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August 23, 2021 | \$99 per year, \$4.50 per copy



Moving, shaking up the fluid power industry

Danfoss acquires Eaton Hydraulics for \$3.3 billion

By Andrew Schunk
Rubber News Staff

NORDBORG, Denmark—A \$3.3 billion transaction between two of the largest power management companies in the world is complete, as Danfoss Co. acquired Dublin, Ireland-based Eaton Corp.'s hydraulics unit Aug. 2.

The addition brings about 10,000 former Eaton employees into the Danfoss fold and adds about \$1.8 billion in annual revenue to Danfoss, specifically the Danfoss Power Solutions segment, which doubled in size with the Eaton Hydraulics addition.

"This is a great day for Danfoss as we welcome 10,000 new colleagues into the organization and create a global leader in mobile and industrial hydraulics," said Danfoss President and CEO Kim Fausing.

"By combining the knowledge and experience of the two strong businesses and great teams, our customers will receive an unmatched level of service and expertise from a single partner.

"We will continue our significant investments to stay on the forefront of technology leadership and provide solutions that improve productivity and reduce emissions to meet the requirements of the future."

The transaction, which closed 19 months after it was announced in January 2020, was contingent upon U.S. Department of Justice and European regulatory agency approval and the subsequent divestment of Danfoss

See Danfoss, page 26



Danfoss Co., headquartered in Nordborg, Denmark, added 30 former Eaton Hydraulics sites and 10,000 employees with the Aug. 2 acquisition.



Fausing

Knowledge flows from experience



Sergius Vernet (center), the founder of Vernay Laboratories Inc., receives an award from Antioch College.



Vernay Laboratories employees discuss the manufacturing process.

Vernay celebrates 75 years, still focusing on innovation, future

By Robert Grace
Special to Rubber News

It's not common for a founder's fingerprints to be all over the company he or she started some 75 years after the fact. But Sergius Vernet was not your typical entrepreneur, and the company he launched in 1946 still bears many of his hallmark traits—not the least of which involved his passion for social equity, curiosity and ingenuity.

This is the story of Vernay Laboratories Inc. It all started modestly enough, back in the 1930s. A single, innovative product—a wax-filled thermostat used to control the temperature of internal combustion engines—propelled Vernet, a prolific young inventor, onto much bigger things.

Those initial sprouts of an idea eventually grew into Vernay Laboratories, now an 800-plus-employee, global company whose precision-molded elastomeric products play a vital role in millions of automobiles, medical devices and consumer products. Today, the privately held firm manufactures more than 1 billion components per year, drawing from a library of more than 33,000 elastomeric materials and compound formulations.

Humble beginnings

Sergius Vernet was born in Brooklyn, N.Y., on Jan. 9, 1899, as the second son to emigrants Rachel Nudelman of Russia and Waldemar Vernet of France. He fell ill with diphtheria, a serious bacterial infection, during high school

and spent a full year in bed, his daughter Debi Vernet recounted recently. He spent much of that time inventing things, which became his first love.

In 1919, Sergius had served 41 days as a U.S. Navy apprentice seaman at the end of World War I. That same year he graduated from a two-year engineering program at Pratt Institute. He worked for four years for Franklin Motor Car Co. in Philadelphia, and in 1921 filed for his first patent—for a starting mechanism for an internal combustion engine—at age 22, according to his daughter.

In 1933, Sergius accepted an invitation from Arthur E. Morgan, then president of Antioch College in Yellow Springs, Ohio, to

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Sergius Vernet

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Vernay

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participate in the nation's first cooperative education program, dubbed the Antioch Industrial Research Institute. Under the agreement, Vernet could use the facilities and equipment at the college, near Dayton in the southwestern part of the state, in return for a 50-percent share in whatever patents his efforts produced. He set up shop in a 15- by 20-foot room in the basement of the college's Science Building.

Vernet was described in a Yellow Springs News article as a "tall, dark-haired, gregarious man" who "cut a striking figure as he walked each morning from his home to his laboratory" at the college.

Already with various patents to his name, he took the opportunity to fine-tune his concept of a wax thermostatic element for use in automotive engine cooling systems. By blending waxes and harnessing their expansive power near the melting point, he enabled the creation of various custom-designed thermostats, offering a major advantage over the common bi-metallic designs used in those days.

In 1934 he founded the Vernay Patents Co., as the "home" for his various inventions. (As regards to the company's name, just to simplify matters, Vernet adapted his own name to the more phonetic spelling of Vernay.)

The Yellow Springs News in 2010 recounted these formative times as part of a series of retrospective articles about the region: "On many occasions," Vernet was quoted in a Springfield News article, "I have been faced with the necessity of using a thermostat which would be accurate, simple and powerful. No such thing existed although there were many thermostats which were satisfactory in cases where power was not necessary. I determined to make a thermostat for which there would unquestionably be a good market. There, in a nutshell, is why inventions are made."

His invention, the Vernatherm, was designed to calibrate tiny changes in temperature. Vernet patented his design in 1938 and took it commercial. Initially used in automobiles, the device later became a key component in many U.S. tanks and airplanes during World War II.

His new company began by blending waxes for two major customers—a large aircraft products company and a plumbing supply company. Vernet had licensed them to build the thermostats for lubrication systems of World War II fighter planes.

The Vernatherm proved so successful during the war that in late 1944 the Army awarded the tiny company's plant the coveted Army-Navy "E" Award for excellence in war production, recounts Paul Graham, a 38-year veteran of the company who retired in 1994 as its vice president of research. The 4,283 U.S. facilities that were so recognized represented only about 5 percent of the nation's war production plants. Graham, speaking recently by phone from his Yellow Springs home, the day before his 92nd birthday, said that Vernay was one of the smallest companies awarded the honor.

The product worked very well, but there was a problem. Those two key customers struggled to find anyone who could meet the requirements to supply the critical rubber components needed for the thermostat. So, never one to miss an opportunity, Vernet bought rubber production equipment and began molding the parts himself.

Vernay Labs is born

In 1946, he incorporated his business in Yellow Springs as Vernay Laboratories Inc.

The YSN article recounted another of Vernet's key traits: "A visionary about human rights as well as science, Vernet counted among his small group of employees women, African-Americans and Japanese-Americans." Additionally, it said, Vernet believed his employees should unionize, so,

when he separated from Antioch College and incorporated the business as Vernay Laboratories in 1946, he invited a union—the CIO United Electrical Radio and Machine Workers Local 768—to be part of the organization.

Graham, an African-American who joined the company as a chemist in 1956, saw this side of Vernet up close and personal. "He was far from the typical entrepreneur, inventor and industrialist. He was very involved in political activities, working in the background." He also noted how Vernet strived to ensure he had a very diverse and integrated work force, at a time when such an approach was far from the norm.

"A person's background didn't matter to him," Graham noted, "as long as he or she was a good engineer." See *Vernay*, page 22

YELLOW SPRINGS NEWS

A WEEKLY INDEPENDENT COMMUNITY NEWSPAPER, YELLOW SPRINGS, OHIO

Yellow Springs: 1928-1943



Photo courtesy of Antiochiana

Sergius Vernet (left) meets with members of Vernay Patents Co.'s Labor Management Committee in October 1944. They are, from left, Sue Fessenden, Herman Jackson and Joan Ellis.

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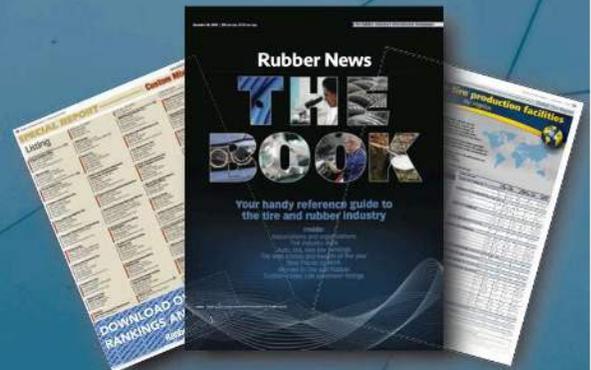
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Vernay

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neer or scientist or worker. He was more concerned about that” than the person’s race, gender, religion or political leanings.

In 1946, Vernet hired Maxine Ophelia Jones, an African-American woman, as the company’s very first employee. Charles Hatcher, an African-American man, was hired as the firm’s personnel manager and later rose to become vice president and treasurer. George Asakawa, a Japanese-American and U.S. Army veteran whose family had been detained in an internment camp in Arizona during the war, was hired in 1946 as Vernay’s first research chemist. He worked at the company for 38 years, later rising to become its president, CEO and eventually chairman.

An Antioch College article notes that Vernet said he once hired Coretta Scott (the future wife of Martin Luther King) when she was in need of a co-op job.

Sergius and his wife had two children. Their son, Serge, worked for Vernay, opening the company’s offices in Japan and participating in the acquisition of Vernay Italia.

YSN quoted Scott Sanders, the Antioch University archivist, as describing Vernet as “very smart, very generous,” and as someone who made Yellow Springs a better place with his intelligence, his philanthropy and his passion for equal rights. These core tenets of diversity, equality and innovative ingenuity remain core principles of Vernay Laboratories today.

Ken Tregillus was another early employee. He majored in chemistry and worked as a co-op



Since its inception, Vernay Laboratories has been focused on the quality of its products and welfare of its work force.

student for Vernet in 1936, helping to develop the thermostat patents in the basement of the Antioch College Science Building. Vernet hired Tregillus in 1947 to work for his company. His efforts helped to develop new compounds for needle-tip valves, carburetors, flow controls and the first Bendix automatic washing machine. Tregillus went on to become chief chemist and VP of the company and served as a member of the board before retiring in 1981. He continued to serve as a consultant and board member until 1990.

As part of his ongoing mission to better society in general and the village of Yellow Springs in particular, Vernet and his wife, Suzanne Miller, in 1953 founded the Vernay Foundation as a philanthropic arm of Vernay Laboratories.

Ruth Aschbacher joined Vernay in 1953 as Sergius’ secretary, served as the first woman on the

board, and as president of the Vernay Foundation before retiring in 1984.

The foundation made donations to Vernay scholarships and helped to fund multiple area-wide projects, including the Glen Helen Nature Preserve, Antioch College, a village swimming pool, a local John F. Kennedy Library, Vernay Foundation Building for Community Nursery School, the Tecumseh Land Trust, and trades shop equipment for Yellow Springs High School.

In 1953, Sergius became a trustee of Antioch College. And in 1956, Yellow Springs presented Vernet with a “Key to the Village” at its centennial celebration.

An arc of growth and innovation

As Vernay grew during the 1950s, it continued to explore the use of synthetic rubber in flow control components. By 1955, rubber parts and molded parts

sales had increased from 5 percent of the business to 95 percent. Vernay developed and patented the designs for both the elastomeric duckbill check valve and the umbrella valve—both of which quickly became the industry standards. And then, in 1962, it developed a combination umbrella/duckbill valve.

Throughout its history, Vernay has earned 81 patents on product geometries and processes. Some additional geometries include the combination valve, bi-directional valve, its medical SupraValve, and much more. The company broadened its product capabilities by continuing to develop technologies to bond metal, plastic and rubber.

Bob Ferguson, Vernay’s vice president of global research and development, and a 16-year company veteran, notes that “innovations are developed daily” at the firm. “Unique component assemblies that are either molded together or brought together through automation keeps our engineering teams busy. Whatever the shape, material design or combination of materials, we are ready to tackle the challenge,” he said.

In June 1964 Antioch College awarded Sergius Vernet with an honorary doctor of engineering degree, making him just the 31st person in the college’s 112-year history at that time to be so honored. In announcing the award, Antioch President James P. Dixon III noted that Vernet pioneered fair employment practices, using his own plant and research laboratories as models. And Dixon further characterized him as “a uniquely inventive man, both scientifically and socially.”

Sergius suffered a heart attack in the plant and died in Springfield, Ohio, on Sept. 5, 1968, at the age of 69. At the time of his

death, he held more than 100 patents for his inventions. And he had laid a solid foundation for the continued success of Vernay Laboratories.

Expanding its footprint

After their founder’s death, Vernay Labs continued to branch out, opening manufacturing and engineering facilities as well as sales offices in key regions to serve customers locally and provide them the benefit of a global network of resources. The company established Vernay Oldenzaal in the Netherlands in 1970, as its first foothold in Europe. It supplemented that presence in 1984 by starting Vernay Italia S.R.L. in Asti, Italy, a plant that is currently undergoing a major expansion.

The firm took its first step into the Asia-Pacific region in 1990 when it established Vernay Japan in Nagoya as an engineering services and sales operation. In 2004, Vernay expanded further into Asia-Pacific by opening a technical center in Singapore.

In 1979 in the U.S., Vernay also opened its largest manufacturing plant, in Griffin, Ga., just south of the firm’s Atlanta headquarters. The facility is in the process of adding significant clean-room space. About 70 miles to the east, it opened a plant in 2000 in Milledgeville, Ga., which now focuses primarily on materials formulation and compounding.

A keen focus on quality

Borrowing a page from the playbook of its ever-curious founder, Vernay Labs in the 1980s turned its attention on how to improve its manufacturing processes. Thus began a new chapter in the company’s storied history.

In 1950, after World War II, W. Edwards Deming was recruited by the Japanese to come teach them how to use his statistical techniques to improve the quality of their manufacturing. Japanese automotive leaders largely credit Deming for helping them to become world leaders in their industry.

Born in 1900 in Iowa and initially educated as an electrical engineer, Deming later specialized in mathematical physics.

Regarding his work with the Japanese, Deming famously stated: “I did not export to Japan American methods; I taught them something new. There’s not a thing in this world to stop the Western world from learning the same principles. They elect not to.”

Or, it should be stated, “Most elect not to.” An exception to the rule was Vernay Laboratories. Having become aware of Deming’s work and his manifesto titled “Deming’s 14 Points for the Transformation of Management,” Vernay’s leaders in 1983 invited the consultant to come to Yellow Springs to help them. Deming accepted, and so began a productive, eye-opening journey.

Vernay was the smallest company that Deming had ever worked with, recounts Steve Russo, then the firm’s operations director who worked directly on the project. “Deming would come (to the plant) about every six months, and stay for three days, usually. He would meet with top management and with employees.

Part of Deming’s core message was to urge management to empower the shop floor workers and

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In 1990, ABC television aired a short documentary titled "If Japan can... Why can't we?" about the increasing industrial competition the U.S. was facing from Japan. The broadcast, narrated by ABC News anchor Peter Jennings, included footage from inside Vernay's plant in Yellow Springs. He noted that by adopting Deming's principles, the company, between 1983 and 1990, was able to slash its number of quality control inspectors dramatically, while reducing the number of defective rubber moldings by a staggering 75 percent. Overall, Jennings reported, productivity at Vernay "rose by an amazing 30 percent."

In the late 1980s, Vernay even hosted a Deming workshop for its customers and suppliers, which, Russo said, "Deming thought was great."

In a country full of manufacturing giants, Vernay was at the forefront of quality management and lean manufacturing principles by the early 1990s.

"It was truly a laboratory," Russo recalled of his time at Vernay, "not just for products, but also as a social system."

Russo, who worked two stints at the company starting in 1984, states that "Vernay is a special company, and it has a special place in my heart."

Managing through adversity

Like all companies, Vernay has had its share of ups and downs. One of its toughest stretches occurred in the early 2000s when the company realized that some of the chemical disposal practices at its 10-acre production site in Yellow Springs were in violation of Environmental Protection Agency regulations. The company had been manufacturing rubber components on the site since 1951, and had polluted the ground water with used mold-release and mold-cleaning chemicals.

It was not known at the time that such materials were potentially harmful, and Vernay's Dayton Street plant was one of thousands of such sites across the country that faced the same problem, according to Ed Urquhart, who became the company's CEO in 2009.

Unlike many others, Vernay self-reported its violations and began vigorous clean-up operations under the oversight of the EPA. The long-term project continues today, and is likely to last for at least a couple more decades, Urquhart said.

Vernay ceased manufacturing at the site in 2005 and demolished the plant in 2009 to accelerate the remediation effort. It then moved its headquarters to the Atlanta area, while maintaining a research and development lab in Yellow Springs.

In 2010, Vernay purchased several acres of property adjacent to the affected plant, to enable it to install two additional extraction wells. The firm also worked with neighboring residents to close their wells and connect them to the municipal water system.

"There is no question that there had been contamination (of the ground water)," said Paul Graham, who retired in 1994 and remains a lifelong resident of Yellow Springs. But he and others sug-

gest, Vernay was not doing anything that many other companies were doing at the time, in terms of chemical disposal practices. There simply was little known decades ago about the damage that could be done.

The company stepped up, assumed responsibility, cooperated fully with the government, and has shouldered the heavy financial burden associated with the cleanup, he noted.

A downturn in the economy, combined with the expense of the cleanup, led to the Vernay Foundation being dissolved on Dec. 31, 2008.

"Vernay is doing the right thing when it comes to that," Russo said, drawing a line directly back to the ethics and principles of Sergius Vernet. "Doing the right
See Vernay, page 24



Vernay Laboratories has expanded its materials and abilities over the years. Above are some of those materials.

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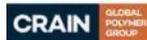
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Vernay

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thing is the fundamental tenet of the company, with its employees, its suppliers and its customers.”

A company in transition

Going back a dozen years or so, Vernay had many strengths as a company, but it also recognized its shortcomings. It had a global presence but lacked a unifying approach to managing those diverse businesses. So it took steps to address those issues.

In the fall of 2009, Vernay recruited Ed Urquhart as its first outside CEO. The German-born Urquhart had moved all around the world during his youth, living in places as diverse as Japan,

Libya, Morocco and Spain. In 1990 he earned a bachelor's degree in mechanical engineering, and then a master's degree in applied mechanics, before gaining an MBA in strategy and finance from Boston University in 2003.

He worked in companies that made printing presses and engine components, and oversaw businesses in Europe, before being recruited by Vernay. Though the country was in a recession at the time, and Vernay's balance sheet was fragile then, “that didn't bother me,” he said. “The core of the company was strong. The people had their hearts in their jobs, and that was very important to me.”

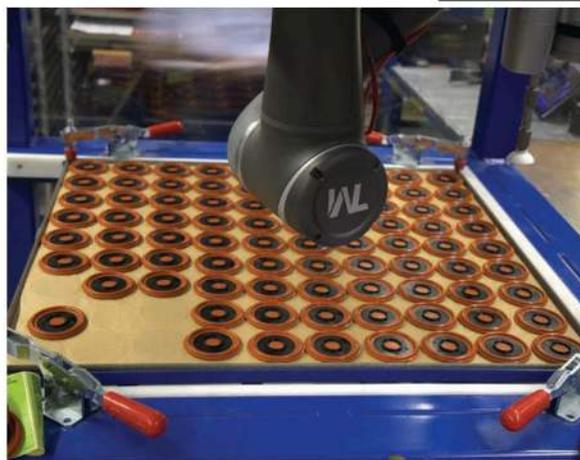
One of Urquhart's first actions was to move Vernay's headquarters to Atlanta, while maintaining its innovative roots in an R&D lab in Yellow Springs. Then

in 2011, the company opened a plant in Suzhou, China—its fifth manufacturing facility.

He also set about bringing in talent with broad, global experience. In June 2010 he recruited Andy Woodward to be the firm's global vice president of sales and marketing. “I was hired,” Woodward said recently, “because I had global experience. I had been managing director of a European company much larger than Vernay. So they wanted an ‘outside of America’ perspective to allow for that global initiative to work.”

“When Ed started 11 years ago,” Woodward said, “he was tasked with not only being the CEO, but with bringing the company's three regions of the world together and create global synergies between them all.”

In April 2012 Ken Madden came



In its 75 years, Vernay has earned 81 patents on products and processes.

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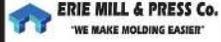
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to Vernay from Freudenberg-NOK, a much bigger firm, where he spent 15 years and was global head of technology. For his new firm he took on the role of vice president of global engineering.

The Canadian native said that when he joined Vernay, "We were a global company without a global launch process. Each of our plants had different equipment. We spent two years coming up with a launch process," which he dubbed SPP, for Small Platform Process.

"Now, no matter where you go (in Vernay), it's the exact same—one global launch process." The various sites all have the same presses, end-of-arm tooling, tool designs, mold frames, etc. With some 30 new-product development engineers globally, the company now can plug and play between plants around the world.

In 2017, the company hired another experienced executive, Christian Deschenes, to be its VP of global operations. Deschenes came to Vernay from rubber company Kraiburg TPE, where he had worked for more than 11 years, and had been director of operations.

The firm now has serious bench strength in its managerial team. Additionally, it has a huge well of experience among its work force. Stephanie Lute, Vernay's global director of human resources policy, has been with the company for 37 years, and still is not its longest-serving employee. That honor currently goes to Walt Etheridge, an operator in Griffin, who has been with the company for 40 years. Mitch Hardy, a tool maker in Milledgeville has 39 years of service. Carla Williamson, a production associate who works in quality in Griffin is a 38-year Vernay veteran. And Vanna Villata, managing director of Vernay Italia, has been with the firm for 35 years.

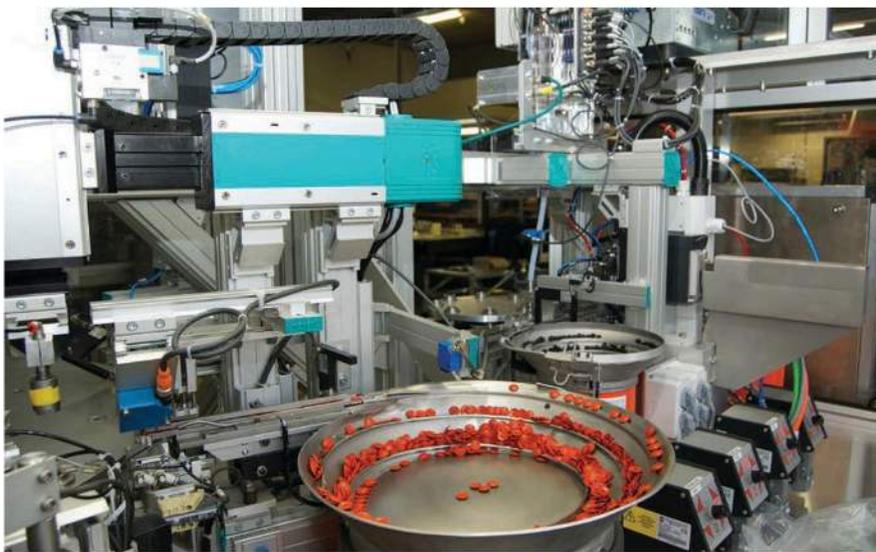
An ever-changing landscape

Still, like other businesses, Vernay Laboratories has to evolve constantly to keep pace with ever-changing customer demands and market dynamics.

"Both plastics and rubber molding are slow-moving industries in terms of technological change," Urquhart said, "but they are also often underestimated in terms of the amount of technology they involve. The landscape is competitive, and in order to survive you have to be good at what you do." In recent years, the industry has seen the adoption of a lot more automation, and companies taking a much more scientific approach to molding.

"When it comes to digitally interconnected Industry 4.0 protocols and the Industrial Internet of Things," declares the CEO, "I would say that we are way ahead of the curve. We have a very good connection to all of our equipment. We see every cycle on every machine, and it gets recorded. We call it our 'heartbeat system.' That's an area where I feel we excel. We have a very robust system that gives management excellent real-time access to all types of operational information and key performance indicators, or KPIs.

Vernay is working to update its technology and equipment, step by step, he said. The company has been making some of the same



Vernay serves a number of end markets with its product portfolio. Among them are the automotive, medical, printing, small engine and consumer markets.

legacy parts for 40 years or more, and some of those are manufactured on older equipment, using older techniques. But those machines run side-by-side with the most modern equipment using the very latest technology. The firm averages having 50 to 60 rubber molding presses in each of its manufacturing locations.

The aim is to transition the older machines to more modern molding technology while maintaining the necessary output levels and consistency.

That's a very capital intensive process, Urquhart said, and can't happen overnight—but it's been going on for the past 10 years, and will continue over the next 10 years.

Distinguishing factors

So what allows Vernay today to stand apart from its competitors?

"First," explains Urquhart, "we are experts in material science. There's probably nobody on the planet who has better material expertise than we do. We develop our own custom recipes to meet the need at hand.

"The second area of expertise in Vernay is that we are very good at co-development with our customers. We get involved in the concept generation, and in developing the way in which fluids and gases flow within their application. We provide them with expert advice, and with design and development support.

"We're not a company that a customer comes to with a finished print, and says, 'Hey, can you make this for us?' Conservatively speaking, probably 95 percent of what we do within Vernay started out as an engineering development project. We employ a lot of good engineers, scientists and chemists in the company. I think that is born out of the original character of Vernay that Sergius started."

"The first word in my mind that describes Vernay is 'tenacious,'" added Woodward. "We love to work on projects, and to dive into every detail of that project, and we love to be completely immersed till we find the perfect solution.

"Now," he notes, "we're driven by a global vision. Our global footprint is a key advantage we have over our competitors."



Vernay operates in the U.S., Italy, Netherlands, Japan, Singapore and China.

Vernay looks ahead

Bob Ferguson joined Vernay in Griffin, Ga., in 2006 as a new-product development engineer for medical applications. For more than a decade now he has served as the firm's vice president of global research and development. Ferguson sees many promising business opportunities ahead.

"I see medical as a continual growth opportunity. That's an area we're really focused on right now." He also points to ongoing developments related to clean energy and mobility, to include such things as electric vehicles and fuel cells. Many older technologies are evolving to become more efficient, more modular and smaller in size, making them more applicable to personal and residential use. And some complex technologies are transitioning into consumer markets such as coffee makers, appliances and the like.

Under Ferguson's leadership, Vernay's 17-person research department, is focusing on:

- Material development capabilities, and expanding into new processing technologies;
- New concept development, which Vernay calls "C2L," for Concept to Launch; and
- Functional performance testing, which involves developing the "fingerprint" or performance characteristics of products when they are exposed to different pressures and flow rates.

Calling Vernay "a research organization, as well," he said, "Our future will involve expansion and development of those three areas." Additionally, notes Woodward, the firm is focused on continuing to advance its operational excellence, to include more automation. "We expect to add

more technicians than production workers to the payroll in the future," he said.

Pursuing medical device projects requires a level of patience that many companies simply don't have. Notes Woodward: "The average project length, from start to production, is very long for medical—typically about five years, while automotive projects typically take more like two to two-and-a-half years. We had one medical project that took more than eight years until it really took off commercially, but that is now one of our best customers."

It takes patience and persistence.

To this end, Vernay is investing to bolster its clean room manufacturing space in both Griffin, Ga., and in Asti, Italy, according to Tara Bryce, the company's global medical business unit manager. Following its streamlined, integrated methodology from concept to launch, Vernay takes responsibility for designing medical components for each customer's application. More than 85 percent of all components produced by Vernay, Bryce said, are custom parts designed specifically for each customer's need.

Deemed an "essential supplier" by the U.S. and Italian governments during the recent COVID-19 pandemic, Vernay provides critical components not only for ventilators and respirators, but for a vast array of devices, including those used in cancer tissue diagnosis, bio-reactors, minimally invasive surgeries, microfluidics, pediatric respiratory inhalers, anesthesia delivery, one-way valves and septums for bag systems, dialysis, negative wound pressure therapies and more.

"We're putting our money where our mouth is" when it comes to the health care sector, Woodward said. "Medical is where we're going. I hope to be able to add clean room capabilities in our Suzhou facility in a couple of years."

The development process for medical devices is essentially backward, contends Woodward. "Material and flow are our two areas of expertise. If you wait till the end of your development process to tackle these issues, you've made a mistake." Often, he said, a medical device OEM comes to Vernay with a problem. "They've been in bed with a plastic supplier, and it's not working, and they don't know what to do. We're really good at understanding the dynamics of flow. We fix problems through analysis and experience."

Engineering out the waste

For Madden, the firm's engineering vice president, the mission ahead is clear. "It's all about launching new products, and better processes," he said. The constant aim is to launch products with less engineered waste and with less labor, all while also boosting the overall quality.

"Less engineered waste means we save money because we use less material, but it also means we're throwing less in the garbage or the landfill," Madden says. "For me, engineered waste is really important. When I joined the company several years ago, the engineered waste of their parts was about 60 percent. That means for every part, we threw that out because we planned that into it. Right now we're averaging about 20-25 percent in all our new parts. It's hard to get better than 20 percent, which is pretty much world-class."

He also stressed "the performance of our parts relies on the characteristics of the rubber." Advances also are continuing in materials development, which allows device designers and parts makers to push the boundaries of performance. Take temperature, for example, he said: 20 years ago you could go to -20°C, and have the part function; now you can go to -40° or -45°C, and have the part still function.

The soul of Vernay

For all the advances in technology and the world, the core of Vernay remains largely unchanged after 75 years.

"Moral character and moral behavior is way more important here than it is at other companies I've been involved with," said Woodward. "It's focused on much more than just profit. It's more, 'Do the right thing first, protect the people, do the things that are morally sound rather than making money.' The moral character comes from the family.

"Vernay is a wonderful company," added Urquhart. "The shareholders can be proud to be part of it. Vernay started as a company that was built on innovation. Due to the success of its innovations, it ended up having to learn how to become an operating company, and manufacture things, which is completely different than just an innovative lab.

"We've grown into a very large operating company. But our core competencies were born out of what Sergius Vernet put in place."