

Grapes: Cold Fermentations—A Chilling Tale (*Number 51 in a series of opinionated articles about grapes and wine in Fair Play*)

By John Smith

White wines, and their pale-pink partners, rosés, need to be kept cold during fermentation to keep their fresh flavors. Because fermenting wines generate a lot of heat, this has led to an innovative array of techniques, equipment and practices for cooling wines during fermentation, both for home winemakers and wineries.

### Trash Cans and Jugs

Usually, the only containers beginning home winemakers have for fermenting are five-gallon glass carboys or large plastic trash cans (no, not used ones, brand new Rubbermaid® or equivalent), and these present a real challenge in cooling. My earliest wines were done at room temperature, and even though a 1975 Chardonnay won Best of Show in a national home winemaking competition (thereby likely propelling me headlong into the twisted life I now lead), it was lacking the delicacy and fruit that can come only from cool fermentation. Our in-laws had blessed us with a 1954-vintage International Harvester refrigerator, and after I changed the thermostat to a beverage-chiller unit that allowed temperature control from 32 to almost 60 degrees, and added a couple of plywood shelves, it was possible to get four five-gallon carboys into the refrigerator—twenty gallons of Chardonnay could then ferment under cold conditions, but none of these wines won any awards, so the early one might have been a fluke!

Probably the best cooling system for home use in a big garbage can is a long coil of stainless steel tubing. If your tap water is cold enough, you can flow that through the tubing, or you can rig up a small pump with cooler full of water and ice. The tubing coils can be bought in lengths of 50 to 120 feet, and in 5/16 or 3/8 inch diameter, from Micromatic (<http://www.micromatic.com/draft-keg-beer/jockey-boxes-cid-670.html>), and the prices range from \$82.00 to \$178.00. As the site name implies, they are intended for “jockey boxes”—coolers full of ice water that cool keg beer, with the beer going through the inside of the tube, but they work great for wine, with the cold water on the inside.

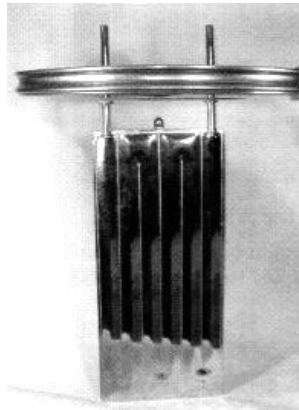


Those who live in colder climates have a natural alternative—leave the wine outside in the cold—no matter what the fermentation container is! In Eastern wineries, grapes are

sometimes harvested when there's snow on the ground, so fermentations can be started inside, then the containers moved outside to keep them cool.

## Big Systems

Modern wineries have better ways to keep wine cool. One low-cost approach is nothing more than grown-up version of the coil above, called a “cooling insert.” It's placed in a plastic or metal tank, and cold water from a well or a handy river runs through it. A small one like that pictured below sells for \$180.00, and is available from St. Patrick's of Texas ([www.stpats.com](http://www.stpats.com))



Most wineries today, though, have opted to use a refrigeration system with a circulating glycol coolant. Unlike the ethylene glycol coolant in auto radiators, this is propylene glycol, which is non-toxic and allowed for use in cooling edible (or drinkable) products. (There is a tale that one winery had used ethylene glycol in its very early days, and when they switched to propylene glycol, the cost for disposal of the “hazardous waste” anti-freeze was many times that of the replacement propylene glycol.) The system generally consists of a chiller, a tank for the coolant and a circulating pump. The coolant is circulated into the winery where it flows through a thin space between the outer and inner walls of a “jacketed” tank—that’s what causes the “dimpled” appearance of many stainless steel wine tanks. The “chiller” is an outdoor unit that houses all the pieces necessary to create the cold—it’s large, expensive and noisy. Oh, and it breaks frequently. Our unit was installed when the winery was built, and in ten years every single piece of the machinery has been replaced at least once, including the compressor (by far the most expensive piece), where the second unit failed recently for the second time just months after the extended warranty expired.

Each tank can have a control unit that reads out the temperature in the tank and controls it by switching the flow of coolant on and off for that tank. Some come with alarms that beep when the temperature exceeds pre-set limits (such as, when the chiller unit fails during the night and the wine temperature rises rapidly). After just one such event, when the winemaker is greeted in the morning by ten simultaneously beeping tank control units that sound like a national emergency, the alarms are usually turned off, because a quick

glance at the temperature readouts (or just not hearing the familiar roar of the chiller) provides the same information—another expensive chiller repair bill is on the way!

### **Kool Plastic**

There are small, single tank chiller units on the market, and for a small winery making only one or two white wines a year, they are a reasonable alternative. In recent years, an innovative system has become available, the KiLR CHiLR™, which has a high-efficiency heat pump that circulates cold air in the space between two insulated plastic tanks—a 500-gallon inner tank mounted inside a 750 gallon outer. With this system, you no longer have to deal with circulating glycol coolant, but you face the disadvantage of having a noisy air-conditioner unit inside the winery. Of course, it could be placed outside, but many times white grapes are harvested during the heat of late summer, and this places an additional burden on the cooling capacity (and the electric bill). It's not cheap (almost \$6,000 delivered up here), but it's self-contained, and so far the reliability seems to be good.



### **The Big Chill**

After the fermentation is complete and before bottling, commercial wines need to be made very cold to remove “tartrates” and prevent the appearance of crystals in the wine when it's chilled for home or restaurant use. This is called “cold stabilization,” and requires that the wine be kept at 25 to 30 degrees Fahrenheit for about a week. The old refrigerator almost worked, chillers with glycol or the plastic tank system work very well, but beware the natural process for this in the dead of winter—if the outside temperature goes below ten degrees, you could wind up with a new frozen treat—a “winesicle.”