



Liquid Nitrogen Dosing

Focus: Wine

Cryotech is known industry wide for its frost-free, vacuum insulated, liquid nitrogen equipment and piping distribution systems. With over 1,000 dosing units installed, Cryotech has a wealth of application specific knowledge.

The Challenge

As the wine industry transitions to screw caps, wine makers are presented with new, unique challenges. Although screw caps eliminate the concern of “cork-taint”, screw cap bottles have a greater volume of headspace. Wine is exposed to oxygen trapped in the bottle headspace which in turn can result in increased dissolved oxygen levels, even after the cap is applied. Cryotech can help.

The Solution

By introducing liquid nitrogen into the bottle after filling, wine makers reduce headspace O₂ content by more than 70%. Typical results are 2.0 - 2.5% O₂. Less headspace O₂ results in a significant reduction of dissolved O₂ pickup. Cryotech has a complete line of liquid nitrogen dosing systems to automate and control the introduction of liquid nitrogen. A very small dose of liquid nitrogen is dosed into the filled bottle. One part of liquid nitrogen warms and turns into 700 parts of gas, displacing O₂ from the headspace.



Partial List of Customers

- Beringer Winery
- Caymus Vineyards
- Constellation Wines
- Domaine Chandon
- E&J Gallo
- G-3 Mobile Bottling
- Halsey Mobile Bottling
- Joel Gott
- Kendall-Jackson
- Napa Wine Company
- Ryan-McGee Mobile Bottling
- Signature Mobile Bottling
- Sonoma Cutrer
- Top-It-Off Mobile Bottling
- Ultima Mobile Bottling

Key Benefits

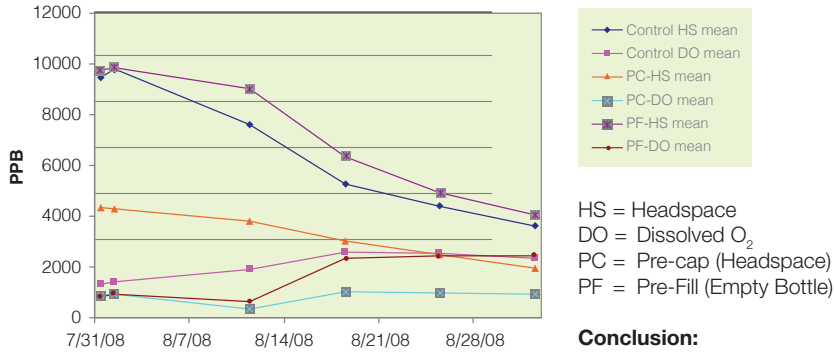
- **Reduce head space oxygen levels** – documented, extended shelf life studies show a 90-95% reduction in headspace oxygen content.
- **Decrease total package oxygen** – a 59% reduction in total package oxygen when compared to a traditional gas purge of headspace.
- **Minimize SO₂ requirements** – studies show consistent “Day 1” and “8 Week” headspace and dissolved oxygen levels, allowing winemakers to confidently control the use of sulfur dioxide while maintaining acceptable free sulfur dioxide levels.

Pre-Fill and Pre-Cap

Purging with Liquid Nitrogen



CT all means compared



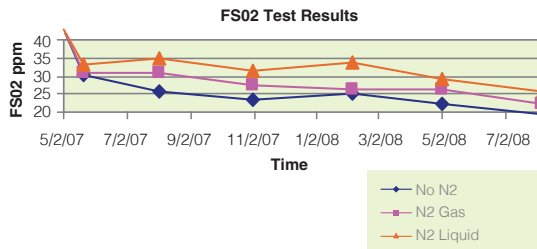
HS = Headspace
DO = Dissolved O₂
PC = Pre-cap (Headspace)
PF = Pre-Fill (Empty Bottle)

Conclusion:
Lowest HS and DO with pre-cap (headspace) liquid nitrogen purge.

Inerting with Liquid Nitrogen

- Effectively flushes O₂ out of the bottle head space
- Extends shelf-life in screw cap packages
- Keeps the fruit in every pour

FSO₂ Results



Conclusion:
Liquid nitrogen dosing best "locks-in" FSO₂ levels.

Liquid nitrogen dosing provides winemakers with better diagnostic insights for proper SO₂ usage.

Customer Testimonial

"Fresher, cleaner, brighter best describes wine protected with liquid nitrogen dosing....In my opinion, the addition of a Cryotech liquid nitrogen dosing system to our bottling line resulted in the single most significant improvement in product quality during my 33 year tenure. You can bet the ranch that a Cryotech system will be on the equipment list of every bottling line I spec."

— VP, Manufacturing and Winemaking at St. Julian Winery

Dissolved O₂ Data

Nobilo Winery Orca Bay—New Zealand Sauvignon Blanc

Headspace Volume- 30 ml; Nozzle size = 0.050"; Line speed = 80 bpm; Dwell time to capper = 4 sec.; all bottles shaken for 1 min.

Dissolved Oxygen (ppm)

- Dissolved O₂ at filler 0.709
- 0ms LN₂ dose control sample 1.86
- 20 ms LN₂ dose 1.08
- 30 ms LN₂ 0.979
- 40 ms LN₂ 0.854
- 50 ms LN₂ 0.801
- 60 ms LN₂ 0.768

Cryotech Services

- Application support
- On-site equipment demonstrations
- System design
- CAD drawings
- Installation and setup
- Technical support
- Maintenance

For more information on any of our products and services please visit us on the Web at:
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