LN2 Dosing Technology – CRYOTECH - USA

"Inerting Head Space Oxygen of Screw Cap Closures through Liquid Nitrogen Dosing"

Neal Schinske

Neal.Schinske@chart-ind.com

+1-408-690-0137

Liquid Nitrogen

- Inexpensive / Small Usage /Available
- Used under atmospheric conditions
- Minimizes SO_2 balance
- Does not freeze wine / No taste issue
- Does not dissolve in wine
- Ecologically friendly
- Expands to a gas 700:1 volumetrically

UltraDoser SC350

Liquid Nitrogen vs Gas Nitrogen Head Space

- Ultradoser SC 350
- Line Speed: 100 bpm
- Head Space: ~30 ml
- Head Space Oxygen with nitrogen gas: 10 – 13%
- Head Space Oxygen with liquid nitrogen: 1.5 – 2.8 %

Dissolved Oxygen
LN2 vs GN2
Total Package Oxygen (ppm)

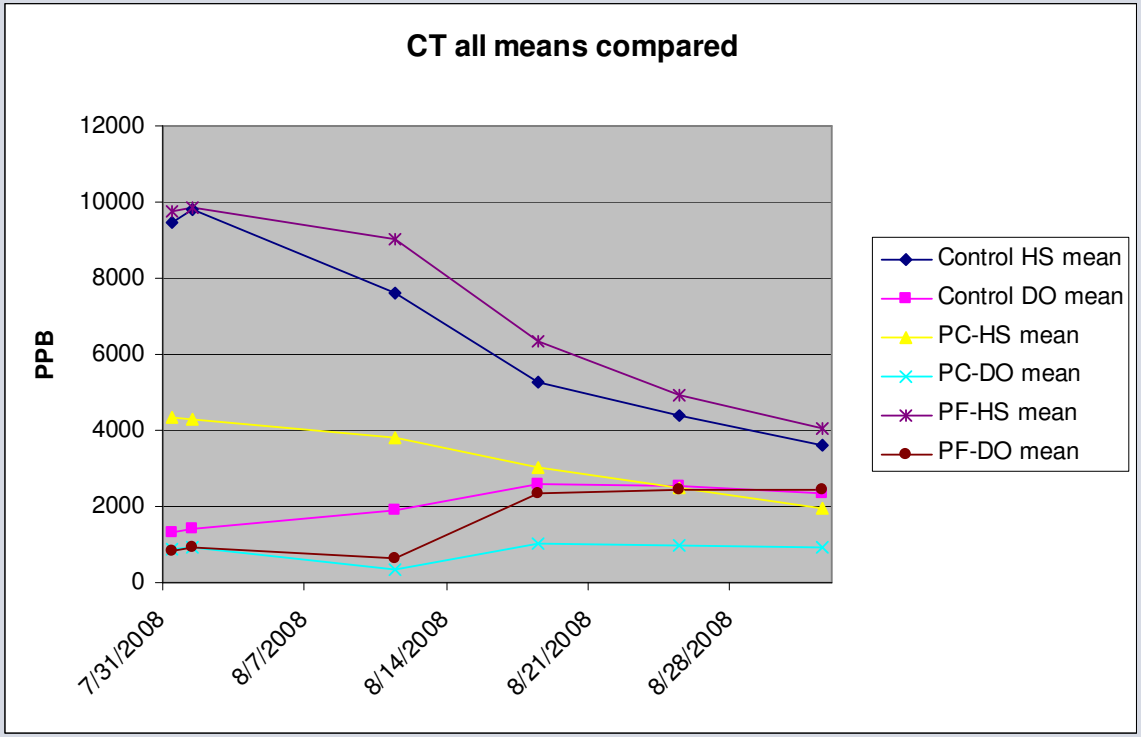
- Control (unshaken = DO at Filler) 0.87
- Control (Nitrogen gas purge of head space and screw cap - shaken) 1.58
- 15 ms Liquid Nitrogen dose (shaken) 1.98
- 20 ms LN2 - shaken 1.62
- 30 ms LN2 - shaken 1.35
- 40 ms LN2 - shaken 1.14
- 60 ms LN2 - shaken 0.91

Joel Gott – Dissolved O_2 Sauvignon Blanc

- Rate: 100 bpm
- Dwell Time 4.5 seconds

		PPM	
		1 day	8 weeks
Control:	DO	0.28	0.94
	TO	0.50	1.68 (shaken)
Dosing:	DO	0.25	0.27
	TO	0.45	0.48 (shaken)

Oxy-Sense Data



HS = Head Space

DO = Dissolved Oxygen

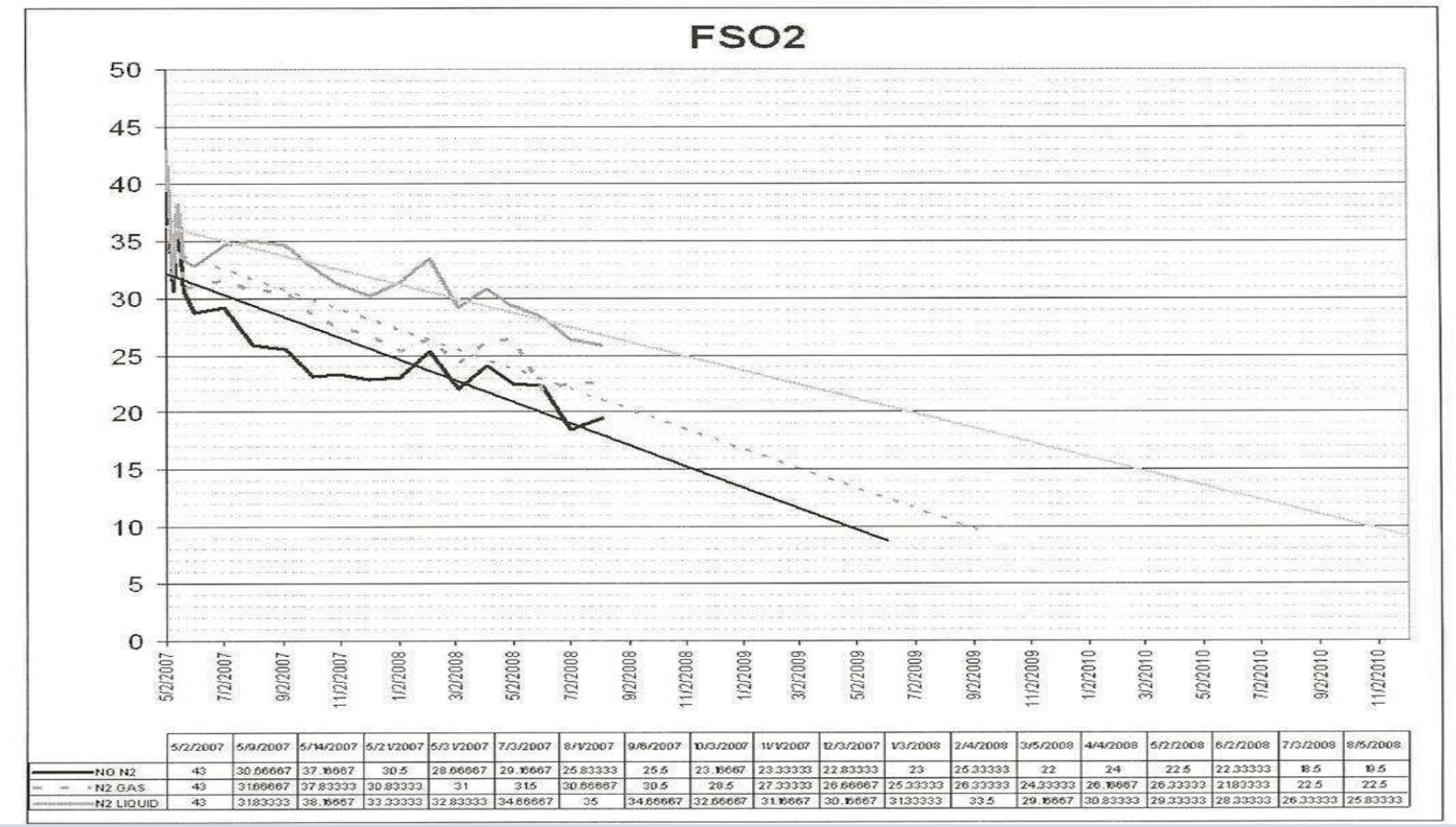
PC = Pre-Cap (Headspace)

PF = Pre-Fill (Empty Bottle Purge)

Findings:

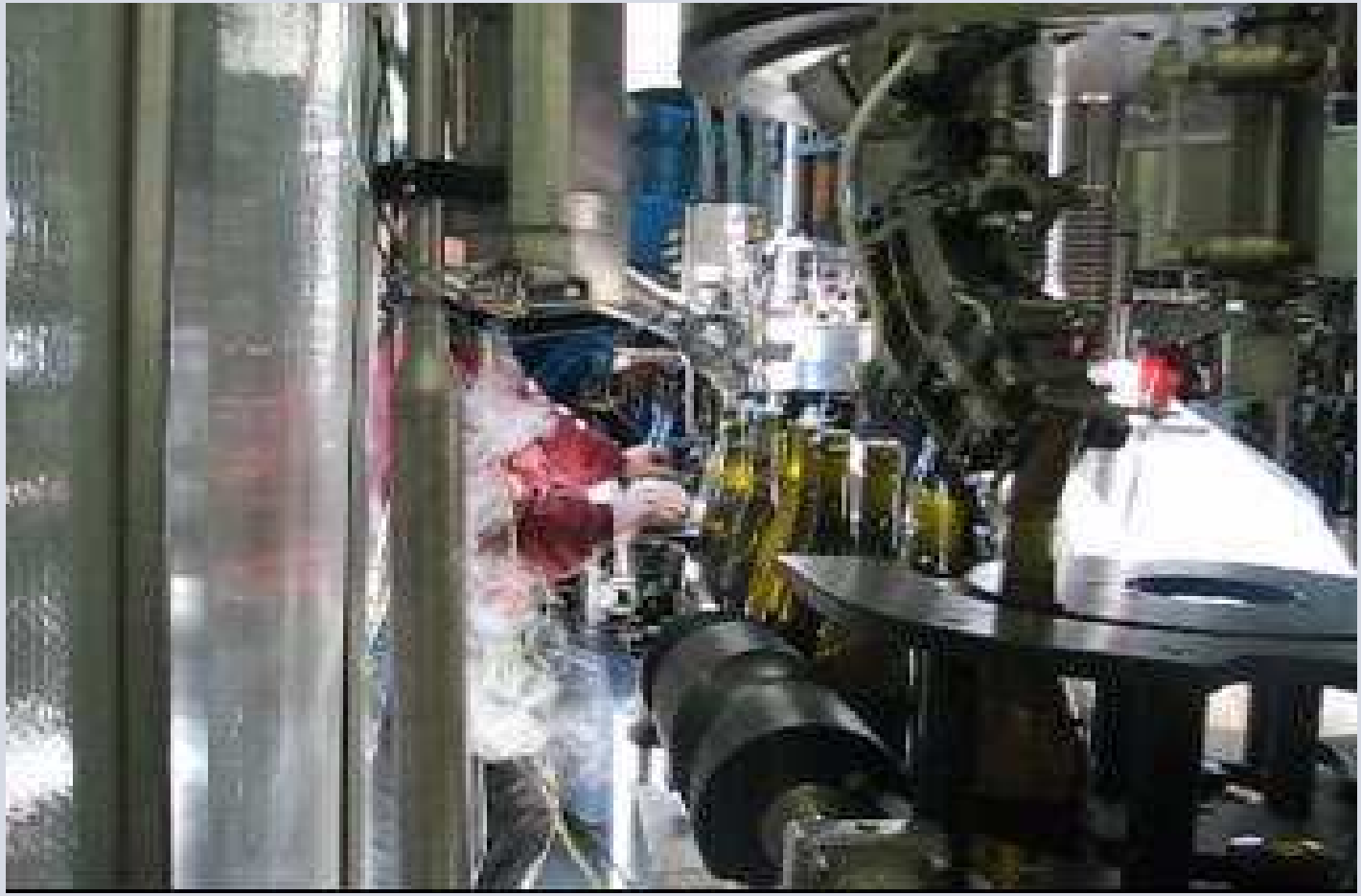
1. **Lowest HS and DO with pre-cap purge**
2. Pre-fill DO lower initially then consistent with control
3. Pre-fill HS initially higher than control even though DO lower than control

Free Sulfur Dioxide Data



	5/2/2007	5/9/2007	5/14/2007	5/21/2007	5/31/2007	7/3/2007	8/1/2007	9/6/2007	10/3/2007	11/1/2007	12/3/2007	1/3/2008	2/4/2008	3/5/2008	4/4/2008	5/2/2008	6/2/2008	7/3/2008	8/5/2008
NO N2	43	30.66667	37.16667	30.5	28.66667	29.16667	25.83333	25.5	23.16667	23.33333	22.83333	23	25.33333	22	24	22.5	22.33333	18.5	19.5
N2 GAS	43	31.66667	37.83333	30.83333	31	31.5	30.66667	30.5	28.5	27.33333	26.66667	25.33333	26.33333	24.33333	26.16667	26.33333	21.83333	22.5	22.5
N2 LIQUID	43	31.83333	38.16667	33.33333	32.83333	34.66667	35	34.66667	32.66667	31.16667	30.16667	31.33333	33.5	29.16667	30.83333	29.33333	28.33333	26.33333	25.83333

Head Space Dosing



Wineries With Cryotech System

- E&J Gallo
- Kendall-Jackson
- Caymus Vineyards
- Hanna Winery
- Ryan-McGee Mobile Bottling
- Mason Winery
- Joel Gott
- Delicato Vineyards
- Fosters Wine (Beringer/Meridian)
- Constellation (Mission Bell/Pacific Rim/Mondavi)
- Sonoma Cutrer
- Geyser Peak
- G-3 Mobile Bottling
- Signature Mobile Bottling
- Ultima Mobile Bottling
- Top-It-Off Mobile Bottling
- Bravo Mobile Bottling
- Halsey Mobile Bottling

Liquid Nitrogen Process

- Total Dissolved Oxygen at Filler Level
- "Plug and Play" on Existing Lines
- Extends sustainability of wine
- Immediately sustains fruitiness
- Lower Overall Nitrogen Use
- Environmentally Friendly