Fire crackles between the seasoned oak staves, fastened with steel hoops. As the sparks settle, the aromas float through the air -- clove, cedar and vanilla. All the nonfruit characteristics you've ever identified in wine are coming to life here, in the warehouse of Seguin Moreau, a cooperage, or barrel making facility, in Napa.

They're actually born long before that, as centuries-old timber in some of Europe and America's most precious forests. Through a laborious process that includes watering and firing, coopers turn the wooden slats into oak barrels, the spice racks of winemaking.
Grapes alone don't make great wine. Juice needs a spine, and cooperages work with winemakers to customize fermentation barrels that achieve a desired wine style, whether it's a soft pinot noir or a big chardonnay. With the exception of mechanized sanding and a few quality control operations, the art of wine barrel making hasn't changed much in 2,000 years.

The monetary value has. Barrels are expensive, and they don't last long. They're relegated to the garden after about five years of use. At the few French cooperages with Napa Valley facilities, such as Seguin Moreau and Calistoga's Nadalie USA, American oak barrels with lumber originating from forests in Missouri and Pennsylvania run about $400; Eastern European barrels cost close to $700, and the highly coveted French oak barrels from the forests of Vosges and Troncais fetch nearly $1,000.

"It's not that the French oak barrels are better," says Francois Peltereau-Villeneuve of Seguin Moreau, standing in the middle of the warehouse where workers are making barrels. He has to yell over the sound of bung holes being drilled. "They just have different characteristics."

Those characteristics start in the forest, much like grapes in a vineyard. Once the optimal oak trees are identified, quartered, and cut into staves, they are left outside to mature with the seasons for a minimum of two years. Sun, rain, and wind contribute to chemical compounds already present in the oak and help to shape the tannins, aromas, and flavor profiles we associate with barrels.

French oak tends to yield subtle spice notes, while American oak is responsible for those sweeter characteristics, such as vanilla. Hungarian oak is similar to French, but doesn't carry quite the same cachet.

"In a way, it's like cooking," says Mark Clarin, winemaker for McGrail Vineyards & Winery in Livermore. He's also made wine at Wente Vineyards and Bonny Doon Vineyard in the Santa Cruz Mountains. For his rich chardonnays, Clarin orders barrels with a medium toast from Canton, an American cooperage. "I get that butterscotch from their oak."

For his cabernet sauvignons, Clarin uses barrels from a variety of forest sources, both French and American. Some wineries even request hybrid barrels. Clarin prefers barrels with staves that have been aged for 36 months and that have a tight grain, which allows for a more gradual integration of oak flavors.

"The longer the staves are aged, the smoother and less harsh the results are," adds Clarin, who buys about 60 barrels a year for the winery's 2,500 case production.

Once the staves arrive at a cooperage, the craftsmanship begins. To assemble a barrel, a cooper fits together about 30 staves and holds them in place with steel hoops. The staves are different sizes, so this step alone can take a novice half an hour to figure out, Peltereau-Villeneuve says.

The barrel is then placed over a fire and the combination of steady, 185-degree heat and water slowly softens the wood so the staves come together with the help of a cable. At Seguin Moreau, Rosendo Leon is in charge of the next and most crucial step -- toasting. He monitors the fires on 10 barrels at once, keeping in mind each winery's requests for level of toast, from light to heavy.
"There's no cheat sheet on the amount of time it takes to achieve, say, a medium plus toast," Peltereau-Villeneuve explains as the multiple fires roar. "He has a feel for it and everything that contributes to it -- the temperature and humidity in the warehouse, the level of fire, how the wood changes color." Lee Miller of Nadalie concurs on the artistry of the toaster.

"Everybody can go to culinary school, but not everybody should be a head chef," she says. "This is a living, natural product. You have to be so in tune as to reproduce the same effect day after day and year after year."

Oak trees used for barrels are up to 200 years old.

- One tree yields about three barrels.
- After they are quartered and cut, staves spend a minimum of 24 months outside so they can season and mature.
- Standard Bordeaux barrels hold about 60 gallons, while Burgundy barrels hold slightly more.
- American oak barrels cost about $400; Eastern European run about $700, and French fetch about $1,000.

— Lee Miller, Nadalie USA

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