

UltraDoser® 500S

Sauvignon Blanc Screw Cap

Headspace Volume- 30 ml; Nozzle size = 0.050";
Bottle Type = BVS Finish Burgundy

Dose Duration

Dose Duration	Headspace DO (ppm)
Current System (control)	0.7
15 ms	1.1
20 ms	0.88
30 ms	0.5
40 ms	0.3
60 ms	0.0 (Not detectable)

Total Package Oxygen (ppm)

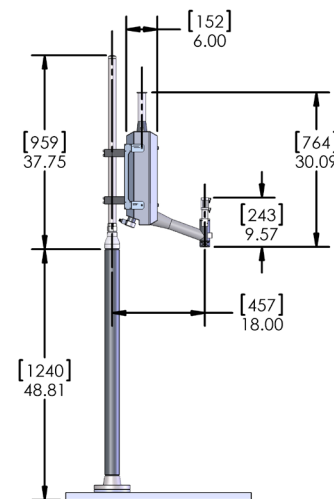
Control (unshaken = DO at filler)	0.87
Control (N ₂ gas purge of headspace & screw cap - shaken)	1.58
15 ms LN ₂ dose (shaken)	1.98
20 ms LN ₂ (shaken)	1.62
30 ms LN ₂ (shaken)	1.35
40 ms LN ₂ (shaken)	1.14
60 ms LN ₂ (shaken)	0.91



Controller Technical Specifications

Model	UltraDoser® 500S
PLC Platform	Siemens
Display	Mono Keypad
Dose Duration	15 to 1000 ms (1 ms intervals)
Dose Volume	0.02 to 14 grams/dose
Encoder Compatible	
Maximum Discrete Dosing (cpm)	500
MicroDose™ Technology	
Line Speed Auto Detect	
Electronic Dose Targeting	✓
Fixed Delay Mode	✓
Speed Compensated Mode	✓
Accuracy	± 5% of dose weight
Multiple Languages	
RemoteDose™ Capable	
Recipe Storage	
Certifications	CE, NEMA 4X

UltraDoser® Dimensions



Liquid Nitrogen Dosing Application Focus



Preservation

Wine Bottling

Chart Inc. 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.

The Solution

By introducing liquid nitrogen into the bottle after filling, wine makers reduce headspace O₂ content by more than 85%. Typical results are 2.0 - 2.5% O₂. Less headspace O₂ results in a significant reduction of dissolved O₂ pickup. Chart 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



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.

Your Local Representative



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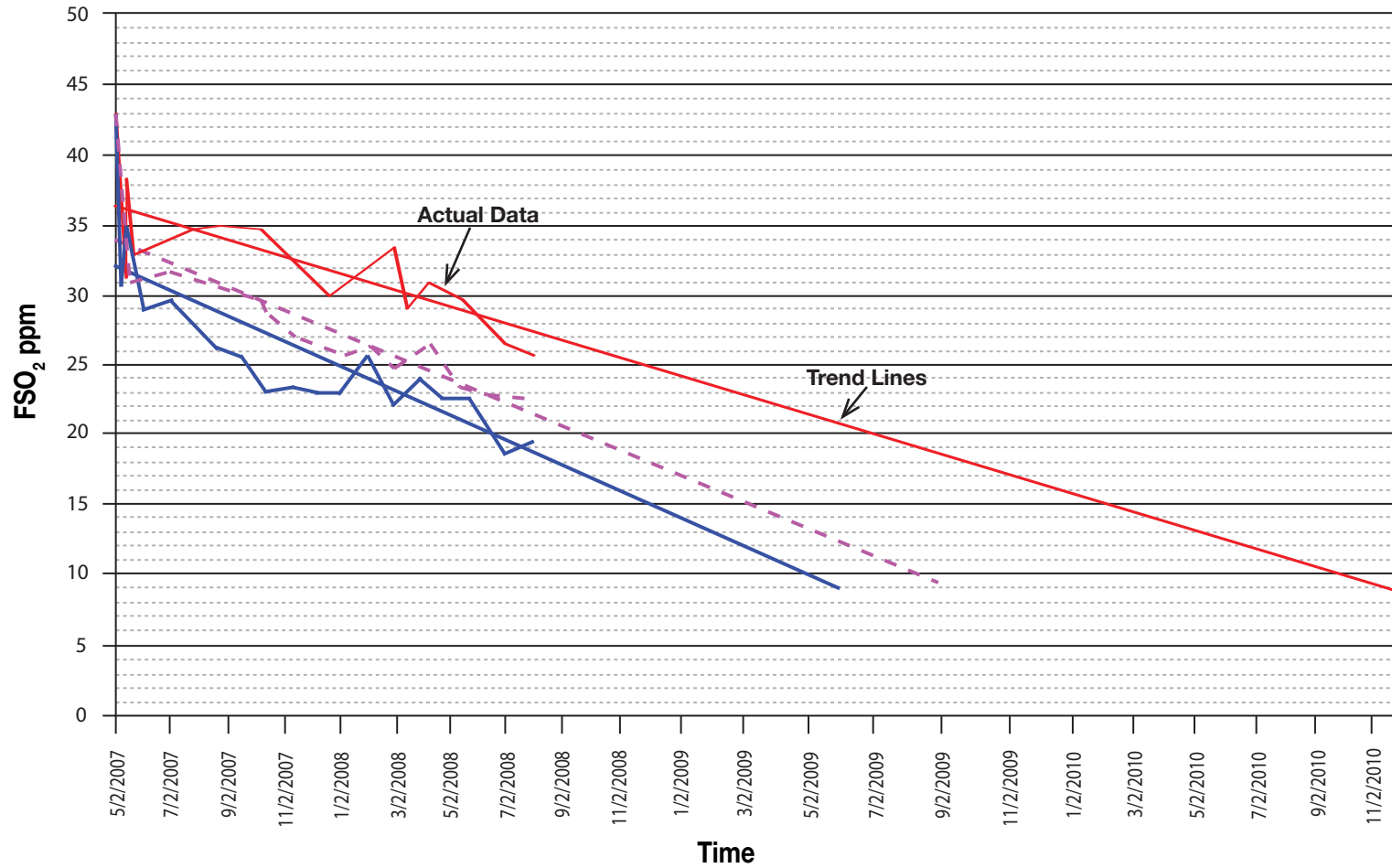
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Free Sulfur Dioxide (FSO₂) Test Results



Legend	
—	No N ₂
- - -	N ₂ Gas
—	N ₂ Liquid



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

Conclusion:

Liquid nitrogen dosing best “locks-in” FSO₂ levels.

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

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.

LN ₂ Dose	Dissolved Oxygen (ppm)	% Over Filler
• Dissolved O ₂ at filler (not shaken).....	0.709.....	—
• 0 ms LN ₂ dose control sample (shaken).....	1.86.....	162
• 20 ms LN ₂ dose (shaken).....	1.08.....	52
• 30 ms LN ₂ (shaken).....	0.979.....	38
• 40 ms LN ₂ (shaken).....	0.854.....	20
• 50 ms LN ₂ (shaken).....	0.801.....	13
• 60 ms LN ₂ (shaken).....	0.768.....	8

Customer Testimonial

“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

Chart 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: www.chartdosers.com



UltraDoser[®] 500S

Headspace Analysis—N₂ Gas vs. LN₂

- Liquid Nitrogen Dosing UnitUltraDoser 500S
- Line Speed100 bpm
- Headspace~30 ml
- Headspace Oxygen with nitrogen gas10-13%
- Headspace Oxygen with liquid nitrogen1.5-2.8%

