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Technically

DELAWARE PROSPERITY PARTNERSHIP

The future of Manufacturing in Delaware

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About the Series

In the midst of one of the worst economic shocks in a century, the manufacturing industry is proving resilient in Delaware, with 44,000 jobs earning their workers an average salary of $60,000. It's the state's second-largest traded sector. And you should probably call it a STEM employer, too.

This four-part series exploring the state's manufacturing industry published by Technical.ly was underwritten and supported by by Delaware Prosperity Partners, a nonprofit state economic development agency, and aims to share insight into the operations of a more industrialized slice of local innovation.

The Technical.ly team thanks Delaware Prosperity Partners for their support of this project. Though reported independently, their insight, data and relationships resulted in more thorough storytelling.

You can find the original series as it appeared here: https://technical.ly/series/manufacturing-delaware/

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Manufacturing in Delaware has evolved from its mill origins. Here's why the industry is a 21st-century economic driver

Today, the state is known for shipping healthcare, life sciences and biotech products — and employing tens of thousands. Here's a look at that evolution to STEM innovation.

Modern manufacturing in Delaware goes back to 1687, when the first flour mill was opened on the Brandywine by a Swedish colonist named Tyman Stidham.

Since then, it has been one of the state's most impactful industries, and one of the things Delaware is known for — not only because of these roots, but because of the state's increasingly important central location on the East Coast, and the high-tech local talent pool.

For instance: E. I. du Pont de Nemours and Company, aka DuPont, is best known for the inventions of nylon, Lycra, Teflon and Kevlar, and is currently focused on components for smartphones, autonomous cars and smart city technology. The company was born in 1802 as a gunpowder works on a site now known as the Hagley Museum and Library. And every road or development with “Powder Mill” or “Paper Mill” in its name references a real manufacturing mill from the past — sometimes, like in Yorklyn, with old mill ruins to explore.

Today, manufacturing is the state’s second-largest traded sector after agriculture, boasting 44,000 jobs with an average salary of $60,000. Here’s how it got there.

Location, location, location

“I think our location has always been an asset, because we’re in a key spot and we had things like the Brandywine water power and other resources, so it’s a long history that has certainly evolved,” said Kurt Foreman, president and CEO of Delaware Prosperity Partnership (DPP), told Technical.ly. “Manufacturing today is a much more diverse portfolio of things, including manufacturing products in the healthcare, life sciences and biotech arenas, to chemicals to other things.”

Those other things rage from companies like New Castle-based Halosil, which makes a fogger that can be used to disinfect classrooms and buses, to Just Food For Dogs, also in New Castle, which makes high-quality pet food, to the chicken producers in Kent and Sussex counties.

Of course, there are also big companies — and employers — like Gore, Solenis and Astra Zeneca.

In our Manufacturing in Delaware series, Technical.ly has explored some of the hidden gems of the Delaware manufacturing industry. That’s included Allied Precision Contract Manufacturing, based in Middletown; Adesis, a contract manufacturing company in New Castle; and Applied Control Engineering (ACE), a Newark-based company that specializes in process control and systems integration.

They each cite their location in the First State as being essential to their success.

“Having access to the headquarters, the scientists and the R&D facilities that go along with [the proximity to companies like DuPont and Chemours] has certainly helped us,” said Ian Burns, president and one of six principle owners of ACE. “It’s also mom-and-pop-type shops where you go down 896 to Corporate Boulevard, we have a lot of customers in that office park in warehouses that you wouldn’t think there was a major manufacturer, but they’re manufacturing. The small ones need us just as much as the big ones because they don’t have an engineering staff on hand.”

(One of those smaller companies is Avkin, which manufactures wearable simulators for healthcare training in its Newport location once known as the indoor bounce house Pump It Up.)

John Lees, the owner of Allied Precision, who launched the beginnings of the company in his garage in 1991, has watched as lower New Castle County has evolved for the industry.

"You go down 896 to Corporate Boulevard, we have a lot of customers in that office park in warehouses that you wouldn’t think there was a major manufacturer, but they’re manufacturing."

IAN BURNS, APPLIED CONTROL ENGINEERING

“Twenty years ago, Middletown was quite rural, but it’s grown leaps and bounds, business-wise,” he said. “It’s been growing steady — probably too fast for its own good. It’s just convenient, and now with the bypass going through it’s even more convenient to get to Philly and Baltimore and everywhere. It’s worked out well for us.”

Pharmaceutical giant Astra Zeneca, which has Delaware locations in Wilmington and Newark, has invested over $100 million in upgrading its 570,000-square-foot Newark plant over the last seven years.

“We’ve done a facility transformation geared at efficiency,” the Newark site’s principal engineer, John Myers, told DPP. “We consolidated our packaging halls, put in a central palletizer, added a new 35,000-square-foot formulation space and focused on serialization and aggregation so we can track an individual bottle to a carton to a case to a pallet.” The site has also incorporated robotics and sustainability practices, with an aim to be carbon negative across its entire supply chain by 2030.

Tax benefits

Another draw is a trade sector focus where Delaware rewards companies for being here and selling elsewhere by reducing their tax liability. “They still pay taxes, but they’re paying on what they sell in Delaware rather than being penalized for having employees and investments in Delaware,” Foreman said. They’re being encouraged to make their product here and then sell it all over the place. That’s a tax advantage, not an incentive. More than 30 other states offer that as well, but it keeps us competitive.”

The relative lack of vacant facilities goes to show that the state has had successes in manufacturing over the past few years.

“We can always build more,” the DPP head said. “We have a strong construction and development community that can work with a company to build the kind of space that they’re looking for.”

A talent magnet

In 1999, Solenis, which evolved from companies including Hercules, Betz Laboratories, Drew and Stockhausen, made a commitment to Delaware with the help of the DPP: It received performance-based grants from the state-run Delaware Strategic Fund for job creation, job retention and capital expenditures.

“Manufacturing is an innovation industry.”

CAROLYN LEE, EXECUTIVE DIRECTOR OF THE MANUFACTURING INSTITUTE

“[DPP has] a broad mandate to grow the economy in Delaware,” Foreman said. “Our job is to help companies that are looking at Delaware, might consider looking at Delaware or are in Delaware, and one of the reasons manufacturing is one of our targets is because typically, historically, those kinds of jobs have paid well and have been jobs that usually come with benefits.”

Carolyn Lee, executive director of The Manufacturing Institute, spoke recently at the Delaware Manufacturing Conference about the industrywide skilled labor shortage — and the industry’s lagging image in the 21st century.

However, “manufacturing is an innovation industry,” she said. Today in manufacturing, jobs are likely high-paying tech and STEM jobs where a worker is far more likely to be working with augmented reality, AI or robotics — the technologies that do much of the actual assembly line work in the 21st century.

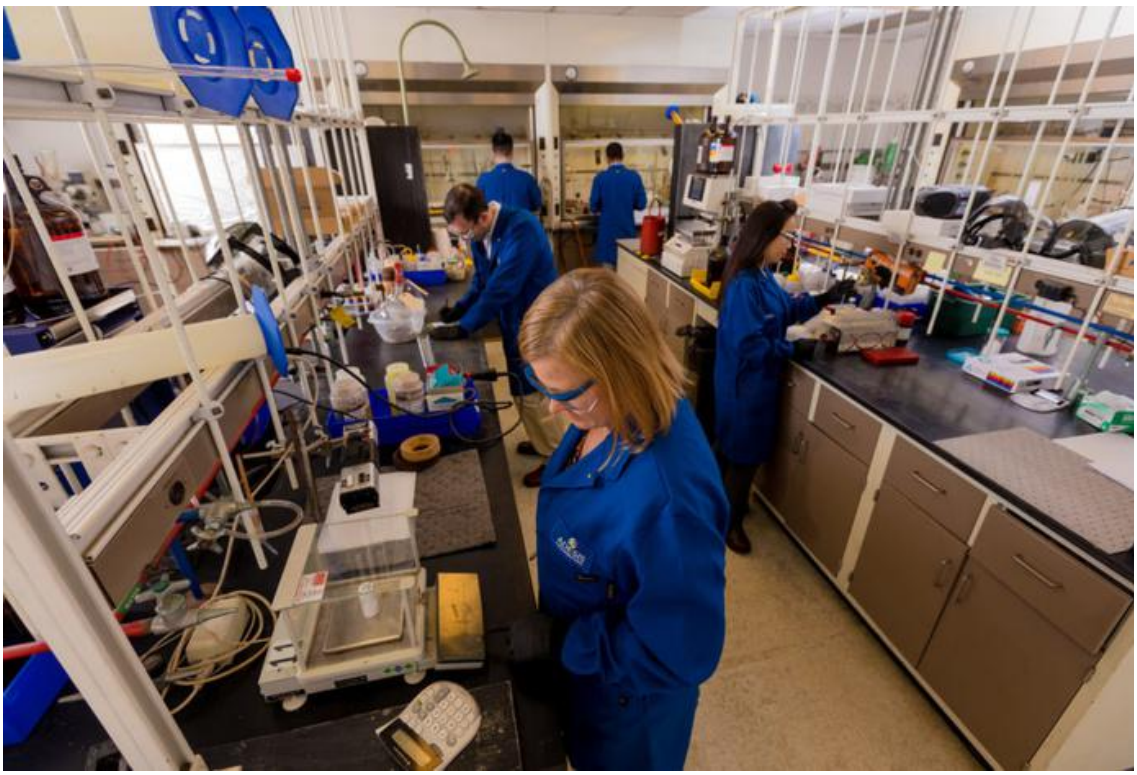
Adesis President Andrew Cottone pointed out that the talent pool in Delaware is strong, even as the industry overall struggles.

“It has a great density of scientific degrees and talent, so recruiting is easier, and it’s easy to get and keep people here with the cost of living, and all of the culture,” he said. “There are people at Adesis who went to Wilmington University or Delaware State University and, of course, University of Delaware.”

And Delaware, says Cottone, “moves at the speed of an entrepreneur” — so you can look forward to continuing growth in the sector.

Why homegrown Adesis continues to grow STEM jobs

A look at Adesis, a 127-person contract manufacturing company headquartered in New Castle.



Delaware, some say, is set to become the “next Silicon Valley” — stay with us — and thanks to an increase in remote work, a lower-than-average cost of living and average internet speeds that have been found to be 48% faster than the rest of the country, the state is becoming even more attractive to entrepreneurs.

That may be true, but just like with the Delaware fintech boom, if you don’t know where to look — i.e. the banking sector rather than scrappy startups — it might look like not a lot is happening. Delaware is its own kind of STEM and business hub that’s just different from other markets. App makers, for instance, will probably never in our time become bigger than manufacturing.

And manufacturing in Delaware is very much a STEM field.

Manufacturing is the state's second-largest traded sector, after agriculture (which includes another often-overlooked sector of the tech industry), boasting 44,000 jobs with an average salary of $60,000. Delaware is the home of DuPont, Gore and AstraZeneca. And manufacturing is much more than making widgets: It includes research and invention and innovation in industries such as chemicals, advanced materials and bioscience.

Take, for example, Adesis, a contract manufacturing company born in a predecessor form in 1991 in a 2,500-square-foot facility in Newport. It's grown quite a bit over its nearly 30 years of existence, with its number of employees nearly tripling from 46 to 127 in just the last five years.

Adesis got its name in 2005 when it was officially formed, five years after moving to its current HQ in New Castle.

"At that point, we were less than 20 employees," Adesis President Andrew Cottone told Technical.ly. "Over the next decade we grew some of our capabilities" as well as the employee count.

In the summer of 2016, one of the company's best clients, Universal Display Corporation (UDC), decided to acquire Adesis.

"We had started working with Adesis about five years before we acquired them," said Darice Liu of UDC. "By the time we acquired them, about half of their chemists were working on projects for us, so from a process chemistry standpoint it made a lot of sense for us to bring them in house. Since then, both the parent and subsidiary has grown very nicely."

That's why today, Adesis has 127 employees and two sites — the New Castle location, which has expanded from 25,000 square feet to 50,000 square feet in recent years, and the Delaware Innovation Space.

“That is working out great for us because the ‘R’ of the R&D [research and development] happens at the Innovation Space, and then we take our manufacturing and scale-up work, the ‘D’ of the R&D, over to New Castle, so it’s a great synergy,” Cottone said.

As a subsidiary of UDC, one of the main products Adesis manufactures is OLED, or organic light-emitting diode.

“OLED is a display technology — if you have an Apple watch, if you have a Samsung smartphone, they all use OLED technology on their displays,” Lui said. “One of the key aspects is that OLEDs are inherently bendable, conformable and rollable. The foldable displays you may have seen on TV, that is all due to OLED technology.”

Adesis has continued to contract with other clients as well.

“Venture capital is saying, ‘Don’t fund brick-and-mortar labs, find a reliable partner who can accelerate your science, your chemistry.’ That’s what Adesis does,” said Cottone. “That’s why contract research is important for society as a whole, because we can accelerate products to market, and it’s also important for our states’ economy, because we’re creating jobs and are seeding our manufacturing with new research and development ideas.”

The Delaware location is a natural fit for Adesis, Cottone said.

“Delaware moves at the speed of an entrepreneur,” he said. “You have the high concentration of talent. You have a real partnership with private industry and also the government.”

Adesis recruiting is often global, because many of its positions require advanced degrees in science. But the talent pool in Delaware and the nearby region is strong, too.

“It has a great density of scientific degrees and talent, so recruiting is easier, and it’s easy to get and keep people here with the cost of living, and all of the culture,” Cottone said. “There are people at Adesis who went to Wilmington University or Delaware State University and, of course, University of Delaware.”

All in all, the company's 127 employees come from 30 countries. Adesis is also a founding member of Intern Delaware, and has had five interns this year.

"If you look at our previous interns through Drexel [University] and our own recruiting, those interns go on to advanced degrees and then come back to Adesis in large part. So we're seeding the future," Cottone said. "We want to encourage STEM [education]. I saw what my wife went through in grad school, I'm a father of three daughters, so I want to empower women in STEM. I also want STEM for inner-city youth represented."

Why should a young person looking for opportunities consider Cottone's field of process chemistry?

"These are high-tech manufacturing jobs," he said. "This type of technician work is going to be sought after for a long time. Younger people … need to be told about chemistry, they need to be have conversations about science so that they know that there's great-paying jobs with great security that will keep you challenged for your career."

As Adesis continues to grow, Cottone continues to look ahead.

"I'm excited about building a business, broadening our services and markets and reaching out for philanthropy projects — donating time at libraries, soup kitchens, food drives and STEM education." And when it comes to technology, "there's a really neat research aspect called antibody drug conjugates, where Adesis is playing a role right now in, hopefully, saving people from some forms of cancer. You take the large molecule and the small molecule and it's linked together by something made at Adesis. We can do some really really difficult chemistry and do it fast."

"Why Delaware? It's about speed, it's about collaboration, it's about the ability to get things done."

This Middletown company that started small is now thriving — through COVID

John Lees started the Allied Precision Contract Manufacturing in his garage is 1991.

In Delaware, manufacturing is a $5 billion industry, with a whopping 94% of the state's global exports coming out of it.

When you think of manufacturing, you might think of factories that produce consumer products like cars. But Delaware has always been more of an industrial manufacturing state, with its top five sectors, according to the Delaware Prosperity Partnership, being pharmaceutical and medicine; agricultural chemical; control instruments; basic chemical; and other general-purpose machinery.

Allied Precision Contract Manufacturing, based in Middletown, falls into the fifth category — the company makes "widgets," often machine parts needed to build and assemble products.

John Lees, the owner of Allied Precision, started the beginnings of the company in his garage in 1991. He grew up in the Newark area and attended school in the New Castle County Vo-Tech School District.
“I knew I wanted to pursue a career in this business at a very early age,” Lees said. “Even as a little kid, I just had the desire to build stuff. My father helped in that regard — he was a machinist and engineer in his day, so I guess you could say it’s in my blood.”

In 1995, Allied Precision was formally founded, with a small shop in Newark. By the early 2000s, the company had outgrown the shop and Lees started looking for a new location.

“In the early 2000s, Middletown was booming,” he said, “so we decided to come down and set up shop down here. It turned out to be a wise thing to do.”

The facility has 15 computerized machining centers, all programmed and operated by a skilled team of 15 employees, who work in two shifts. That means there are about seven or eight people working in the large space at a time — a plus during the COVID-19 pandemic, especially since contract manufacturing companies are considered essential businesses.

“The client base that we have still needed parts during the pandemic,” he said. Those include parts needed in the medical, transportation and agriculture industries. “We ended up getting busier through the shutdown.”

In the spring, when fears of a potential ventilator shortage were at their height, Allied Precision was contracted to make component parts for ventilators.

“That’s just one of the many needs that were and still are out there,” Lees said.

While the company manufactures parts for virtually every facet of industry in the world, it does have a niche in the defense industry, manufacturing parts for final products they often aren’t privy to.

“Our orders can range from one to two parts to 20,000 to 30,000 parts,” Lees said. “We’ve got different machines that lend themselves to processing parts very efficiently.”

"Manufacturing is the backbone of what keeps the country going, and we're proud to be a part of that."

ALLIED PRECISION OWNER JOHN LEES

A high level of skill is required, which young people considering manufacturing careers can begin to develop at vo-tech high schools and via some Delaware Pathways programs like engineering.

Apprenticeships are one way to grow from high school to a career in manufacturing.

“I was fortunate as a young fellow to get a state-sponsored apprenticeship under my belt at a very high-end shop across town,” he said. “There was a number of journeymen that took me under their wings to teach me the trade, and it’s turned out to be a very valuable asset.”

In that spirit, Allied Precision sponsors youth coming out of their last year of high school to join for summertime positions.

“We expose them to different operations in the shop, just to get their feet wet so it can prepare them for engineering and/or machining occupations down the road.”

After nearly two decades based in Middletown, Lees says he’s seen an evolution that is still underway.

“Twenty years ago, Middletown was quite rural, but it’s grown leaps and bounds business-wise,” he said. “It’s been growing steady — probably too fast for its own good. It’s just convenient, and now with the bypass going through it’s even more convenient to get to Philly and Baltimore and everywhere. It’s worked out well for us.”

By way of reminiscing on the time that’s passed, some of Lees’ favorite parts wind up in a display case at the facility.

“I’ve got a whole showcase here, full of a large variety of parts,” he said. “I often say that there’s a story with every one of the parts in the case. It’s a culmination of 25-plus years of making parts for different folks and different companies around the world.

How Newark's Applied Control Engineering keeps local factories running smoothly

"We provide engineers who work in automation, and the tools that make them competitive." Here's how the company that specializes in process control and systems integration has grown over the years, and what that growth means for the state.

When some of the biggest companies that make up the First State's $5 billion manufacturing industry need support behind the scenes to keep their wheels turning, they call in some local help.

See, factories producing widgets on assembly lines are just one part of Delaware's manufacturing sector. It also includes companies that provide services to those physical manufacturers, such as research and development or engineering.

Applied Control Engineering (ACE), a Newark-based company that specializes in process control and systems integration, is one that provides engineering services.

Founded in 1991 by three former DuPont chemical engineers, the 2021 CFE Media System Integrator of the Year company has seen slow and steady growth. It acquired TransAmerican Automation, Inc. in 2005 and nowadays has offices in Delaware, Connecticut, Maryland, Massachusetts, Pennsylvania and Texas.

When Ian Burns, president and one of six principle owners of ACE, started with the company right out of college 26 years ago, it had just 10 employees. Today, it has over 130 employees, with 75 of them in Delaware. Of those, 50 work in engineering. Some are active in the community, supporting future STEM careers by volunteering at schools, judging science fairs and project-based competitions, and coaching FIRST Robotics teams.

“We provide engineers who work in automation,” he said, “and the tools that make them competitive.”

Much of the engineering ACE provides supports the computer systems in manufacturing plants’ command centers, where everything is monitored, from temperature to production speed. These systems keep the plants and their employees safe by showing any real-time potential problems, letting employees know when maintenance is needed, and creating detailed datasets that executives can parse. Here in Delaware, it’s usually a chemical, pharmaceutical, or oil and gas plant where this work is applied.

ACE has clients of all sizes. Being near huge manufacturers like DuPont and FMC has its benefits.

“Having access to the headquarters, the scientists and the R&D facilities that go along with [that proximity] has certainly helped us,” Burns said.

But the big players are only a part of the industry in Delaware:

“It’s also mom-and-pop-type shops where you go down 896 to Corporate Boulevard, we have a lot of customers in that office park in warehouses that you wouldn’t think there was a major manufacturer, but they’re manufacturing. The small ones need us just as much as the big ones because they don’t have an engineering staff on hand.”

It makes sense that small manufacturing companies open in Delaware, he said.

“We’ve got a great talent pool of both young individuals and a good workforce able to support a manufacturing environment,” Burns said. “There are lots of other manufacturers in the area, so the infrastructure to support manufacturing is here.”

Despite the skilled labor shortage that has impacted the larger industry in the state, ACE has been able to find engineers, both out of the University of Delaware and from the small pool of engineers ready move on from jobs at the bigger companies.

“Having them in the region has certainly helped us grow, because we have resources we can reach out to and hire,” Burns said.

The company has hired several engineers in Delaware already this year, and it plans to continue hiring as it continues to grow.

One of ACE’s growth areas is cybersecurity.

“Every automation system out there is a computer and is more or less connected to the internet somehow,” Burns said. “By helping on the cybersecurity side, we’re helping to prevent incidents like the attack on a water treatment plant in Oldsmar, Florida, in February.”

In that case, an attacker remotely accessed the facility’s computer system and increased the amount of sodium hydroxide, or lye, added to the water by more than 100 times before a remote supervisor intervened. No one was harmed, but it’s a reminder that cybersecurity is essential now that virtually everything is online.

“When Ian and I stared in this business, you didn’t connect these systems to anything, you had a controller, maybe a computer interface,” said Dave Erby, ACE operations manager and another principle owner of the company. “Now you have whole networks. There’s the need for data, but the other edge of the sword is that you’ve got to protect it.”

In essence, automation, which has been linked to job loss since the beginning, is also a big a job creator.

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ACE PRESIDENT IAN BURNS

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“Some of the most automation-proof jobs are in the trades in automation,” Erby said. “Automation companies are constantly expanding with their processes. Supporting manufacturing is very much a team effort, so you’ve got your mechanical contractors, your electrical contractors — those are things that are not going to go away. You can’t automate that in the future. For stable jobs that pay good wages, those are some of the best jobs to get into, I think, especially since those types of jobs don’t really require a four-year degree.”

Degree-holding engineers are also in high demand.

“We’re constantly looking for control systems engineers, engineers from electrical to mechanical to chemical that can support the automation side,” Erby said. “Manufacturing seems to be set to expand, overall, and I think Delaware is going to see that as well.”