Liquid Nitrogen Dosing Application Focus

Preservation

Wine Bottling

Chart is known industry wide for its frost-free, vacuum insulated, liquid nitrogen equipment and piping distribution systems. With over 3,000 dosing units installed, Chart has a wealth of application specific knowledge across a wide range of dosing applications.

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. Chart can help make this transition a success.

The Solution

By introducing liquid nitrogen into the bottle after filling, wine makers reduce headspace $O_2$ content by more than 85%. Typical results are 2.0 - 2.5% $O_2$. Less headspace $O_2$ results in a significant reduction of dissolved $O_2$ pickup. 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 $O_2$ from the headspace.

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 $SO_2$ 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.

Partial List of Customers

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

Inerting with Liquid Nitrogen
• Effectively flushes O\textsubscript{2} out of the bottle head space
• Extends shelf-life in screw cap packages
• Keeps the fruit in every pour

Customer Testimonials
"Fresher, cleaner, brighter best describes wine protected with liquid nitrogen dosing....In my opinion, the addition of a Chart 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 Chart system will be on the equipment list of every bottling line I spec."
— VP, Manufacturing and Winemaking at St. Julian Winery

Paso Robles Wine Country was named 2013 Wine Region of the Year by Wine Enthusiast Magazine. Our customer in that area states that it's "all because of the doser"!

FSO\textsubscript{2} Results

Conclusion:
The conclusion is that the most effective dosing was achieved with liquid nitrogen for both Headspace (HS) and Dissolved Oxygen (DO) tests. Liquid nitrogen dosing best  "locks-in" FSO\textsubscript{2} levels. Liquid nitrogen dosing provides winemakers with better diagnostic insights for proper SO\textsubscript{2} usage.

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

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