

THE ILLINOIS MANUFACTURER

FIRST QUARTER 2019



LEADING THE CHARGE: MARK DENZLER PROMOTED
TO PRESIDENT AND CEO OF THE IMA



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Illinois Manufacturers' Association

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The Illinois Manufacturers' Association is the only statewide association dedicated exclusively to advocating, promoting and strengthening the manufacturing sector in Illinois. The IMA is the oldest and largest state manufacturing trade association in the United States, representing nearly 4,000 companies and facilities.

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GREAT THINGS TO COME

MARK DENZLER, PRESIDENT & CEO



Growing up in Decatur – a heart of the industrial sector in Illinois – gave me great appreciation for the manufacturing sector because it helped put food on our table. When I return to town, that familiar smell of soybean processing from Archer Daniels Midland and Tate & Lyle always welcomes me home and reminds me of the role of manufacturing in our economy.

I cannot begin to tell you how thrilled I am to lead the Illinois Manufacturers' Association in 2019! Manufacturing makes the world a better place every single day and one of the favorite parts of my job is visiting factories and talking with the women and men that are making great products right here in Illinois.

When I look back and see what manufacturers have accomplished in the last decade with the Internet of Things and Industry 4.0, I cannot wait to see what is in store for the future! The thought of space tourism, autonomous vehicles, augmented reality, and smart factories are no longer simply pipe dreams. They are the future.

We had a great year in 2018 but even better things are ahead in 2019! The IMA celebrated its 125th anniversary and the state's rich manufacturing legacy that included honoring the MacLean-Fogg Company as the first-ever Manufacturer of the Year.

Jim Nelson and the IMA Education Foundation continued to lead Illinois' efforts to narrow the skills gap and build a pipeline of workers for modern manufacturing. More than 200 high schools and 40 community colleges now have manufacturing programs while the ICATT apprenticeship program championed by the IMA and German-American Chamber of Commerce is paying dividends for participating companies. Hundreds of manufacturing companies opened their doors to students and the general public as part of Manufacturing Month in October.

Our great membership team, led by Cindy Tomei, expanded IMA programming and held more than four dozen programs across Illinois, allowing manufacturing leaders to network and share best practices. Forums included topics like tax reform, trade and tariffs, cybersecurity, opioids and medical marijuana, and sexual harassment in the workplace. We placed a special emphasis on education and workforce development, working alongside our partners at the Illinois Manufacturing Excellence Center (IMEC) on a series of events.

At the State Capitol, the IMA government affairs team successfully worked to extend the Research & Development tax credit, helped modernize the Telecommunication Act allowing for new 5G technology, and reduced penalties for small companies that voluntarily disclose environmental non-compliance. We worked hand-in-hand with the National Association of Manufacturers on tax reform and regulatory relief in Washington D.C. The IMA Education Foundation led the effort to pass new laws expanding apprenticeships to young men and women at age 16 while providing state funds to school districts to upgrade manufacturing and vocational education programs.

The IMA hosted 300 manufacturing leaders for our annual Business Day at the Capitol in April. Back in legislative districts, the IMA and our member companies hosted more than four dozen legislative roundtables and open houses featuring the Governor, Members of Congress, and state lawmakers. We accommodated the U.S. Ambassador to Germany on two visits while hosting Consuls General from Japan and Turkey in factories.

In the coming year, you'll see more great things from the IMA team!

We're working to re-brand the Association to better reflect a modern manufacturing trade association and the IMA will be conducting a new economic impact study touting the benefits of the manufacturing sector in Illinois. This will provide great ammunition as we advocate for more pro-jobs and pro-growth policies at the State Capitol and we'll unveil new communications, technology, and tools to tell the story.

The IMA will be significantly increasing our programs and services across the entire state and working with our partner organizations like IMEC, local chambers, and economic development corporations. I'm excited about the potential of a new IMA Health Care Plan that we may be able to offer our small companies later this year thanks to a change in federal law.

Addressing the education and workforce challenge will remain a top priority. Our plans are to continue growing the number of Manufacturing Day events and making sure that students, parents, teachers, and counselors understand the promise of manufacturing and the goods jobs that it provides.

The IMA's value proposition is strong and will continue to increase in the coming year. We know that your time and resources are precious so we appreciate your investment in the Association. I'm looking forward to leading the IMA and I hope to see you at an IMA event soon! ♦

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Q&A WITH GOVERNOR JB PRITZKER

JB PRITZKER

Illinois voters recently elected Democrat JB Pritzker as the 43rd Governor in Illinois. Pritzker and Juliana Stratton, the first African-American Lt. Governor in the state's two hundred year history, have a great opportunity to reform Illinois and address many of the state's formidable challenges. The IMA sat down recently with Governor Pritzker who weighed in on his business background while sharing his view of manufacturing, top goals for Illinois, a capital infrastructure plan, and plans for addressing the workforce gap.



What are your top goals as Governor?

As governor, my top three priorities will be creating jobs throughout the state, expanding healthcare to all Illinois families, and investing in education so every child gets the quality education they deserve. It is critical that we build up our state and provide people with job opportunities after years of instability and uncertainty. In addition to attracting larger companies, Illinois must invest in the ecosystem for small businesses and start-ups that are the backbone of our economy and employ millions of people. That includes revitalizing the network of Small Business Development Centers (SBDCs) across the state, expanding access to capital, and creating and enhancing new business incubators and accelerators. Even with our state's many challenges, we have extraordinarily attractive features that are worth extolling the virtues of, and as governor, I will be our state's best Chief Marketing Officer.

The manufacturing sector employs 580,000 workers and contributes the single largest share of the state's GDP. What message would you like to share with manufacturing leaders about how you can help the industrial sector grow and prosper?

Creating jobs and restoring economic stability and vibrancy to the hardest hit communities across Illinois is a top priority of my administration. During the campaign, I put forward a comprehensive job creation plan that focuses on attracting and building up small businesses, building infrastructure, such as statewide high-speed broadband internet connectivity, investing in higher education, nurturing our agricultural economy, and advanced manufacturing. Having engaged in building up the startup environment in Chicago, I believe strongly in Illinoisans' creativity and entrepreneurial drive as the biggest and best creator of new jobs for Illinois.



Tell us about your experience in business and innovation, and especially your role with 1871? Research & development activities are crucial for the manufacturing sector that use ingenuity and innovation.

Not that long ago, Illinois was way behind when it came to creating technology jobs – and we were missing out on the high-paying jobs those businesses create. So I worked for almost two decades to turn Chicago into a leader in technology business development. I'm proud of my work spearheading the effort to build up the state's technology ecosystem, which has made Chicago one of the top ten startup hubs in the world. In addition to helping create the Illinois Venture Capital Association, Excelerate (now Techstars Chicago), Chicagoland Entrepreneurial Center, and ChicagoNEXT, I founded 1871, a non-profit small business incubator. 1871 brought together educational and civic resources to support startup businesses and has already created more than 7,000 good paying jobs in Illinois. More than 500 businesses do work there. Illinois was named one of the top ten technology startup hubs in the world, and 1871 was named the leading business incubator in the world.

Manufacturers depend on a strong transportation system and we have not had a capital infrastructure bill for many years. Do you anticipate passage of a capital bill to rebuild our roads and bridges?

Illinois is the supply chain hub of the na-

tion, but we haven't had a capital bill in ten years. We must maintain our infrastructure to remain the leader, and as governor, I'll prioritize a comprehensive 21st Century Capital Bill to rebuild our roads, bridges, and waterways. The cost of not doing anything to upgrade the state's infrastructure is too great for our state and future. I'll work with Republicans and Democrats in the General Assembly to determine the best revenue source to help us fund an infrastructure capital bill as well as federal lawmakers to ensure Illinois secures as many federal dollars as possible for capital projects to rebuild Illinois.

The shortage of manufacturing workers and the skills gap is a major challenge and many schools have gone away from vocational education. How does your Administration plan to address the workforce development question that impacts manufacturers and high tech industries?

I want to expand vocational training and add computer coding classes to our high school curriculum. Once our young people graduate high school, it is important that we invest in their continued success by properly funding higher education. Illinois' universities and community colleges are hubs of economic growth, workforce training, and innovation. I will guarantee they get the investments they need by empowering community colleges, expanding youth apprenticeship programs, and supporting university-based incubators and start-ups.

We also need to focus on affordability. Students who choose to go to college should be able to graduate without strapping themselves with debt for the rest of their lives. And those who choose not to go to college should have access to quality vocational training so they can graduate and build careers. By partnering with the private sector, including in writing the curriculum to help retrain our workers, we can build the workforce of tomorrow.

What do you do to relax? We've also just seen an expensive and divisive election – tell us something about yourself that we may not know!

I loved ending this long campaign season by spending time with my family. I've been married to my wife MK for 25 years. She grew up in Vermillion, South Dakota where her father was a professor and administrator at the University of South Dakota. He previously had been chief of staff for popular South Dakota Governor, Dick Kneip. MK's mother served in the South Dakota State Senate. MK worked for Governor Bob Kerrey of Nebraska and for U.S. Senator Tom Daschle of South Dakota before we met on Capitol Hill when I was working for U.S. Senator Alan Dixon. MK is my partner in everything in life. We have two wonderful kids, Teddi (16) and Donny (14). Teddi is an athlete and an avid student of social justice, and Donny is a football fanatic and a math whiz. ♦

A NEW YEAR, A NEW SKILLS GAP, A SHRINKING WORKFORCE

JIM NELSON



The Center for Governmental Studies at Northern Illinois University recently released a report that shows evidence of a demographic transition in Illinois and across the nation. That transition means that by 2025, the total available workforce in Illinois could be nearly 350,000 fewer than today.

The study used data from the Illinois Department of Public Health and looked at the state's total population beginning in 2010 and projected out the three major age groups through 2025 (Under 20, 20 to 64 and 65 and older). Looking at the working age population, those 20 to 64, in 2010 there were 7,737,825 men and women in the age group. By 2025, that number will shrink by 4 percent to 7,400,557. While many think the shrinkage will be short-lived and made up over time by those in the under 20 age group, the Department's records also show that the population of those under 20 will drop by 3 percent; from 3,489,224 to 3,395,020. That's a loss of more than 94,000 potential workers entering the workforce. To round out the study, the population of those 65 and older will actually increase from 1,614,931 to 2,468,084, a whopping 53 percent increase. So, what's a manufacturer – or any employer for that matter – to do?

Frankly, the options are limited:

1. Employers could entice their existing workforce to remain working well beyond normal retirement age. However, older, more experienced workers are also more expensive to the payroll and convincing them to keep working would likely mean paying a premium in wages and/or benefits. Over time, this will lead to wage inflation that could trigger inflationary pressures.

2. Because there will be fewer workers in the labor force, the competition for talent will become greater. Employers will vie for talent with few key ingredients at their disposal realistically leaving higher entry wages, higher annual increases to keep talent and enhanced benefit packages to keep talent from migrating elsewhere. Moreover, there will be significant increases in employee-poaching from other companies; a practice that while frowned upon, is recognized as a "necessary evil". Poaching will also lead to wage inflation and greater overall costs.

3. There is little doubt employers will have to make up for talent shortages by expanding reliance on automation. This will require significant outlays for capital acquisition of new digital machinery and systems. While these expenditures can be viewed as one-time costs, it does signal a quickening demise of manufacturing with manual machinery and possibly the end of the small job shops as we know them. However, increasing reliance on automated systems also brings with it a new challenge...a new skills gap. Nearly 20 percent of US manufacturing has already made the transition to digital manufacturing (aka: Industry 4.0, Internet of Things, Industrial Internet of Things and so forth) and the skills required to operate in this nascent environment have increased both the entry-level knowledge and skills needed by new employees and will mandate retraining incumbent employees. While some may believe this isn't a big deal, it's important to note that not one Illinois secondary or post-secondary school is teaching digital manufacturing, and more than one faculty member has confided they themselves don't possess the knowledge or skills to do so.

The best solution available to every manufacturer is to create a comprehensive workforce strategy for your company, and a strategy that relies on engaging talented men and women earlier. Employers should take a longer view of workforce needs. The days of finding a quality replacement for someone retiring in the next 30 days are over. Companies are going to have to look at workforce needs over a five-year window to assure production continues uninterrupted. This is where Registered Apprenticeships really become a useful tool for manufacturers. Because Registered Apprenticeships allow companies to pay a training wage, which is often far less than normal starting salaries, using an apprenticeship approach allows employers to custom train its workforce at a lower overall cost and mold the workers it wants from the outset. The mix of on-the-job training aligned to related technical instruction guarantees that employees are ready to go as older workers transition to retirement.

The ICATT Apprenticeship Program is one Registered Apprenticeship program that features a prepared on-the-job training plan that can be easily adapted and customized for the unique needs of every manufacturer. The IMA partners with the German-American Chamber of Commerce as the leaders of the ICATT Apprenticeship Program and acts as the intermediary so that employers don't have to engage with the federal Labor Department bureaucracy. ICATT programs are all grounded to industry standards and employers who are part of the ICATT program have all returned for second and third apprentices according to their individual company needs.

In the years ahead, manufacturers will be facing unprecedented challenges to assure that they have the high-quality workforce necessary to remain competitive and relevant in the ever-changing world of digital manufacturing. Looking long-term at meeting workforce needs in an environment of shrinking available talent and a new and growing skills gap will mean changes in how companies operate, and the sooner those changes begin, the better for our industry. ♦

Jim Nelson is Vice President of External Affairs and Executive Director of the IMA Education Foundation.

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CYBERSECURITY: ONE PIECE OF A COMPREHENSIVE INFORMATION SECURITY PROGRAM

IMEC

Cybersecurity has continued to be a hot topic within manufacturing over the past several years, especially for the Defense supply chain as the Federal Government has increased their emphasis on addressing threats to the security of information. In December 2015, the U.S. Department of Defense (DOD) released a rule to the Defense Federal Acquisition Regulation Supplement (DFARS) that required government contractors to implement the requirements of National Institutes of Standards and Technology (NIST) Special Publication (SP) 800-171 by December 31, 2017. Organizations at all levels of industry found themselves tasked with a new form of security compliance focused on the handling and control of information in an area of their operations which has been, historically, taken for granted. While the initial level of attention allocated to this new requirement was, arguably, less than expected, as the deadline fast approached we observed a marked increase in efforts to achieve, or develop a plan to achieve, compliance.

The requirements of NIST SP 800-171, superseded in June of 2018 by NIST SP 800-171 Revision 1, are intended to protect the confidentiality of Controlled Unclassified Information (CUI) in non-federal organizations and all levels of their supply chains. A failure to meet these requirements, including the development of a supporting System Security Plan (SSP) and Plan of Actions & Milestones (POA&M) may result in the loss of supply contracts and liability for the organization should an escape of CUI occur internally or through their suppliers and service providers. While organization doing business with the federal government should expect these types of requirements to increase over time, it is good practice for all organizations (manufacturers included) to protect information they have been provided during business activities.

While cybersecurity, and the external threats commonly associated with it such as Hacking, Spyware, Ransomware and

Malware, should be front-of-mind topics for all organizations, it is also important to realize that traditional cybersecurity is just one piece of an effective Information Security Program. An organization's exposure to information vulnerabilities extends well beyond the interconnected world. A Risk-Based comprehensive Information Security program also includes:

- **Privacy:** Adequately protecting the information and identity of your employees, customers, suppliers and other resource providers. Ensuring that controls, systems and procedures are in place to restrict access to this information to only those who absolutely need it and include procedures for the archiving and purging of excess, expired or unnecessary information.

- **Physical Security:** Protecting, isolating, limiting and monitoring access to information stores, access points and any interconnected devices. Securing data storage, access points and other means of physical access to unencrypted information.

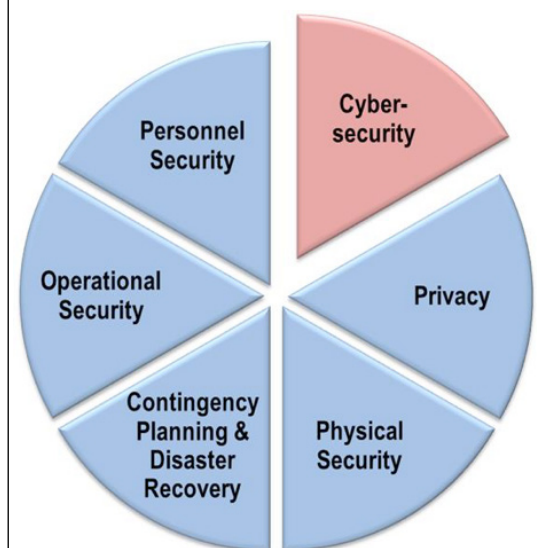
- **Contingency Planning & Disaster Recovery:** Developing, testing and deploying the hardware, tools and processes needed to quickly and effectively recover information in event of a catastrophe. Speed to recovery from an information event can be the difference between recovery and loss of operations.

- **Operational Security:** Protecting private business intentions, processes and media response channels. Limiting the access to strategic and market differentiating information. Developing an informational response plan to quickly and effectively address any potentially adverse information regarding the organization.

- **Personnel Security:** Implementing background checks for staff and service providers with access to information as well as behavior monitoring to proactively detect exposure risks. The depth and comprehensiveness of these checks should be in alignment with the sensitivity and strategic importance of the information to be accessed. Implement the tools and pro-

cedure necessary to have confidence that those invited to access information are focused on using it for the good of the organization and its stakeholders. Monitor activity at all levels and implement triggers and warnings should information flow or user behaviors vary beyond normal expectations. Test all levels of the organization for vulnerabilities, including social engineering, to discover and address potential exposure points.

Fortunately, manufacturers have a variety of continually maturing tools, templates, and documented Best Practices, along with the shared experiences of other organizations available to them to assist in their pursuit of comprehensive organizational security, starting with cybersecurity. The first step is to assess and evaluate the viability of one's existing cybersecurity protections and tools. From this baseline, a planned and measured approach to addressing, closing and testing each finding may then be undertaken. Ultimately, taking protective steps can decrease the risk of exposure and reduce the time and resources spent on a security breach, should one occur. ♦





WORKING HARD AND TAKING RISKS: RAHCO RUBBER'S JOURNEY TO SUCCESS

To some, being given the reins to a fledgling business at 24 years old sounds like a recipe for disaster. For Steve Anton, CEO of Rahco Rubber in Des Plaines, it was a chance for success.

"You have to stick your neck out a little. You need to test yourself and what you're capable of," Steve said. It has been through hard work, going the extra mile, and taking risks that the Anton family has built a business with over 100 employees that manufactures custom-molded and custom-formulated rubber parts, components, and seals for OEMs across the nation.

From the components found in braking systems of major motorcycle OEMs to the critical diaphragm and valves in commercial plumbing applications or an aeration membrane for a waste water treatment system, Rahco Rubber's components are not only essential to the products we use, but are essential to the function of our everyday lives.

Working in unison with customers across many industries, the team at Rahco Rubber designs formulations and manufacturing processes that deliver robust long-term solutions. Raw material selection, flash-less mold and low waste mold design, scrap mitigating practices, and proposing geometry enhancements for manufacturability are all merit-driven approaches that ultimately support the sustainable outcome of such highly-engineered parts.

"Few OEMs have the time, internal expertise, or resources needed, especially when designing, enhancing or optimizing parts for today's lifestyle demands," Steve said. "While we serve that need, it's Rahco's collaborative approach, quality standards and value-added services that make us a true partner to customers—and that's a title we didn't earn overnight."

Though Rahco Rubber has a large presence today, the company's beginnings were small.

Steve's father, Bill Anton, was working for Fidelitone in 1967. At the time, it was the largest manufacturer of phonograph needles in the world. The needles were assembled with a plastic component and highly-engineered rubber, which Fidelitone decided to produce in-house after its supplier couldn't meet the engineering requirements. The small team of engineers, a rubber chemist and a few presses expanded the business and even supplied parts to other industries over time. However, the company wasn't turning a profit.

**"IF YOU TREAT PEOPLE DIFFERENTLY,
YOU HAVE A CHANCE AT GETTING THEIR
BEST EFFORTS, THEIR BEST CREATIVITY,
AND SO MUCH MORE. YOU JUST CAN'T
PUT A PRICE TAG ON THAT."** -STEVE ANTON

"The president of Fidelitone, who was my dad's close friend, told him to get rid of all the rubber activity and sell all the equipment," Steve said. But Bill instead saw an opportunity in custom molding, high-precision rubber and the many applications. He decided to take a risk and offered to purchase the equipment to start his own operation—and not only did his boss agree, but joined in the venture.

"It was Rutherford, Anton, and Hudson—the 'RAH' in Rahco—and Rutherford served as the president of the company," Steve said.

By 1976, however, something needed to change if the business was to flourish. Bill Anton turned to his 24-year-old son and offered him the



Steve Anton shows off a boot used in center pivots and lateral move machines in a farming irrigation system.



Jimmy Anton and Vince Williamson (Quality Control) make sure to get a few laughs in while on the job.



An employee measures chemicals by weight in order to make precisely-manufactured rubber compounds for different products.

company. "I was a top salesman at a computer company at the time, and when my dad asked me if I wanted to help out, I initially said no," Steve said. "Somehow my he convinced me to come into the business. And here I am 43 years later!"

With only three employees and a few presses, Steve began his decades-long work of transforming Rahco Rubber as a leading manufacturer.

Today, the entire family is actively involved in every aspect of the business. Alongside his brothers Jimmy and Jack — who collectively represent 116 years of experience at Rahco Rubber — the Antons continue to lead the business as it grows and evolves in the 21st century.

"I don't want to do things the same way every day. I don't want to do the same things we were doing 25 years ago," Steve said. "If we don't embrace the future and learn how to do things better, faster, and with less scrap, somebody else will."

With the constantly-changing landscape of manufacturing, there is a critical need to invest in technology, resources, and workforce to ensure relevance and to remain competitive in the future.

Another challenge the Anton family tackles is providing design concepts and molding methods that produce little to no waste. "As an environmental advocate, Rahco works diligently to reduce its carbon footprint and landfill impact," Jack Anton explained. "Not creating waste via flashless-wasteless precision molding, using dry ice pneumatic blasting for cleaning and cryogenically trimming components to meet customers' requirements are everyday examples of how we 'walk the talk.'"

Working one-on-one with customers, the team at Rahco Rubber formulates rubber compounds specific to the tasks the parts will perform and analyzes the production designs to minimize residual waste

as much as possible.

While working to modernize the products and processes, Rahco always keeps the same goals in the forefront: work hard, go the extra mile, and take care of your people.

"We've always cared about our workers. Some people have been here 30, even 40 years. We get to know their families and see their kids grow up," Steve said. "We treat them with respect and dignity in everything that they do. People need to know they are important and valued."

Jack Anton recalled an instance where a newly hired employee couldn't afford to attend his father's funeral: "He had been working at Rahco for only a few months, and he didn't have enough money saved to buy the plane ticket back to Mexico. Rahco gave him time off work and helped buy tickets for him and his family to go to the funeral. That's real commitment to employees."

"You're only as good as your people," Steve chimed in. "If you don't treat people the right way, they'll only give you what it takes to make things ok," he noted. "But if you treat people differently, you have a chance of getting their best efforts, their best creativity, and so much more. You just can't put a price tag on that."

With such deep roots, Steve sees Rahco staying in Illinois forever.

"We grew this business from basically nothing. This is our history. Illinois is a very challenging place to be, but we would never consider going anywhere else. This is where our people and our intellectual property and our hearts are," Steve said.

Congratulations to Rahco Rubber and the Anton family for over 50 years of working hard and taking risks in order to engineer components of a higher quality and efficiency. The IMA is proud to have them manufacturing in Illinois. ♦

THE BIGGEST ENERGY WASTERS IN INDUSTRIAL FACILITIES, AND WHAT TO DO ABOUT THEM

CONSTELLATION



Many business leaders might consider energy costs as nothing more than an operational requirement. This causes their organizations to pay their monthly bills, groan and complete the cycle again in another month. What these businesses don't realize is that you have much more control over your energy costs than you might think.

According to a recent report from the Energy Information Administration, industrial facilities accounted for 60 percent of all energy consumed in the United States last year. The impact of your energy consumption could seem like a monthly expense, but the waste adds up quickly and could be impacting your bottom line.

By recognizing the greatest energy wasters in your facilities and adjusting your energy management strategy, your business will be able to see results. By creating a more effective energy strategy and working to increase efficiency, your business could realize sustainable, long-term success that benefits your employees, customers and community.

- **HVAC:** The need to heat, cool and ventilate your industrial facilities plays a critical role in consumption. Last year, industrial facilities required 69 billion kWh to meet their HVAC needs. But did you know that poorly performing air compressors alone contributed to \$3.2 billion of unnecessary HVAC-related energy expenses? Conducting an HVAC audit can help determine where your HVAC systems could be burning up your budget.

- **Lighting:** The EIA found that facility

lighting required almost 52 billion kWh of electricity last year. While you may not be able to operate with the lights off, lighting system upgrades are among the simplest fixes you can make at your facility today. Low cost LEDs are now competitive with traditional incandescent bulbs. These long-lasting, high efficiency bulbs will curb your utility bills and decrease maintenance expenses. Combining these bulbs with a smart lighting system that can respond automatically to facility conditions can also cut lighting-related energy waste.

- **Process heating:** In many industrial manufacturing settings, heat must be supplied for the forging of various materials and commodities. In 2016, the EIA found that process heating required nearly 94 billion kWh of electricity to meet demand. This accounts for roughly 17 percent of all industrial usage. The Department of Energy has put forth a guideline for improving process heating systems. The recommendations can be applied in one year and reach a standard payback within two years.

- **Electrochemical processes:** Some materials cannot be created through simple process heating, which may require a more complex electrochemical reaction. Last year, electrochemical processes in United States facilities required almost 93 billion kWh. That is almost the same amount required for process heating. Recent research into these processes has shown a promise for turning waste heat back into energy. Through a renewable energy system that leverages electrochemical waste, industrial facilities may be able to create a high-effi-

cient loop that powers itself.

- **Machinery Use:** The greatest contributor to industrial energy consumption is the energy required to power machinery. Requiring 426 billion kWh to meet demand, machine drive accounts for more than HVAC, lighting, process heating and electrochemical processes combined. However, it is also one of the easiest costs to control. Energy prices change over the day, week, month and year. As a result, facilities can capitalize on these fluctuations by operating heavy machinery in off peak hours when electricity is offered at a lower cost. Changing your workflows and operational processes might seem challenging, but there is a lot of potential for cutting energy waste.

By analyzing where your business' energy costs are coming from and taking a positive step to correct them, you are already one step ahead of many other businesses when it comes to cutting energy costs. We believe it is important to consider high energy costs as an opportunity to rethink your overall energy strategy.

Constellation offers products and tools that will help your business do just that. Beyond our products, Constellation's Efficiency Made Easy® (EME), an award-winning efficiency and sustainability program, can help you make many of the efficiency updates discussed above with no upfront capital. Learn more about EME and more products and tools that could help your business on constellation.com. ♦

Constellation – 24/7 access to billing and energy usage data

HOW MANUFACTURERS CAN AVOID STATE TAX PITFALLS

DHJJ

Manufacturers in Illinois need to understand where state tax pitfalls may occur and keep their processes in order so they don't have "state tax surprises" that can come up during a state tax audit or a state questionnaire. Finding out you missed something during an audit can lead to a large amount of tax due since the error can cover a four-year period. Likewise, finding out you should have been filing tax returns in another state after they contact you can lead to a large tax liability. State tax laws are loaded with these "pitfalls." Below are some of the most common tax pitfalls for manufacturers, and how to avoid them.

Common State Tax Errors and Omissions

- **Customer Resale Certificates:** Even if your business does not sell to the end user, Illinois will require that you have a resale certificate for each customer within the state. If there is a "Ship to" address in Illinois, you will need to ensure these certificates are current (no more than three years old).

- **Blanket Resale Exemption:** You probably issue a blanket resale certificate to vendors since everything you buy from a vendor is for resale. However, this stops working well when your business purchases something taxable, but no tax is charged. Your business now has a sale and use tax due on the transaction.

- **Machinery and Equipment Exemption:** A common scenario that comes up in an audit is a company not getting charged sales tax from a vendor for items such as supplies, lubricants, and items used in a production area. While equipment used to produce a product is generally exempt from sales tax, these other items are generally taxable. Sales tax will be due to the state.

- **Equipment Purchases:** During an audit, the state looks at all equipment purchases to see if sales tax was paid properly. Therefore, your company should always review all equipment purchases carefully for sales tax compliance. Be careful on equipment used in the shop. For example, packaging equipment and

fork lifts are taxable in some cases, but in others, they are exempt from sales tax. You must find out how the equipment is used to determine if sales tax should be paid.

- **Out-of-State Purchases:** The most common error during an audit is the purchase of taxable items from an out-of-state vendor who does not charge Illinois sales tax. A company must self-assess a use tax if the vendor does not properly charge sales tax to the company. Every audit tests for this in great detail. Since many manufacturers do not regularly file sales and use tax forms, they completely miss this tax and are blindsided by a large tax liability. Common items include shop supplies, engineering supplies, office supplies, computer equipment, software, and equipment in the shop that is not machinery, etc.

- **Installation Service:** A common omission for state tax occurs during installation services. If your company installs and trains on site, you probably have an income tax filing requirement in the states that you provide these services. This is certainly the case if your employees do the installation and can also be the case if a company uses a third party to handle the installation.

- **Delivery:** Does your company have delivery trucks? Do you sometimes deliver

to customers outside of Illinois? If the answers are "Yes," your company probably has an income tax filing requirement in every state to which you deliver. The interstate commerce exemption only applies if you use an independent carrier.

- **States with a Gross Receipts Tax:** Did you know many states have taxes that are based on gross sales? States such as Ohio, Washington, Tennessee and Texas have a tax that is simply based on having sales in the state. This is probably the number one "surprise" in the state tax area. A company has no employees in a state and no contact with a state and to their amazement may still have a filing requirement, and a large amount of tax due!

Other Tax Changes to Consider

The Tax Cuts and Jobs Act made significant changes to tax laws that impact manufacturers, both from a cost perspective and a growth perspective. Some of these changes don't last forever. It is important to manufacturing executives to understand the different implications as you make decisions impacting investments and growth. It is time for executives to take a look at current strategies and ensure your manufacturing company is taking advantage of the new provisions before time runs out. ♦



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TODAY'S TECH IS THE KEY TO THE FUTURE

EY



Today's transformative age is affecting how manufacturing companies are balancing short-term needs with long-term strategies. Technology plays an important role in that balancing act, but leading manufacturers are more likely to perceive it as an enabler rather than the end-all, be-all destination. Technology can help optimize production quality and capacity, monitor machines for proactive repairs, and develop a more agile and responsive supply chain.

And not all technology needs to be developed in-house. Many companies are seeking to augment their capabilities through joint ventures and acquisitions. In fact, 73 percent of industrials companies surveyed by the EY Global Capital Confidence Barometer are placing portfolio transformation at the top of their

BY GENERATING OPTIMAL
PRODUCTIVITY AND
EFFICIENCY VIA THE "SMART
FLOORS" OF TODAY'S
MANUFACTURING PLANTS,
MANUFACTURERS CAN BE
MORE COMPETITIVE OR
RECOGNIZE A BIGGER
FINANCIAL RETURN.

boardroom agenda. Companies are reviewing their portfolios more frequently to get ahead of threats from digitally-enabled competitors and startups. Their focus is on building a digital ecosystem, a key factor in growing automation and innovation.

Transitioning to a digital ecosystem is no longer optional for Illinois manufacturers. Technology incubator mHUB provides resources and mentors for early stage innovators in physical product development and packaging. Artificial intelligence (AI) software company Uptake Technologies is helping companies in asset-centric heavy industries use data generated by the Internet of Things (IoT) to improve operations. And a global fabricating machinery manufacturer now has an Illinois smart factory to demonstrate how fully networked production

can be used by sheet metal workers to integrate people, machines, automation and software.

Smarter Factories are the Future

For manufacturing, the future lies within the connected plant. Equipped with smart floors and IoT-enabled devices, the “cognitive plant” of today is highly automated and very different in appearance from the manufacturing facilities of decades past. Enabled by AI, robotics and augmented reality, nearly everything in the plant — from the machines creating the product to the tools used for maintenance — feeds efficiency and enhances productivity.

The manufacturing plant of today has digitized virtually every aspect of how manufacturing actions are executed. Production quality, capacity and productivity are simultaneously monitored and analyzed. From that output, data analytics on machines’ trends and performance begin to predict downtime, outages and anticipated repairs that might otherwise cause further delays or other problems for the manufacturer.

The highly optimized technology in factories today supports and enhances business fundamentals. By generating optimal productivity and efficiency via the “smart floors” of today’s manufacturing plants, manufacturers can be more competitive or recognize a bigger financial return. When using technology to improve production, it’s necessary to understand the competitive landscape, where disruption can surface and a competitor could gain an advantage. While this is often easier said than done, it is today’s reality.

Disruption is Not a Product

To prepare for the future, manufacturers must use technology to disrupt — or risk being disrupted. Manufacturers do not become disrupters by producing an excellent end product. Factors such as costs, sales and how a product gets to market are the vehicles of disruption among manufacturers — and technology is at the root of delivering efficiencies in costs, sales and production.

When seeking to disrupt, manufacturers should consider three key questions:

1. How can I meet changing customer demands?
2. How can cost, capacity and production improve?
3. In what ways can my business be disrupted — by competitors with a more integrated manufacturing process, custom production, better inventory management or 3D-printed materials?

While the answers to these questions may vary across industries, below are a few broad-based strategies to help companies move toward the future of manufacturing.

Leverage the wealth of data at your disposal. Manufacturers must maximize efficiency and plan ahead. It’s necessary to continuously analyze and understand the state of the factory in order to anticipate and improve. For example, instead of waiting for a machine to break, workers can anticipate the “break” using data and trends to order a part ahead of time, resulting in a shorter shutdown period. By making a factory more data-driven and reliable, manufacturers facilitate continuous improvement.

Data-driven decision making offers quantitative information to reveal where things need to be changed. People are an important part of this process — they can interpret the data, embrace digital and determine where it needs to be applied.

Focus on customer outcomes. While the digitization of the factory enables multiple capabilities, it’s also the pathway to the next level of innovation. As customers focus more on outcomes, it is critical that manufacturers have the same mindset. Customers are purchasing a specific outcome: a sustainable, systemic level of performance delivered by a product. At the end of the day, customers buy from the manufacturer that can best deliver the desired outcome.

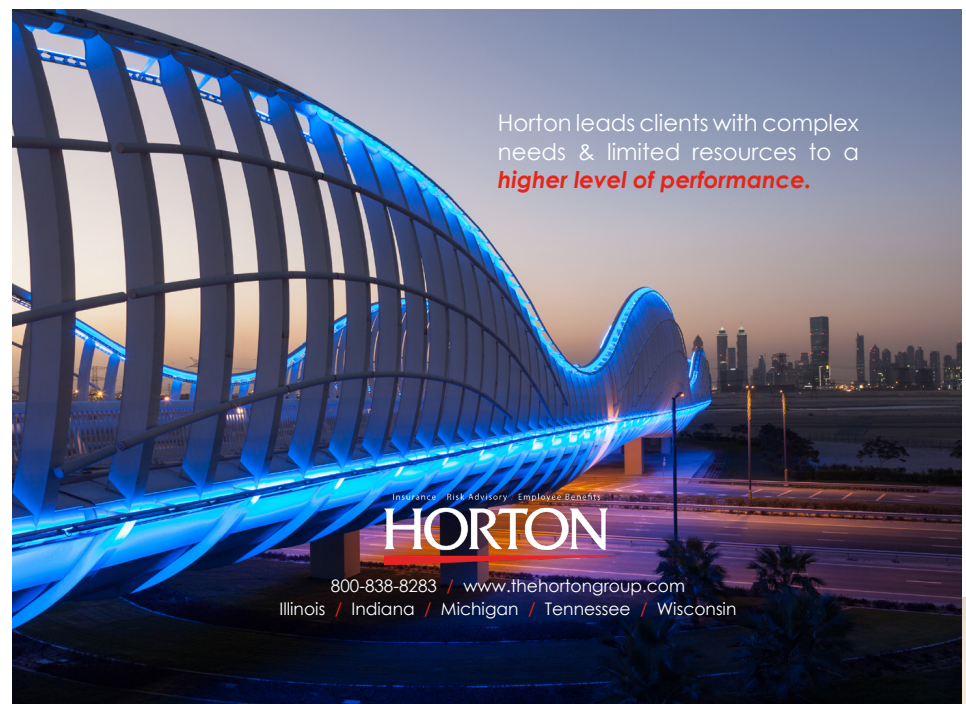
Sometimes that outcome can only be delivered by new technology, such as the recently-produced 3D-printed titanium

wheel. While only a concept for now, the wheel introduces new materials, design capabilities, performance and mass customization opportunities to customers. In time, this could be highly disruptive to manufacturers in the high-end wheel market.

Explore emerging technologies. To prepare for and develop the manufacturing plant of the future, manufacturers need to monitor and learn about the latest technological innovations, even when a specific use for manufacturing isn’t immediately clear.

Some of the uses for blockchain technology in manufacturing are only now surfacing. The technology can be used effectively in production and processes in the global trade arena, where there may be restrictions around sourcing parts or materials from various countries. The technology can help protect the integrity of the supply chain by using raw materials sourced without violating any regulations, as well as minimize safety issues caused by a product recall and due to an optimized, highly trackable supply chain, it can also help companies guard against counterfeiting.

Amid the digital age and economic growth, manufacturers can design the plant of the future by embracing today’s advancements in technology, investing in smart manufacturing processes, improving customer outcomes and maximizing efficiency. The market leaders will be those who embrace change and deliver innovative ideas faster than their competitors. ♦



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GETTING TO KNOW THE NEW CEO

AN INTERVIEW WITH MARK DENZLER

Tell us about your journey with the IMA.

I'm currently on my second tour of duty at the IMA! I worked for the IMA for four years in the late 1990s and early 2000's before leaving for a position at State Farm Insurance. Greg recruited me back to the IMA in 2006 and I've been here ever since. Manufacturers are the best of the best and it's an honor to represent them every day.

As Bill Hickey (former IMA chair) likes to say, "manufacturing creates wealth in this nation."

What do you predict for the future of Illinois manufacturing?

Manufacturing matters – our sector makes the world a better place every single day. I'm truly excited about the future of manufacturing and how fast our sector is evolving. I cannot wait to see what the future holds. It's hard to imagine that the iPhone didn't exist 12 years ago and its now in its tenth generation. Illinois manufacturers are working to eliminate Hepatitis and other diseases. A Rockford manufacturer is machining parts for the Orion spacecraft that will take man further into space than ever before.

One of the favorite parts of my job is visiting member companies and seeing all of the cool things that are made in Illinois. Manufacturers have an awesome story to tell. Our members are making life-saving products, feeding the world, powering our homes and businesses, transporting people around the world and into space, building our infrastructure, and helping secure our nation's defense.

We need to share our manufacturing success story with policymakers, the media, and the general public. Most importantly, we need to highlight the promise of manufacturing and its high-paying jobs for students, parents, teachers, and counselors. Today's students are the future of our industry and I cannot wait to see what they accomplish.

And what are some of the struggles Illinois manufacturers may face?

When I talk to companies, the single largest challenge is finding qualified workers especially with record low unemploy-

ment. Nationally, the U.S. Department of Labor reported in October that more than one half million manufacturing jobs are unfilled across the country. Illinois will need to replace 300,000 workers over the next 10 to 15 years as baby boomers retire. The IMA Education Foundation, led by Jim Nelson, is leading the charge to address the skills gap but it will take a comprehensive and sustained approach. I'm proud of the job that Jim and his team are doing with apprenticeships, Manufacturing Day events, and implementing manufacturing skills standards in our schools.

The trade issue is also challenging for many companies. Ninety-five percent of the world's consumers live outside of the United States so trade is critically important to the manufacturing and agricultural sectors. However, companies have also been harmed by unfair trade practices from many countries including China so there have to be clear ground rules. American manufacturers can compete and win against anybody in the world on a level playing field.

Manufacturers are also facing more challenges at the local level of government particularly in Chicago and Cook County where elected leaders often look at them as the golden goose to be plucked.

What are some of the accomplishments you're most proud of with the IMA?

I'm proud to represent manufacturing companies and the wonderful products that are made across Illinois every day. IMA members are innovative and entrepreneurial and amazingly cool!

During my tenure, the IMA team has worked on a host of issues from large policy issues like tax reform an environmental regulation to smaller, industry-specific issues that only impact a portion of our membership. It's hard to pinpoint one particular issue but some of the tremendous successes include a twenty-five year extension of the Illinois Enterprise Zone Program, extension of the Research & Development tax credit, creation of the Hydraulic Fracturing Act, and some reform of the Workers' Compensation Act.



Mark (with wife, Debbi) was honored to be inducted into UIS Hall of Fame.

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THE ALTERNATE UNIVERSE OF LOCKOUT/TAGOUT

ROCKFORD SYSTEMS, LLC

On the surface, at least, machine lockout/tagout (LOTO) appears simple: Identify and isolate energy sources, lock and tag, and perform the procedure that needs to get done.

Simple, right? Wrong.

When energy is required to complete machine diagnostics or set-up work, or when a minor maintenance job is going to throw production hours behind schedule, LOTO becomes something far more complex than a textbook explanation.

Once you understand its intricacies, it is understandable why LOTO, as outlined in OSHA standard 29 CFR 1910.147 "The Control of Hazardous Energy (Lockout/Tagout)," has become an everyday struggle for many safety personnel. And why LOTO ranks among OSHA's top ten violations, year after year. It is also understandable why industry is fast embracing the concept of "Alternative Measures".

OSHA Requirements

OSHA 29 CFR 1910.147 requires employees to remove power sources to a machine that could otherwise result in personal injury if energy were unintentionally released during maintenance or service. It clearly states facilities are responsible for establishing a written program covering how required safety measures will be applied. This includes provisions for developing machine-specific energy control procedures, training authorized workers to protect themselves with lockout/tagout, and for periodic inspections of the adequacy of the written procedures, along with the performance of personnel applying them.

As comprehensive as LOTO may be, it can be very time-intensive, often requiring longer than usual to finish the actual maintenance task on the machine. Production comes to a halt, resulting in the day's production numbers potentially being missed. This becomes even more frustrating when the maintenance task is one that must be implemented several times a day. Loss of time and profits create a strong incentive to bypass LOTO to

carry out repetitive machine tasks. However, it still violates OSHA requirements and puts workers in serious danger.

Thankfully, OSHA 29 CFR 1910.147 also outlines "Alternative Protection Measure" (APM) procedures that can result in increased efficiency without compromising the safety of the operation. This exception is also referred to as the "minor servicing exception." Designed for machine tasks that demand frequent repetitive access, i.e., clearing a jam on a conveyor or a minor tool change, Alternative Measures do not require that power sources be completely cut off. Examples of Alternative Methods technology may include key-controlled locks, control switches, interlocked guards, remote devices and disconnects. It can also mean locking out just a section of a piece of equipment, rather than the entire machine.

ANSI Requirements

The newest ANSI standard, ANSI/ASSE Z244.1 (2016) The Control of Hazardous Energy – Lockout, Tagout and Alternative Methods, agrees with OSHA in that workers should be protected from injury due to unexpected equipment startup or release of potentially hazardous energy. However, the ANSI committee did not try to align fully with every historic OSHA compliance requirement. Instead, the new standard gives expanded guidance beyond OSHA's regulatory limitation to tasks that are "routine, repetitive and integral to production operations".

ANSI makes it very clear that LOTO shall be used unless the user can demonstrate that a well-established alternative method will provide effective protection. In situations where the task is not well understood or risk assessed, lockout shall be the default protective measure applied to control machinery or processes. Section 8.2.1 of ANSI/ASSE Z244.1 (2016) specifies that alternative methods shall only be used after hazards have been assessed and documented through the application of a Practicability (or Jus-

tification) Study to determine that the techniques used will result in a negligible risk or no risk for sudden start up. Following the Hierarchy of Control model, ANSI/ASSE Z244.1 (2016) provides detailed guidance on if, when, and how a range of alternative control methods can be applied to result in equal or improved protection for people performing specific tasks. In addition, alternative risk reduction methodology is covered in detail specific to a number of new technologies including the Packaging, Pharmaceutical, Plastics, Printing, and Steel Industries; Semiconductor and Robotic Applications and others challenged by the current regulatory limitations.

Since the two standards are somewhat conflicting it is best to review ANSI first to help identify discrepancies that may not meet federal minimum regulations.

At this point, it would be appropriate to underscore that LOTO provides the greatest level of protection and, whenever possible, it should be utilized to protect employees from hazardous energy. In other words, inconvenience alone is not an acceptable excuse to use alternative measures. In addition, CFR 1910.147 clearly states that an allowable alternative measure must provide the same or greater level of protection as LOTO. Otherwise, it is considered noncompliant and therefore insufficient to replace LOTO.

By using standard safety-rated devices, such as interlock gates and e-stop buttons, a plant manager can achieve safe, reliable machine access that replaces standard LOTO procedures without violating OSHA requirements. Implementing alternative procedures to ensure equivalent protection for specific tasks can enhance productivity without endangering employees. But those procedures -- and their benefits -- come with strings attached, requiring a thorough understanding of the latest OSHA and ANSI standards. ♦

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Critical Cleaning in Hydraulic Pump Repair

Success Story

Activity: Critical Cleaning - Rebuild
Industry: Industrial Machinery & Equipment Repair
Widgets: Hydraulic Pumps & Cylinders
Soils: Grease, Oil, Dirt & Grime
Method: Combination Cleaning
Material: Mild & Carbon Steel, Cast Iron
Product: Mirachem M2750
Key Features: Safety, Performance



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THE RIGHT METRICS FOR MATERIALS AND OPERATIONS

MILLER COOPER & CO., LTD

Metrics clearly have value. Measurements enable managers to act on what matters most and to support continual improvement. They are particularly meaningful when supporting a comprehensive strategy.

From a financial standpoint, profitability, cash flow, movement of assets, and return on investment are important. They can be computed from financial statements. For operations, on the other hand, metrics depend on the nature of the business and the industry. Hotels look at occupancy rates, whereas retailers analyze profit contributed per square foot.

lots are being assailed by technology. 3D printing creates prototypes in an additive manner without generating scrap. Programming eliminates manual changeover of equipment. Operations that were once separate can now be combined.

A metric for materials may have been its percentage to sales; indeed, selling price may even be quoted at a factor of material cost. But better product design can reduce the number of stock keeping units (SKUs). This increases average purchases per SKU, which helps ordering efficiency and volume discounts while reducing inventory. Alternative materials such as aluminum, plastic,

For example, uncommon widths and lengths incur additional machine set-up cost. Adjusting the machine, loading the material, and running test pieces for a new lot can take as long as the time to process. In painting, darker colors may need special purging when changing over a line. Too much of the wrong mix creates losses. Better order sequencing and automated handling could cut costs.

A slitting operation divides a coil into narrower widths. Coils are cut to the extent needed for a job, leaving a leftover or off-fall piece. If the piece is wide enough and common enough for use in other jobs, it appears

AS IN OPERATIONS, APPLYING THE WRONG METRIC SPELLS DISASTER. WITH MANUFACTURING COST PER EARNED LABOR HOUR, OUTSOURCING SEEMS A MATTER OF COMPARING TO VENDOR RATES. A BIG PITFALL IS BUYING WHEN IT SEEMS TO BE CHEAPER THAN MAKING, WHILE THE FIXED MANUFACTURING PORTION OF THE RATE REMAINS

In manufacturing, operations metrics often highlight direct costs. Process plants prefer units per hour, whereas job shops may measure hours charged. While simplicity might seem like the answer, the wrong metrics can lead to losses. Rather, a custom system set ensures focus on the right areas.

Developing the right metrics takes effort. They must be suitable for monitoring and control, while emphasizing frequent feedback on actions taken.

Update for Innovation

As if metrics weren't complex enough already, the parameters are constantly changing. Industry rules of thumb rapidly become obsolete as technology advances. Before automation, manual effort required just to follow orders through production was tremendous, to the point that companies would often forego having detailed systems. New technologies are a matter of weighing costs and benefits. Even if a company does not adopt them, they factor directly into its market competitiveness.

Manufacturing is embarking on a new age. Former constraints on custom of small

or carbide may work better at lower cost. Machinery today adapts to differing grades of material, reducing the need for inspection and pre-processing.

Even metrics for direct labor per unit become questionable. Operators can simultaneously tend to multiple running machines. Quality improvements remove rework. Automated scheduling reduces downtime. Cellular manufacturing minimizes handling and work-in-process.

Footage Shipped

A metal processor facing declining revenues and profits might measure square footage shipped by gauge. Sheets converted from raw coils were priced that way, as a percentage mark-up on metal cost. However, most businesses are more complex than they may seem. Footage is no longer equally profitable while it might have been in the past. Without change, small lots or excess scrap cause losses. General price increases drive away routine business, while loss orders continue to grow in number. Paradoxically, increasing footage out the door might reduce profits even more.

legitimate to measure success as total footage shipped. However, tying up a press for reprocessing may be cost-prohibitive, unless a more economical machine is available to use.

Moreover, the piece may be so unusual that it winds up as scrap. In that case, ownership might be shifted back to customers. When faced with orders involving small lots, unusual grades, or high scrap, the metal processor might choose to toll customer-owned material, rather than buy it. That way, pricing is based upon machine time, including set-up, while off-fall and weight problems become the customer's responsibility.

Even significant material cost may be overlooked when using a footage metric. Purchases from supplying mills are generally in pounds. For suppliers, the heavier the metal, within tolerance, the better. Companies that track inventory and ship inventory by the foot might not readily report how much money they are losing when a supplier runs heavy. Unless controlled, the company winds up eating the excess cost when selling by the foot. Vendors that run heavy should be ordered light or dropped altogether.



Sales, purchasing and operations each has a role in returning the company to profitability. Some measures of significance include:

- Set-up versus run time, or number of set-ups.
- Off-fall versus finished production.
- Inventory aged over six months, and in excess of six months' requirements.
- Actual versus theoretical weight per foot.

Quoting systems must draw on these factors and be supported by accurate and comprehensive cost accounting.

In other contexts, footage installed causes another type of problem. Paying workers based on piece pay leads them to throw away excess material, resulting in pure waste. Technology today can measure work with more precision, even to a point where drones can accurately measure piles of gravel.

Manufacturing Cost Per Hour

Similar choices affect making in-house versus outsourcing. Companies may be expected to provide a package of products or

services but do only part of them exceedingly well. Certain operations may be specialized, or uneconomic when done at low volume. Without expertise, rejects may rise to an intolerable level. Similarly, proliferating SKUs choke a company.

As in operations, applying the wrong metric spells disaster. With manufacturing cost per earned labor hour, outsourcing seems a matter of comparing to vendor rates. A big pitfall is buying when it seems to be cheaper than making, while the fixed manufacturing portion of the rate remains.

Management considering outsourcing should not apply unrelated operation cost to shrinking labor hours. Rather, it should exclude costs relating to the handling of purchased items, idled manufacturing capacity, and fixed occupancy and other costs from its rates. Unless this is done, as work continues to be farmed out, rates will continue to increase, and more work will be farmed out. Vendor prices for outsourcing will appear more and more attractive. Even with the same sales, a decreased distributor's mar-

gin, along with idled manufacturing capacity, fixed costs, and new overhead to support outsourcing, will likely cause an end to manufacturing and eventually put the company out of business.

Rather than an hourly rate, outsourcing decisions need to project how costs will react or not react by line item. That way, only the costs saved will be considered in the decision. Outsourcing can also address risks in the supply chain. A company that machines castings needs to deal with vendor defects, such as porosity, whereas another that outsources machining does not.

Conversely, insourcing has new advantages. Faced with tariffs, companies may find that the incremental cost of reshoring operations is not as high as it seemed. While the price of imports is lower, domestic vendors may offer better minimum order, delivery, quality, service, customization, and payment terms. With insourcing, infrastructure can be better utilized, through more productive hours spent in the plant. ♦

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THE IMPACT OF BLOCKCHAIN ON THE MANUFACTURING INDUSTRY

ICE MILLER



The world is abuzz with discussions about “Blockchain.” You might have even started to wonder whether Blockchain could change the way the manufacturing industry does business, but are not exactly sure what or where to begin asking questions. Read on for answers to some key questions about this revolutionary technology and its uses in the manufacturing industry.

What is Blockchain?

Generally, Blockchain technology provides a distributed and open recording system that removes the need for a centralized authority such as banks or government officials. Blockchain technology centers around transactions. While a Blockchain transaction may be a purchase

using currency for goods or services (such as a bitcoin transaction), it actually is any type of transaction or exchange that can be expressed in an “if-then” equation. For example, a Blockchain transaction may be, “If the warehouse stock of legal pads drops to under 50 units, then place an order for 1,000 more units.” Or it may be, “If the shelf stock of ground beef in the store contains packages with control numbers 12345 through 13456, then pull the product for potential salmonella contamination.” Each user within the Blockchain retains a complete copy of all transactions performed within it and verifies any new transactions as legitimate before being added. That means all the users in the network can pull up a full record of all

transactions without going to some other authority.

The reliability of Blockchain information means transactions of any type will see increased transparency, faster and easier methodology, heightened trust, and an unalterable record that is difficult to falsify. Blockchain will undoubtedly change every industry, including the manufacturing industry. To understand the possibilities of this technology, it is important to review the successes of Blockchain so far. For example, Blockchain has become increasingly popular in the food industry for improving product safety. The technology has also become accepted in the health care industry for managing sensitive information about patient health.

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How Have Companies Successfully Implemented Blockchain in the Food Industry?

Retailer Walmart has swiftly adopted and taken advantage of the potential of Blockchain technology. The company uses IBM's Blockchain technology to improve its processes for identifying and recalling contaminated foods. Like most grocers, Walmart's old practice had been to preemptively remove food from its shelves that may or may not have been contaminated. However, IBM's Blockchain technology now independently verifies an array of information about a particular Walmart food product, including the time and place

ministration ("FDA") compliance much easier. The FDA mandates that manufacturers use a unique device identification system ("UDI") that identifies medical devices throughout the entire process of manufacture, distribution, and use. Blockchain technology makes manufactured medical devices completely traceable, as the UDI system requires. If a device malfunctions, the FDA and other regulatory agencies will investigate to determine who is responsible. Because Blockchain tracks and validates each step of the manufacturing process, it will be much easier to determine which subcontractor's part was the component that failed.

ed at just the right time. But when a product needs to be recalled, it may be hard to perform root cause analysis and trace the problem to the specific component and the supplier who manufactured the component. Thus, the manufacturer must recall more items than may actually be implicated and the timeline for conducting this analysis is often lengthy.

Not so with Blockchain. Just as with a medical device, the design and building process of anything manufacturers might be creating is recorded every step of the way. Thus, Blockchain technology will force subcontractors for parts, components, and software to remain accountable

BLOCKCHAIN MAY TRULY REVOLUTIONIZE THE MANUFACTURING INDUSTRY. IN SOME WAYS, WE HAVE BARELY SCRATCHED THE SURFACE OF BLOCKCHAIN'S POTENTIAL.

it originated; environmental conditions; and other circumstances that may impact the quality and safety of the food product. The technology has sliced the time it takes to track details about Walmart's produce from six days to a mere two seconds.

Blockchain technology saves time and money, improves food safety, and greatly reduces food waste. No wonder merchants are excited about Walmart's experiment, seeing possibilities for areas including order fulfillment, procurement, and inventory control.

How Has Blockchain Revolutionized the Medical Device Industry?

With its security and trustworthiness, Blockchain technology is ideal for an industry that depends on precision and accuracy, such as the medical device industry. Blockchain can help secure HIPAA-protected, patient-specific information on devices and can help certain devices share their data as needed while keeping it private and secure. Furthermore, Blockchain can assist in permanent record-keeping of the development, design, production, part sourcing, and distribution of each and every device, making Food and Drug Ad-

How Does the Manufacturing Industry Fit In?

When we look at the examples of Walmart and the medical device industry, the possibilities of Blockchain in the manufacturing industry appear endless. First, Blockchain can revolutionize the way a manufacturing company tracks a widget or component along a complex supply chain. Distributed tracking through Blockchain traces the widget each time it moves from step-to-step along the supply chain, recording the whole product journey and facilitating communication between departments along every step, all the while keeping product records safe and organized. Even if one set of records is altered or destroyed, Blockchain's distributed system will retain the widget tracking information, preventing a breakdown of the supply chain and keeping manufacturing lines moving.

Blockchain can further assist manufacturers in investigating and responding to product failures. As we know, no one obtains parts from just one supplier. Multiple parts may come from one supplier, or a single part may be provided by many suppliers – whoever has the amount need-

for their roles in an item's manufacture. The immutability of the data hosted on the Blockchain provides a key advantage for this process. With Blockchain, a manufacturer will know exactly which of its manufactured products contains the malfunctioning part or component. Taking a cue from Walmart, there is no more need to recall 10,000 products when only 1,000 actually have a problem.

What's Next?

Blockchain may truly revolutionize the manufacturing industry. In some ways, we have barely scratched the surface of Blockchain's potential. The powerful verification and storage abilities of Blockchain can transform product safety and alter the needs for auditing and tracing. Many industries are currently exploiting Blockchain technology to make their products safer and more reliable, and the manufacturing industry will be no different. So the question is not whether we will see Blockchain uses within the manufacturing industry; the real question is which manufacturer will lead the charge in our Blockchain-enabled society? ♦



MACLEAN-FOGG RECEIVES IMA'S FIRST MANUFACTURER OF THE YEAR AWARD

The IMA was honored to present Barry and Duncan MacLean of MacLean-Fogg Company with the first annual 'Manufacturer of the Year' award at the IMA's 125th Anniversary Annual Luncheon this past December. MacLean-Fogg Company, founded in 1925, has not only been an influential manufacturer in Illinois, but around the world. For over 90 years the company has been a leader in operational excellence, innovation and technology, and workforce development in addition to being a strong voice for the manufacturing sector. In honor of Barry's contributions to the manufacturing sector, the award now carries the name as the Barry L. MacLean Manufacturer of the Year.

MacLean-Fogg Company began when John MacLean Sr. and Jack Fogg took a chance and started their own business in locking fasteners. They offered only one lock nut to North American railroads and secured two customers – the Santa Fe Railroad and the Milwaukee Railroad. Two years later John Jr. joined the business and instilled philosophy that is still the motto of the company today: "Help the industry, and we will help ourselves. Solve the customer's problems, at a fair price, and on time."

Barry MacLean came into the family business in 1961 and became president in 1972. Under his direction the MacLean-Fogg Company has evolved into a global force, with 26 facilities and 3,200 employees all over the world. Seeing the opportunity for expansion into other industries, Barry moved the family business into more markets, purchasing and acquiring various manufacturing companies in Illinois and the nation. The company no longer sells only one product for railroads and is now manufacturing steel, plastic, carbon fiber, and fiberglass for the industrial, auto, and electric and utility industries.

In 2015 Duncan MacLean became president of MacLean-Fogg Company, and is the fourth generation of the MacLean family to enter the business. Duncan is confident that as long as he stays true to his grandfather's principal of helping the industry and solving

customers' problems, the business will thrive for another 90+ years.

Today, MacLean-Fogg Company is comprised of MacLean-Fogg Component Solutions (MFCS) and MacLean Power Systems (MPS). MacLean-Fogg Component Solutions, a primary business, provides engineered metal and plastic components to the industrial, automotive, and military markets. MacLean Power Systems, a primary business, provides unique devices used in the transmission and distribution of electrical power.

MFCS is a leading manufacturer of fastener components, engineered components and engineered plastics for automotive, heavy truck, and other diverse industries. MPS is a leading manufacturer of products for electric utility, telecommunications and civil markets.

"Barry MacLean and his family run one of the most successful manufacturing companies in the state and embody the leadership, values, and commitment that make manufacturing a vibrant cog in our nation's economy," said IMA President and CEO Mark Denzler. "There is no company that embodies the manufacturing spirit and entrepreneurship more than MacLean-Fogg."

The manufacturing industry has quite literally built America, and it improves the lives of people around the world every day. Not only has MacLean-Fogg Company manufactured innovative products that have changed lives across the globe, but the MacLean family has always stayed active within the manufacturing community. Barry MacLean served as the IMA Chair from 1990 to 1991 and was integral in the decision to bring past IMA president Greg Baise into the association. He has also served as an IMA Board member for over a quarter of a century, and continually works with the IMA to promote, advocate, and strengthen Illinois' manufacturing sector. MacLean-Fogg Company exemplifies what it means to be an Illinois manufacturer, and the IMA is thrilled to name MacLean-Fogg Company our first Manufacturer of the Year. ♦



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DEFENDING YOUR BUSINESS AGAINST THE COMING RECESSION

CFO SIMPLIFIED



Business operates in cycles. It expands and contracts. When the market expands, some companies do well in spite of themselves. A growing economy hides lots of business mistakes. Sooner or later, the economy will slow. Successful companies will anticipate, rather than react to that change, and will survive or even thrive in the slowdown. Others won't be so lucky. Here are steps you can take to protect your business from the coming recession.

Accounts Receivable

Review your AR aging. Has the percentage over 90 or 120 days been growing? The money is better in your pocket than

your customers'. The longer it's out there, the harder it is to collect.

Write off bad debt. It's good tax planning, plus having uncollectible items on your AR Aging misstates your company's financial position. A large AR balance should only make you feel good when you collect it. Remember, anything over 120 days is especially hard to collect.

Watch for late paying customers. Know your customers' normal pay cycle. If they begin delaying their payments, it might mean that they're getting short of cash. Maybe it's time to tighten their credit.

Beware of unusually large orders. They might be building stock as a hedge against

a coming cash shortage. This protects their ability to deliver, but it's probably not great news for you.

Make collection calls. Call customers that pay their bills late. Also call in advance of a large invoice being due. Verify that the invoice is being processed, and ask when the check is going to be mailed.

Inventory

Service businesses have inventory, too. Staff hours are your inventory. Use it or lose it. Track staff utilization. All that "unused" inventory is an expense without offsetting revenue.

Verify your inventory value. Does the total of your Inventory Value Report match

the entry on your balance sheet? Accurate numbers are critical.

Are you buying the wrong inventory? Calculate your inventory turns. Track your inventory by item family or class. Otherwise how do you know you're making good use of your inventory dollars? When the market takes a downturn, slow moving inventory is even harder to sell. Reduce that inventory now.

What is your normal inventory level? Did you increase your inventory to match growing sales? Maybe you should reduce your inventory before the recession hits. You're better off being in cash. When the recession arrives, sales will slow, and you don't want extra money sitting on the shelf.

What's delivery time on restocking orders? If you reduce inventory, you still need to deliver to your customers. Know

is variable. With Interest rates rising, your monthly payments could climb quickly. By getting a term loan at a fixed rate, you get stable monthly payments. Not only that, but you now have a credit line to draw on.

Make Staff Reductions

If sales shrink, how much staff do you really need? When companies grow, they add staff. When they shrink, they should reduce staff. That's not employee friendly, but if your challenge is to save the company, you need to make hard choices. Do you keep everyone employed till the money runs out, or do you keep a smaller group of employees and provide them with secure employment?

Reorganize. What positions can be eliminated? If you streamlined operations, would you be able to reduce staff? As a start, cross train your staff to fill the roles

contract.

Insurance is a big monthly expense. Explore changes to your insurance by increasing your deductible or other changes in coverage. Changing to monthly payments may improve your cash flow.

Customer Concentration

According to Pareto's Principle – 20 percent of your customers account for 80 percent of your business. That's too high a concentration in an uncertain business climate. How would your business be affected if one of your large customers failed? If the economy contracts, it could happen. Don't become a casualty of your own success. Adding more customers spreads that risk, or eliminates it completely.

There's also risk in carrying unique inventory for a specific customer. What if their sales slow? What if they fall on hard times? Who else can you sell it to?

THE SLOWING ECONOMY AFFECTS EVERYONE. IF YOU'VE BEEN ENJOYING THE BOOM FOR THE PAST 10 YEARS, THIS CAN BE A REAL SHOCK. BUT IF YOU REDUCE THE RISK, YOU MAY REDUCE THE PAIN AS WELL. DON'T BUY NEW EQUIPMENT, SIGN NEW LEASES, OR JUMP INTO NEW BUSINESS VENTURES WITHOUT A REAL ANALYSIS OF HOW A RECESSION WOULD IMPACT ON THAT MOVE.

how long it will take you to restock. You need to know that you will get what you need, when you need it. See if your major suppliers will hold inventory for you ready for shipment. It reduces your restocking time and your inventory investment.

Manage your Credit

Use your credit line carefully. Don't use it to cover operating losses. If you lack availability, you can't borrow when you really need to. Plus, if you file borrowing base certificates, a drop in sales can significantly reduce your availability. You might find yourself out of formula.

A credit line is your safety net. When business slows, you will need a cash cushion until you can build sales again. If you are over-advanced or close to the top of your line, you are going to be in a difficult position when the bank calls.

Pay off your current line with a Term Loan. The interest on your operating line

that are needed if someone leaves or gets laid off. You can't operate if you aren't able to invoice, pay bills, run payroll or ship product.

Watch your Overhead

If you rent, talk to your landlord about a reduction in your monthly rent payments. Agreeing to a reduction of your rent might not make him happy, but paying less is a lot better than not paying anything.

If you own the building you're in, consider refinancing. Interest rates are rising, but if you can lock in a fixed rate for a longer term, it could reduce your monthly payments, adding a bit more to your monthly cash flow.

Buy your utilities from a broker. If you aren't already buying Natural Gas and Electricity from a broker, you should be. They know bulk sales companies that could give you a substantial discount. You could save 10 – 20% monthly on your utilities, especially if you sign a multi-year

Look for other channels of distribution. You might be able to reduce inventory by selling on Amazon.com, Ebay, or other online services.

If your largest customer gets into trouble, they might have trouble paying your invoices. If they force you to extend terms to Net 60 or even Net 90, you might not be able to say no. This could create a real cash crunch. Prepare now for that possibility.

A slowing economy affects everyone. If you've been enjoying the boom for the past 10 years, this can be a real shock. But if you reduce the risk, you may reduce the pain as well. Don't buy new equipment, sign new leases, or jump into new business ventures without a real analysis of how a recession would impact on that move. Don't make new, expensive long-term commitments. Now is the time to be prudent. By doing some advance planning, you can protect yourself from the difficulties of the upcoming recession. ♦

MEMBER NEWS

WITTENSTEIN in U.S. Hosts U.S. Ambassador Richard Grenell To Discuss ICATT Apprenticeship Program



WITTENSTEIN

U.S. Ambassador to Germany Richard Grenell paid a visit in December to WITTENSTEIN's North American headquarters this week to learn about the company's leadership and success in its apprenticeships through the Industry Consortium for Advanced Technical Training (ICATT). WITTENSTEIN has received national recognition for its work in the apprenticeship program and provided Ambassador Grenell a chance to speak with apprentices, trainers and graduates of the program.

The Ambassador's visit was also part of the U.S. government's focus on supporting programs advancing workforce development.

"Manufacturing in America is growing again, and we must invest in workforce training to support that growth over the long term," says Ambassador Grenell. "The German model for workforce development, especially in manufacturing, is second to none. German manufacturers have invested heavily in the United States and their world-class apprenticeship programs have helped prepare U.S. workers for the jobs of today and tomorrow. More U.S. companies should adopt similar programs to address their workforce needs."

The ICATT Apprenticeship Program works with companies to develop custom company training plans, vet and recruit apprentices, collaborate with community colleges on classroom training, and provide on-going management. It is the only apprenticeship program in the Midwest fully benchmarked on the German Dual Education System.

The U.S. Departments of State and Commerce are supporting the tour as part of the federal government's commitment to preparing U.S. workers for modern jobs in manufacturing and other key sectors.

Peter Riehle, President and CEO, WITTENSTEIN Holdings Corporation notes, "Our Company's claim is to be 'One with the Future.' We know we have a strong future in America, and our investment in apprentices, on-the-job training and career development for our American employees reflects this commitment."

AbbVie Announces \$55 Million in Charitable Donations



In America, more than 15 million children live in poverty and face significant barriers to education. Often facing hunger, homelessness, emotional trauma, lack of access to basic medical care or other barriers, these students can have higher dropout rates, lower promotion rates and lower on-time graduation rates.

At AbbVie, we understand that education is essential to help young people succeed inside and outside of the classroom. We have a long-standing commitment to working with our nonprofit partners with expertise in ensuring underserved students are equipped for success.

On November 16, 2018 we announced we are donating \$55 million total to three leading nonprofit organizations working to address the educational gap for children in high need areas: Communities In Schools, City Year and the University of Chicago Education Lab.

The work of these organizations ensures a whole-child and whole-school approach to learning, providing students with social and emotional support as well as academic support:

- AbbVie's \$30 million donation will allow Communities In Schools to provide essential support services to nearly 70,000 more underserved kids; \$6 million of the donation is specifically earmarked to help 16 high-need Chicago public schools.

- AbbVie's \$10 million support will help City Year to deploy teams who help students acquire critical strengths and skills, serving more than 18,000 students in 36 schools over the next five years.

- Finally, AbbVie's partnership with the University of Chicago Education Lab by investing \$15 million will support work

in partnership with the Chicago Public Schools to design, test and scale promising practices to improve the educational and life outcomes of youth at highest risk of dropout and violent victimization. This partnership will generate evidence that districts across the country can draw on in their efforts to better serve children.

The donations are part of a broader \$350 million charitable contribution that AbbVie has pledged to nonprofit partners in 2018. Just this August, we announced \$100 million to Ronald McDonald House Charities, the single largest donation the organization has received.

These donations exemplify AbbVie's longstanding commitment to children, families and communities in need. AbbVie is committed to three key philanthropic areas where we can make the most impact – building sustainable healthcare systems, effective educational programs and strong communities.

Constellation and Enel Green Power Sign Energy Deal With Starbucks



Constellation
An Exelon Company

Constellation, an Exelon (NYSE: EXC) company and the nation's leading competitive energy provider, has signed a long-term agreement with Starbucks to power more than 340 company-operated Illinois stores with 100 percent renewable energy produced by Enel Green Power (EGP) North America, Inc.'s HillTopper wind project in Logan County, Ill. The deal is made possible by a separate long-term agreement between Enel and Constellation under which Constellation will purchase a 14-megawatt1 portion of the energy generated by HillTopper.

"It's exciting to see Starbucks continue its commitment to play a role in the growth of renewable energy markets," said Rebecca Zimmer, director of global environmental impact for Starbucks. "We are identifying and investing in new green power projects that are close to our retail communities and give our store partners a story they can be proud of."

The agreements reinforce Starbucks' commitment to greening its operations through

energy and water conservation measures and advancing renewable energy sources through its purchasing practices and will enable Starbucks to support the generation of approximately 48,000 megawatt-hours of wind power from EGP's HillTopper wind project, enough to brew nearly 100 million cups of coffee, or more than seven cups of coffee for every Illinois resident. It will deliver an annual environmental benefit equivalent to removing nearly 8,000 passenger vehicles from the road.

"Constellation is dedicated to providing clean energy solutions that help our customers meet their environmental goals," said Mark Huston, president of Constellation's national retail business. "Starbucks is among the nation's top purchasers of renewable electricity and it is fitting that they chose Constellation to sustainably power hundreds of their Illinois locations."

The agreement leverages the Constellation Offsite Renewables (COrE) offering, which increases access to renewable energy for commercial and industrial customers, enabling Starbucks to contribute to the development of HillTopper in Illinois, where the stores are located.

"An increasing number of commercial and industrial customers are choosing renewables as a competitive and clean way to meet their energy needs and they look for customized solutions addressing their specific energy profile," said Georgios Papadimitriou, head of Enel Green Power North America. "The agreement with Constellation is an example of an innovative approach we are taking to meet the needs of these commercial and industrial customers to enable them to achieve their sustainability targets in a cost-effective way."

The HillTopper wind farm, is expected to enter into service by the end of 2018. The facility will have a total capacity of 185 megawatts and, once fully operational, will be able to generate around 570 gigawatt-hours of electricity annually. Investment in the construction of HillTopper amounts to approximately \$325 million.

The 20 Best Workplaces in Manufacturing and Production Includes IMA Members FONA, Reynolds America, and 3M

Fortune research partner Great Place to Work surveyed thousands to compile this year's list of 20 companies, which represent a variety of manufacturers, including those in the automotive, electronic, and food product industries.

3 FONA International Inc.



Headquarters Location: Geneva, Ill.
Industry Vertical: Food and Beverage
U.S. Employees: 220
Global Employees: 216

Employees say:

"Each employee has the ability to make their role, their own. They are the CEO of their role. As long as one stays with our values, one can create their own path and destiny."

14 Reynolds American Inc.



Headquarters Location: Winston-Salem, N.C.
Industry Vertical: Tobacco
U.S. Employees: 5,281

Employees say:

"I love my job, my boss helps me grow with the company and gives me the tools needed to succeed."

20 3M Company



Headquarters Location: St. Paul, Minn.
Industry Vertical: Manufacturing
U.S. Employees: More than 36,682
Global Employees: More than 91,000

Employees say:

"There is a great level of trust here between employer and employee. I've never felt micromanaged. I find it makes me want to work harder, be more results-driven and manage my time better because I'm part of a community that feels like one big family." ♦

The Illinois Manufacturer is underwritten by Constellation – an Exelon Company

NEW IMA MEMBERS

A.L. HANSEN MANUFACTURING CO.
Waukegan, IL

AMERICAN NTN BEARING MANUFACTURING CORPORATION
Elgin, IL

COMCAST
Chicago, IL

DAVIS MACHINE CO.
Joliet, IL

DECATUR INDUSTRIAL ELECTRIC
Decatur, IL

EARTH FRIENDLY PRODUCTS
Addison, IL

EASTMAN CHEMICAL COMPANY
East Saint Louis, IL

EVAPCO, INC.
Greenup, IL

FERRARA CANDY COMPANY
Bellwood, IL

GREIF INC
Bradley, IL

HOME RUN INN FROZEN FOODS
Woodridge, IL

PRETIUM PACKAGING
Aurora, IL

ROC GROUP
Chicago, IL

ROCKNEL FASTENER, INC.
Rockford, IL

TOYOTA BOSHOKU ILLINOIS
Lawrenceville, IL



Meet Daniel. In high school, Daniel struggled with his studies not really knowing what he would do with his life. He knew he enjoyed bringing his ideas to life, and loved working with his hands.

Daniel visited Dream It. Do It. Illinois and then enrolled in his community college. On a whim he signed up for a class in welding for artists. ***Something clicked.***

Today, Daniel is a certified welder making over \$65,000. He wakes up every morning in his own home and drives his new car to work.

There are more than 450 careers available in manufacturing, and any one of them can be yours.



This is Daniel's story...what's yours?

DreamItDoItIL.com



Who can help simplify my energy purchasing decisions?

Constellation is the easy answer to complex energy purchasing decisions. As the endorsed energy supplier for the Illinois Manufacturers' Association, we make it easy to navigate and select from a full array of energy strategies, bringing you intelligent insights, an unparalleled view of market trends, and tools that will make purchasing energy clearer and more manageable.

To learn more about participating in the IMA Energy Program, please contact Rich Cialabrini at **richard.cialabrini@constellation.com** or **847.738.2510**.



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