



**W**ooden barrels and tanks appear to look the same as they did centuries ago, yet so much has changed inside and out.

One of the oldest vessels for holding liquid is still in use, and continues a rapid evolution as cooperages strive for greater environmental sustainability, cost savings and consistency. Some coopers adopt materials such as steel and Plexiglas, seeking better performance. Others change how barrels are made as they work toward greater consistency.

The conventional toasting process – putting a nearly complete barrel over a fire – has been enhanced by computerized toasting and carefully controlled

fires that apply a consistent heat to the wood and reduce blistering.

One of the newest barrels comes from Esprit de Dryades, the research and development arm of the Vicard Group. Jean-Charles Vicard, head of the Cognac-based company, has been obsessed with attaining barrel consistency. So for the Vicard Generation 7 barrel, released in September 2013, Esprit de Dryades abandoned the conventional method of coopering barrels by forest and grain and instead relies on sampling that reflects the actual tannins in the wood. Then coopers make the barrel in a process Vicard developed to control for variables in the process.



The Vicard Generation 7 barrel was created to deliver consistency year after year.

“How many winemakers have ordered 30 fine-grain, medium-toast barrels and ended up with their favorites, the middle and the outliers?” asked Christy Thomas of Esprit de Dryades. “Jean-Charles feels he is on a path to deliver the

holy grail to winemakers: the same barrel year after year.”

Vicard found that customers could not quantify the difference in the outcome among wine from barrels made from the nine oak forests of France. Even if they could, those differences would be impossible to replicate, he found. Even within a forest, one would find barrel-to-barrel and year-to-year inconsistencies. But the actual measurable tannins in the wood, rather than the tightness of the grain, proved the most consistent measure. Wide grain is considered less tannic and tight grain more tannic. But Esprit de Dryades learned the correlation is accurate just 70% of the time. Now, it tests for ellagitannin levels, then sort and cooper barrels accordingly.

Mirco-perforated staves are steam-bent for no more than four minutes, the point after which the hydrosoluble tannins in the wood are extracted. The tiny slits are no more than a millimeter deep, shallow enough to prevent contamination.

The fire is fueled by a spaghetti-like wood waste agglomerate fed by an auger and an air vent governed by a computer programmed to the toast level. The fires burn within a double cone shaped like

a fat cigar that extends to the top of the barrel. The barrel itself rotates around the stationary cone so heat, rather than fire, toasts the barrel. Vicard calls this process “molecular toasting.”

The G7 red-wine barrel goes through a gradual toast, starting at 180°F and increasing 10 degrees every 20 minutes, resulting in a toast that nearly goes through the stave. The entire toast process takes place in a box that controls for ambient air, and has a 2-degree margin of error.

“Coopers will tell you barrels toasted at 7 a.m. are different than those at 3 p.m.,” Thomas explained. “The toasting box is another piece of the process that controls for variables.”

When a customer finds a barrel that works for him or her, the profile is saved and that barrel can be produced again and again, Thomas said, with consistent results.

## AT A GLANCE

- + Economic demands are driving wineries to look for new barrel options.
- + Innovations include steel barrels fitted with oak staves and barrels with transparent staves that allow for a view of fermentation in action.
- + With high-tech assays of oak quality and more tightly controlled manufacturing and toasting, barrels become ever more consistent within brand and even year to year.
- + Among conventional barrels, the range of options available to winemakers continues to grow.

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"We aren't saying these are the best barrels on the market," she said. "We are saying that if you can find what you want in a G7, you can get the same effect year after year."

The G7 barrels are categorized by tannin level: Symetrie, low tannin, Originie, medium tannin and Energie high tannin. High-tannin barrels are popular in Burgundy, Thomas said, where wineries pair them with neutral barrels to get more bang for the buck. Last year, Vicard sold several thousand of the barrels, mostly in Italy and France.

Prices range from 680 euros for a Burgundy barrel to 870 euros for a Bordeaux chateau style.

#### PROVING ITS METTLE

Vista, Calif.-based Modern Cooperage wants to do away with some oak barrels, offering a metal barrel with an inner stave assembly



The Modern Cooperage barrel is made from steel and features an interior stave system.

that makers say saves money and gets results at least as good as a wood barrel with inner staves.

To prolong the life of neutral wood barrels, a winery may pay \$50-\$70 to have the head removed, plus the cost of the staves. Even those staves will lose their ability to impart character to the wine and the process will have to be done again.

"A wood barrel loses the ability to impart flavor rapidly and the longer you have it, it becomes a money pit," said Patrick Pickett, a winemaking consultant with Modern Cooperage. "You keep putting money in and getting less out."

In early 2013, Modern Cooperage released a steel barrel with an inner stave system accessible through the top of the barrel that requires no special skill to maintain or use. Modern's goal was to have a steel barrel that works seamlessly with existing cellar equipment. The barrel's profile is similar

to an American or Bordeaux import barrel. It will sit easily on a Western Square or similar rack. The bung-hole is in the conventional place. It accepts standard staves available from a number of manufacturers. The barrel has a capacity of 79.5 gallons before accepting as many as 25 staves that clip onto the assembly. Every 10 staves displace about a gallon and Pickett said between 10 and 14 staves offers the extraction one would get with a new barrel. With the range of staves available, winemakers' options are infinite.

With a life of 30-40 years, the Modern Cooperage barrel cost amortized over time, including French oak staves, works out to about \$100 annually.

"This allows you to get an equal contribution of oak at a lower price," Pickett said.

While the barrels can be used for reds and even as fermentation vessels, the initial interest has been from chardonnay makers, Pickett said. The stave assembly has a paddle that serves as an integrated lees stirrer. With a crank handle with two rotations, cellar workers can stir the lees without opening or moving the barrel, reducing the risk of oxygenation and the need for sulfite additions. Like changing staves, stirring doesn't require any special skill. Also, the barrels don't lose wine to evaporation, so they won't need topping off.

Modern Cooperage is also marketing the sustainability of steel barrels – saving trees – to combat a persistent industry stigma around steel barrels and staves. (An oak tree takes more than a century to reach maturity to yield two to four barrels.) While several wineries are using the steel barrel with good results, Pickett is hesitant to share their identities because they are worried about image, and fear a steel barrel and staves may be viewed as inauthentic or taking a short cut.

"When you are using staves, you confront a perception issue because it is nontraditional. I compare it to the feelings people had about Stelvin closures 10 years ago," Pickett said. "Winemakers fall along similar lines as the general public: Some want to attach to tradition and others are interested in new technology that promises better quality."

An oxygen delivery system is the works that will allow micro-oxygenation in Modern Cooperage barrels.

#### INSIDE FERMENTATION

Once wine is in a barrel or tank, the winemaker doesn't have much chance to see inside the fermentation. Checking through a bung-hole or tank top can offer some information about what is going on, but a surface glimpse isn't the same as a top-to-bottom view.

The idea for a transparent-stave vessel sprang from Seguin Moreau's participation in a design competition for the new cellar at Château Mouton Rothschild. One of the specifications called for oak tanks that gave winemakers the ability to see inside the fermentation process. Six years of research and prototypes yielded the Seguin Moreau Transparent Stave

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Tank which looks conventional at first. One could miss the two see-through staves running top to bottom, made of food-quality Plexiglas. In 2011, Seguin Moreau delivered 44 vats fitted with transparent staves and retrofitted some others at Mouton.

The new cellar and tanks were unveiled in June 2013, after which, according to an agreement with the winery, Moreau may offer the transparent-stave option more broadly. Christopher Hansen, general manager of the cooperage's Napa, Calif., division, said the stave option is now offered on upright tanks between 20 and 220 hectoliters, for 1,000 euros. A version was set to be unveiled in the United States at the 2014 Unified Wine & Grape Symposium in Sacramento, Calif.

"Coopers have been putting Plexiglas heads into barrels for many years," Hansen said. "We and Mouton wanted to do this for upright tanks."



Seguin Moreau created tanks with transparent staves for Château Mouton Rothschild. The see-through staves allow winemakers to view fermentations in action.

Tanks need to have a minimum of two transparent staves to allow enough light into the closed vessel to be able to see into the wine, especially a red wine. The clear

staves allow a top-to-bottom view of the fermentation to enable winemakers to see the range of activity at a glance – from filling of the tank and the vigor of fermentation to the

formation of the cap and the efficacy of punchdown and pumpover.

#### BEYOND CURIOSITY

Jason Moulton, an associate winemaker at Brassfield Estate in Lake County, Calif., said he isn't sure being able to see into a fer-

mentation would do much more than satisfy winemaker curiosity.

Seeing the turbidity of the must would help him better determine what valve would yield clear juice for pumpover, he said, but most of what he needs to know he can find out from testing.

"Transparent staves are interest-

ing and fascinating from an aesthetic and educational perspective," Moulton said. "Having the ability to see into a tank isn't something I'd consider critical to a winemaker or to wine quality."

Hansen said hospitality played into Mouton's plan with its cellar renovation and agreed that the stave option is not for everybody.

#### LESS-OAKY OAK

Cooperage 1912 of Napa Valley recognized the increase in cool-climate wine production and the conundrum faced by its makers: They want the influence of barrels but hesitate to put juice with beautiful varietal character and zingy acidity into vessels that could flatten the fruit and shave down the acids.

"Cool-climate wines tend to be very fruit-focused, with higher acidity and delicate overall tasting notes," said Cooperage 1912 sales director Jason Stout.

In response, the company added a Cool Climate series to its T.W. Boswell line of barrels, for winemakers who want all the benefits of oak barrels – micro-oxygenation, polymerization of tannins, wine-making tradition – but with less obvious wood character.

The barrels, set to debut at the 2014 Unified Wine & Grape Symposium, are made with extra-fine-grain French oak which Boswell grades by scanning growth rings. The wood is dried for 36 months before being coopered into what the company calls "low-impact" barrels. The Cool Climate line includes three different options, each designed for a different set of varieties.

**David Falchek** is a regular contributor to trade publications such as *Vineyard & Winery Management* and *Beverage Media*. He also writes a regular consumer wine column for *The Scranton Times-Tribune*, in Scranton, Pa.

Comments? Please e-mail us at [feedback@vwmmedia.com](mailto:feedback@vwmmedia.com).

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