

# Show Stopper: How Plastic Popped the Cork Monopoly

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By TIMOTHY AEPPEL

ZEBULON, N.C.—In a nondescript factory in this small, wooded town, 10 giant machines worked around the clock last year to churn out 1.4 billion plastic corks, enough to circle the earth 1.33 times if laid end-to-end.

Unknown to most American wine drinkers, the plant's owner, Nomacorc LLC, has quietly revolutionized the 400-year-old wine-cork industry. Since the 1600s, wine has been bottled almost exclusively with natural cork, a porous material that literally grows on trees in Portugal, Spain and other Mediterranean lands.

## Plastic Cork Maker Rises to the Top



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Amanda Lucier for the Wall Street Journal

The story of the Nomacorc factory in rural Zebulon, N.C., epitomizes how U.S. manufacturing is using a mix of brains and automation to counter forces squeezing it from all sides.

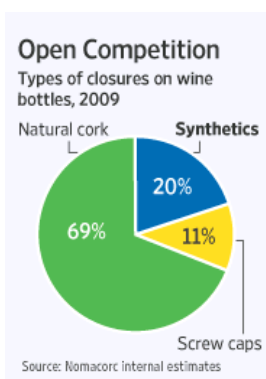
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media campaign to tout the superiority of natural cork over synthetics.

"It's easy for cork to be taken for granted—but its importance goes well beyond its tiny little size," says Carlos de Jesus, head of international marketing for the Amorim Group, the world's largest cork producer in Santa Maria de Lamas, Portugal.

The story of how Nomacorc and other stopper upstarts broke the centuries-old cork monopoly is a lesson in how innovation, timing and hustle combined to exploit an opening in a once airtight market. It shows that any dominant industry can be vulnerable to competition, especially if it grows complacent about its position.

Cork was first adapted to close bottles of sparkling wine by a French Benedictine monk named Dom Perignon in the late 1600s. For the next four centuries, cork was considered the ultimate wine stopper: Its cellular structure makes it easy to compress into the neck of a bottle, where it expands to form a tight seal. Wine also benefits from "breathing," which is facilitated by cork's cell structure. An air-tight seal on a wine bottle can cause another set of problems and is one factor that limited the use of plastics and screw caps in the past.



Cork is harvested from the outer bark of cork oak trees, always by hand by workers using axes designed to slit the bark without harming the deeper layers of the tree. It can take two decades for a tree to grow old enough for the first harvest and subsequent culling is done only once every nine or ten years.

Despite its labor-intensive origins, cork remains cost effective. The most inexpensive corks start at 2 cents and go up to 1.5 euros for the finest varieties used in the best wines.

Although it was long known that cork could sometimes ruin the taste of wine, the problem wasn't well understood until the early 1980s. Then, chemists finally pinpointed the main cause of cork taint: The powerful chemical 2-4-6

Trichloroanisole or TCA. It can get into wine through contaminated cork, tainted barrels or pallets and render bottles undrinkable.

By the 1990s, retailers and wineries were clamoring for a solution to wine taint but the cork industry didn't respond. "No industry with 95% to 97% market share is going to see its

propensity to listen increase—and that's what happened to us," says Mr. de Jesus from Amorim.

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The outcry was just the opening needed by Mr. Noel, a Belgian immigrant who in 1998 began making what he calls "corcs," he says in part to avoid lawsuits from cork producers, in his North Carolina plastics factory.

Mr. Noel, whose company had specialized in extruded plastics such as pool noodles, named the new business Nomacorc LLC. He eventually built a new, highly automated factory that does nothing but churn out the plastic stoppers, 157 million a month.

The business took off as wineries, desperate for closures that wouldn't cause cork taint, lined up to buy his product. Nomacorc now has plants on three continents, which produce 2 billion corks a year.

What Mr. Noel and other plastics innovators realized was that they could use new technology to make a new kind of closure. Plastic corks had been tried in the past—but were largely rejected because they were made of solid plastic, which can be difficult to insert and extract and can leave gaps around the edges that are prone to leaks.

Mr. Noel's innovation was to make corks with two types of extruded plastic: A firm inner core that would hold the shape of the cork and a spongy exterior that would fit better. The new corks had the feel of natural cork and were easier to remove with a cork screw, which addressed a key consumer objection. Not only that, but they could be printed to look like cork or made in fanciful colors. Nomacorc holds 30 patents on its products and the techniques to make them.

"We changed the way winemakers think about making and closing wine," says Mr. Noel.

A host of other upstarts emerged around the same time, including Supreme Corq LLC in Kent, Washington, and Neocork Technologies in Napa, Calif.

One of the earliest innovators was NuKorc Pty. Ltd. in Pooraka, Australia, which began making extruded plastic corks in 1996. NuKorc filed for bankruptcy protection in March, a victim of the economic downturn and the rise of screw caps. Metal screw caps now dominate Australia and New Zealand's wine markets, where they aren't as associated with cheap wine as they are in the U.S. Screw caps start at 4 cents apiece and are thus slightly more expensive than the cheapest plastic and natural corks.

In 2002, the founder of California's Bonny Doon Vineyard, Randall Grahm—a screw-cap advocate—held a "funeral for cork" in New York's Grand Central Station. The ceremony included a casket containing a dummy made of cork.

"Synthetics solved a problem," says Mark Coleman, director of business development for Neocork, founded by investors representing five California wineries and now selling stoppers in 22 countries. Mr. Coleman says the U.S. in particular embraced plastic: He estimates half of the top 30 selling brands in the U.S. now use synthetic corks

Jochen Michalski, president of Cork Supply, a Portugal-based cork producer and distributor, was among the first to break ranks and start selling both natural and plastic corks to wineries around the world in 1997.

"At the beginning, it was a hard decision—because I believed in cork and thought I'd be in cork for all my life," says Mr. Michalski. Fellow cork producers also turned up the heat: "A lot of pressure was put onto me in Portugal by the big boys—they tried to cut us out of the supply chain, by talking to suppliers," he says.

Cork Supply buys raw cork from growers and fashions them into finished corks. Mr. Michalski says the rapid rise of alternative closures was driven by retailers, including large grocery chains in Britain and the U.S., who demanded a fix for wine taint. In the end, Cork Supply didn't lose any suppliers.

Mr. Michalski contends there will always be a market for natural cork in wine. But moving down the price ladder, he says, there's more demand for less-expensive types of closures—including corks made of bits of cork glued together, plastic stoppers and screw caps.

"Even though we're a pure cork company, my motto is you sell what your customer wants and not what you want to sell," he says. "So we made a point to offer synthetic and it's worked very well." Synthetics now account for about 20% of Cork Supply's sales.

As alternative closures grabbed market share, cork makers began fighting back with marketing campaigns aimed at discrediting plastic and touting the virtues of the natural product. Green groups picked up the theme, including one that enlisted support from Britain's

Prince Charles in a campaign that warned that the decline of natural cork could endanger Europe's vast cork forests. In a speech several years ago, the Prince Charles called plastic corks, "nasty plastic plugs." If the natural cork industry faded, he said, there could be temptation to cut the trees down.

Mr. de Jesus says natural cork makers have changed their ways—and many now rely on new screening technology that sharply cut the amount of cork contaminated with TCA that ends up in wine closures. But the problem wasn't eliminated. One reason: There are some 600 cork producers in the world, and many small operators lack the ability to screen cork for any trace of the chemical.

Natural cork makers believe the tables are turning again against the upstarts. Mr. de Jesus contends that surveys of public opinion show that natural cork has an approval rating of about 92%.

The problem is that consumers don't buy corks, they buy wine. And so cork makers are mounting yet another round in their public-relations battle with this summer's advertising campaign.

The new campaign will target plastic and screw caps. One print ad, for instance, shows a gnarled cork tree with a horse in the background. The caption reads: "Harvested correctly, a cork tree can last up to 300 years. Unfortunately a plastic cork can last even longer." The print ads will be run in wine industry trade magazines and publications for wine enthusiasts, says Mr. de Jesus.

Plastic cork producers counter that their product is 100% recyclable and uses four times less energy to produce than natural corks.

Moreover, the plastic producers believe they have a new ace in the hole. Nomacorc, now majority owned by Boston-based investment group Summit Partners, has been pouring money into developing the science around wine closures with a focus on controlling oxygen entry in bottles.

Natural cork has irregular cellular structures making it difficult to know exactly how much oxygen will enter a bottle—while plastic has the virtue of consistency. "Oxygen management is resonating within the industry and Nomacorc is leading the charge," boasts Lars von Kantzow, the company's Swedish chief executive.

Leading the way through the company's North Carolina factory, Mr. von Kantzow stops in front of a stack of huge bins of plastic corks. The company employs 400 people worldwide, 250 of them in Zebulon. The plant is dominated by huge extrusion machines, which feed corks into machines that print the names and logos of wineries on them.

A key issue in the plant is making sure even a single cork printed for one winery doesn't find its way into a giant container headed to a competitor. "It's like dropping a baby in the nursery," says Mr. von Kantzow. "It just can't happen."

The company employs five PhDs who do nothing but study the impact of oxygen levels in wine—and how that is influenced by different types of corks. This growing trove of intellectual capital isn't restricted to cork technology. The company studies the shape of bottle necks—where subtle differences can mean tiny variations in the amount of air that gets inside. They even study how far corks should be inserted for maximum benefit. The company recently launched a side business selling German-made equipment that vintners can use to measure oxygen levels in wine.

Last August, "Wines & Vines," an industry magazine, devoted an entire issue to "closure issues." It suggested that the oxygen issue could play a key role in wine's future.

"For centuries winemakers have simply filled bottles by gravity and then popped in a cork. And by and large, they have gotten away with it," the magazine noted. It then delved into the latest research, some coordinated by Nomacorc, which is focused on studying what happens to wine once it's bottled. "Enhanced knowledge about the interaction between oxygen and wine is likely to result in more wines reaching consumers in optimal condition, which has to be a good thing," the research article concluded.

Meanwhile, the cork makers are confident they can win back customers. "A pink plastic stopper between a consumer's mouth and his wine does not keep me awake at night," says Amorim's Mr. de Jesus. "But a bad cork, that's what worries me."

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