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Sophisticated Technology Helps Winemakers Control Tank Temperatures

*** EXCEPT FROM ORIGINAL ARTICLE ***

By Paul Franson

Ever since winemakers first installed cooling jackets that allow them to control fermentation temperatures, they've been seeking better controls to automate the process.

Fermentation temperature is important for controlling wine characteristics and quality, of course. White wines, for example, are fermented at relatively cool temperatures to maintain freshness, but if the tank is too cool, the yeast essential to the fermenting process may not grow efficiently or at all, possibly allowing undesirable yeasts to take over and form bad odors and tastes. And different whites are fermented at different temperatures to help emphasize fresh, fruity or more complex flavors.

Red wines, by contrast, are fermented at higher temperatures to help extract colors and flavors from grape skin. In either case, if the fermenting wine gets too hot, it will suffer off flavors, even tasting as if it has been cooked.

Winemakers use tanks that can be cooled, but they must know the temperature within the tanks. The usual way of cooling the tanks is with external jackets that contain a liquid cooled by a refrigerating system. Some tanks can be heated, too, desirable in some cool climates or for certain processes like malolactic fermentation.

Early controls simply set the temperature in each tank manually. For a winery with many tanks, and some have hundreds, this can be a tedious proposition.

Alternately, the information can be fed to a central spot for control by a computer. In this case, a problem can obviously arise if the computer fails, and it also prevents winemakers from adjusting temperature locally.



TankNet controller reading a brix probe at Monterey Wine Company.

For that reason, many wineries use a program called TankNet from Acrolon Technologies in Sonoma to monitor the tanks. The TankNet system combines the best features of both techniques: overall monitoring and control of all tank temperatures plus local override of settings at the tank.

Raymond Vineyards and Acacia Vineyards are among the wineries using the system. A former employee at Chalone Wine Group, which owns Acacia, in fact developed TankNet.

Acacia General Manager and Winemaker Michael Terrien uses the TankNet system to monitor temperature in each tank, displaying it for Terrien in one central spot. There are also control boxes on the tanks, and employees can

check the temperature and make changes there as well.

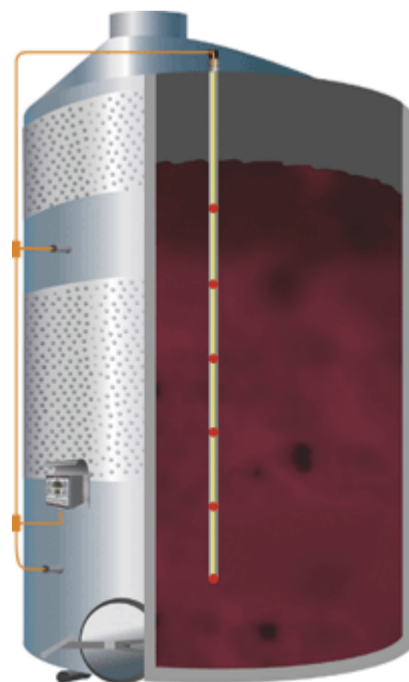
The system issues alarms if anything goes wrong, and it's possible to use it to turn cooling pumps on and off, too, though Acacia hasn't implemented that function. Naturally, that could then be done automatically based on temperature in the tanks.

TankNet's Paul Egidio said the system could also be integrated with monitors for the percentage of sugar in the wine, liquid level, carbon dioxide and humidity.

Troy Davis is the Industrial Refrigeration Director at Indoor Environmental Services in Napa, a mechanical contractor specializing in wineries with offices in Santa Rosa, Sacramento and a fabrication shop/office in Napa.

Its current projects include installing TankNet systems at Duckhorn Winery, Paraduxx Winery and Villa Amorosa Winery for this harvest. These systems will link not only the tanks, but also chillers, glycol heater and barrel rooms so they can all be tied into a PC network for complete mechanical control. A Web Browser for each control will allow offsite control as well.

Davis notes that in the past, tank controls didn't include a total system that offers both tank and mechanical equipment control, using a stand-alone controller for each unit. "There have been many uses in the valley with all computer type systems, but when the program or computer fails, then all temperature control is lost for the tanks and other equipment. With the TankNet system, each control can act independently of the PC system if needed," he notes.



Controller on tank with two standard probes plus a Stratiprobe.