



Caymus Vineyards installs a liquid-nitrogen dosing system to overcome the problems associated with the additional headspace resulting from a switch from corks to screw caps.

Liquid nitrogen dosing eliminates air in wine bottles

Jack Mans, Plant Operations Editor

In 1989, Caymus Vineyards, Rutherford, CA, a winery known for its award-winning Napa Valley Cabernets, introduced Conundrum, a new, proprietary blend of Sauvignon Blanc, Chardonnay, Muscat Canelli, Semillon and Viognier that was a “conundrum” of flavors and textures.

“Conundrum is a complex blend born out of owner Chuck Wagner’s idea that a wine could mirror, in complexity and creativity, the dishes created by a new generation of chefs that are not bound by the traditions of the past,” says winemaker Jon Bolta. “The winery has always been adamant about making and delivering premium-quality wines, and we were determined that Conundrum would offer up uncompromising crispness or freshness in every glass.

“We treat each contributing wine and the unique flavor it delivers separately. We pick each varietal at several different levels of ripeness and acidity. We ferment some lots in stainless, and some in oak to complement their distinct character. When it’s time for blending, we have more like sixty components rather than five—all of which contribute unique aromas, flavors and textures. We work hard to create these flavor layers, and we want to maintain them in the bottle.”

Says production manager Steve Augustus, “While white wines are usually consumed early on and not laid down, you can’t predict

transportation and storage times, so we still have the concern of preserving Conundrum’s bouquet, color and flavor. This means keeping dissolved oxygen levels to a minimum. Jon and I were especially concerned about the oxygen in the headspace that would occur when we decided to replace the cork with a twist-top closure.

“All of us were well aware of the success that the Australian, New Zealand, Swiss and Chilean winemakers had enjoyed with screw caps. We were also familiar with the closure study that was presented at the annual ASEV [American Society for Enology and Viticulture] conference last year, in which

Hogue Cellars had scientifically analyzed a variety of

closures, including corks, synthetics and screw tops, and screw tops were proven superior in letting the customer drink the wine as it was created. But still, Conundrum is a very special wine.”

Last April, during a visit to the Napa Wine Company’s custom crush facility in Oakville, CA, Bolta and Augustus watched the bottling of several reds and whites from the Pepi Winery. Pepi made the switch from natural corks to screw caps in March of 2004 and were enthusiastic about the benefits they were realizing. Customers had

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readily accepted the change, and they were starting to accrue the long-term benefits, including significant cost savings from twist-top closures over cork, faster line speeds and a simplified bottling process. "We were looking to keep the fruit in the wine and to eliminate TCA [2,4,6-Trichloroanisole] which is attributed to corks. While TCA does not pose a health risk at the levels found in wine, it does impart aromas and flavors that are objectionable. Any cost savings or other long-term benefits, such as production efficiencies, would be added bonuses," says Bolta.

Adds Augustus, "We had a concern about the forty-three-millimeter headspace that would

have been displaced by the cork in our Conundrum bottles. We decided that, like Pepi, we would add a 'dose' of liquid nitrogen between the filling and capping operations. After learning that **VBS International** (www.vbsinternational.com), a company only a couple of hours away in San Jose, had a lot of experience with nitrogen dosing, we contacted them the very next day.

"Working with VBS, we tested a number of different parameters as we looked for the optimal gas, the optimal dose and the optimal equipment to cost-effectively minimize dissolved oxygen for our lines. We measured Argon versus nitrogen,

dose duration, different nozzle sizes, different line speeds, different fill levels and other variables, including residual gas pressure. VBS was very supportive throughout the process and worked very closely with Steve in achieving a new level of quality assurance."

Says Bolta, "Headspace is definitely an issue. The acceptable amount of headspace depends on the wines' sensitivity to oxygen, the time required for transport—especially if it's an exported product—and the time it might be stored prior to drinking."

Caymus installed a VBS nitrogen-dosing system. The standalone system has a precision vertical dosing head mounted over




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the existing bottle conveyor between the filler and the capper. A sensor detects a bottle entering the dosage zone and initiates the injection of a very small dose, about 0.10 g, of liquid nitrogen at a temperature of minus 320 deg F into each bottle. The nitrogen rapidly expands volumetrically as it changes from a liquid to a gas inside the bottle, and pushes atmospheric gases, including oxygen, out of the bottle.

More and more winemakers are making the switch to screw tops to preserve the fresh fruit taste of their wines and to reduce the cost of bottling. And many of these same winemakers have found that adding liquid nitrogen dosing to their bottling operations is a very cost-efficient way to guarantee the results. Even small to medium-sized winemakers find that the very modest cost of adding liquid nitrogen dosing to a capping operation can be amortized over a single bottling.

More information is available:

VBS International, Inc.,
408/371-3303.
www.vbsinternational.com.
Circle No. 234.