000 to 500,000 barrels per year, traditionally rely on CO₂ as an essential gas for their brewing processes. After all, it's in beer as a byproduct of fermentation. But practicality, sustainability, and economy all point to the fact that using nitrogen gas generated on-site during the brewing process is in the brewery's best interest.



1 Practicality

Nitrogen is the proven food and beverage industry-embraced alternative to CO₂. For years, nitrogen has been the go-to choice to remove oxygen from all types of packed goods, from fruit and cheese to potato chips—*and beer!*

Nitrogen offers breweries many advantages and is ideal for several applications throughout the brewing process. On-site nitrogen extraction using a generator provides breweries the ability to produce the required quantities of inert gas itself – removing the need to bring in expensive CO₂.

When purging tanks between uses, utilizing nitrogen makes the tank oxygen-free; it keeps wort, beer, and residual mash from oxidizing and contaminating the next batch of beer. For similar reasons, nitrogen can be used to push beer from one tank to the next. Lastly, in the brewing process's final stages, nitrogen is the ideal gas for cleaning, inerting, and pressurizing kegs, bottles, and cans before filling.

While nitrogen generated on-site contains a similar trace amount of oxygen as seen utilizing CO₂, the purity for brewery applications can go up to 99.999%. Think of the purity level you choose as a recipe you get to tweak in line with your needs and preferences.

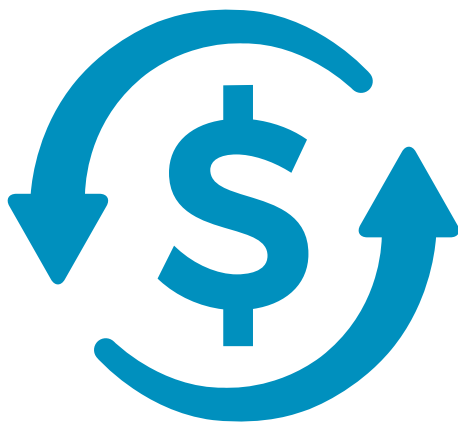


2 Sustainability

It's no secret that CO₂ concentrations are already causing the planet to heat up. CO₂ is produced through the combustion of organic materials or fossil fuels. In contrast, nitrogen is created by simply separating it from other gases that occur naturally in the air – about 21% oxygen, plus trace gases. When nitrogen used in a brewing process – such as purging or inerting – is released, it merely returns into the air it came from and eliminates greenhouse gas emissions.

Breweries will still need some CO₂ for carbonization, but nitrogen can eliminate two-thirds of a brewery's CO₂ requirements. The demand for CO₂ to make products such as dry ice – which uses a significant amount of CO₂ and is necessary to transport vaccines – is proliferating. Breweries across the United States share concerns over supply levels and question if they can cope with breweries' demand while keeping pricing levels consistent.

Replacing a portion of CO₂ with nitrogen significantly reduces a brewery's carbon footprint. A brewery producing 10,000 barrels a year that replaces just two-thirds of its CO₂ consumption with nitrogen can reduce greenhouse gas emissions by up to 24 metric tons per year. For example, an Atlas Copco customer that produces >180,000 barrels per year saw a staggering 1.2 million-pound reduction of CO₂ usage annually when switching to nitrogen.



3 Economy

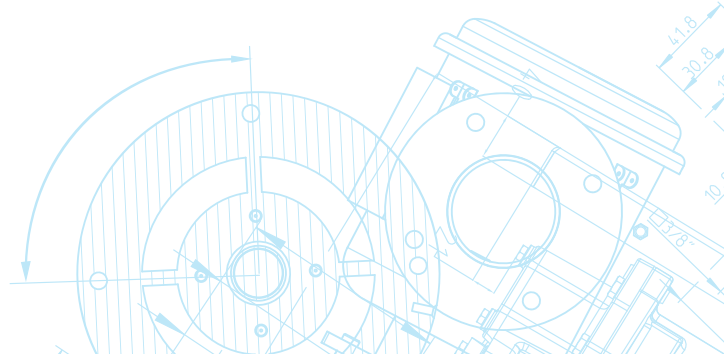
For many breweries, reducing its carbon footprint by two-thirds would be reason enough to switch to nitrogen, even if the cost were the same as CO₂. But nitrogen costs less—*a lot less*.

Unlike CO₂, you can quickly generate all the nitrogen you need, at the purity level you require, on-demand, and on-site. A nitrogen generator is a compact, full-featured industrial air compressor with a special membrane to separate nitrogen from the compressed air stream. Using on-site nitrogen generation, brewers are typically paying about \$0.10 to \$0.15 CCF. Breweries can easily compare that to what they are paying today for CO₂ in gas cylinders, which can easily cost 50-times this amount. Additionally, in remote areas, the cost of CO₂ can double or even triple, depending on how far the brewery is from the gas distribution center.

As more breweries focus on canning lines, switching to nitrogen can make a real difference. A canning line can easily consume 6-10 scfm of CO₂, about one pound of CO₂ per minute. A small nitrogen generator costs around \$500-\$800 per month, based on a 5-year lease-to-own program. A 10,000 barrel a year brewery would save close to a third of what they pay for CO₂ today. Scale that to the aforementioned 180,000 a year barrel brewery – the ROI for nitrogen was eight months, resulting in a ten-year supply of on-site nitrogen for roughly the same cost of eight months of CO₂ usage.

Additionally, a nitrogen generator has a small footprint freeing up valuable floor space previously devoted to full and empty CO₂ cylinders. Doing so can allow production expansion, more room for inventory, or additional hospitality space.

As previously mentioned, on-site nitrogen generation is not about completely removing CO₂ from your operation – the importance is understood – instead, it's about leveraging the efficiency and cost advantages of nitrogen compared to CO₂ and reducing your greenhouse gas emissions at the same time.



4 Making the Switch

With six standard packages, a nitrogen generator is available to cover 80% of all breweries – from a few thousand barrels a year to several hundred thousand barrels a year. A brewery can oversize its nitrogen generator to accommodate for growth while maintaining efficiency. Plus, the modular design can add a second generator if the brewery's business expands substantially.

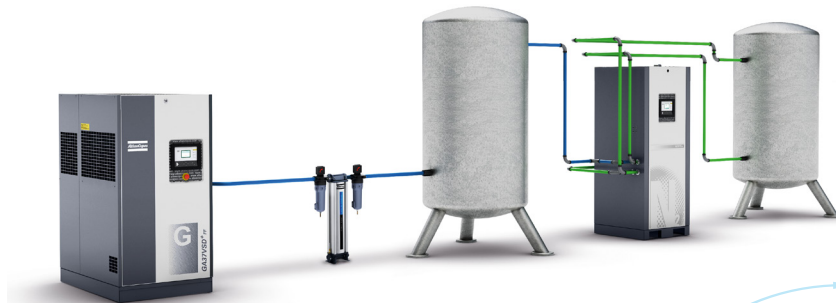
By switching to on-site nitrogen generation, brewers can significantly improve production, greatly reduce their carbon footprint and save a lot of money. Armed with your answers, reach out to your local nitrogen generator expert to discuss your specific needs.

Selecting the right-size nitrogen generator can be completed by answering a few easy questions.

1. What are the sizes of your FVs (fermenting vessels) and BBTs (brite tanks)?
2. Do your inert tanks transfer products or package at the same time?
3. What is your transfer rate for packaging (cans, bottles, kegs)?
4. What's the volume of CO₂ delivered annually?
5. What's the cost per #CO₂ and total annual CO₂ spend?
6. Do you use nitrogen in the product or draught system?
7. What's the cost per N₂ CCF or N₂ cylinder and the total annual spend?



Note: For breweries producing over 300,000 barrels a year, we recommend looking at a dedicated CO₂ recovery system to enable efficiency and sustainability. Learn more [here](#).



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