

New Belgium Brewing Company

Opto 22 Ethernet Technology Helps Fast-Growing Brewery Maintain Quality Standards

Microbreweries became popular in the early 1990s because they offered beer that was distinctively different—beer connoisseurs would say superior—than the products being offered by the larger, more established breweries.

Most microbreweries were started by beer lovers who began making their ales and pilsners at home. Many of these, however, folded quickly because they could not continue producing quality beer as demand for the product increased.

“One of the biggest problems with microbreweries is consistency,” says Igor Valuyev, chief electrical and control engineer with the New Belgium Brewing Company. “One day you can get a great batch of beer and the next day you’ll have a batch you can’t even drink.”

New Belgium Brewing Company, based in Fort Collins, Colorado, started out as a microbrewery. The company’s founder, Jeff Lebesch, brewed the company’s first beer—Fat-Tire Amber Ale—in the basement of his home in 1991. The name of the beer and the company both refer to a bike trip that Lebesch took through Belgium on a fat-tire bicycle. It was there that Lebesch obtained the special strain of yeast that is a prime ingredient in all of his company’s products.

By conquering the problem of consistency in the brewing process, New Belgium Brewery has grown from a home-based microbrewery to what is now considered craftsman brewery. Today, New Belgium produces more than a dozen different beers, including

its flagship Fat-Tire, along with raspberry and cherry ales and wheat beer. In total, the company ships more than 200,000 barrels of beer to restaurants, bars, and retail outlets in 12 western states.

Maintaining High Standards

Valuyev credits process control technology supplied by Temecula, California-based Opto 22 for ensuring that every drop of beer meets the company’s exacting quality standards.

Opto 22 develops and manufactures hardware and software for process control, monitoring, and data acquisition applications. The company’s offerings include the widely deployed Opto 22 FactoryFloor® software, which offers a flowchart-based control programming environment for users to develop control and data acquisition applications quickly and easily, and the world-renowned SNAP Ethernet I/O™ system which makes it easy to monitor and control devices on a plant floor, at a remote location, or just about anywhere else.



The features and functionality of these two products are ideal for companies like New Belgium Brewing, which must closely monitor all of its production processes in order to ensure quality. In fact, New Belgium is so concerned about product quality that, despite numerous requests, it refuses to ship beer to private individuals outside of its current distribution area because the U.S. Postal Service and other shippers cannot guarantee that the beer will be kept at the proper temperature.

Opto 22 technology not only automates the New Belgium plant, it takes care of these temperature issues, plus a whole lot more. "We have a very high level of automation for a brewery of our size," Valuyev says. "But what really makes us unique is that we have taken control of our own processes. We write our own programs for controlling our production equipment and the Opto 22 technology is what makes that possible."

Flexible Yet Consistent

"We have great flexibility in where we choose to deploy the Opto 22 hardware. We also have the ability to expand the use of that hardware," says Valuyev. This means that means each Opto 22 controller can accommodate a large number of I/O points from relatively long distances. Also, because Opto 22 understands that many of its customers are emerging companies like New Belgium, it designed its

controllers to be capable of accepting new I/O points after installation—a major selling point for both Lebesch and Valuyev. "Early on, all of us knew that this company would be growing," Valuyev says. "We understood that when that expansion came about, it would require the creation of new processes for new products, as well as a ramp-up in production on existing products."

New Belgium's brewing processes are managed by a series of automated machines that are, in turn, controlled and monitored by SNAP Ethernet I/O controllers. These controllers send messages to each of the various machines telling them which ingredients to mix at what temperatures in order to brew New Belgium's individual beers. The SNAP controllers also continuously poll these machines to ensure that all processes are running properly.

Production workers manage all of these processes through the OptoDisplay component of the FactoryFloor software suites. OptoDisplay provides a graphical user interface (GUI) displaying the very equipment on the New Belgium networks. OptoDisplay also lets Valuyev and others at the brewery plot trends using either real-time or historical data. Furthermore, OptoDisplay allows New Belgium to define alarm events and appropriate responses for processes out of acceptable ranges.



Love At First Sight

Valuyev says Jeff Lebesch, New Belgium's founder, was sold on the FactoryFloor package at first sight. The initial object of his affection was OptoControl, which is the programming tool that engineers use to design control processes. "Jeff is not an engineer," Valuyev related. "So he needed a system that he could jump into immediately and start designing his control processes without having to learn all about programmable logic controllers (PLCs) and ladder logic."

FactoryFloor's OptoControl component allows users to develop control programs and determine the order in which specific operations should occur—all by drawing easy-to-use flowcharts.

Once the system was up and running, Valuyev says New Belgium quickly discovered that Opto 22 had extended its ease-of-use concepts to the OptoDisplay operator interface. "When we explain our process flows to new employees, they usually understand them right away," he says. "In fact, I recently hired someone with no production or programming experience and within a couple of weeks, they not only learned to use the system, they were able to troubleshoot problems."

Noting that the Opto 22 system also sends periodic reports on manufacturing processes to operators' desktops automatically, Valuyev says, "Our operators' job is to constantly evaluate and respond to the fresh information that is flashing in front of them. The

system gives them the ability to adjust processes on the fly whenever necessary. They no longer have to worry about running around the plant trying to make adjustments."

Significant Savings

Valuyev estimates that New Belgium is spending 50 percent less on labor costs than most breweries with comparable levels of automation, primarily because of the flexibility and other benefits it has gained from the use of Opto 22 technology. The next stage for New Belgium, Valuyev says, is to take advantage of Opto 22's wireless capabilities. "That way the operators can be anywhere—at lunch, in the break room, or even outside the building—and still see, in real time, what's happening with our production processes."



About Opto 22

Opto 22 manufactures and develops hardware and software products for applications in industrial automation, remote monitoring, and enterprise data acquisition. Using standard, commercially available Internet, networking, and computer technologies, Opto 22's SNAP systems allow customers to monitor, control, and acquire data from all of the mechanical, electrical, or electronic assets that are key to their business operations. Opto 22's products and services support automation end users, OEMs, and information technology and operations personnel. founded in 1974 and with over 85 million Opto 22-connected devices deployed worldwide, the company has an established reputation for quality and reliability. Opto 22 products are sold through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at 800-321-OPTO or visit our Web site at www.opto22.com.