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Amgen congratulates the winners of the 2018 Manufacturing Excellence Awards. We are proud to join you. It is hard work, innovation and dedication to manufacturing that brings us all together. We applaud your pursuit of excellence – as your contributions and commitment make the state of Rhode Island and our communities stronger.



Cox Business is proud to continue our sponsorship of the Providence Business News' Manufacturing Awards. Cox Business, a division of Cox Communications, is a family and American owned company providing competitive voice, video and data services in the Rhode Island and we're excited to celebrate all of the honorees this year.



Bryant University is pleased to continue its sponsorship of The Providence Business News' Manufacturing Awards and proudly congratulates the winners of this year's 2018 awards. For 155 years, Bryant has delivered an unmatched education that inspires students to discover their passion and become innovative leaders with character around the world.



Gallo|Thomas is proud to sponsor the 2018 Manufacturing Awards. We congratulate the outstanding group of 2018 honorees and salute your unique attributes and business acumen. Gallo|Thomas is passionate about serving our clients, our employees, and our local community – and delighted to share this special evening with the companies and individuals honored this year.



National Grid extends our congratulations to Amgen on their award for Overall Excellence in Manufacturing. Amgen's commitment to making energy efficiency improvements in their facility is just another reason they are deserving of this award. Congratulations to all the recipients of the 2018 PBN Manufacturing Awards.

LETTER FROM THE EDITOR

Connection is the key to success

BIG IDEAS GATHER THE HEADLINES and oftentimes the investment. But this year's crop of Manufacturing Award winners succeed because their efforts start on a far more granular level, on the shop floor or in the focused relationships with employees.



The winner for Leadership & Strategy, Amgen Rhode Island's Tia Bush, embodies the qualities that contribute to her, and her company, standing out.

An Amgen lifer, Bush started her career at the company jumping into its biologic tanks and scrubbing down the walls after a batch of medicine had been created.

But the hallmark of her leadership style, she says, is engaging her staff. "It's important to work with the team collectively," Bush said, and the results she gets at the West Greenwich facility validate her approach. In fact, in the same year that she is taking home the award for leadership, Bush's team earned top honors for overall excellence at companies with more than 500 employees. The two honors are not unrelated.

Bush and Amgen are not alone in their reliance on using exemplary communication with employees to build successful businesses. Toray Plastics (America) Inc., for instance, the winner in Workforce Development and Training, starts its educational efforts the moment someone joins the company, with an eye to help each employee develop a career arc that is challenging and rewarding.

The Town Dock took home honors for lean management, a tool for process improvement that is driven by communication and empowerment. Without the hard work and buy-in from employees, this would not have been possible. Read the entire section to take in more such stories. Maybe they will inspire you and your own staffs.

PBN recognition programs are successful because the business community supports them, from entering the programs to sponsorships. This year's Manufacturing Awards is no exception, including support from presenting sponsor Polaris MEP and partner sponsors Cox Business, National Grid and Gallo | Thomas Insurance.

Mark S. Murphy

Mark S. Murphy
 Editor

HANDS-ON LEADER: Tia Bush, Amgen's vice president of Rhode Island and Woburn, Mass., site operations, likes to get firsthand experience with the jobs her colleagues perform. PBN PHOTO/RUPERT WHITELEY

Bush enlists colleagues in company's future

BY SUSAN SHALHOUB | Contributing Writer

MENTION A LEADER BEING HUMBLE AND RELATABLE, and you're talking about Tia Bush, **Amgen Inc.**'s vice president of site operations in West Greenwich and Woburn, Mass.

"She's a great listener," and completely approachable, said Tara Griggs Urban, senior manager of corporate affairs at the biotechnology company, which focuses on unmet medical needs, creating medications for those with serious illnesses.

Bush, quick to give credit to the team at Amgen, is in a unique position. The global manufacturing company is the only place she's ever worked, starting at the ground floor just out of college and working her way up.

"Tara loves this story," said Bush. "My first job was climbing into stainless-steel tanks to swab the sides, to make sure they were clean ... I have to be willing to do the jobs I ask others to do."

Originally from Ohio, Bush's ability to be adaptable to a changing environment started early. Part of a military family, they moved often, she said, which she enjoyed. She was the first in her family to graduate college, earning a biological science degree from the University of Southern California in 1992 and heading to work at the Amgen headquarters in Thousand Oaks, Calif., at a great time in the industry.

"It really was the initial growth of biotech," she said.

Amgen, which has six main areas of therapeutics: cardiovascular disease, oncology, bone health, neuroscience, nephrology and inflammation, was a great place for women then, and still is. Bush was by no means the only female in her work environment due to Amgen's commitment to diversity, which includes a women's advisory council.

"Not once have I felt like I haven't been challenged or valued," she said. She's stayed with the company for decades – enriching her professional development and evolving right along with the company.

'Tia remembers her roots and where she came from ... people know that she knows what they are going through personally and professionally.'

TARA GRIGGS URBAN, Amgen senior manager of corporate affairs

In her career, Bush has served in a diverse array of roles at multiple Amgen manufacturing locations. She led the Quality team during the construction of a new facility in Longmont, Colo. She learned the drug-product side of the business while working at the company's Juncos, Puerto Rico, site for six years. Her first stint at Amgen Rhode Island, from 2002-2010, was in an executive director role, where she

was head of quality, including on the floor, quality control laboratories, compliance and training.

"I learned from leaders, learned to adapt and learned to go outside my comfort zone with mistakes along the way. I learned to take risks and it certainly has paid off," she said.

The most important part of her job? Being visible to team members. She is always looking for what might work best for the team in Rhode Island and how it can contribute more to Amgen's mission of serving patients. Getting their input, she said, is vital.

"I want to engage leaders in developing strategy. That helps get buy-in. It has to be consistent with where we're going as a company. It's important to work with the team collectively." But strategy also has to involve her – as a leader – showing genuine concern for people and what they care about, Bush said.

Urban said Bush brought in a consultant last year to demonstrate how team members might better identify their strengths, learn about how they process information and their individual learning styles. "It was all about identifying ways to work with each other," Urban said, which is a value for the company overall and the customers it serves.

Bush may not get many gaps in her schedule, but when she does, she goes down to the production area, she said, in search of direct updates, feedback and insights from the team.

"Tia is like that movie 'The Doctor' [starring William Hurt, 1991]," said Urban. "It's a story about a doctor who didn't have much bedside manner, who wasn't warm with patients until he was a patient himself. Tia remembers her roots and where she came from. ... People know that she knows what they are going through personally and professionally. ... It comes naturally to her." ■

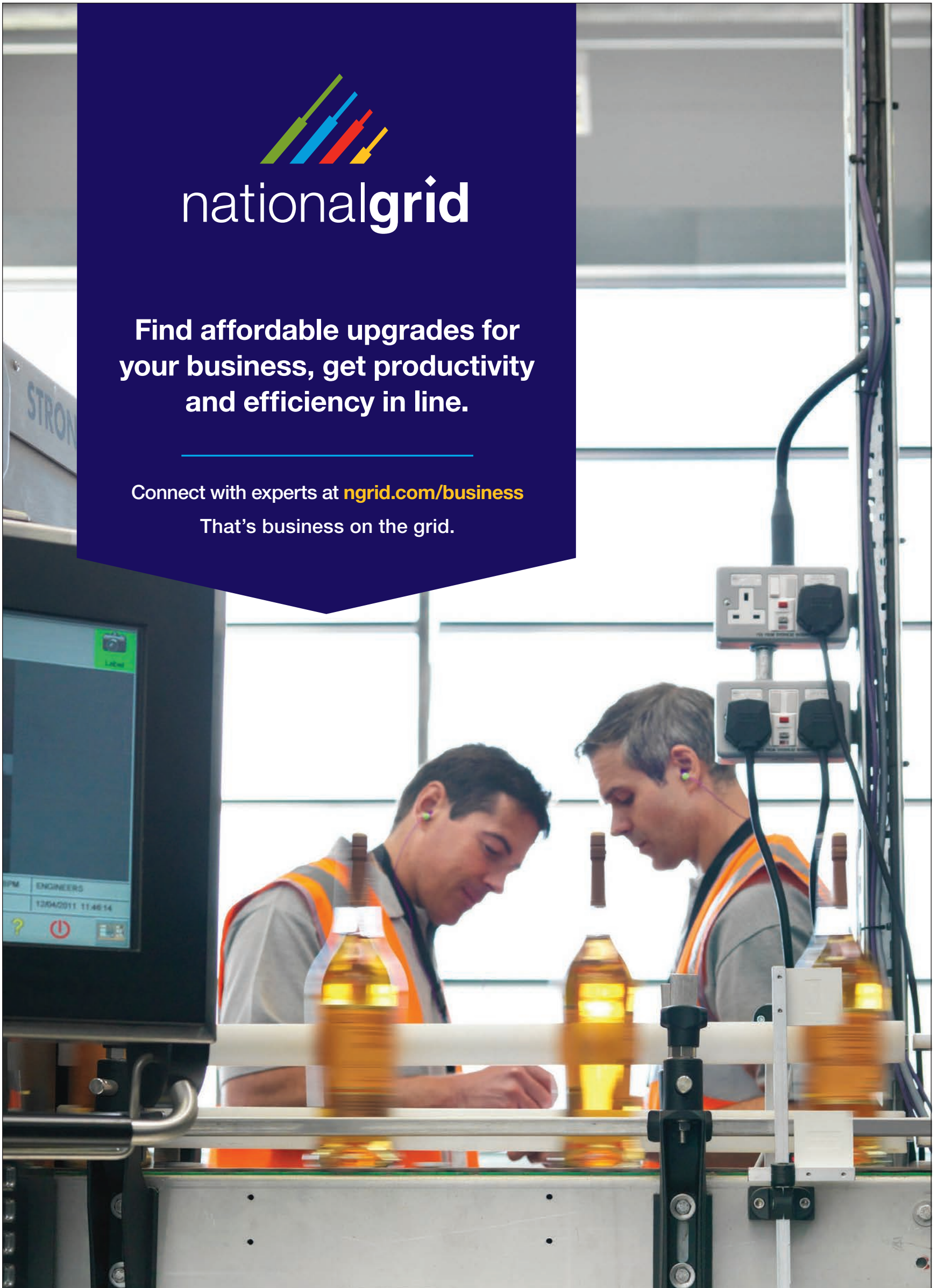




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SAFETY BRIEFING: Devon Zayas, left, and Scott Lyons, senior associates in the process-development division at Amgen's laboratory in West Greenwich, conduct a pre-job safety briefing for hand-valve manipulations on the 100-liter stainless-steel bioreactor. PBN PHOTO/RUPERT WHITELEY



Patients at the center of Amgen innovation

BY SUSAN SHALHOUB | Contributing Writer

“WE HAVE A MANTRA, ‘Serving every patient, every time.’ It’s the rally cry of our organization,” said Tia Bush, vice president of **Amgen Inc.**’s Rhode Island and Woburn, Mass., operations.

“It’s there when we evaluate our work, get our products to patients and make appropriate investments so the patient doesn’t have to go without medications they need,” she said.

For the drug manufacturer to serve every patient, every time, is a mission with fine-tuned logistics at play. In addition, Amgen aggressively researches and educates itself about growth opportunities on its horizon.

Amgen revenue for 2017 remained flat but showed increases in seven product areas, according to a company press release. Its goal is to increase investments to fuel more growth of novel medications in large patient populations – one of those investments being a new manufacturing plant.

A new product pipeline for Amgen involves the drug Repatha, made here in Rhode Island. It’s shown success clearing the liver of LDL (bad cholesterol) and has great possibility in other ways.

Robert A. Bradway, Amgen chairman and CEO, spoke about the drug in a recent press release: “We expect several developments to provide an additional boost for these products, most notably the recent inclusion of cardiovascular outcomes data in the Repatha ... information.”

Growth, risk-taking and innovation are a few of the factors in Amgen’s success, along with committed employees and constant, careful examination of its operations.

Lean manufacturing, a practice at Amgen for over a decade, is a cornerstone of company culture and a driver of strong employee engagement.

“We’ve been focused on the cultural aspect of it, how we work and focus on concepts and

‘We’ve been focused on the cultural aspect of it, how we work and focus on concepts.’

TIA BUSH,
Amgen Rhode Island vice president

practices of continuous improvement,” said Bush. “We keep this as our true north. It allows us to really understand ... opportunities for improvement to empower staff in their roles around listening to what their ideas are.”

Taking the soliciting of feedback and implementing employee ideas a step further, Senior Manager of Corporate Affairs Tara Griggs Urban said employees get appropriate recognition for their efforts at Amgen. First-, second- and third-place winners are chosen from each plant for an Innovation Award, for example, with final winners selected at company headquarters in California.

Another method of improving efficiency comes in equipment – saving money and downtime – with Amgen’s use of predictive analysis.

In December, the company performed maintenance optimization of all its major manufacturing equipment. Converting its maintenance schedule from calendar-based to usage-based has been a huge saver of time and money: with a 45 percent drop in maintenance hours needed and 22 percent less in materials costs since 2014, according to the company.

This year, the manufacturer plans to use a system of statistical analysis techniques to be able to analyze real-time data that will help it better predict when an equipment system might fail or have an issue, such as a weak valve, for example. A pilot program at one site was a success, so the method will now be expanded, said Bush.

Doing things better, more efficiently and faster is only part of continuous improvement at Amgen. The innovation doesn’t stop there. The environment is a priority, as well, with a sustainability plan and an environment, health, safety and sustainability director in place.

“Everything in our café is compostable, from forks, knives, plates, cups,” said Urban.

“Even in my own personal situation, it’s raised my level of understanding on what can be recycled,” said Bush.

With a presence in more than 100 countries, Amgen leaves no stone unturned when it comes to problem-solving or strengthening its impact for seriously ill patients around the globe.

Augmented-reality technology, which superimposes a computer-generated image on goggles worn by the user, is being explored as a tool for these long-distance collaborations, for example, said Urban.

“So far, it’s been very promising,” she said. “If someone in Singapore has an issue, here in Rhode Island an engineer can put the glasses on, see what they are seeing and help them repair or tune up a piece of equipment.” ■





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CLEAN TEAM: President and CEO Stuart Benton works on the packing floor with Bradford employees. PBN PHOTO/RUPERT WHITELEY

Bradford capitalizes on creative cleanliness

BY MICHAEL J. DECICCO | Contributing Writer

THE ORIGINAL BRADFORD SOAP WORKS INC., in West Warwick, has revolutionized what soap means to the average consumer.

The company created the first natural bar soap for Tom's of Maine 30 years ago when the toothpaste manufacturer was looking to expand, said Bradford President and CEO Stuart R. Benton. It developed the first dermatological soap for Galderma/Cetaphil, and is the leading manufacturer of solid cleansing products, including bath fizzes, cleansing sticks and shower pouf sponges, as well as specialty scented and all-natural bar soaps.

"Bradford co-developed many of the leading personal-care brands that are available on the market today," Benton said. "We now manufacture 44 percent of the specialty bar soaps in the U.S."

Bradford Soap Works was founded in 1876 by two men from Bradford, England, who came to America to sell flake soap and scouring wool for textile mills. By the 1900s, the company moved into other industrial soap applications. By the 1960s, the focus turned to personal-care cleaning products.

The organization now consists of a 200,000-square-foot facility in West Warwick, employing 350 workers, a plant in Indiana that employs another 50 people, and two other facilities, in California and Mexicali, Mexico.

The company, Benton said, has survived 142 years by continuing to evolve and innovate through market research and product development, and understanding its customers. "We've always been able to pivot, change paths to create something new," he said.

Its unique manufacturing process is a key reason behind this success. Other soap manufacturers buy their base soap product, termed "noodles" due to their pasta shape, from Malaysia or Indonesia. Bradford Soap does things

differently, boiling soap oils and fats into its own base soap in relatively small, 40,000-pound kettles. This allows the company to create custom formulations that other manufacturers cannot. Bradford Soap can add specialty ingredients to the soap that a company using a different process can't include because the



BRADFORD

other company's noodles are already formed.

Part two of this process, Benton said, is pressing the noodles into the shape of soap. Between 2-5 percent of specialty ingredients can be added to the soap at that point, he said.

As a result of this unique method, Bradford Soap has more than 50 live soap-base formulations it uses for its clients' custom orders. "Bradford creates custom formulations and manufactures bar soaps and solid cleansing for the 'Who's Who' of the personal-care industry," Benton said.

The top 10 list of Bradford's customers includes Amway, Colgate Palmolive, L'Oreal, Estee Lauder, Johnson & Johnson, Walmart and Unilever. All distribute what the company manufactures for them worldwide.

Bradford Soap developed Amway's first personal-care product, which is now sold in more than 80 countries. For Unilever, the company developed a synthetic cleansing bar to be mailed as samples to potential customers.

In a related accomplishment, Bradford Soap created an ingredient that is now used worldwide in synthetic cleansing. Yet it was the first U.S. soap manufacturer to receive, in 2001, organic certification. It developed the world's first bar soap made from 100 percent algal oil, and it was first to use Rainforest Alliance-certified palm oil in soaps.

For Shick, the company developed the first soap strips to be applied to razors. For Bath & Body Works, it developed soaps that double as aromatherapy.

"We are more than a manufacturing company," Benton said proudly, "in the way we understand what consumers want, in looking for ways to create innovative ideas and products." ■



PROUD OF THE COMPANY WE KEEP.

At Amgen, we are proud to be recognized by the Providence Business News for manufacturing excellence.

Congratulations to this year’s winners for their excellence in each category. Together, we help strengthen and reinvent Rhode Island’s manufacturing industry.



Amgen congratulates Tia Bush, Vice President of Operations - Amgen Rhode Island, for her Strategic Leadership Award.



BOARDS REVIEWED: From left, Randy Broyles, shipper, and CEO Edward McMahon look at the orders going out at Epec Engineered Technologies. PBN PHOTO/MICHAEL SALERNO

Circuit innovation on an Epec scale

BY SUSAN SHALHOUB | Contributing Writer

EPEC ENGINEERED TECHNOLOGIES may be the oldest circuit board company in North America, but its openness to change has helped it thrive in the modern day.

The 65-year-old, custom build-to-print electronics company shows its staying power not only with diversification, global engagement and an innovative culture, but speed to market as well. Its emphasis on aggressive growth over the past 15 years has been led by CEO Edward McMahon, with a revenue increase of more than \$2 million from 2016 to 2017.

Based in New Bedford, Epec has certainly made its mark on history, with sky-high innovation. It was an Epec circuit board that went up on the Apollo flights in the 1960s-1970s, “pretty cutting edge at the time,” said Epec President Kendall Paradise.

But as circuit boards got lighter and smaller over the years, company leadership knew Epec had to grow in different directions. Now, everything Epec manufactures relates to circuit boards somehow, said Paradise. Company leaders continue to look for products fitting that business model while meeting current demand, and they continue to find ways to improve.

While Epec’s core business is circuit boards, they are now a component in projects rather than one separate circuit board product sold to customers, Paradise said, in industries such as aerospace, military and medical.

Heavy copper circuit boards that draw more power without overheating, for example, were added, along with battery packs, and flexible and rigid circuit boards, cable assemblies, user interface and HMI, or human machine interface. “When you pump gas, it’s the buttons you push, the front panel and all the stuff behind it,” Paradise said.

But while diversifying product offerings, Epec and its 116 employees had to do it over multiple locations in Florida, Colorado, China and Wales in a way that would ensure the same levels of quality and consistency cross-company.

Paradise, no stranger to the world of printed circuit boards, took up the charge.

‘We like to get in on the design process as early as possible. The shorter the production cycle, the sooner the customer can get it.’

KENDALL PARADISE, Epec president

Her family owned Beaver Brook Circuits before Epec acquired it in 2002. She’s credited with heading up Epec’s global logistics and supply-chain management model, even living in China for six months.

“We aren’t all in the same building, so it forces you to think about how you communicate as a company. It promotes a lot of brainstorming. It forces us to be active with things [such as] weekly check-ins,” said Paradise.

For the most part – despite the distance – all employees have met one another, she said.

Engineers are brought in to work together from time to time, in person. Annual meetings have all leadership team members in attendance from across locations, with face-to-face interactions helpful in building a team dynamic.

But a modern, unified information technology network was also needed.

Epec won a 2015 Manufacturing Leadership Award in Innovation Process Leadership from the Manufacturing Leadership Council after replacing an inflexible ERP application system with the cloud-based NetSuite system across locations in 2007.

“In another innovation, Epec uses an online configure-price-quote engine ... to enable customers to configure build-to-print circuit boards over Epec’s e-commerce website ... reducing lag time and manual steps for both Epec and its customers while providing a complete record of specifications and transactions,” the council said in a press release.

This reducing of lag time is a priority for Epec. Paradise calls it a company differentiator.

“We like to get in on the design process as early as possible,” she said, creating a quality prototype that allows Epec to have total control over the manufacturing process, taking care of any issues right away. “The shorter the production cycle, the sooner the customer can get it.”

Last year, for instance, the company switched to a central warehousing site in Hong Kong instead of multiple sites, to better track products and get final inspections performed quicker, said Paradise.

Reducing unnecessary steps, a core principle of lean manufacturing, is a companywide goal in which all Epec employees participate. Quicker production that doesn’t impact quality is a value-add for customers, said Paradise, and a group effort.

“It’s the reason we have so many 30-or-more-year employees,” she said. “The CEO’s mindset is always, ‘OK, what’s next?’ ” ■

Congratulations to all the honorees of the 2018 PBN Manufacturing Awards.



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TEAM EFFORT: Goodwin-Bradley President Robert Goodwin discusses a project with José Rodríguez at the company's Oxford Street plant in Providence.
PBN PHOTO/RUPERT WHITELEY

Adventures on the cutting edge

BY WENDY PIERMAN MITZEL | Contributing Writer

FROM WORKING WITH HENRY FORD on the Model T to providing the key component for the nation's aerospace projects, fourth-generation manufacturer **Goodwin-Bradley Pattern Co.** has spent the last 105 years staying on the cutting edge.

"We've never selected the road more traveled," said President Robert Goodwin. "A lot of things we take on, others have rejected. We haven't played it safe. We see opportunity and it's more fun to take on the challenges."

Goodwin-Bradley started in 1912 in metal casting, but now its products include molds and tool making, manual machining, compression and rubber molds, patterns and casting, prototypes, trimming and machining, CNC, CMM, and metrology and inspections.

By continually reassessing the market, investing in new equipment and training, and following the theory that their employees can make just about anything, the Providence manufacturer is strategically positioned to grow the business.

"I've never seen the manufacturing environment this exuberant," said Chris Goodwin, Robert's son and vice president of sales. "It's crazy how many things are being built right now. I'm not sure if it's military buildup or tax code incentives ... but I was waiting for this boom to happen. I was told by customers it was coming."

The company employs 17 people, and as new equipment is developed and added will need people who can program, run and monitor it.

"It's very hard to find people who are skilled at what we do," said Chris Goodwin. "Our guys can take any kind of print or CAD (computer aided design) file and make anything."

This type of highly skilled technical machining is high pressure, says Chris Goodwin. There is very little lead time and there is no room for mistakes. So, Goodwin-Bradley invests in people who are committed to learning the trade. Management teams receive leadership training such as strategic planning,

'We see opportunity and it's more fun to take on the challenges.'

ROBERT GOODWIN,
Goodwin-Bradley president

analyses, job costing and estimating, and the front-line receives accelerated training as well. He says manufacturing programs are good feeders into the workforce, but the on-the-job internships and mentoring make the difference.

"It's not an individual effort," said Robert Goodwin. "It's a team."

The Goodwin family takes pride in the investment they make in their people. Half of the staff has been with the company for more than 20 years. And Goodwin takes pride in the company tradition of making adjustments so that no one is ever laid off during down years.

"We foster a family environment," said Robert Goodwin. "We care about our employees and try to help them out during hard times or bumps in the road."

Along with relationships within the company, the Goodwins look to work with others in the industry.

In 2014 Goodwin-Bradley instituted a collaboration program "to promote conversation, collaboration and innovation among Rhode Island manufacturers who, typically, had seen and treated other members of the collaboration strictly as competitors."

Chris Goodwin says the company realized the benefits of collaborating with others on bids so each could play to their strong suit. The intention was to allow each collaborating company to take on bigger projects single companies otherwise would not be able to handle due to either lack of manpower or equipment to handle the bid requirements.

"The last thing we want to do with a new customer is say we are too busy," Chris Goodwin said.

Chris credits his dad, now 70, with using his computer-systems background in getting the business to where it is today.

"Dad came into the business at age 34, after years in New York City working in the insurance industry," he said. "My father started the technology revolution. Without him, the business would have gone under."

"My father is a big-time reader," he added. "He started reading every book and magazine on manufacturing he could get his hands on. He taught himself to work the CNC machine by learning the manuals." ■



GOODWIN-BRADLEY
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Toray Plastics (America) is a proud recipient
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“The heart and soul of Toray are our employees. They support our mission and drive our business, working hard every day to ensure that our customers’ needs are met or exceeded and that the company maintains its leadership position in its core markets.”

- Mike Brandmeier, President & CEO



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GLOBAL REACH: From left, AVTECH President Rick Grundy and owner Michael Sigourney observe as John Pinckney, the company's reseller channel manager, monitor a demonstration of AVTECH's Room Alert technology, demand for which has driven worldwide exports. PBN PHOTO/RUPERT WHITELEY

Cybersecurity drives exports

BY SUSAN SHALHOUB | Contributing Writer

JUST AS ITS ROOM ALERT technology products are responsive – notifying a facility when its IT area gets too warm or cold – so is software maker **AVTECH** responsive to continuous demand for its products.

“We are very lucky,” noted President Rick Grundy. “It is how we became an international company. With those customers in other countries looking for solutions like what we offer, they found us and selected us.”

It does appear the world is AVTECH's oyster.

The 30-year-old company – with Google, Microsoft and all branches of the U.S. military among its clients – is building on this momentum. It has made great strides in exporting, hiring a reseller channel manager and establishing a new online reseller portal over the past year.

Now shipping to more than 180 countries, the Warren-based company looks to increase its global presence with greater depth. Its exports grew from 21 percent to 30 percent of revenue from 2016 to 2017. With continued international expansion, exports should make up 40 percent of all AVTECH revenue by 2020, according to the company.

Beyond strategy, two other things boost the company's export success: AVTECH'S participation in state-sponsored trade missions and the ever-increasing importance of cybersecurity in general.

“Breaches [such as] Equifax have showed us that there are a lot of bad actors on the internet,” said Grundy. He calls anti-hacker security messaging a perfect match for what AVTECH offers, as a complete IT security scenario. “While supportive of property firewalls and antiviral software, we are also positioning [the market] to remember environmental monitoring is a part of that.”

‘There are a lot of bad actors on the internet!’

RICK GRUNDY, AVTECH president

Environmental monitoring is a 24-hour-a-day system that notifies companies when their IT infrastructure or stored products are in jeopardy, as soon as it happens, via text, email or computer.

AVTECH's Room Alert technology monitors areas such as server rooms, measuring temperature, humidity, dew point and other environmental factors. Its sensors can detect movement, air flow issues, flooding, leaks, power outages, smoke or fire. Applications are vast: commercial and residential properties, the food-and-beverage industry; cold storage; and the medical and pharmaceutical fields, for example, Grundy said.

“Condensation can cause corrosion for electrical equipment,” said Grundy. Low dew points put equipment at risk for static electricity, which can damage technology, he said.

Along with cybersecurity as an increasingly

recognized priority, Grundy also credits the state for offering resources that have strengthened AVTECH's global status.

“We have participated in every trade mission sponsored by R.I. Commerce Corp. in the last two years ... including Ireland, the U.K. and Israel,” he said. An AVTECH contingent is set to visit the United Arab Emirates this year. More international trade shows are also planned for the company this year, with successful shows in London and Frankfurt, Germany, in 2017.

The John H. Chafee Center for International Business at Bryant University has been a valuable resource for AVTECH as well.

The company participates in a program at the Chafee Center, getting reimbursed for initiatives such as export marketing, international trade shows and export training. Bryant students in the International Business Practicum program will help the company further investigate key markets.

“We have good breadth across the world, but we need to work on depth,” Grundy said, with areas of Europe, Canada, the South African region, and Central and South America on the list.

Some of the far-flung locales where AVTECH has exported its products include New Zealand, Australia, Guam, the Middle East and Mauritius, a tiny island off of Africa.

From a Rhode Island company launched in the 1990s with a Room Alert product that relied on a dial-up modem, to a firm with 1,500 resellers that keeps pace with the latest technology, and manufacturing and fulfillment compliancy with countries to which it ships, there is plenty to track.

“The business continues to evolve,” Grundy said. ■



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GREEN TEAM: National Marker CEO Michael Black, left, and General Manager Patrick Madigan show off the company's solar array outside its North Smithfield facility.
PBN PHOTO/RUPERT WHITELEY

Signs point to green industry

BY JOHN LAHTINEN | Contributing Writer

MANY THINGS HAVE changed in the nearly 100 years since **National Marker Co.** opened its doors, but not the company's dedication to quality, which has prompted a number of energy-efficient innovations.

North Smithfield-based NMC manufactures an extensive catalog of safety signs, tags and labels, many of which are designed specifically to meet state and federal safety regulations. The company sells through 1,300 industrial distributors across the United States, reaching deep into the manufacturing, food processing, oil, gas and construction sectors.

"National Marker is a large-format printer that focuses on safety and custom identification products," said Patrick Madigan, general manager. "The items we create each day are keeping people safe in the workplace by labeling hazards, identifying routes of safety or outlining safety procedures."

Two key market differentiators setting the company apart and fueling its continued success are Sign Muscle and customization.

Sign Muscle – a proprietary, anti-graffiti, UV protective liquid coating – protects every sign the company creates. The product won't fade or crack in harsh weather conditions and chemicals will not penetrate the surface of the sign. NMC guarantees that products protected by Sign Muscle will be readable for life, saving its customers time and money.

In addition, NMC offers its customers the ability to customize any product and with more than 55 percent of the company's business being custom work, it is critical that orders – from pricing to design to production to delivery – be fulfilled efficiently.

"Each day we make hundreds of signs for our customers with different combinations of print technologies and substrates," said Madigan. "With a lead time of just two days, I enjoy the challenge of building systems and teams

'We have been an influencer in the community and ambassadors for green practices.'

MEGHAN ARNOLD, National Marker Co. product development

that can take ideas and turn those ideas into finished products, almost overnight."

Having always embraced the practices and principles of green manufacturing, NMC is constantly seeking new and innovative ways to increase efficiencies, and reduce waste and energy usage.

The company's most substantial green project – the installation of a 242-kilowatt roof-mounted solar system – was completed in 2015. The new system now provides 40 percent of all

the electricity used at NMC. Before the solar system was installed, the company built a new roof containing twice the existing insulation. The move cut heating and cooling energy costs by more than 15 percent.

In 2017, NMC outfitted its facility with the most efficient lighting available and more recent investments in modern printing equipment have increased capacity, while at the same time reducing energy consumption by 25 percent. With additional modifications, the company has seen reductions in natural gas and water consumption. NMC also has worked closely with its vendors to implement recycling programs for its corrugated, plastic and aluminum waste.

Meghan Arnold, who works in product development/art automation, is always happy to tell customers of the company's several materials manufactured using recycled or post-consumer goods, as well as recyclable materials and materials that have a reduced environmental impact such as materials with no polyvinyl-chlorides, or PVCs.

"I was excited and proud that NMC was investing in green energy when we installed solar panels and even more excited when we started to see the returns," Arnold said. "Now on my drive to work I am seeing more solar panels in our area. I am excited that we have been an influencer in the community and ambassadors for green practices."

"By choosing to follow green manufacturing practices, we are preserving and enhancing our immediate environment. I want this to continue to be a beautiful place to live, work and raise a family. I would like residents of this community to be happy manufacturing is taking place in their own neighborhood," she said. ■



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LEAN SCENE: Town Dock President and CEO Ryan Clark oversees the inspection process of the day's squid landing. Town Dock is Rhode Island's largest calamari processor and the nation's largest supplier to the domestic market.
PBN PHOTO/RUPERT WHITELEY

Lean management nets big catch

BY NANCY KIRSCH | Contributing Writer

CALL IT SQUID OR CALAMARI, but when it's on your menu, family-owned **The Town Dock** is likely to be the supplier.

Ryan Clark, president and CEO, declined to reveal specific market share data but said Town Dock, which annually handles more than 5 million pounds of calamari, is Rhode Island's largest calamari processor and the nation's largest supplier of the cephalopods to the domestic market.

The Town Dock supplies domestic calamari caught by its dedicated fleet of seven fishing vessels and partner fishing vessels along the East Coast, and calamari from the West Coast and other worldwide venues. Founded in 1980 by Clark's father, Noah G. Clark, the company has a customer base that includes restaurants, seafood and broadline distributors, caterers, and supermarkets.

Seventy-five of its 90 employees work in Rhode Island; others are scattered around the country.

After learning about lean management – a never-ending process of continuous improvement – from Polaris MEP, Town Dock's leadership embraced the concept and hasn't looked back. (Polaris MEP, an entity of the University of Rhode Island Research Division that is funded by the National Institute of Standards & Technology, guides Rhode Island's manufacturers toward sustainable growth, innovative technology and cost-efficiencies.)

"Most of my [employees] have been exposed to Polaris trainings, lunch-and-learns and events," said Clark. "Our team has brought [lean management] alive." These are but a few of Town Dock's lean improvements:

- Its processing plants in Johnston and Narragansett and its fishing-boat fleet added color-coded areas for tools and heavy equipment. The result? More-efficient inventory management

and faster preventative maintenance and/or repairs to the fishing vessels.

- Using Kanban cards – a lean-management tool visually conveying a chore's progress through a system or process – on its reorder lines in its dry-goods warehouse contributed to more-efficient packaging and expanded inventory of the case packaging for the calamari lines.

- By learning how to create a spaghetti diagram – a lean tool visually depicting the actual workflow – a team identified problems with the work flow processes for the production personnel in the Johnston plant. The resolution – investing in weather-proof printers and workstations on the line where the production personnel worked – brought significant cost

'Our team has brought [lean management] alive.'

RYAN CLARK,
Town Dock president and CEO

savings and order-accuracy improvements.

The company's growth is primarily due to the team's strength, cohesiveness and talent, and secondarily to lean management, whose return on investment is at least 10 times its cost, says Clark. Growth has been remarkable:

- Gross revenues grew by nearly 36 percent from 2015 to 2017.

- Developing and marketing locally caught calamari to compete against the dominant Chinese market has grown into millions of pounds of new annual sales, which led to hiring more than 20 additional employees.

- By investing more than \$1 million to upgrade blast-freezing and processing methodologies and purchasing a 5,000-square-foot corporate office building in Narragansett, Town Dock can now handle 300,000 pounds of squid per day, up from the earlier 125,000 pounds daily capacity.

How does Town Dock differentiate itself? "It's the freshness and quality of the product from Rhode Island's waters, the team that [stands] behind every pound sold and the team's expertise to give customers the most consistent, best-tasting product that anyone can offer," said Clark. Later this spring, he revealed that Town Dock's main calamari line will be the world's first squid species to receive the blue fish label – akin to a seal of approval – from the Marine Stewardship Council, an international organization promoting scientifically grounded sustainable fishing practices.

In the never-ending process of continuous improvement, Clark hopes to take lessons learned from calamari-processing teams and incorporate them with employees working in sales, administration, global procurement and logistics. ■





ON A ROLL: From left, Cooley Group employees Bo LeBlue, Cas Pereira and Joe Mello convert a finished goods roll of CoolGuard liner material, often used to line reservoirs, to the proper size. PBN PHOTO/RUPERT WHITELEY

Cooley Group tailors membranes, signs for industrial demands

BY SUSAN SHALHOUB | Contributing Writer

IT DIDN'T MATTER who you were rooting for in Super Bowl 2018. The **Cooley Group** of Pawtucket definitely came out a winner, and on top.

"The roof on the Super Bowl stadium was ours," said Daniel R. Dwight, president and CEO of the 91-year-old company. "People buy Cooley products because they perform," in this case, keeping football fans, players and coaches warm and dry at U.S. Bank Stadium in Minneapolis.

For Cooley and its 205 employees, good things come in threes.

The company has three divisions: commercial graphics, engineered membranes and building products. Its three pillars of sustainable growth: environmental stewardship, social responsibility and economic prosperity.

Each has factored in to Cooley's dedication to innovating customer solutions. Dwight said 45 percent of the company's annual revenue is from new products.

Cooley's innovation is evident around the globe, with locations in the United States, Canada and Europe. Its products are marketed and distributed in 50 countries. Its research and development facility is in Cranston. It has facilities and textile-knitting and weaving operations in Pawtucket and Cranston, and in South Carolina.

The company manufactures membranes with polymer materials and textiles such as nylon or Kevlar, and customizes solutions. Its chemical compounds help fine-tune the product for customer needs, such as temperature tolerance or fire resistance, collaborating on customer prototypes with companies such as DowDuPont.

Applications can be connected to headline news.

"We're very big on water containment for reservoirs," said Dwight.

It was a Cooley high-performance membrane used to cover a water reservoir in Cape Town, South Africa, for example, to keep already-

'We kept driving the industry to go lighter and lighter weight.'

DANIEL R. DWIGHT,
Cooley Group president and CEO

scarce water from evaporating and to keep debris out. The company also makes bladder tanks, floating baffles and baffle curtains, which improve efficiency for water and wastewater, preventing stagnancy and directing flow.

Cooley products also helped contain the 2010 BP oil spill in the Gulf of Mexico; creating an effective fabric for geomembranes, berm liners and oil booms during that time.

Cooley produces goods for the military as well.

"We make portable bladders. ... Material is fabricated into the bladder to hold jet fuel. The bladder is made, shipped, unfolded. They bring in jet fuel, fill the bladder and run helicopter missions. Then the bladder goes back in a box and goes somewhere else," said Dwight.

Inflatable boats, roll-up doors and liners for water reservoirs or fuel and chemical storage round out Cooley's engineered membrane division.

In commercial graphics, Cooley provides

indoor and outdoor advertising, such as billboards. According to Dwight, 70 percent of every billboard in North America is made with Cooley material.

But the company is leading the way in reducing the carbon footprint of the billboard process, getting rid of vinyl, or PVC, in billboard substrates.

"Now it's predominantly PVC ... we kept driving the industry to go lighter and lighter weight. Even though we own the market, we are driving PVC out of the market," said Dwight. Cooley's innovative PVC-free material, EnviroFlex PE, is 100 percent recyclable, touted as cheaper to ship and install.

Cooley's building materials, meanwhile, include commercial roofing and recreational-vehicle roofing components known for their durability.

No matter the application, Cooley seeks progress.

Company leadership is behind the idea of "M 4.0," or the view that the industry is in its fourth industrial revolution, with mechanical innovation; electricity and mass production; and computers preceding it. The future, said Dwight, is "the digital interconnection of everything and everyone."

Cooley is a member of the Manufacturing Leadership Council run by research group Frost & Sullivan, based in California. Members tour noncompeting plants to exchange ideas, and participate in weekly conference calls.

Cooley learns from companies in the council on issues such as optimizing equipment.

"What is GE doing that could make us more efficient? Predictive maintenance ... to not lose production time" on equipment, for example, Dwight said. Cooley figures out what practices make sense for a company of its size – and continues to innovate even better. ■



SAFETY THIRST: From left, Gerry Fournier, operations manager, and Mathiew Medeiros, digital marketing specialist, discuss safety tips submitted via the igus iPad safety app. PBN PHOTO/RUPERT WHITELEY

Making safe habits stick

BY WENDY PIERMAN MITZEL | Contributing Writer

WHEN LEADERS AT **igus Inc.** decided to implement safety defibrillators and offer CPR classes to employees, they had no idea there would be such an immediate life-saving effect.

“To our surprise, 25 percent of the workforce signed up for the training,” said Gerry Fournier, operations manager. “But the most remarkable thing was, just a little while after, one of our employees, coming into work one day, saw a person in distress in the snow. He stopped and performed CPR. Because he had just done that training, he felt comfortable doing so.”

According to Fournier, the medics said it saved the man’s life.

“We’re very proud of him,” he said.

Of course, thinking about safety is just part of the job at igus, the North American production and distribution facility for the larger igus GmbH in Germany. The company specializes in engineered plastics and parts such as ball bearings and chains and cables.

“Safety is part of our [daily operation],” said Lead Supervisor Mark Leland, a 25-year igus employee. “Team leaders and supervisors mix on the floor with employees, so there’s an awareness that helps to promote a safe environment. We have daily team meetings to review any issues and concerns.”

The team at igus also created an iPad application that allows all employees to participate in workplace processes and safety, the goal being to get direct information and input from the warehouse floor.

“You have to have a tool or mechanism in place for employees,” said Fournier. “They don’t want to fill out paperwork. So, we developed our own app you can take notes of safety hazards.”

“Any employee can document something they see,” said Leland. “They take a picture,

‘They take a picture, send it through email and **we put together a team to take care of the issue.**’

MARK LELAND, igus lead supervisor

send it through email and we put together a team to take care of the issue and prevent it from happening again.”

For the last 13 months approximately 60 items were reported for consideration. Only three were safety-related. And the company’s insurance carrier reports a very low percentage of loss. Even better, the iPad app allows all employees to take ownership of safety and improvement to the company process. It’s

important for all employees to understand the ramifications of even a small mistake.

Something as seemingly benign as nudging a product rack can compromise the whole system, possibly sending items cascading across the floor. It nearly happened once, but with immediate attention given to the problem, a larger accident was prevented.

“No small incident is too small to tell us,” said Fournier. “Just let us know. You’re not going to get fired.”

Ergonomics is another big component of the warehouse and office design, according to Leland.

Lift trucks are specifically designed to minimize impacts of heavy hauls and have enclosed cabins to eliminate fall hazards. Tables and chairs are adjustable to allow for proper work height.

“We want employees to stay in their comfort zone to allow for less fatigue and fewer strains to occur,” said Leland.

He said the floor is also designed with tracks to keep lift trucks in the right place, and a system where the right equipment is in the right spot at the right time, eliminating the potential for employees to use the wrong tools for a task.

It certainly doesn’t hurt to be part of the safety team; in fact, it pays off in many ways. Once a month, the Idea of the Month is awarded to the employee whose idea had the most impact.

The emphasis on safety is good for the customer, too. Many igus products are designed to be a better alternative to traditional bronze parts that are often covered in oil and slippery.

“Our products are oil-free and clean, there’s no maintenance later on. It’s a big advantage for us in the marketplace,” said Fournier. ■





SUPPLY AND COMMAND:
From left, AstroNova CEO Gregory Woods, Purchasing Manager James McGovern and Vice President of Instrument Manufacturing Stephen Petrarca review the company's new vendor-owned/managed inventory system.

PBN PHOTO/RUPERT WHITELEY

AstroNova keeps eye on supplies

BY SUSAN SHALHOUB | Contributing Writer

THOUGH THEY HAVE APPLICATIONS across many industries, such as aerospace, automotive and packaging, all **AstroNova Inc.** products involve data visualization. The products help companies get, analyze, store and print data they need to ultimately improve their bottom line.

The 49-year-old West Warwick company adapts its highly specialized products to its clients' needs.

For example, not just any old printer can go onboard and function well on an aircraft. Airborne printers need to be rugged and use airborne thermal paper to print things such as passenger manifests, maintenance records and weather maps. AstroNova has made a name for itself in this niche. (Airbus and Boeing are customers.)

Getting products such as airborne printers manufactured and shipped out to clients has gotten more efficient due to AstroNova's new tech tool, with great results. According to the company, its average annual revenue growth over the past four years has been 13 percent.

About a year ago, it invested in a new Enterprise Resource Planning system, Enterprise One from Oracle.

"It's Excel-based," said AstroNova Corporate Purchasing Manager James McGovern, allowing for data manipulation without processing. "You can export right off the screen."

If vendor products, or supplies the company needs in manufacturing, go out late, AstroNova knows immediately; a monthly report then shows trends so the company can pinpoint potential problem vendors and find solutions more quickly.

Another way the new system has helped AstroNova's supply chain is when it comes to the issue of pricing the materials needed to manufacture its products.

"Costing has always been a challenge ... but we can track standard costing, how they vary in price. We get a standard cost screen and can print requisitions," said McGovern. "It shows

'We have VOMI
[vendor-owned/
managed inventory].
A vendor owns it,
I just take it
when I need it.'

**JAMES MCGOVERN, AstroNova
corporate purchasing manager**

us what we paid last time."

Long-term component planning is also easier and quicker, he said. The system allows AstroNova to forecast out its needs and place bulk orders, minimizing the need of having to keep too much inventory on hand.

Along with tools to more accurately plan material needs, VOMI is another way AstroNova works to keep its on-hand inventory as low as possible.

Another main factor in AstroNova's supply-chain success has been its use of vendor-owned/managed inventory, or VOMI, said McGovern. It's a system through which a warehouse vendor gets a look ahead at what

the company needs with an annual purchase order, then holds that inventory until those supplies are needed. AstroNova doesn't pay until it actually uses those items.

"We have a warehouse here," said McGovern, "then we have VOMI. A vendor owns it, I just take it when I need it," he said. With the VOMI warehousing based in Rhode Island, those materials are trucked over to AstroNova when requested. The company tries to use up the supplies by the end of the year, or deduct them from the next year's order, said McGovern.

Through VOMI, vendors also buy parts for AstroNova and keep them together as a kit for the manufacturing of certain products. It saves time and prevents the company from having to order and kit the products separately, McGovern said.

Opening the door to more-efficient supply-chain management allows the company to further focus on its customer base, such as the military, continuing to meet military standards for defense. Manufacturers, such as those in the cosmetics and food industries, are also clients in need of product identification that AstroNova provides with its TrojanLabel and QuickLabel brands. Its Test & Measurement division designs and manufactures data-acquisition equipment for the energy, pulp and paper, automobile and transportation industries, to name a few, such as data-acquisition recorders.

A recent supply challenge for AstroNova has been prompted by the increased use of sensors in cars, McGovern said, such as dashboard warning lights.

These materials to make the sensors are in high demand, he said. "It's now harder to get those electrical components. We have to watch the market." It is a supply-chain task made that much easier with an advanced ERP system and innovative warehousing practices securely in place. ■





STANDING OUT: Gerry Marzilli, safety and training coordinator at Toray Plastics (America), gives a training session focusing on Occupational Safety and Health Administration safety notes from the previous year. PBN PHOTO/MICHAEL SALERNO

Workforce shapes up with classes

BY MICHAEL J. DECICCO | Contributing Writer

TORAY PLASTICS (AMERICA) INC. has successfully molded plastic products for industries ranging from automotive parts to food packaging, in part because it also takes diligent care in shaping its workforce with educational and career-advancement programs.

Lisa Ahart, vice president of corporate human resources and environmental health and safety, said Toray's engineering-development and leadership-training programs are the "standout" reasons it earned a PBN manufacturing award.

The company's engineering development program educates its new shift-engineers about the company's departments, helping to identify where their talents might be best applied in the future. Toray's leadership-training program, developed with the University of Rhode Island using a Real Jobs Rhode Island grant, includes curriculum to train employees as mentors who can cultivate the leadership skills of other employees.

"These programs stand out as symbols of who we are, our workforce-development philosophy," Ahart said.

The curriculum Toray helped develop at URI for its engineers and others concerns "not just academics but practical career-development skills," Ahart said.

With a similar goal in mind, the engineering-development program, which started in 2015, offers new company engineers knowledge of the workings of departments within the organization to which they might only have limited exposure, such as the sales division, she said. It gives them a better understanding of how their work fits in with those other divisions and shows where they might find the right fit in a future promotion, whether it be in sales, man-

'It was really good to experience other areas of the business I wouldn't have seen otherwise.'

JAMES OTA, Toray engineer

agement or a particular engineering discipline.

Toray Plastics (America) Inc., which launched as part of the Toray Group's family of companies in 1985, boasts it is currently the only U.S. manufacturer of precision-performance polyester, polypropylene and metallized and bio-based films that produces 190 million pounds of film for flexible and rigid packaging and lids, and graphic, industrial, optical and electronic applications nationally and inter-

nationally. It employs 600 at its polypropylene film division in South Kingstown, which the company notes is a leading global supplier to the automotive and flooring industries.

Ahart is an example of the R.I. division's success with workforce development. In her 15 years with the company, she has been promoted four times. Other companies, she said, don't seem to value the human resources department as an integral part of their operations. "Toray sees human resources as a business partner," she elaborated. "We can't be successful without all the lines working together."

Senior Human Resources Manager Rhonda Arsenault, an employee of that department for 10 years, said in 2017 alone, four of the 12 candidates in the URI leadership-development program became mentors, and two of the five employees who participated in the company's engineering-development program have been promoted. One employee, Toray engineer James Ota, she said, has earned a "significant" promotion as a result of the program.

In the summer of 2015, Ota interned at Toray while attending URI. The following semester, his senior year, he continued as a part-time intern until graduation. He was hired full time as a Toray engineer in the summer of 2017, just two years after starting at Toray.

"What was great for me was that while going through their engineering-development program, it was really good to experience other areas of the business I wouldn't have seen otherwise, to understand the different applications of the products in the real world. I learned I would like to work in sales someday. I learned my personality is a tool in my tool box that I have." ■

'TORAY'
Innovation by Chemistry

Ascending brewer

BY SUSAN SHALHOUB | Contributing Writer

THE **SONS OF LIBERTY BEER & SPIRITS CO.**'s success as an emerging manufacturer came about in part due to its innovation and quality product, but also due to its ability to see opportunity and grab it by the horns.

The distillery, brewery and tasting room has been able to revamp its business structure as the result of a change in Rhode Island law in recent years, said Bryan Ricard, head of marketing.

"The law allowed for more on-site consumption," said Ricard. "Before, we could only sell a small bottle" of product to customers. "Now, we can serve 36 ounces of beer or 4.5 ounces of alcohol."

Sons of Liberty began in the fall of 2011.

Owner Michael Reppucci, who worked in the family finance business but enjoyed making wine, launched the company with his own funds. He learned to make whiskey from a craft-whiskey consultant with a background in chemical engineering who was a retired master distiller at Maker's Mark, said Ricard.

Ricard, educated in marketing, was "making sandwiches at

Panera" but left that job to come work with Reppucci and Chris Guillette; now the company team is made up of about 20 people, Ricard said.

The company makes American single-malt whiskey from beer – something Reppucci didn't see anyone else in the market doing at the time he opened Sons of Liberty.

One of the challenges in whiskey manufacturing, said Ricard, is that it calls for an owner to invest in lots of materials and equipment upfront, and then wait – for years – for the product to be ready.

New England offers some advantage in whiskey-making over other parts of the country, however, as does Sons of Liberty's location at Peace Dale Mill in South Kingstown.

The region's temperature differential from season to season helps.



DISTILLED WISDOM: From left: Chris Guillette, distiller at Sons of Liberty, and Sons of Liberty CEO Mike Reppucci with one of the distillery's whisky stills. Reppucci took advantage of a change in Rhode Island law to expand Sons of Liberty's primarily sales-based business into an event and bar venue.

PBN PHOTO/RUPERT WHITELEY

"In the warmer climate, the whisky expands to the oak, grabs the flavor of the barrel. In colder winter months, it brings the flavors into the whisky," Richard said.

The other location advantage? The company's home at

the mill had plenty of expansion space. After the law changed and Sons of Liberty could offer more drinking on-site, it was able to take over adjoining space and added bars, seating and games.

"It was the birth of a completely new business," Ricard said. ■



WILLIAM DAVIES HIGH SCHOOL | **COLLABORATION IN MANUFACTURING**

Davies students meet industry needs

BY JAMIE LOWE | Contributing Writer

WILLIAM M. DAVIES, JR. CAREER & TECHNICAL HIGH SCHOOL in Lincoln provides advanced manufacturing training to 289 students in biomanufacturing, electrical & renewable energy, machine technology and pre-engineering programs, including 40 completing work-based learning prior to graduation.

"Our goal at Davies – and also, increasingly, a goal of the state – is for all students to have a work-based learning experience prior to graduation," said Fallon Masterson, marketing communications specialist at William Davies.

Such experiences range from job-shadowing to apprenticeships, internships and paid employment.

"We're also exploring opportunities in the coming school year that will offer our instructors the ability to pursue externships. Some teachers have already taken advantage of this, but as a school we're working to expand these opportunities, so teachers can take relevant skills back to the classroom," Masterson said.

The work-based learning program caters its design to the needs of the industry. Davies meets the

needs of the employer by ensuring its curricula offer high-skilled and relevant training. This can be seen in the implementation of training in SolidWorks, 3-D software used in engineering and manufacturing. Two of Davies' advanced manufacturing programs employ SolidWorks in the curricula, giving the students a leg up in manufacturing, industrial design and engineering jobs. "By addressing skills gaps, we can increase the value of the workforce-development services we offer to the state," said Masterson.

Davies continues to evolve by employing a workforce-readiness skills standard, designed to enhance students' 21st-century employability skills (the 21st Century Workforce Rubric). The rubric is



FIRSTHAND: From left, William M. Davies, Jr. Career & Technical High School student Nathanael Chery performs jewelry-machining work at Tiffany, guided by his Machine Technology teacher, Briar Dacier. Chery is part of the school's work-based learning program.

PBN PHOTO/RUPERT WHITELEY

used to measure four key "soft skills": professionalism, communication, critical thinking and collaboration.

"We are able to address, train and provide the necessary technical skills that align to meet the needs of

our industry partners. Technical skills are applied, practiced and even perfected at times in real-world, industry-related situations through our Work-Based Learning program," said Susan Votto, the school's supervisor for the Center of Advanced Manufacturing. ■



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