



**HV  
MFG**

# THE COUNCIL OF INDUSTRY MAGAZINE

**SPRING 2020**

COMPANY PROFILE  
**eMAGIN**

APPRENTICE SPOTLIGHT  
**ROBERT PAPALE**  
ZIERICK CORPORATION

STEPPING UP AMIDST THE COVID-19 CRISIS  
**HUDSON VALLEY MANUFACTURES**

**MANUFACTURING IS ESSENTIAL**

MEMBERSHIP DIRECTORY INSIDE



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# CONTENTS

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## FEATURES

- 10 HV MANUFACTURERS STEP UP  
Many Hudson Valley Manufacturers  
Provide What is Needed During This Crisis.
- 25 LOOKING AT THE FUTURE OF ROBOTICS  
HV Pathways Prepares for Competition.
- 30 COMPANY PROFILE  
eMagin Leads in OLED Microdisplays.
- 39 APPRENTICE SPOTLIGHT  
Rob Papale Finds a Career at Zierick.

## COMPANY PROFILE



Members of the staff at eMagin, Hopewell Junction, NY.

## IN THIS ISSUE

- 5 LETTER FROM THE PRESIDENT  
**Manufacturing is Essential.**
- 6 MANUFACTURING NEWS BRIEFS  
**Policy Priorities for Manufacturers.**
- 20 CHALLENGES AND GROWTH  
**Restarting After COVID-19**  
With Advice from Skip Weisman.
- 34 TECHNOLOGY AND INNOVATION  
**AI and the Future of Manufacturing.**
- 45 MEMBER DIRECTORY  
**A Current Listing of Council of Industry Members.**
- 58 ASSOCIATE MEMBER DIRECTORY  
**A Current Listing of Council of Industry**  
**Associate Members.**

## ON THE COVER

Rob Papale shares his experiences and career path from FIRST Robotics to mentoring apprentices at Zierick Manufacturing Corporation in Mt. Kisco, NY.

Cover photo by Tom LeBarbera  
Picture This Studios



## MANUFACTURING IS VITAL AND THE COUNCIL OF INDUSTRY IS VITAL TO MANUFACTURING

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# MANUFACTURING IS ESSENTIAL

DEAR READER

## Welcome to the Spring 2020 Edition of HV Mfg

Planning for this edition began in earnest in December of 2019 in a pre-coronavirus world and while parts of that world seem distant and irrelevant in April 2020 much of this magazine's content, I believe, remains current and of interest to the Hudson Valley Manufacturing Community. Like all of you, however, we were forced to adjust to the new realities of the post-coronavirus world and make several changes to the magazine for this edition.

First, this edition will only be available digitally. This was an extremely difficult decision, but given that so many readers are working remotely this made the most sense. Second, some of the content needed to change. For example, we had planned to follow the Hudson Valley Pathways students through their FIRST Robotics Competition at Rockland Community College in late March. With that competition cancelled and school being conducted via distance learning that article now focuses instead on the Pathway team's preparations, adjustment to their circumstances and their focus on next year's competitions. Third, we were able to adapt our usual Leader Q&A profile to instead highlight some of the wonderful work our members and associate members are doing to help their communities or quickly pivot their business to meet urgent needs.

In fact there is some great content in this edition. Alison Butler's profile of eMagin highlights one of the region's most innovative companies and a world leader in high definition micro displays. SUNY New Paltz Journalism student Taylor Dowd writes about Artificial Intelligence and Machine Learning. We profile Rob Papale, Toolmaker from Zierick Manufacturing and the first MIAP apprentice to receive his Department of Labor Credential. Skip Weisman writes about the importance of communication and transparency to effective leadership, not only in this crisis, but in more normal times as well. We also have our News Briefs.

This edition also includes the Membership Directory. Let me take this opportunity to say how proud I am of all the members of this association, many of which are essential and working hard and safely to make people's lives a little more safe and secure. The commitment these companies have shown to their suppliers and customers is noteworthy. The commitment they have shown to their employees is impressive and heartwarming.

I also want to thank our Associate Members who have been so generous with their expertise and worked with the Council of Industry to keep our members informed, compliant, safe and healthy through the outbreak and the shutdown.

Finally, a sincere thank you to all the advertisers. Your support helps us spread the message that manufacturing is not just alive and well in the Hudson Valley it is "essential" to the region and the nation.

Thank you for being a reader of HV Mfg and thank you for your continued support of Hudson Valley Manufacturing and the Council of Industry.



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### FEDERAL

#### Trump Declares National Emergency in Latest Bid to Combat Coronavirus

“To unleash the full power of the federal government under this effort today, I’m officially declaring a **national emergency**,” he said March 13th at an announcement in the Rose Garden. “Two very big words.”

Trump said the move would eradicate the testing shortcomings that health experts say hindered the country’s ability to contain the virus when it first appeared on American shores. In recent days, much of the country’s public spaces have shuttered — professional sports have been suspended, concert halls are closed until further notice and many Americans have been asked to self-isolate. The self-isolation order has been extended through May 1st.



#### Families First Coronavirus Response Act

The recently passed Families First Coronavirus Response Act makes substantial changes to sick and FMLA leave for businesses and employees in 2020.

##### Emergency Family and Medical Leave Expansion Act

The first section of the FFCRA that applies to businesses pertains to an expansion of the U.S. Family and Medical Leave Act (FMLA). Until the end of 2020, employers with fewer than 500 employees will now be required to provide employees with up to 10 weeks of paid FMLA. The first two weeks of the normal 12-week FMLA leave may be provided unpaid, but an employee may be able to be paid through the paid sick leave provision or other paid leave the employee has available.

##### Emergency Paid Sick Leave Act

The second leave provision of the FFCRA that affects businesses is emergency paid sick leave. Until the end of 2020,

employers with fewer than 500 employees must offer paid sick leave to those who meet criteria associated with the public health emergency.

##### Tax Credits for Paid Sick Leave and Paid FMLA

To help employers afford the new paid sick leave and paid FMLA benefits, companies are able to seek reimbursement through tax credits.

Each quarter, private companies are entitled to fully refundable tax credits for both paid sick leave and paid FMLA. The tax credits are applied against an employer’s already-owed Social Security taxes. However, if that offset is not enough to cover these payouts to employees, then the Treasury Department is authorized to help cover the rest with cash payouts. In addition, the Treasury is directed to issue regulations to waive penalties for businesses not submitting their payroll taxes if they do so in anticipation of a refund under the new law. In addition, the Treasury Department has said they will soon be releasing a form for small businesses to request an expedited advance on their refund.

### Essential Manufacturing

Empire State Development determined what manufacturing businesses were essential on March 20th. That list has been updated several times.

Firms that are in one of these categories or are an essential supplier to them, are exempt from the closure order rule.

As of April 20th that list is:

- food processing, including all foods and beverages
- chemicals
- medical equipment/instruments
- pharmaceuticals
- safety and sanitary products
- telecommunications
- microelectronics/semi-conductor
- agriculture/farms
- paper products
- automotive

“Why not be part of raising the talent you are looking for. This is a multi-year interview process and I already have my eye on two future employees”  
-Rich Croce of Viking Industry

“You and your company can't afford not to participate”  
-Ellen Anderson of Selux

## Are you a manufacturer interested in growing through **partnerships**?

- Are you struggling to find good **employees**?
- Do you want to participate in a multi-year interview process?
- Are you interested in supporting the growth and development of the **youth** of the Hudson Valley?
- Are you looking to engage **talented minds** to help your company succeed?

If you answered **yes**, then a partnership with the Hudson Valley Pathways Academy P-TEC High School is right for you! We offer a range of possible partnership options to accommodate how you want to be involved in growing your future talent.



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## Coronavirus Aid, Relief, and Economic Security (CARES) Act

On March 27, 2020, President Trump signed the largest economic stimulus package in American history into law. Although the Coronavirus Aid, Relief, and Economic Security Act (“CARES Act”) made several amendments to the Families First Coronavirus Response Act (“FFCRA”), the majority of the amendments were technical corrections that do not impact the substantive provisions of the FFCRA.



The Act includes a number of different programs and interventions that provide or intend to provide financial relief to eligible employers and employees alike. We have summarized the key aspects of the law, including:

- Creates the Paycheck Protection Program through the Small Business Administration to make loans available to eligible employers and self-employment individuals. Loans may convert to grants if certain provisions are met.
- The act provides enhanced unemployment insurance benefits to employees for total and partial unemployment and to employers for retaining certain employees.
- The act confirms the emergency FMLA and sick leave benefits available to employees and advanced tax credits employers can take in providing these benefits.
- The Federal government will make loans to certain distressed businesses and places limits on compensation paid to executives servicing businesses subject to these loans.

## Immigration Order

President Trump signed an Executive Order temporarily barring new immigrants, including some family members of U.S. citizens and foreign workers looking to move to the U.S., in the next 60 days.

Mr. Trump said the immigration suspension, which he announced April 20th is designed to reduce immigration at a time when tens of millions of Americans have lost jobs as a result of the coronavirus crisis. “We must first take care of the American worker,” Mr. Trump said, adding that suspending immigration would also help “conserve vital medical resources for American citizens.”

The executive order wouldn't impact immigrants already living in the U.S. or foreigners coming on temporary visas for work or travel. That category includes H-1B visas, which allow more than 85,000 high-skilled foreigners to come to the U.S. for at least three years to work. It also includes seasonal migrant workers who come to the U.S. annually to work on farms, where they make up about one-tenth of the agricultural workforce, and at other businesses such as resorts or county fairs.



## Governor Cuomo Signs the 'New York State on PAUSE' Executive Order

On March 20th Governor Andrew M. Cuomo signed the "New York State on PAUSE"

executive order, a 10-point policy to assure uniform safety for all New Yorkers. It includes a new directive that all non-essential businesses statewide must close in-office personnel functions effective at 8pm on Sunday, March 22, and temporarily bans all non-essential gatherings of individuals of any size for any reason.

"We know the most effective way to reduce the spread of this



virus is through social distancing and density reduction measures," Governor Cuomo said. "I have said from the start that any policy decision we make will be based on the facts, and as we get more facts we will calibrate our response accordingly. This executive order

builds on the actions we have taken to reduce the spread of the virus and protect the wellbeing of our friends, colleagues and neighbors. But again, I want to remind New Yorkers that the panic we are seeing is outpacing the reality of the virus — and we will

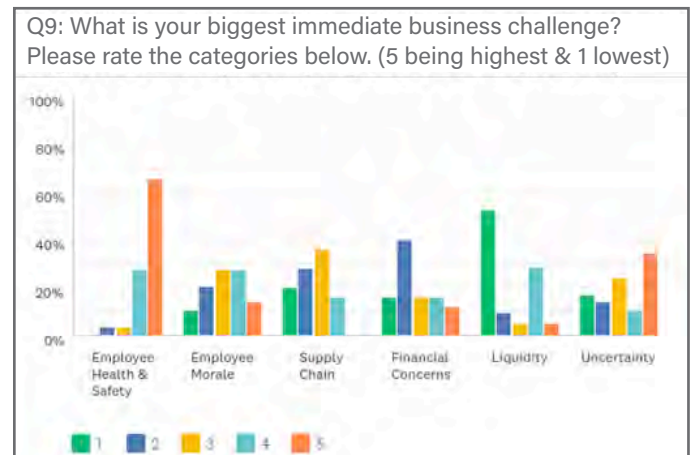
get through this period of time together."

PAUSE has been extended through May 15th.



## Council of Industry Survey: Members Operating at 78% Capacity, Employee Health Number 1 Concern

Over the week of April 10th - 17th the Council of Industry polled its members to determine their response to the COVID-19 outbreak and the government order to cease non-essential business activities. Members answered questions about employee safety, orders, supply chain and concerns about the future. The response rate was 40%



You can see the full survey here

[www.councilofindustry.org/wp-content/uploads/2020/04/Council-of-Industry-Member-Operating-Survey-During-Covid-19.pdf](http://www.councilofindustry.org/wp-content/uploads/2020/04/Council-of-Industry-Member-Operating-Survey-During-Covid-19.pdf)

## New York State Emergency Paid Sick Leave Act

The New York State Paid Sick Leave Act creates two leave programs: The "paid sick leave" program for quarantined employees, and an expansion of existing N.Y. Paid Family Leave (PFL) and Disability Benefit Leave (DBL, or commonly called "short-term disability" leave) for quarantined employees.

The Act took effect upon Gov. Cuomo's signing on March 18.

Critically, the Act only applies to employees who have been ordered to quarantine or isolate by New York State, the Department of Health, a local health board, or another government entity authorized to issue a quarantine or isolation order. This means that the Act does not cover employees who have voluntarily chosen to quarantine or self-isolate.

Additionally, the Act will not apply to quarantined employees who are asymptomatic and able to perform their job functions remotely.

# MANUFACTURING STEPS UP

WITH COUNCIL OF INDUSTRY STAFF

The Council of Industry counts among its friends and members some of the most community minded and generous organizations in the Hudson Valley region. Every day our members and friends donate their time and money to organizations and causes supporting healthcare, education, poverty remediation, the arts and more. So it should not come as a surprise that so many have stepped up to help those in need during the Coronavirus Crisis.

What is surprising is how quickly and decisively they acted. From reconfiguring lines and utilizing 3D printers to produce PPE, to donating time and resources to make sure students in need get the tools they need to learn remotely and have enough to eat,

to a state agency working 14 hour days 7 days per week to help businesses cope with the shutdown organizations turned on a dime to jump into action.

HV Mfg thought we would take a few pages to share SOME (just some) of the stories of organization that are part of our association rising to the occasion. This is my no means complete and there are literally dozens more. We do, however, think these stories are indicative of all the ways our members and our friends have gone above and beyond to help our region get through the coronavirus crisis. We are proud to tell these stories, and of all the

members of our association.



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# An Early Organizer of PPE For The Hudson Valley

WITH CHRIS MASTERS

**CI:** What you are doing at ACCESS Supports for Living to keep employees and clients healthy?



**CM:** Through organized leadership, early on as COVID-19 was unfolding, we began planning to ensure the people we serve and our staff were safe. Our team was trained in FEMA Emergency response and we operationalized a command response center at the beginning of March. This command center is available and covered 24/7 to respond to needs. We have operated one of the largest organizations in the HV through a combination of work from home and skeleton crews needed to provide services.

We have secured needed PPE for ACCESS and many other Hudson Valley organizations, partnering with local and national manufactures. We have also supported dozens of other HV organizations by sending them several thousands of masks and face shields and hundreds of gallons of hand sanitizer. Pretty cool!

**CI:** What mental health programs are available?

**CM:** On March 23rd we opened a 24/7 Virtual Mental Health and Substance Use Urgent Care serving our community. We have served hundreds of clients through this service. This has been a huge service and one covered by several media outlets. Services can be reached at 1-888-750-2266.

ACCESS launched a webinar series on 4/20 to support those families who are navigating this pandemic with special needs family members.

**CI:** How did ACCESS shift gears to help with PPE?

**CM:** Our team began sourcing PPE both locally and throughout the nation. We have been very successful in procuring face shields, masks, and also entered into production of hand sanitizer with Black Dirt Distillery, with the assistance of HVEDC and Senator Schumer. Through this sourcing we have been able to help ourselves and support our partners by sending thousands of masks

and face shields and hundreds of gallons of sanitizer to HV organizations.

**CI:** What obstacles have you faced and how did you overcome them?

**CM:** Like others, the safety of our clients and staff came first. Securing PPE has been a documented challenge for everyone, ACCESS has led by proactively finding sources with local partners like Orange Packaging, Black Dirt Distillery and USHECO, but also sourcing from Florida, Tennessee and Vermont.

We supplied our staff and also distributed several thousands of masks around the Hudson Valley.

Running our business and working with folks who have I/DD is a challenge during what was a normal time. Add the anxiety and limitations we are faced with today and I say our staff has been doing heroic work with very little recognition. We have over 500 direct support professionals on the front lines every day.

We had to pause on some of the ACCESS Business Solutions contracts like our new Merchant Marine deal, but we simply opened up to the opportunities that presented themselves. We are currently working with new customers on the product side while launching a digital marketing campaign. Additionally, we are in the process for new contracts with janitorial customers.

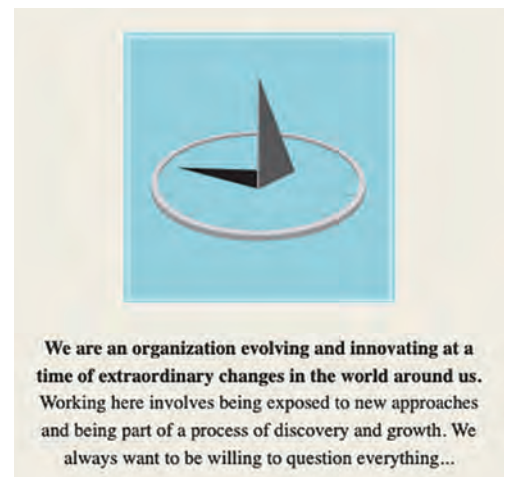
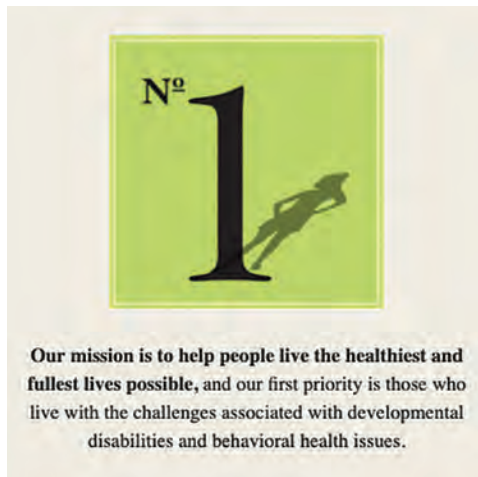
**CI:** How do you see ACCESS emerging from this?

**CM:** INCREDIBLY well positioned – by taking a leadership role in PPE, by innovating and still delivering services on the front line and giving back to so many – we are well positioned.

We showed the ability to use our manufacturing experience to pivot quickly. We have several local manufacturers who want to partner when we get through this. There are new customers and new business opportunities.

We showed our courageous commitment to our clients who are the most vulnerable folks in our community.

We deepened relationships significantly with private sector, government, non-profits and once again showed we are a true and reliable partner of the region.





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# From Prototype to Full Production – Filling The Need

BY TAYLOR DOWD

Newburgh-based manufacturing company Orange Packaging has ramped up production to create PPE amid coronavirus. The company designs, manufactures, and delivers reusable face shields made with a clear RPET mask.

In recent weeks, the company has received thousands of face shield orders as hospitals seek to find ways to protect frontline workers and acquire sufficient amounts of protective gear for frontline workers. St. Luke's and Nyack Hospital, among other New York hospitals, have quickly become eager clients.

Orange Packaging owner Michael Esposito was able to gain traction after his brother, Anthony, made a face shield prototype. Social media allowed Esposito to share the idea, and quickly after, the company began to receive order inquiries.

"Forty-eight hours later we were filling orders. From that Facebook post it just blew up with friends of friends sharing it. To date, we are over 100,000 shield orders within two weeks, and we have orders flowing in," says Esposito, according to T-SEC.

Stepping up to fulfill demand has required Esposito to shift his company's business model and convert production—which usually entails creating fixtures, signs, parts, and other packaging—to focusing on making face shields. Orange Packaging will add a permanent line of PPE products to its list of services, according to Spectrum News. ▼





# New York State's Regional Economic Development Councils

## Sharing Critical Information and Fostering Communication

When Governor Cuomo created the Regional Economic Development Councils in 2011 his intent was to re-invent the way economic development was handled in the state, decentralizing decision making and encouraging each of the 10 regions across the state to develop long term strategic plans for their economic growth.

In this regard the Regional Councils have been a huge success, targeting investment in projects that each region has prioritized stimulating, job growth, wage growth and additional private investment.

As the COVID 19 pandemic has unfolded however, The Regional Councils proved to be an even more valuable resource for New York State than we thought. The Councils – especially our own Mid-Hudson Regional Council became a vital conduit for information critical to flow to the business community, non-profit organizations and municipalities. And, perhaps even more important, for information to flow from those entities back to the state decision makers in Albany.

Staffed by employees of Empire State Development, the Councils are public private partnerships made up of volunteer local experts and stakeholders from business, academia, local government and non-governmental organizations. In the Mid-

Hudson the Council, under the leadership of Meghan Taylor, has become a tight knit group of leaders who work closely together to further the interests of the Hudson Valley.

As the crisis unfolded and the shutdown loomed the Regional Council sprang into action. Working 12-16 hour days 7 days per week the ESD and Regional Council staff fed information through Council members to county and municipal governments, business leaders and community organizations like the Council of Industry. The vital information on paid leave, unemployment extension the need for critical supplies and how to access state and federal support flowed quickly and accurately, providing answers and reassuring business.

When the all-important discussion of “Essential” and “Non-Essential” businesses took place it was ESD and Regional Council staff that shared information, fought for critical industries and generally kept the lines of communication open. When the call for additional PPE and companies to help produce ventilators went out it was the Regional Council that collected that information. They were able to communicate the frustration of companies that wanted to help, and could help, but did not know where to turn to decision makers in Albany, ultimately shaping the improvements to the State’s process for organizing support.



### COVID-19 Business Resources

As New York State continually monitors and responds to developments related to COVID-19, ESD is providing up-to-date guidance and business-related resources.

[LEARN MORE](https://regionalcouncils.ny.gov/mid-hudson)

<https://regionalcouncils.ny.gov/mid-hudson>

### Help NYS Get COVID-19 Test Kits, Medical Supplies and Personal Protective Equipment (PPE)

If your business can sell, produce or donate critical medical supplies or personal protective equipment, contact us today.

[CLICK HERE](https://coronavirus.health.ny.gov/get-involved-how-you-can-help)

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# Arnoff Moving and Storage Helps Dutchess Outreach

## ► Feed Poughkeepsie Residents In Need

When the shutdown began in March Dutchess Outreach, a Poughkeepsie-based non-profit that provides a variety of services for those in need, became overwhelmed with requests for help. The organization, struggling to meet the needs of city residents, reached out to Mayor Rob Rolison and others.

Dutchess Outreach runs a food pantry as well as the Lunch Box at the Family Partnership Center to provide food for those that are nutritionally disadvantaged. The pantry provides emergency food supplies designed to feed people for up to five days. The amount of food distributed is based on the number of people in the household. The nutritional



supplies have a variety of fruits and vegetables, protein sources such as frozen meat, tuna fish, and peanut butter. Grains are also part of the supply including bread, pasta, rice, and cereal.

The pandemic and the resulting shutdown has forced the Family Partnership to limit access to its building. This in turn forced Dutchess Outreach to relocate their pantry to the basement floor so the food could be distributed to people waiting outside.

The enormous task of moving the entire pantry with a limited staff was made easier by the mayor. City of Poughkeepsie employees moving pantry items for Dutchess Outreach. “When we needed to move all of the food, including non-perishables, refrigerated goods, and frozen meat along with the freezers. Mayor Rolison sent Poughkeepsie DPW workers to help. “We couldn’t have done it without them,” said Associate Director Tara Whalen.

In addition to moving the pantry, space was needed to store the refrigerated items. Mayor Rolison knew who to reach out to – he called Mike Arnoff, President and Council of Industry member. Arnoff Moving and Storage and Mike went to work finding the resources.

Though refrigerated trailers are in high demand right now Arnoff finally located a 53-foot refrigerated trailer and delivered it to the parking lot of the Family Partnership Center.

“When the Mayor reaches out for help during a pandemic you just react – you listen to his needs and find a solution. The city needed a place to store refrigerated food for families in need. We solved the problem with a refrigerated trailer. Sourced it and had it delivered within 24 hours,” said Arnoff.

Praising the combined efforts of her staff, the City of Poughkeepsie, and Arnoff Moving & Storage, Whalen said “The

**DUTCHESS OUTREACH WITHOUT OUR DEDICATED FORCE OF COMMUNITY VOLUNTEERS, DUTCHESS OUTREACH WOULD NOT BE ABLE TO PROVIDE THE RANGE OF VITAL SERVICES NECESSARY TO THE RESIDENTS OF DUTCHESS COUNTY.**

assistance provided to our Dutchess Outreach staff by Mayor Rolison, city workers, and Arnoff have made it possible for us to continue to feed those in need. This display of teamwork is something everyone can be proud of.”





# Hudson Valley Additive Manufacturing Center (HVAMC) at SUNY New Paltz

## Steps Up To 3D Print Face Shields

BY ALISON BUTLER

When the call to produce more PPE went out The Hudson Valley Additive Manufacturing Center (HVAMC) at SUNY New Paltz jumped in with both feet. As Dan Freedman, Dean of the School of Science and Engineering at SUNY New Paltz explains on the CI Podcast devoted to this story ([listen here https://www.councilofindustry.org/ci-podcast/dan-freedman/](https://www.councilofindustry.org/ci-podcast/dan-freedman/)). “We were contacted almost simultaneously by the Ulster County Executives Office and Mike Oates at Hudson Valley Economic Development Corporation saying there was a need for Personal Protective Equipment and was there anything we could do.”

In response HVAMC's Cat Wilson and Aaron Nelson found the plans for 3D printing the face shields and redesigned the model to a more functional and comfortable version. The main visor and the band in the back were printed at HVAMC but the next obstacle was sourcing the materials for the elastic and shield portion locally. With material stores sold out of elastic they have decided to use 3.5" rubber bands. For the shields, they came up with the idea of using transparencies for overhead projectors as the shield portion and this worked out very well.

HVAMC currently has 17 desktop printers running and 3 bigger Stratasys printers producing 200 a day in the Center. The NOVO Foundation and council member Central Hudson have both given generous donations to keep this initiative going. Thanks to this generosity the PPE has been donated to the first responders and hospitals in need locally. They are delivering 100 per day to Ulster County and sending more down to Orange Regional Medical Center. The need for more is still great and immediate with some saying New York City could need 15 million in the next few months. They are still working on securing

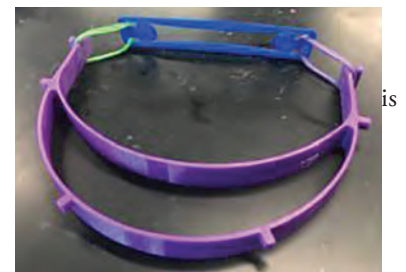
materials and supply chain logistics with help from Council of Industry member, IBM.

Increasing production has been another hurdle. IBM has also been very helpful in cutting plastic for face shields in addition to 3D printing parts and providing design and supply chain

knowledge that is vital to ramping up production of these as quickly as possible. HVAMC is also working with USHECO, an injection molder in Kingston and Council of Industry member, to make more parts faster. The outpouring of people wanting to contribute has been fantastic, there are now upwards of 30 different high schools, colleges and companies printing parts on 3D printers including Council members Schatz Bearing Corp, and Allendale Machinery Systems. Rondout and Red Hook High School are also contributing 3D printed parts. “Everyone’s help is tremendously appreciated,” said Freedman. “The



whole project speaks to the idea of community pitching in during difficult times. This pandemic like nothing most of us have ever seen, and 3D printing provides a unique way of handling the crisis.”



If your organization has 3D printers or materials needed and would like to pitch in you can find information, plans, advice and more here. <https://www.newpaltz.edu/hvamc/covid19faceshields/>





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# It Was Never About The Bags

## Unshattered Pivots from Custom Bags to Face Masks

BY JOHNIEANNE HANSEN

**A**t the Council of Industry all manufacturers are special, but for me some are a bit more special. In fact, I have a favorite and that favorite is Unshattered, a manufacturer of custom handbags in Hopewell Junction, Dutchess County.

Unshattered is a 501c3 nonprofit social enterprise. Their mission is to end relapse by providing job skills, training and employment for women in recovery from addiction. Since 2016, Unshattered has been manufacturing handbags and accessories crafted from repurposed materials designed and produced by women winning their battle against addiction.

When Governor Cuomo ordered non-essential businesses to close March 20th there was an exception for organizations serving populations who were economically at risk. It was, however, unclear if Unshattered qualified under this exemption and since fundamentally they are manufacturing handbags, they needed to abide by the clearer mandate to decrease workforce and close their doors.

During the same press conference, however, the Governor also called for help from anyone or any company who could produce personal protective equipment including face masks. In less than 24 hours the Unshattered team drafted a mask, consulted with a physician from Vassar Brothers Medical Center, and began producing a safe and effective product. By Saturday at noon they were in full production mode and back to being essential.

### PIVOT / PURPOSE

I asked Kelly Lyndgaard, Founder and CEO how this disruption was impacting the team, she answered by providing a little context and background.

Kelly got involved with a local recovery home after hearing how difficult it had been for women to get back on their feet

economically and maintain their sobriety even after completing a twelve-month residential program. The women on her team tell her that the substance wasn't the problem, it was the solution

— a bad solution. “They were using as a solution for the pain and if you can get them to sobriety and give them purpose, community,

meaning and stability they are the most resilient, creative and hardworking employees you'll ever find.”

“So, to answer your question directly: They have been incredible. This team turned on a dime. They rebuilt our manufacturing process, drafted and designed a quality product ready to go in twenty-four hours. They changed their roles internally and stepped up — they handled all of it.”

### DEMAND / VOLUME

The team is busy making and donating masks to hospitals and care givers, receiving orders by the thousands. They are booked about three weeks out and have over 3,000 orders in the system. The team quickly realized they alone could not meet the demand and put a call out to the community for help. They posted the pattern on the website and started a community collection program, they set up a touch free drop box outside of the office to accept mask donations.

Unshattered continues to pay the wages of their employees while donating time, resources and

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materials to fulfill the healthcare orders, they depend on the donations from the community to make this happen.

If you want to learn more or help visit: [www.unshattered.org](http://www.unshattered.org).



# Teaming Up To Make A Difference

BY ALISON BUTLER

In early March, as the effects of COVID-19 first began their ripple through society and the economy the customers of USHECO Inc., a small manufacturer of custom plastic parts in Kingston, stopped placing orders and the company was cutting back employee hours.

It was about this time that designs for plastic face shields started to come out and the company was able to, as Strategy & Communication Coordinator Alethea Shuman describes it, “pivot and find an opportunity to stay open and be helpful.” They rapidly changed their production focus to this important piece of personal protection equipment. This is a small company and they have learned a lot about flexibility in the past couple of years, so they were able to switch easily.

“We are teaming up with one of our direct competitors out of Connecticut to produce these. We are also working with Zumtobel, another Council of Industry member, to help with sourcing and they offered to set up a clean cell to allow us to manufacture face shields there as well. That adds another 20,000 we will be able to produce each week.” This will help USHECO to ramp up for the 500,000 orders already placed and the potential for another 800,000. The biggest limitation is securing enough material to keep up with demand and after that is the availability of machinery. Another Council of Industry member, Ertel Alsop, has offered use of their die cutters if needed. “USHECO is willing to work with anybody and everybody that is willing to step up to the plate.”



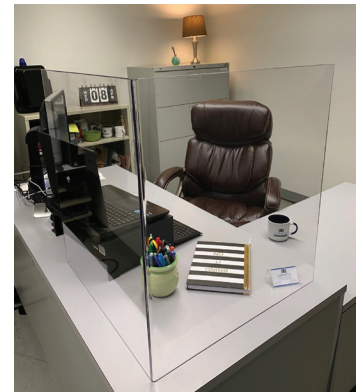
"Pivot...Stay Open and Be Helpful"

USHECO is also working with Hudson Valley Additive Manufacturing Center (HVAMC) at SUNY New Paltz and M-Tech Design. Dan Young at M-Tech Design was able to make a mold for the headband portion in 4 days, this is a process that usually takes 8 -12 weeks, an incredibly fast turnaround. USHECO is now producing the headbands for masks going to Dutchess and Ulster Counties. The mask itself is being assembled somewhere else but USHECO has produced 5,000 of the headbands for them so far.

USHECO is able to keep its employees safe while producing this important PPE. Because they are small, with only 10 people on the production floor at a time in 40,000 sq ft facility there is plenty of room for 6 feet of separation at all times. In addition, they are cleaning surfaces every day with bleach and employees have access to face masks. The facility doesn't allow visitors inside, but an exception was made for the County Executive to tour recently while wearing a face mask.

When considering the future, the availability of materials is a concern. The USHECO face shield design is a reusable one using a heavier material that most companies do not have the equipment to bend but fortunately, USHECO does. The new design they are working on currently is a disposable mask using a thinner material but

supplies of this won't last forever. Shuman wonders, “How long can the raw materials last? We make our traditional products from these same materials for companies that supply electronic parts. When business starts to go back to normal will we have the materials to still make our products?”



## Prioritizing For What's Needed Now

Hudson Valley Plastics is a manufacturing plant in Pawling that produces small, custom-made plastic parts for clients in industries including cosmetics, automotive, and food and beverage. The healthcare industry has been in such high demand, however, that the company halted its regular manufacturing in order to fulfill healthcare orders. Now, Hudson Valley Plastics

prioritizes creating dosage cups, test tubes and PPE.

“These are not products we’ve ever had to ramp up production for,” says Diana Tomassetti, the president and CEO of Hudson Valley Plastics. “But at this point in time, you follow where the demand for your services is most needed and thanks to our innovative team, making the shift will not be difficult,” Rockland County Business Journal reports.



# IBM Committed To Learning ▼

**C**ouncil of Industry member IBM Poughkeepsie has stepped up in many ways. In addition to helping HVAMC with face shield production, they are providing tablet devices and internet connectivity to NYC public school students, with a goal of putting 300,000 mobile learning devices in the students hands by mid-May.

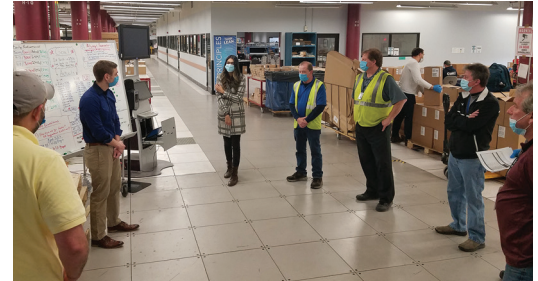
IBM is partnering with the City of New York and the Department of Education to provide students with the technology they need to stay connected and learning during this challenging time. A company statement says, "We have all been forced to adapt to new ways of working, learning, and interacting during this pandemic. This is especially true for our young people who have been displaced from their schools and daily routines. We view it as our responsibility



to leverage the very best of our technology to lessen this burden – and to give students with the tools they need to succeed."

So far IBM has deployed in excess of 100,000 tablets that are internet ready and loaded with all the software that students will need to continue their academic year. They are on track to deliver an additional 200,000 in the coming weeks. The provisioning work is being done from their Poughkeepsie site by a very dedicated team. While following social distancing and health guidelines they have designed a manufacturing facility and scaled to capacity in order to fulfill this incredible opportunity. The site is producing in excess of 5,000 tablets a day.

This project builds on a deep commitment that IBM has to the New York City community and its schools. IBM is thankful for this opportunity to help and work with Commissioner Jessica Tisch (Department of IT & Telecom) who has been a great partner.



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# BOUNCING BACK FROM COVID-19



In an interview about leading through unpredictability on National Public Radio in the midst of the Coronavirus crisis retired Army General Stanley McChrystal said, “leaders have to be absolutely straight forward, tell everyone the truth and communicate with a level of candor that convinces people they are getting the best information available.”

He added, “What we don’t know leaves a vacuum in our mind and we fill it with the most terrifying ideas.”

Coming out of the COVID-19 crisis will involve a lot of unpredictability. Your communication as a company leader must follow McChrystal’s advice, and not just when going into or out of a crisis.

Communicating with transparency and candor must become a core company principle.



For your employees not only is “knowledge power” but “knowledge is empowering.” Employees who feel “in the know” will feel trusted and more likely bring positive attitudes and high-morale to the workplace.

## TRANSPARENCY

Concerns manufacturing companies will be facing are the unpredictable questions such as:

- How fast or slow will the economy recover?
- What is our supply chain going to look like?
- What does our workforce need to be to meet customer demands?

McChrystal also offered a strategy to combat a vacuum of information saying, “you set up a system that provides information across levels, identifies best practices, and what’s working and what isn’t, so the entire organization gets smarter.”

The manufacturers that will emerge from the crisis strongest will be the ones that set new expectations for how company leadership communicates with their team members, similar to what McChrystal is suggesting.

The phrase, “Knowledge is Power” attributed to Sir Francis Bacon in the 16th Century is what McChrystal is espousing here. For your employees not only is “knowledge power” but “knowledge is empowering.” Employees who feel “in the know” will feel trusted and more likely bring positive attitudes and high-morale to the workplace.

To quickly rebound from this COVID-19 crisis it is more important than ever that you have everyone rowing together in the same direction. The best way to create that is through direct, candid and transparent communication that gives your team members the knowledge that will empower them.

Not communicating in this manner creates the vacuum McChrystal mentioned above. For your company the “terrifying ideas” team members fill it with are rumors and gossip that undermine trust in company leadership and lowers morale and motivation. As we come out of this virus crisis communicating with transparency, in a direct and candid manner, that encourages dialogue and collaboration with your team is the key to your company rebounding quickly. Communicating with high-levels of candor and transparency is the only sensible way to run a company.

## CANDOR

Jack Welch, the famous former CEO of General Electric who recently passed away on March 1, 2020 at the age of 80, was one of the first leaders to espouse candor as a leadership strategy. Kim Scott authored a book with “Radical Candor” as the title, and Ray Dalio founder of the \$5 billion hedge fund Bridgewater Associates, operates the company with radical candor as its core principle.

But for candor to be appreciated and trusted it has to come with transparency, otherwise it’s just one person’s opinion.

## “WORKPLACE TRANSPARENCY” CREATES A WIN-WIN-WIN ENVIRONMENT.

To be most successful all players on the team must be playing with the same information. That’s where too many organizations fail their people, and why they don’t get the buy-in and commitment necessary to build and grow quicker. Bringing

workplace transparency into your company addresses three key areas your business needs to maximize results.

**First, it serves company leadership who, once everyone in the company has the same information and trusts it:**

- Removes the friction and resistance most workplaces struggle with.
- Eliminates the “us” vs. “them” environment so many company leaders face between employees and company leadership.
- Allows company leaders to get out of their “isolation chamber” where they often feel alone in caring about the company and when having to make hard decisions on direction they have collaborators to help.

**Second, it serves employees who, once provided information they can trust from company leaders will:**

- Feel trusted and as if they are more than just a cog in the wheel.
- Begin to think beyond the paycheck and want to collaborate with company leaders to help the company get back to what it was, and beyond.
- Bring the best of themselves more often and feel a sense of purpose.



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Third, it serves your customers because when company leadership and all team members are rowing in the same direction, customers get the highest quality product.

In two articles on the jobs website Glassdoor, Workplace Transparency was defined as “a philosophy of sharing information freely in an effort to benefit the organization and its people, and operating in a way that creates openness between managers and employees.” The coronavirus pandemic offers the opportunity to become more transparent.

Workplace transparency should be applied to three critical areas of your workplace.

- Vision and Strategy
- Operational and behavioral performance
- Financial performance

## VISION AND STRATEGY

Now, just when business conditions are at their most challenging, dynamic organizations need to effectively communicate their vision and strategy. In virtually every small

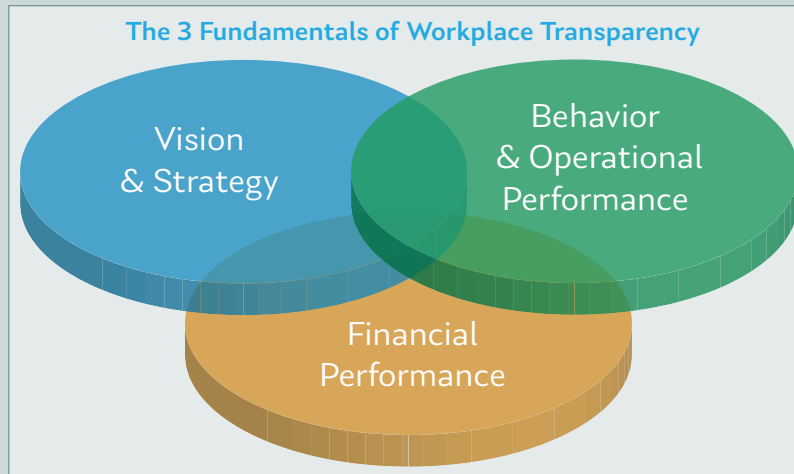
business I’ve worked with employees have told me in my initial interviews that they feel their company leaders are “just going through the motions” and have provided “no real direction” on the future of the company.

There are two reasons for this. Either the company leaders haven’t created a vision and strategy for the company’s future, or they are keeping to themselves. Both are counter-productive and create the unmotivated, low-morale, resistant employees business leaders complain about.

A compelling vision and strategy for the future of the company is vital and must be communicated with transparency to everyone. The best company leaders involve employees in conversations during its creation. Remember, people support what they help create.

## OPERATIONAL AND BEHAVIORAL PERFORMANCE

In the weeks and months ahead, manufacturers will be facing workforce obstacles including increased absenteeism, workplace



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illness and cutbacks, or paradoxically, increased demand. It's never too soon to communicate expectations and obstacles to employees to encourage collaboration and build momentum.

In many firms operational and behavior performance expectations are ambiguous at best and non-existent at worst. Conversations around performance metrics rarely occur with any level of transparency and candor. Any attempt at an annual "performance review" is met with anxiety, cynicism, and disappointment. Clients tell me often that their annual performance reviews are "Ground Hog Day" conversations. The same conversations occur year-after-year while performance and behaviors of team members never improve.

Company leaders and mid-level managers need to collaborate with team members in candid and transparent conversations to raise the bar on expectations for both job performance metrics,

and attitude and behavior adjustments. Even more importantly is that there must be an outlet that provides opportunities for team members to give constructive feedback and to share ideas for

**When there is joint accountability people can't hide. When people can't hide your company will thrive.**

workplace and operational improvements. And a process must be in place that actually closes the loop on what is shared.

This means ideas from the front lines are either implemented and the person providing the idea is given full credit, or real, specific business case reasons are provided explaining why the suggestion is not being implemented.

## FINANCIAL PERFORMANCE

This is the game changer, especially when the company might be facing challenges.

Company leaders who are open to the concept of open-book management and financial transparency, including getting employees involved in understanding the financials of their company, will help drive company profits to new heights.

Jack Stack, the CEO of SRC Holdings in Springfield, Missouri, says, "It is the only sensible way to run a company."

Stack has the credentials to say it. He started the concept of open-book management, of sharing and teaching business financial literacy to employees in 1983 out of necessity. Open-book management is transforming business in the companies that adopt and adapt it (to learn more visit [www.YourChampionshipCompany.com/greatgame](http://www.YourChampionshipCompany.com/greatgame)).

Financial transparency and involving employees in influencing the numbers is the quickest way to, either turn around a financially struggling company, or grow a company that has become stagnant.

But, leaders who keep the financials close to their vest are losing out on the collective genius of latent entrepreneurs throughout the company. Business leaders are typically concerned with sharing financial information with employees for five specific reasons including:

- **Employees will know the profit/loss of the company:**
  - Yes, and isn't knowing and understanding reality better than what they are imagining in their minds and gossiping to their co-workers about?
- **The competition may learn your numbers:**
  - Yes, and what can they do with it other than compare it with their own to know if they're winning or losing?
- **Employees won't understand the financials:**
  - You are underestimating them. Employees will embrace being "in the know." They will be open to learning and contributing to making the numbers better so everyone can receive a stake in the outcome of the improvements they help create.
- **Everyone will know other's salaries:**
  - This works without sharing specific individual salary information and is unnecessary.
- **Company leaders are not comfortable in their own understanding of the financials:**
  - Here is where you need to be humble to learn the fundamentals and then teach it to employees because the best way to learn is to teach. Start with a small core leadership team and build from there.

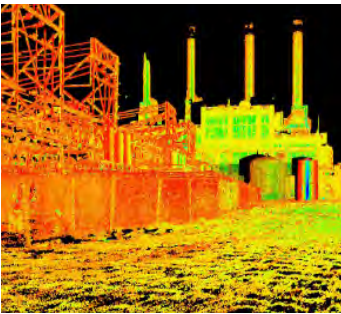
When you bring workplace transparency into your company in the three contexts outlined here you will have everyone on your team focused on a compelling future vision trusting that there is joint accountability across all levels of the company. The biggest advantage to workplace transparency for company leaders is that it eliminates entitlement mentalities because with information and knowledge, comes greater responsibility, and with responsibility comes accountability. Entitlement mentalities go away when there is joint accountability with company leaders as accountable to employees as employees are to company leaders. It becomes a truly symbiotic relationship built on mutual trust and respect.

When there is joint accountability people can't hide. When people can't hide your company will thrive.

The driver of all this is workplace transparency. It is the quickest way to rebound from the virus crisis and build a company that thrives well into the future.

*Skip Weisman is the Hudson Valley's premier business coach focusing on transforming mediocre, stagnant, or negative work environments into championship company cultures that are more positive, more productive and even more profitable. Skip is the only certified Great Game of Business Open Book Management Coach in New York and he works with manufacturing companies to implement a systematic process of financial transparency that brings employee accountability to the workplace.*





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# FIRST ROBOTICS INFINITE RECHARGE

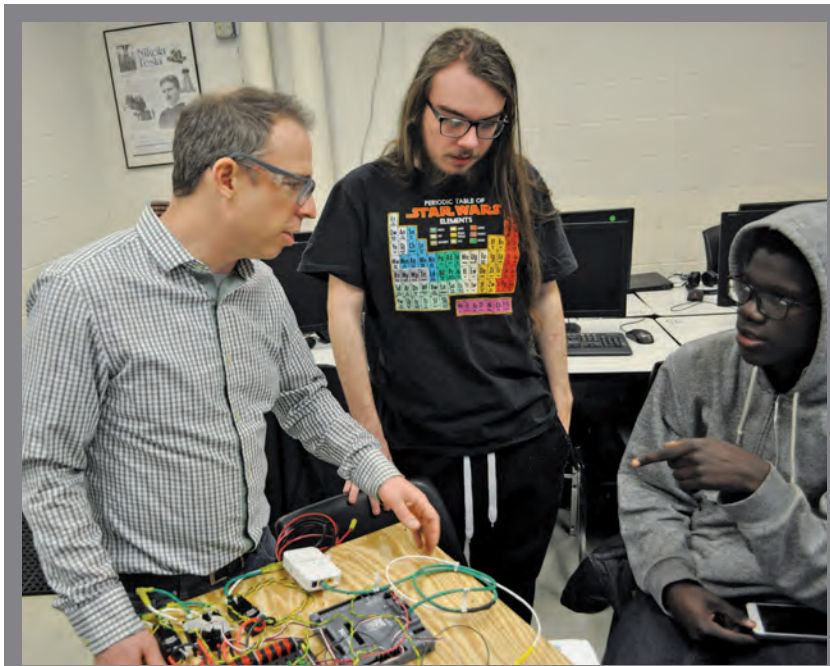


Teachers Bill Lopez and Matt Leifeld work with young scholars Regan Miller and Dartanian Barringer to strategize on ball intake.

Imagine a competition where excited, technology-driven high school students compete as teams, head to head with robots they have designed, built and programmed themselves. This happens annually and hundreds of teams were preparing to compete at Rockland Community College and RPI in March, Houston in April and Detroit in May when development came to a sudden halt.

FIRST (For Inspiration and Recognition of Science and Technology) was founded by inventor Dean Kamen in 1989 and is the world's leading youth serving nonprofit advancing science, technology, engineering, and math. This program inspires students in grades K-12 worldwide while teaching leadership by engaging them in hands-on robotics challenges.

FIRST LEGO League Jr. is for grade K-4, FIRST LEGO League is Grades 4-8, and FIRST Tech Challenge covers grades 7-12, while the FIRST Robotics Competition is grade 9-12.



Hudson Valley Pathways Academy First Robotics coach Noah Smith consults with young scholars Elijah Effner and Omari James regarding programming the robot.

The program is supported by corporations, educational and professional institutions and individuals who provide mentorship time and talent, equipment, and funding. Participation in FIRST is proven to encourage students to pursue education and careers in STEM-related fields. They develop self-confidence in STEM and real-world skills that can lead to careers in STEM related fields and more. High School participants are also eligible to apply for more than \$80 million in scholarships to participating colleges and universities.

Working with professional Mentors participants design and build a robot, and compete in high-intensity events that reward the effectiveness of each robot, the power of team strategy and collaboration, and the determination of students. The competition teams create powerful mentoring relationships between the students and professional mentors, many of which are engineers and other professionals. The event starts with a Kickoff event that unveils a new, exciting, and challenging game. From the Kickoff, teams have limited time to build and program a robot to compete in the game using a kit of parts provided by FIRST and a standard set of rules. This year's theme focuses on renewable sources of energy and is titled INFINITE RECHARGE.

FIRST Robotics has become an event to look forward to for the Hudson Valley Pathways Academy and other innovative schools around the country. It ties together the adrenaline rush of competitive sports and the brain-straining precision that accompanies technology and science. To actually succeed in FIRST, you have to be passionate, willing to learn from others, and solve problems in real time. Simple enthusiasm alone isn't enough in this nerve-wracking, but fun-filled annual competition.

FIRST Robotics is a program that builds student creativity, innovation, and critical thinking. The goal of FIRST is to build and design a robot that's able to perform multiple unique tasks and then put your teams' skills to the test in competitions that take place around the country.

This year the theme of First Robotics is *Star Wars, Infinite Recharge*. The main goal for the robot in this competition is to shoot and score "Power Cells" (foam balls) to energize a Shield Generator to protect the team. Students are tasked with designing a robot that can function both, autonomously and manually. The Robotics Challenge is a fun and interactive experience giving students an opportunity to take their creative ideas to the next level. The FIRST competition presents students with the task of learning how to build and code a bot from scratch, tied together with teamwork and problem-solving as factors for the success of completing the robot. The whole HVPA student body dedicated a lot of time and effort to assemble the robot this year.

The HVPA robotics team made many improvements since our inaugural year. FIRST Robotics has become a school wide effort with just about every student helping in one way or another. Young Scholars broke into assigned teams to design, machine, build, and code the robot. Others worked together to manage finances, create team logos, design t-shirts, and "brand" the squad. While other students participated as photographers, videographers, website developers, social media marketers and journalists, working on this article for the HV Mfg magazine. Some students even learned how to design Star Wars themed costumes from industry professionals.

As a team the staff and teachers have been actively involved with the students. Matt Boice has helped with assembling, materials, and the build protocol. Teachers, Matt Fagan, Noah Smith, and Joyceanne Wlodarczyk have mentored students through various aspects of development. William Lopez has acted as coach and building consultant. Matt Leifeld was a productive design and programming coach. The students turn to mentor and Principal, Peter Harris for logistical, budgeting, and finance support. Administrator, Steve Casa is a fully involved mentor and industry partner liaison.

Chapter One student, Ben Dubois, gave us feedback on what he's gained from his FIRST robotics experience, some challenges he's had, and what he's excited about for the competition. Building something this complex brings trial and error, this was one of the things Ben struggled with. He said, "The biggest challenge I've faced so far is the repetition and problem-solving... we'll be running into the same problem this year. We have to find good solutions and sometimes figuring it out is really hard." Even with his struggles, he's still managed to be persistent and keep working when things get tough.

Math teacher, Matthew Leifeld echoes what Ben said. "Learning how to code was a process of problem solving. Each student has run into difficulties and issues that they've had to figure out. Because of this, students have gained skills working





Consultant instructor Sal Ligitino coaches Heidi Cardenas-Ruballos in her first attempt at cutting a part for the robot.



Young scholars Brandon Pendell and Travis Boice work together to construct the bumpers for the robot.

as a team and persevering. These dispositions will help them in preparation for their future career and provide them with the necessary competencies.”

Robert Reilly Shaw, a first year student and coder for this year’s competition, explains the process of learning how to code. “It was a lot of research and studying and when working with code you need patience. It takes a lot of time and effort to code a robot to do the necessary tasks for the competition.”

Founder of the HVPA robotics team and science teacher, Noah Smith, shows what participating in FIRST Robotics is like for a student. He says, “Among other things, FIRST Robotics emphasizes cooperation, growth, and the soft skills for leadership under pressure.” Smith continues, “This past year students have learned java, applied physics, and how to meet deadlines.”

Regan Miller, a third year student at Pathways, chosen as student “coach” for last year’s team, has benefited greatly from

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the robotics program. “FIRST has really tested my leadership skills. As a “coach” I motivate my peers, organize and divide labor, and help my teammates set goals.” Competitions have given Regan the opportunity to meet students from other schools and work together with them. At competitions “I’ve been able to communicate with other teams to devise strategies, share resources, and improve each others robots.”

Local business professionals visited with the students and mentored them through various phases of the project. Linda Engler from Ad Essentials spent time teaching photography, marketing and journalism to those students responsible for communications.

Alethea Shuman, VP of Sales and Engineering from USHECO provided help in project management and CAD design.

Ken Myers, the Laboratory Supervisor at the Center for Automation Technologies and Systems Vice President for Research at RPI, acted as a mentor in machining and design strategy. Ken provided materials and consulting on building the robot.

Salvatore Ligotino, Robotic Instructor at Ulster BOCES career and technology center and SUNY Ulster played an instrumental role in the project. Sal provided support in building, design and implementation of the plan to create the Robot.

Ilya Vett, a longtime costume and puppet designer for the Lion King on Broadway and Jaf Farkas a prop designer in the film industry visited the classroom and offered assistance for the design of the mascot’s costume.

Al Kloss from Saultana Upholstered Furniture helped with sewing the fabric for the bumpers that were required for competition. Numerous other industry partners offered help and the hope for next year is to have a more integrated process. The Council of Industry members have supported the schools’ FIRST Robotics efforts with an eye on the future.

HVPA’s robotics team was putting the finishing touches on their robot when they were informed that school would continue remotely and that the competitions were to be suspended due to COVID-19. 49 teams were registered to participate in the event at Rockland Community College and 27 teams at Rensselaer Polytechnic Institute (RPI) in March. The HVPA team was invited to attend both cooperitions.

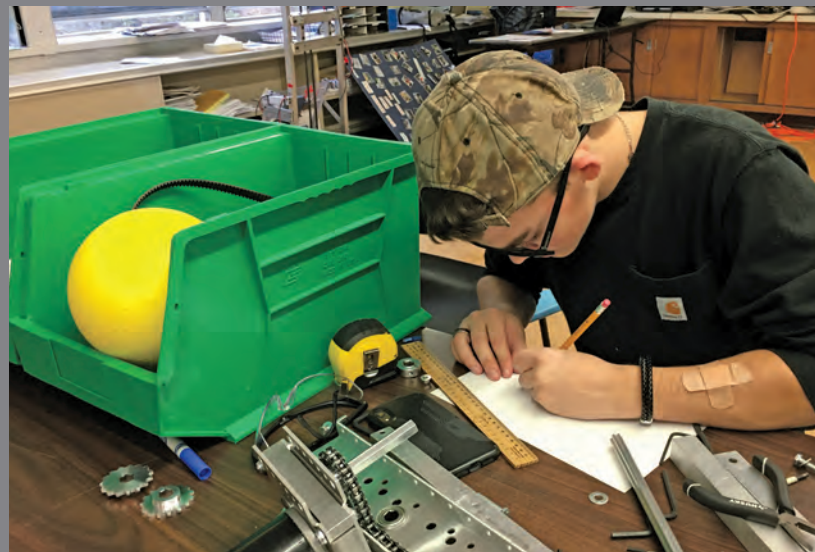
The whole FIRST community was disappointed when hearing that the competitions were cancelled, but that was short-lived with all the more pressing real concerns over family and friends getting sick or worse passing away from the COVID-19 pandemic. The FIRST community quickly shifted from disappointment to thinking about how they could help the local community. Salvatore Ligotino, the HVPA Robotics Instructor, was helping make plastic parts for splash guards at SUNY New Paltz.

Perhaps the program has achieved such amazing results because FIRST is known for Gracious Professionalism and Coopertition. If you haven’t heard these terms before – “Gracious Professionalism is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community. With

Gracious Professionalism, fierce competition and mutual gain are not separate notions. Gracious professionals learn and compete like crazy, but treat one another with respect and kindness in the process.” And at FIRST, Coopertition is “displaying unqualified kindness and respect in the face of fierce competition.” Coopertition is founded on the concept and a philosophy that teams can and should help and cooperate with each other even as they compete. Coopertition involves learning from teammates. It is teaching teammates. It is learning from Mentors. And it is managing and being managed. Coopertition means competing always, but assisting and enabling others when you can.



Erik Augustin-Santos, Juan Neri-Ramos, Maxwell Roque, and Matthew Albert organize tools and work on electrical elements of the robot.



Benjamin Dubois plans critical elevator movement system.



Last year nearly 100,000 high school students on 3,940 FIRST Robotics Competition teams took part in 100 district events, 11 District Championships, and 62 Regional Events (in the U.S., Australia, Canada, Israel, Mexico, and Turkey), and the FIRST Championship. Teams are comprised of professional mentors and 10 or more student members in grades 9-12. In addition, each FIRST team has one or more sponsors. Those sponsors include companies, universities, or professional organizations that donate their time, talent, funds, equipment, and much more to the team effort.



Pictured are Communications team members Yshecka Smith and Serenity Wroblewski working on drafts for this article. Other members of the team include Bean Crane, Erryn Teague and Matt Petty.



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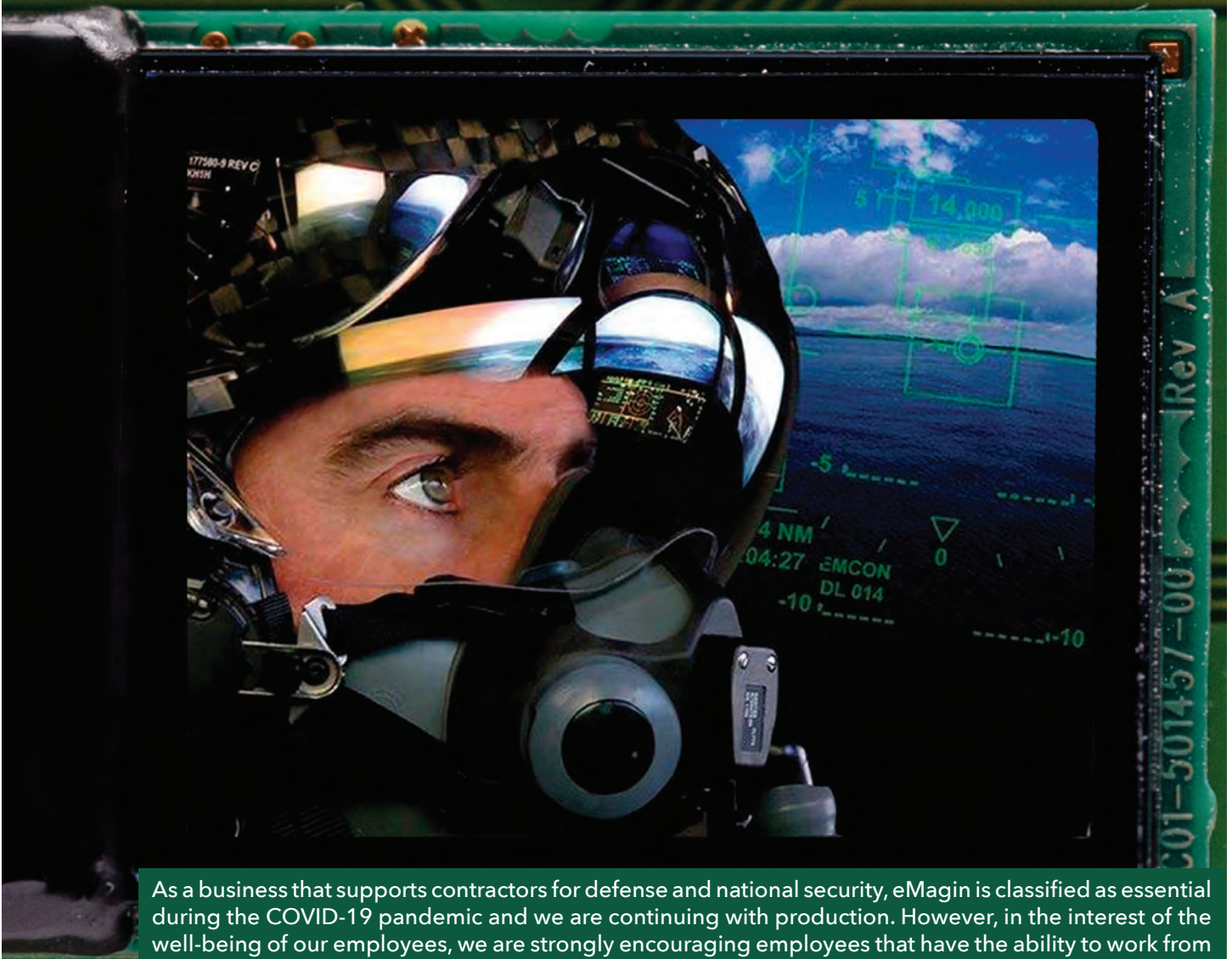
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## COMPANY PROFILE

eMAGIN CORPORATION | BY ALISON BUTLER

# eMagin THE FUTURE



As a business that supports contractors for defense and national security, eMagin is classified as essential during the COVID-19 pandemic and we are continuing with production. However, in the interest of the well-being of our employees, we are strongly encouraging employees that have the ability to work from home to do so and for those where the ability to work from home is limited or not possible, to work alternative shifts to significantly reduce the on-site population at peak times. We have also increased the cleaning frequency of our facility are practicing the social distancing guidelines.

It wasn't long ago that only superheroes in comic books could see through walls and superimpose diagrams over the landscape, person or machine in front of them. The helmet worn by Marvel's Ironman used to be science fiction, but not anymore. Imagine a device that can make the solid steel of an armored vehicle seem invisible. Picture yourself in a tank or armoured vehicle on patrol in a hostile environment. Climbing out of the vehicle to look around could put your safety in jeopardy but how else can you assess the terrain or where incoming attacks originate from? Now imagine your helmet visor has a microdisplay screen connected to a feed from cameras mounted all around the vehicle's exterior. Viewing this full-color streaming video allows you to see a full 360 degrees around your position in real-time.



This sci-fi turned reality is made possible by a technology called OLED microdisplay and it is designed and manufactured by East Fishkill based eMagin Corporation.

## The Technology

An OLED is an organic light emitting diode that is made of several very thin layers of organic material sandwiched between an anode and a cathode. It can be the screen on your cell phone, or the television mounted on your wall. eMagin manufactures OLED microdisplays, meaning they are much smaller with a higher resolution, ranging from 640 x 480 (pixels) up to 2048 x 2048 in resolution. These screens are a half-inch to an inch diagonally with 1080 or 1920 x 1080 resolution. In comparison to an HD TV, this resolution is higher on a screen that is less than an inch long diagonally. eMagin is also working on a prototype with 4,000 x 4,000 resolution.

The displays are small and lightweight so they can be integrated into a head-mounted display (HMD) similar to goggles or a helmet visor, and where they display data and images that are enlarged for viewing. eMagin CEO Andrew Sculley explains that “the quality of the display is exceptional with thousands more pixels per inch than your cell phone. When viewed through a magnifying headset the images on the microdisplays appear comparable in size to a computer monitor or large-screen television.”

eMagin’s OLED microdisplays deliver high resolution images that perform effectively even in extreme temperatures and high vibration conditions. They are essential in products ranging from military aviation helmets, military weapons sights and targeting systems, night vision and thermal imaging devices, training and simulation equipment, visualization for ocular surgery, mobile ultrasound and augmented reality devices, or AR, applications.

Mark Koch, CFO of eMagin explains why these displays are superior over other types of screens, “The OLED microdisplays offer significant advantages over comparable liquid crystal microdisplays such as higher contrast, greater power efficiency, less weight, more compact size, and negligible image smearing.”

## Company History

The company was formed in 2000 through a reverse merger of Fashion Dynamics Corporation and FED Corporation, a developer and manufacturer of optical systems and microdisplays for the electronics industry. The newly formed company took on the clever name, eMagin Corporation. In addition to the technical know-how acquired through the merger, several members of the management team came from The Eastman Kodak Company, a pioneer in OLED technology.

eMagin soon found its current home in the former IBM Fishkill site now known as iPark. This location was ideal because it already had the space, facilities, some equipment, and most importantly, the talented people needed for the OLED manufacturing process. Many local employees from former area employers found themselves back in their old facility working in the cleanrooms once again. One of these is Joseph Saltarelli, Senior Vice President of Operations at eMagin. “Many of eMagin’s employees come from local talent. Some have been with eMagin from the beginning, while others have come here from other present and former

workforce. Since its inception, eMagin has hired skills from manufacturing through research and development with a variety of education levels from high school through advanced degrees.”

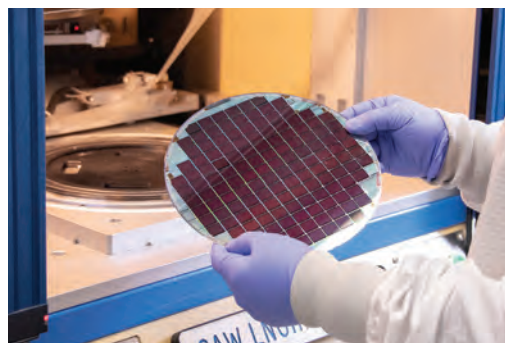
“In the beginning, we did have a license from

Eastman Kodak for a fundamental patent that expired in 2007,” explains Sculley. “Since then eMagin has developed over 65 US and international patents and applications.” The company’s first microdisplays, the super video graphics array or SVGA+, OLED was introduced in 2001. By 2008 they were engineering samples of their super-extended graphics arrays or SXGA 120 OLED microdisplays and were selling significant quantities of them by 2010.

Through the years the products have evolved with digital SVGA in 2014 and a smaller pixel pitch digital SXGA in 2015. It was also in 2015 that eMagin developed a prototype immersive headset using their 2K x 2K display.

Then in 2016, eMagin demonstrated what they believe to be the world’s first highest brightness and highest resolution microdisplay using their direct patterning method. In 2017 they advanced their backplane design and the displays became even brighter, exceeding 5,000 cd/m2. eMagin has since made further improvements to

local companies such as IBM, Micrus, and GLOBALFOUNDRIES. Throughout the years, as those companies were downsizing or transitioning their operations, eMagin was able to capitalize on hiring people with the right technical backgrounds to supplement the existing talented



Lead technician Angela Espinosa prepares a wafer full of microdisplays for eMagin’s packaging process.



Clean room technician Chris Rea takes critical measurements as part of eMagin’s OLED fabrication process.

features and brightness in their WUXGA displays and they are the only company to have demonstrated this technology.

To put all this technology into perspective, Sculley explains

"The standard cell phone display has a lot of black space between pixels but the OLED microdisplays are white with a color filter so there is no black space between pixels. Your standard cell phone screen sub-pixel is 20 microns, our whole full color pixel is 10 microns. Keep in mind, the diameter of a human hair is on the order of just 75 microns.

## The Manufacturing Process

The OLED microdisplay manufacturing process starts with a special wafer designed by eMagin that tells the pixels how to light up. Layer upon layer of special organic materials are deposited in thin films in just the right sequence so that an 'energy staircase' can form between the different materials for light to travel through. This process then must be encapsulated to protect against moisture and oxygen which would degrade the organic materials and the cathode.

Providing a quality product is vital to eMagin and the consumers demand perfection. Certain displays must also be made anti-reflective and formulated so they can be incorporated into a variety of head-mounted gear. In addition to their rigorous quality control processes, eMagin has a lifetime guarantee against black spots and exceptional quality control to prevent imperfect displays from getting to the end-user.

The cycle time to produce the microdisplays is 8-11 weeks total. It takes 6-8 weeks just to make the specialty wafer. From there, the cleanroom film deposition process takes about a week and then another two weeks to go through packaging. According to Koch, "Because we keep wafer inventory in-house, we can often shorten this cycle time. We have an expanding book of open orders from military and other customers, all with scheduled delivery dates which allows us to plan production and achieve over a 95% on time delivery rate."

Research and development are key components of eMagin's success. With challenges in both development and the manufacturing process, they are continually working on product improvements. The OLED microdisplays are being designed for inclusion in products manufactured by OEMs (original equipment manufacturers) and other buyers. These are the companies that place the microdisplays into headsets, binoculars, or helmets that they manufacture. The microdisplays can be separate components or integrated into bundles coupled with eMagin's optics or complete systems by their customers. Approximately 80% of eMagin's products go into military applications with the other 20% being used in medical or veterinary products, or thermal and night vision devices for first responders.

## Military Applications

eMagin is recognized by the US Government as a leader in the OLED microdisplay field and has received funding from the US

**"Providing a quality product is vital to eMagin and the consumers demand perfection." ... eMagin has a lifetime guarantee against black spots and exceptional quality control to prevent imperfect displays from getting to the end-user.**

Army's night vision labs to improve and design displays. Their displays are key components in the F-35 advanced pilots' helmet which allows even new pilots to perform nighttime aircraft carrier landings. eMagin also provides displays for advanced binocular night vision systems that have both light and thermal imaging capabilities. As a part of the Family of Weapons system, eMagin's displays allow soldiers to wirelessly connect their rifle sights to their headsets enabling them to shoot around corners.

### How's that for superhero capabilities.

eMagin is the only US based company with the manufacturing capabilities for OLED microdisplays. What makes eMagin's OLED microdisplays stand out from other manufacturers besides that they are made in this country instead of overseas, is that they are directly patterned OLED Microdisplays which means they have a much higher brightness and efficient. "We are taking a step forward in this direction separating us from our competitors who only use white with color filters. Sculley explains. eMagin produces 50,000 - 60,000 OLED microdisplays a year here in their Dutchess County facility and has the capacity to support increased production.

## Commercial and Consumer Applications

The commercial market for the OLED microdisplays includes medical equipment such as imaging for large animal veterinarians and eye surgery. With the hi-resolution OLED microdisplay doctors can place a virtual map over the eye they are operating on. This



eMagin Senior Management Team (left to right): CEO Andrew Sculley, CFO Mark Koch, and Senior VP of Operations Joe Saltarelli. Not pictured: COO Dr. Amal Ghosh, Senior VP of Product Development Olivier Prache, and VP of Business Development Doug Hughes.



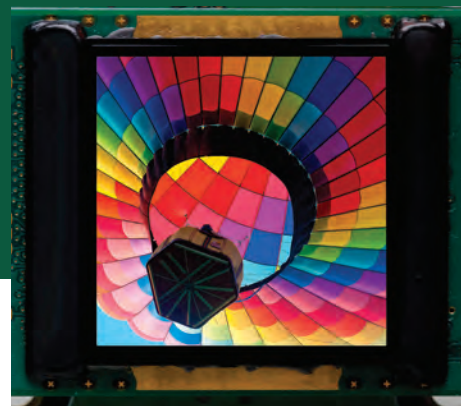
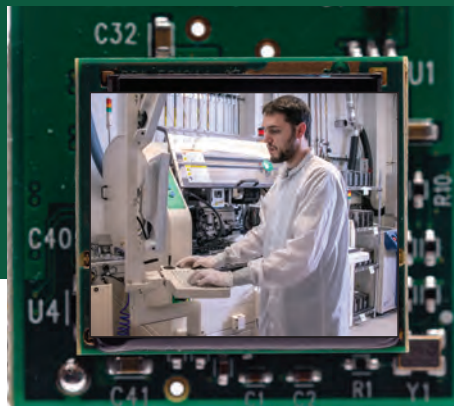


image-guided technology increases the precision of the execution of the procedure by visually mapping the surgical plan to landmarks on the patient's eye. This is currently being used for ophthalmic cataract surgery where the benefit is that a surgeon, enabled with high-resolution OLED image-guided technology, can digitally measure and mark the pre-operative eye to ensure customized incisions, alignment and lens placement for each patient.

For veterinarians, a lightweight, head-mounted display is available which can be used in a wide range of applications from on the farm to in the clinic. "These enable vets to see the results of images they are taking in the field. It's especially useful with large animals like cows and horses that cannot be seen in traditional offices," explains Saltarelli.

For first responders, eMagin's compact, lightweight, low power, and high brightness displays can be used in several applications including low light and thermal vision for law enforcement and firefighters. These can also be used for personal display systems for field maintenance on machinery. With cameras enabling technicians to see inside of hard to reach areas to diagnose problems without disassembling the equipment.

There are a variety of consumer uses that eMagin hopes to become further involved with in the future as the Augmented Reality and Virtual Reality markets take off. eMagin's unique high brightness and high-resolution OLED-on-silicon microdisplays surpass the performance threshold required by consumer product companies for their next-generation AR and VR headsets. According to Saltarelli, "Our proprietary direct patterning technology provides brightness that no other OLED microdisplay technology can match. Additionally, our microdisplays offer unique on-chip performance capabilities and the next generation for consumer will use DDIC (Display Driver Integrated Circuits) as was our recommendation to many companies. Hence not all on-chip enables numerous consumer applications."

## Location and Talent

One key to eMagin's success is their location and employees. The company was fortunate to have moved into a location that provided not only the facility but the technical workforce and equipment necessary for their process. The building they are in was the former IBM Lime Kiln Road Semiconductor manufacturing site and was one of the few facilities in the United States with the infrastructure necessary to produce OLED microdisplays. Sculley describes it as, "A great facility in a great place." This location came with much of the necessary equipment, class 10 cleanroom, gasses and chemicals required for the manufacturing process.

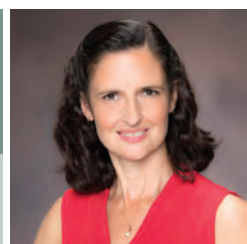
Saltarelli explains, "In addition to the equipment and clean room, many of the technicians, engineers, and maintenance

people were available locally, some starting with eMagin from the beginning and others coming from other local technical companies." Currently, the company employs approximately 100 people, 70 of those are involved in operations, of which 50 are directly involved in the manufacturing production. eMagin runs three shifts and an alternating 12-hour shift to ensure coverage 24 hours a day, 7 days a week in the cleanroom operations area. In addition the packaging department runs 2 shifts a day. There is also a facility in Santa Clara, California where the silicon wafers are designed, with 6 employees.

There are a wide range of job requirements and educational backgrounds throughout eMagin. eMagin employs production technicians, engineers, research scientists, quality control, procurement, and financial professionals, and several support staff. Depending on the position, they may hire people right out of high school or college, all the way up to PhD's with OLED expertise. The process to make an OLED microdisplay is complicated and they have had modest growth so eMagin is always looking for skilled engineers, OLED experts, and manufacturing employees to fill open positions and replace employees planning to retire in the next few years. To see what it's like to be an engineering technician at eMagin watch this CI video: [https://youtu.be/yn7PI0t\\_G9U](https://youtu.be/yn7PI0t_G9U) sponsored by Thompsons Mahopac Bank.

There are several local suppliers and Council of Industry members used by eMagin for their manufacturing processes. Among these are Metrix and Marco Manufacturing who supply printed circuit board services.

As AR and VR applications become more and more common it will be exciting to see what amazing products eMagin finds their microdisplays being used in. The company's commitment to developing the best technology, most efficient manufacturing process and superior quality will ensure that eMagin will remain an industry leader and that military, first responders, doctors, mechanics, maintenance professionals, and everyday consumers all can play the role of superhero.



*Alison Butler is the Director of Member Engagement at the Council of Industry.*

## THE AI GUIDE

### How Artificial Intelligence is Shaping the Future of Manufacturing

The expanding phenomenon of artificial intelligence (AI) has already contributed to major developments in the manufacturing industry. AI in simplest terms refers to a machine's ability to perform tasks normally completed by humans. Machine learning, a more distinct component of AI, involves algorithms recognizing patterns from large data sets to generate responses. In the manufacturing business of today, and increasingly tomorrow, AI works to simplify processes in areas like human resources, maintenance, and quality assurance.

Many use the terms AI and machine learning synonymously; however, they have key differences. AI entails machines performing in ways that are "intelligent," human-like, and situationally adaptive. In machine learning, machines collect and analyze massive amounts of data, then make predictions based on what they have learned. Machine learning is typically applied more often than AI in the manufacturing industry. Training machines to discern these data sets can help various areas of manufacturing ultimately become more productive.



AI originated back in 1956, when the term "artificial intelligence" was coined during a conference at Dartmouth College, according to LiveScience. When government funding and public interest in AI subsided some years later, researchers experienced a major drop off, known as the "AI winter," when research stagnated. However, in 1977, the field gained interest when IBM's Deep Blue computer became the first one to beat a chessmaster, Garry Kasparov.

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## AI and Human Resources

AI has developed many processes in human resources, and is only expected to grow. According to a 2017 CareerBuilder survey, 55% of HR managers say AI will become a regular part of HR within five years.

It plays a major role in decision-making processes, particularly when it comes to talent acquisition and employee evaluation. For example, Google used machine learning in its selection process of potential candidates to determine the frontrunners. This method eliminates bias that could potentially come from a recruiter or interviewer.

The company also released an AI-powered tool, candidate discovery, in its recruitment software called Hire by Google. Candidate discovery allows employers precision in sifting through applications. It simplifies the recruiting process, gathering applicants based on criteria like location and skillset.

AI implementations, however, do not always prove effective. One of Amazon's systems observed patterns in resumes submitted to the company over a decade-long period, according to Reuters. Due to the largely male-dominant nature of the industry, the system taught itself to reject women's resumes, viewing them as less valuable.

Ken Sloan, associate professor in Marist's School of Management, explains companies in the past have experienced issues with bias, though developments have helped address them. "AI thinks based on data and human input," he says. "As it learns about people, it begins to speculate."

The machines react to information provided to them: biases in data

lead to biases in results. They are intelligent and powerful enough to "think." Ultimately, however, the data from which they draw conclusions is inputted by humans. Completely eliminating biases will pose challenges so long as humans continue to program machines. Sloan mentions companies sometimes fail in AI developments. Several years ago, Microsoft sought to create a Twitter bot that could develop a lexicon based on Internet traffic. Essentially, it would learn to "tweet" based on comments by other people, typically those aged 18-24. The



bot, however, learned negative behaviors after imitating followers who made racist, profane comments. Microsoft quickly suspended the bot.

Privacy issues can ensue when data is over collected, according to Forbes. To prevent potential data breaches, companies should ensure

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employees consent to having personal data collected, and that the information is used for essential purposes only. According to Forbes, Europe has already taken measures to protect consumers from potential technology dangers with its General Data Protection Regulation policy. In January 2020, the California Consumer Privacy Act was passed secure privacy for the state's residents.

The Future of Artificial Intelligence Act, a federal bill, was one of the first measures taken to protect against AI misuse. Since its 2017 introduction to the Senate, however, it has yet to be further pursued.

## AI and Machine Learning

Machine learning has begun to develop areas like product human resources, reliability testing, inventory control, design and prototyping. Typically, companies that generate larger amounts of digital data will

equipment is performing poorly and helps allow for repair scheduling to minimize the potential obstructions caused by failing machines.

Depending on the kind of data, three different processes are used in machine learning: Supervised learning starts with an established set of data. The machine is then programmed to comprehend patterns. It follows an input-output framework. Unsupervised learning entails machines breaking down unlabeled data, which is information that has not been given identifying characteristics or labels. Information on social media, like Twitter or Facebook, requires algorithms to categorize data based on trends, without human involvement.

Reinforcement learning is an interactive kind of machine learning in which computers function to determine the most ideal behavior based on trial and error experimentation. The technology recognizes rewards and punishment to determine which behaviors are best.

A subset of machine learning called deep learning employs a strategy similar to the workings of a human brain. It processes data for decision-making by using a hierarchical application of artificial neural networks. The more layers of artificial neurons used, the more complicated concepts it can understand.

## AI In the Hudson Valley

The local presence of AI is relatively small but expanding. IBM is one of the frontrunners in the emerging technology, applying machine learning technology. Its platform, Watson Explorer, in conjunction with other technology, analyzed thousands of radiology reports from Akershus University Hospital. The purpose of examining this data is to ultimately improve treatment procedures and ensure best practices are being followed.

Fryer Machine Systems is a Hudson Valley-based machining manufacturer that has implemented AI use. The companies typically carry out specialty work for clients by developing new designs and making improvements to pre-existing framework to better suit the clients' needs. Fryer is one of the largest users of computer numerical controls (CNC) in the U.S., which helps enable AI capabilities.

Larry Fryer, the company's president, describes how AI and machine learning give his company an edge in improving machines to become more productive and make more parts per hour. "The analytics are being looked at much more closely," he says. "We need to get more out of our equipment by using less people and automating is the only way to do that."

AI developments allow machines to better monitor production. They identify problems before they happen and make corrections before issues worsen. One area of machine learning that is becoming more widespread in smaller companies is the machine's ability to measure the parts it has made, Fryer explains. In the past, a coordinate measuring system (CMS) would measure these parts, but using it was complicated and inefficient.

Now, machine learning has simplified the process. A machine can inspect and measure the parts, knowing what size they should be, and make adjustments by fixing itself without operator intervention. "We've been at the forefront of starting to embrace AI and machine learning in a lot of the applications that we work on," Fryer says.

Aaron Phipps, Vice President of manufacturing and engineering at MPI Systems, believes machine learning could have a substantial impact on simplifying processes.

The company has yet to implement AI-related systems, but machine learning could greatly benefit MPI Systems in the future by



benefit from machine learning. For this reason, most smaller businesses have yet to take on AI applications. Johnson Samuel, Associate Professor, Mechanical Aerospace and Nuclear Engineering at RPI, suggests the larger the amount of data and "digital pipelines" a company has, the stronger its ability to implement AI. "High stake players have infrastructure to already go there," he says.

Companies that collect data can improve areas like quality assurance and maintenance. Various numerical and vision-based data trends allow machines to make predictions about quality. Maintenance relies on data and machine learning allows for prediction of failure, Samuel says.

Google, Amazon and Samsung are just several examples of major companies that have already implemented AI to improve company functionality. AI has already manifested itself in everyday life, through ways that have become familiar and common in the digital age.

Ecommerce platforms like Amazon use it to track purchases and suggest other products that may interest shoppers. Streaming services like Netflix use it to suggest shows and movies. Voice command agents "Alexa" and "Siri" use it to improve speech recognition functions on phones.

The machine learning process occurs when programmers feed machines information called training data, the initial data set used to train an algorithm. Then, the machines essentially generate another algorithm based on trends and patterns it concluded from training data.

Predictive maintenance software helps analyze equipment and identify when functionality issues may arise. It determines when





# MACHINE LEARNING

advancing process control operations. Machines that “make decisions not based on a feeling but actual hard facts” would minimize potential faulty decisions by removing the need for choice or emotion-based conclusions. Programmed machines would be more systematic and function consistently and independently of its operators.

Adapting machine learning technologies would streamline manufacturing processes and better ensure accuracy. Though no serious plans are in the works, Phipps takes interest in the possibility of machine learning in the company’s future.

“Any type of machine learning protocol where the machine can make good decisions based on [large data sets] is gonna be beneficial in improving the performance of machines,” he says.

## The Future of AI

A Gartner study found 85% of customer interactions will occur without a human agent by 2020. Though AI’s role in manufacturing has a limited reach in smaller businesses, experts agree it is likely only a matter of time before it infiltrates into businesses, both small and large. “It will trickle down to almost every facet of our life, but that’s a long ways away,” Samuel says.

In upcoming years, industries expect AI to grow exponentially. Misuse or over collection of data can pose serious consequences, but manufacturing companies can find major benefits in implementation, both in time and efficiency. Ultimately, conjoining industry with AI and machine learning will lead to massive developments in manufacturing and around the world.



*Taylor Dowd is a fourth-year journalism student at SUNY New Paltz. She plans to pursue a career in the media industry by following her passion for writing and food.*



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## FEATURED APPRENTICE

Rob Papale, Zierick Manufacturing Corporation | BY ALISON BUTLER

# THE PATH OF A TOOLMAKER

From Legos to FIRST Robotics to  
A Career in Manufacturing



Those who want to enter Zierick's Apprenticeship program go through a probationary period first. Here, new Journeyman Rob Papale works with probationer Omar Hernandez.

**R**ob Papale first realized he was interested in manufacturing while in high school at Saunders Trades and Technical High School in Westchester County. He joined the FIRST Robotics club at the school (see HV Mfg article on FIRST Robotics in this issue page 23) and was instantly hooked. "FIRST Robotics bridges the gap from Legos to the real world," Rob says. After high school, he attended Westchester Community College and later Manhattan College where he completed his bachelor's degree in Mechanical Engineering. It was while he was at WCC that Rob found Zierick Manufacturing Corporation.

"I learned about the company from a classmate who was employed at Zierick. He would talk about the jobs he got to do, how he worked with his hands and cool machines. It sounded really exciting," Rob explains. Zierick Manufacturing Corporation designs and manufactures standard and custom electronic components and assembly equipment. Their processes include tool design, build and maintenance, stamping, plating and assembly.

When Rob started at Zierick in 2014, he was still attending college and the company appreciated how important this was to him and worked with his schedule by hiring him part-time. At first, because of classes Rob could only work one day a week during the semester but was able to add more hours during academic and summer breaks. As Joe Turcott, Finance and HR Manager for Zierick, explains, "Our work schedule is not your typical Monday through Friday, 9-5 anyway. We do a 4-day work week, 10 hours a day, allowing for a three-day weekend and the ability to get into work and home again without Westchester's notorious rush hour traffic."



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Rob Papale with Senior Toolmaker Mario Rojo and his new toolbox, a gift from the company.

Rob had completed his engineering degree and was learning the basics of becoming a Toolmaker when Johnnieanne Hansen, Vice President of Operations and Workforce Development at the Council of Industry, approached the company about the Apprenticeship Program in 2017. Zierick had been training Toolmakers in their own informal training program for years under Journeyman and Vice President of Engineering, Frank Lynster. Frank who was currently in charge of training new Toolmakers, had completed a Toolmaker apprenticeship program in the 1960's after taking an 8-hour aptitude test in high school. He recalls how the first company he worked for offered an apprenticeship program and turned out 2-3 Toolmakers per year with approximately a dozen employees in the program at any one time. When he came to Zierick in the 1980's his skill, knowledge, and enthusiasm for training led Zierick to be ripe for the opportunity when a formalized Apprenticeship Program came along.

Gretchen Zierick, President of Zierick Manufacturing Corporation, explains how Rob was chosen as Zierick's first apprentice, "I was impressed with Rob's energy and drive and knew he would be a good candidate for the apprenticeship position. Frank gave him the nickname of Turbo because he is always going so fast."

Rob did his part to live up to that nickname, "When Frank and Gretchen first told me about the program, we looked at it and I was already on track and had several of the requirements. I was, and still am, eager to learn as much as Frank can teach."

Part of the program consists of related instruction, online or in-classroom training in more theoretical or knowledge-based aspects of the trades. There are many ways to satisfy the required 144 hours a year of related instruction and Rob chose to use the Tooling U subscription provided by the Council of Industry and take classes in CI's Certificate in Manufacturing Leadership Program at WCC. "I liked that Tooling U and the Leadership classes were an outside resource for my training. I was able to learn more about press operation on machines that are different from the ones we have at Zierick. The classes offered a lot of insight and prepared me to think about the future." Another advantage of the formalized program is

the credential awarded upon completion issued by the Department of Labor and nationally recognized. It is similar to a Journeyman card recognized by unions in that it certifies the holder's skill and knowledge in that trade wherever they choose to work.

During the On-the-Job Training portion, it was Rob's mentor Frank that really made an impression. When Rob started, he didn't know much. "Frank was very patient and willing to repeat himself as many times as it took. He is old school and wouldn't let me skip any steps. I learned it is important to go through all of the motions," said Rob. "The company has been supportive, especially Gretchen who was very encouraging throughout the process." To celebrate the completion of his apprenticeship and the semi-retirement of Frank, Zierick held a pizza party. At the celebration, Rob was presented with a Gerstner & Sons wooden Journeyman's tool chest. "It is a really, really, nice toolbox, Toolmakers know this is the toolbox they want to get. I thought I would have to save up to afford one like this someday," said Rob.

"It was important that we celebrated this accomplishment in front of the entire company,"

explains Gretchen. "Not only did Rob complete his apprenticeship but Frank and our plant engineer Ken were retiring too." Frank has since moved to North Carolina but returns every other month to support Rob and the next round of apprentices at Zierick. The company culture inspires such dedication and loyalty that they have quite a few retirees that come into work one or two days a week and many more that show up for parties and celebrations. Employee's benefit from not only Zierick's flexible work hours and



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With his mentor Frank semi-retired and living in North Carolina, Rob often consults with Senior Toolmaker, Mario Rojo.

dedication to training and education, but also from their employee recognition program and fun events they hold throughout the year to build camaraderie. This spirit and enthusiasm are evident in Rob especially when he talks about what is next for him.

Now that Rob has his Toolmaker certification his new title is Toolmaker/Engineer. He wants to learn die design and eventually be a tool designer. He is currently working on troubleshooting. According to Frank, "Troubleshooting is a skill that is hard to teach and it takes a lot of time to learn. Now I give Rob all the tools that don't work so he can develop his critical thinking and problem-solving skills."

Rob is also interested in passing on the skills he has learned. Currently, his bench is next to a future apprentice and he enjoys working and teaching others. "It's nice to teach my co-workers because there is so much work out there and it feels good to work as a team," Rob explains. He would like to eventually be the Vice President of Engineering, following in his mentor's footsteps, and inspire the next line of apprentice Toolmakers.

Zierick is doing its part to find future employees and possible apprentices. They run a summer internship program for students 18 and older. As part of this program, they have interns working

on real-life problems, doing work on projects and giving a presentation on what they have learned and accomplished. One recent intern is now working at Zierick full-time.

The company also encourages young people to "come by for a visit" as Joe says. He doesn't like to call it an interview but prefers to have them visit whenever it's convenient for them and get a tour of the facility. "If they like what they see and seem like a good fit then we will sit down for a conversation," Joe explains. The apprenticeship program through the Council of Industry has been a boon to Zierick in training their future workforce. Gretchen explains how she has wanted to formalize an apprenticeship program since she hired Frank almost 40 years ago. Both

Gretchen and Joe agree that once Zierick started advertising jobs as apprenticeships or added apprentice to the job title or description the volume of resumes increased.

As for determining who would be a good candidate for an apprenticeship, Frank recommends looking for someone that likes to work with their hands, enjoys learning something new and wants to continue to learn. They also need to be dedicated because there is no substitute for doing the actual work.

The end result, as Rob can attest to is very satisfying. "There is always something new to learn and you will always have a job. It is never boring, and you are continually moving up the ladder."

*Alison Butler is the Director of Member Engagement at the Council of Industry.*



The New York State Manufacturers Intermediary Apprenticeship Program (MIAP) is administered in the Hudson Valley by the Council of Industry and is an employer-led public-private program [[www.councilofindustry.org/apprentice-program](http://www.councilofindustry.org/apprentice-program)] for registered apprentices in manufacturing occupations. This apprenticeship has two basic elements. The first, On-the-Job Training (OJT), consists of a journey-level, craft person capable and willing to share their experience with an apprentice, in a hands-on manner. The second, Related Instruction (RI), consists of learning more theoretical or knowledge-based aspects of a craft. This registered apprentice program typically runs 16 months to four years in duration.





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### **FRYER MACHINE SYSTEMS, INC.**

70 Jon Barrett Road, Robin Hill Industrial Park  
Patterson, NY 12563  
[www.fryermachine.com](http://www.fryermachine.com)  
PHONE: (845) 878-2500

Manufacturer of CNC machining centers and lathes designed for tool room, prototype, and mold-making uses.



### **GILLETTE CREAMERY**

PO Box 256, Gardiner, NY 12525  
[www.gillettecreamery.com](http://www.gillettecreamery.com)  
PHONE: (845) 419-0900

Wholesale Food Distributor specializing in tri-temperature warehousing and delivery of dry, refrigerated and frozen foods.

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2529 Route 52, Hopewell Junction, NY 12533  
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PHONE: (845) 592-4150

A leading full-service semiconductor design, development, fabrication and innovation company with locations across the globe.

### **GTI GRAPHIC TECHNOLOGY, INC.**

PO Box 3138, 211 Dupont Avenue, Newburgh, NY 12550  
[www.gt-lite.com](http://www.gt-lite.com)  
PHONE: (845) 562-7066

Design and manufacture of specialized lighting systems for visual color evaluation, color matching and color communication for the graphic arts, photographic and industrial markets.

### **GW MANUFACTURING**

46 Violet Avenue, Poughkeepsie, NY 12601  
[www.gwmanufacturing.net](http://www.gwmanufacturing.net)  
PHONE: (718) 386-8078

Woodworking & Fabrication.



### **HOWMET AEROSPACE (FORMERLY ARCONIC FASTENING SYSTEMS)**

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PHONE: (845) 334-7223

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HV Shred, Inc. dba Legal Shred is a New York State licensed, locally owned and operated shredding service. Shredding is done on-site while clients witness on a color monitor. All clients get a certificate of destruction to demonstrate their due diligence to comply with the alphabet soup of federal regulations protecting consumers' confidential information. Helping to protect the environment, Legal Shred recycles all shredded material.

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[www.ibm.com/us/en/](http://www.ibm.com/us/en/)  
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A multinational technology and consulting corporation, with headquarters in Armonk, New York. IBM manufactures and markets computer hardware and software, and offers infrastructure, hosting and consulting services in areas ranging from mainframe computers to nanotechnology.

### **IPA TOOLS**

234 Tinker Street, Woodstock, NY 12498  
[www.ipatools.com](http://www.ipatools.com)  
PHONE: (845) 679-4500

FUTURE NOW® Innovative Products of America (IPA®) is an Original Equipment Manufacturer (OEM) specializing in the development of innovative tools and equipment since 1991. Located in Woodstock, New York, IPA® is supported by a dedicated team of electro-mechanical engineers, an experienced global sourcing department, full scale sales and marketing services, and on-site manufacturing. These elements allow IPA® to offer cutting edge solutions, holding true to the company motto, "Future Now®".



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130 Salt Point Turnpike, Poughkeepsie, NY 12603  
[www.jamestaylor.com](http://www.jamestaylor.com)  
PHONE: (845) 452-3780

Manufacturer of woodworking machinery for furniture, cabinets, windows, doors, moulding, millwork, and flooring.

#### **JBT CORPORATION**

134 Flatbush Avenue, Kingston, NY 12401

[www.jbtc.com](http://www.jbtc.com)

PHONE: (845) 340-9727

Manufacturer & distributor of equipment for the food processing industry.



#### **KDC/ONE KOLMAR**

20 West King Street, Port Jervis, NY 12771

[www.kolmar.com](http://www.kolmar.com)

PHONE: (845) 856-5311

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51 Hatfield Lane, Goshen, NY 10924

[www.konicaminolta.com/us-en/index.html](http://www.konicaminolta.com/us-en/index.html)

PHONE: (845) 294-8400

Konica Minolta's facility in Orange County, New York is a Foreign Trade Zone, which serves as assembly operations for toner cartridges for copy machines.

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[www.rmsmedicalproducts.com](http://www.rmsmedicalproducts.com)

PHONE: (845) 469-2042

CONTACT: James Ojio • [jojio@kmamax.com](mailto:jojio@kmamax.com)

KORU Medical Systems is a leading developer and manufacturer of medical devices and supplies.



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#### **MATERION BREWSTER LLC**

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PHONE: (845) 769-4127

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[www.mechanicalrubber.com](http://www.mechanicalrubber.com)

PHONE: (845) 986-2271

Custom Plastics and Rubber elastomer manufacturer which uses die cut, extrusion, lathe cut, mixing, molding, sheeting and stripping processes along with the fabrication of Engineered Flexible Connectors that includes Expansion Joints, Pump Connectors and Flue Ducts.



### **METALLIZED CARBON CORPORATION**

19 South Water Street, Ossining, NY 10562

[www.metcar.com](http://www.metcar.com)

PHONE: (914) 941-3738

Metallized Carbon Corporation has been supplying industrial customers worldwide with Engineered Carbon/Graphite Solutions for Severe Service Lubrication since 1945. Corporate headquarters are in Ossining, NY with manufacturing facilities located in Ossining, Mexico and Singapore. Metallized Carbon manufactures the Metcar family of Solid, Self-Lubricating, Oil-Free materials. With over 65 years of Application Engineering experience, the Company offers the field expertise and the hard data necessary to provide the Solid Choice for Lubrication to a wide variety of industries. Metallized Carbon is ISO 9001/2008 registered including product design and material development. We operate under the International Traffic in Arms Regulations (ITAR).

### **METTRIX TECHNOLOGY CORPORATION**

8 Nancy Court, Wappingers Falls, NY 12590

[www.mettrix.com](http://www.mettrix.com)

PHONE: (845) 221-4800

In business in Dutchess County since 1998, Mettrix provides a range of electronics-related services including design to customers spanning the U.S. from the west coast to the east coast. Our services include through-hole and surface mount (SMT, SMD) assembly, wire harness construction and box build. Let us be "Your Team at Mettrix."

### **MEYER TOOL**

60 Turner Drive, Middletown, NY 10941

[www.meyertool.com](http://www.meyertool.com)

PHONE: (845) 695-0300

CONTACT: Rosemarie Caputo • [rosemarie.caputo@meyertool.com](mailto:rosemarie.caputo@meyertool.com)

Meyer Tool is a privately held, high-tech manufacturing company supplying a variety of precision components to the aerospace and gas turbine engine industries. The company began as Meyer Tool & Die in 1951, and has evolved over the years into an industry leader in turbine technologies, vertically integrated and offering all post casting processes as the trusted manufacturing partner. Meyer Tool currently has over 1,100 electrical discharge machining (EDM) machines (wire, ram, and fast hole drilling). Meyer Tool not only specializes in EDM, but also waterjet machining, conventional machining, abrasive grinding, laser machining and welding, EB welding, coating, airflow testing and other processes required to be the trusted manufacturing partner for airfoils and other hot section turbine components.

Meyer Tool is a quality-driven, technology-focused organization with a workforce of over 1,500 team members throughout ten facilities world-wide. The company's headquarters is located in Cincinnati, Ohio with supporting sites in Kentucky, Texas, Florida, North Carolina, South Carolina, New York, Connecticut, Canada and Poland. Meyer Tool supports all of the OEM Primes in the gas turbine engine industry with both new-make and overhaul/repair services. The company holds AS9100 and Nadcap certifications for all special processes.

### **MICROMOLD PRODUCTS, INC.**

7 Odell Plaza #133, Yonkers NY 10701

[www.micromold.com](http://www.micromold.com)

PHONE: (914) 969-2850

Micromold manufactures a broad line of corrosion resistant plastic products for the process industries. We specialize in standard and custom products made from PTFE, Kynar, polypropylene, PEEK, nylon, Kel-F, and UHMW.

Our products include: a complete line of dip pipes and spargers, available in either solid PTFE, or PTFE lined and jacketed steel; complex reactor internals; PTFE valves; PTFE and Kynar strainers; and our FLUOR-O-FLO™ PTFE NPT threaded piping system.

Micromold also makes a full line of CNC machined parts for process industry OEMs including ball valve seats, butterfly valve seats, pump seals and instrumentation components as well as a complete range of plastic screw machine parts for process industry OEMs and distributors.

### **MILLROCK TECHNOLOGY, INC.**

39 Kieffer Lane, Kingston, NY 12401

[www.millrocktech.com](http://www.millrocktech.com)

PHONE: (845) 339-5700

Millrock Technology, a world recognized leader in freeze dryers and related systems, manufactures equipment for the pharmaceutical and biotech industries. Freeze Dryers, used in the laboratory and production range from 2 to 200 square feet of shelf area that meet the rigid criteria of the FDA's 21CFR part 11 and GMP. Experience since 1957.

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[www.bgstair.com](http://www.bgstair.com)

PHONE: (845) 783-4245

Manufacturer of wood stairs and railing.

### **MPI, INC.**

165 Smith Street, Poughkeepsie, NY 12601

[www.mpi-systems.com](http://www.mpi-systems.com)

PHONE: (845) 471-7630

MPI is the worldwide leader in wax-room equipment used in the investment casting process. As the acknowledged leader in wax-room innovations, MPI has developed and introduced more systems and products than all of its competition combined. With numerous patents and patents pending, MPI offers wax-room solutions that can't be found anywhere else.



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4 Stagedoor Road, Fishkill, NY 12524  
www.nerak-systems.com  
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NERAK Systems Inc., a subsidiary of NERAK GmbH Foerdertechnik from Germany, represents the NERAK brand for the USA, Canada and Mexico.

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25 Oakland Avenue, Chester, NY 10918  
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www.pawlingep.com

PHONE: (845) 855-1000

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www.wearepdi.com

PHONE: (845) 365-1700

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www.peckham.com

PHONE: (914) 949-2000

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www.pharmacann.com

PHONE: (845) 248-8363

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6 Albany Post Rd. Newburgh, NY 12550

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**PK-30 SYSTEM, INC.**

2452 Lucas Turnpike, High Falls, NY 12440

[www.pk30system.com](http://www.pk30system.com)

PHONE: (845) 687-9774

PK-30 System is a meticulously designed and engineered aluminum glazing framework system providing a flexible, beautiful, environmentally friendly and cost effective way to divide interior space. It is suitable for both residential and professional interiors and can be used in widely varying configurations including sliding doors, hinged doors, pocket doors, folding walls and fixed panels. The system accepts any 1/4" or 1/2" thick panel material allowing unlimited design choices. Components are extruded from high-grade 6000 series aluminum alloy with a 62% recycled content, allowing narrow profiles that are rigid and lightweight. Satin anodized finishing gives the material a soft sheen that resists corrosion and is easy to clean. PPG Duracron liquid electrostatic extrusion coating finishing may be specified and is available in a wide range of color options.

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PHONE: (914) 337-2005

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**SABO INDUSTRIAL CORP.**

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[www.takasago.com](http://www.takasago.com)

PHONE: (201) 767-9001

Takasago International Corporation was established in Japan in 1920. For nearly 100 years, with a corporate philosophy "Contributing to Society through Technology" in mind, Takasago has developed flavors and fragrances for some of the world's most successful manufactures of foods, beverages, fine fragrances, home and personal care products. We are a global leading company especially in the Asian region.

For over 35 years, we also have been a leading company as the first industrial producer of I-Menthol using our core technology, asymmetric synthesis. The technology enables us to produce unique, novel, and nature-identical aroma ingredients and in addition, to manufacture pharmaceutical intermediates, functional materials, and other fine chemicals.

Nowadays the Takasago Group maintains offices, production sites, and R&D centers in 27 countries and regions. Through our network of global research, production, creativity and marketing, we develop products tailored to the needs of individual markets.

By utilizing our technologies and our global network, we will continue developing high-quality and innovative products that contribute to cultural and social progress.

## **TRMI (THE REVENUE MARKETS, INC)**

5120 Route 209, Accord, NY 12404

[www.trmi.com](http://www.trmi.com)

PHONE: (845) 626-8655

TRMI Systems Integration is a provider of technology, equipment, and services for the tolling industry throughout the US, North and South America. TRMI develops a range of toll collection systems using technologies ranging from cash and coin collection systems to All-Electronic Tolling for high speed tolling of free flow traffic on highways and bridges. In addition, our Airport Systems Group designs traffic management systems for airport ground transportation management.

Our staff includes software and hardware development engineers, installation and maintenance technicians, and IT support personnel. TRMI's main office and headquarters is in Accord, NY and we have offices in Virginia and California.



## **UAP PRODUCTION LLC**

453 State Route 17K, Rock Tavern, NY 12575

[www.polichtallix.com](http://www.polichtallix.com)

PHONE: (845) 567-9464

UAP Production LLC strives to be the artists' source for all objects cast or fabricated in metal, embracing all the tasks necessary and appropriate to fulfill that aspiration, including enlarging, mold making, structural and metallurgical engineering, repairs, restoration and consummate craftsmanship. We aspire to excellence in the delivery of technology and manufacturing services, always trying to

make the newest art with the latest technology. To achieve this goal, we partner with our suppliers to combine cutting edge technology with old world craft and tradition, endeavoring to give artists satisfaction and seeking continuous improvement in our employee's skills and craftsmanship.

## **ULTRA SEAL CORPORATION**

521 Main Street, New Paltz, NY 12561

[www.ultra-seal.com](http://www.ultra-seal.com)

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## **UNICORR PACKAGING GROUP**

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[www.unicorr.com](http://www.unicorr.com)

PHONE: (845) 778-3555

Unicorr has been a leader in providing innovative corrugated container and protective packaging solutions since 1946. From 'Retail Ready' packaging, Point of Purchase displays to Crating, Custom Foam Molding, Reusable and Protective Packaging, we are much more than your standard box manufacturer. Our plants in Walden, New York, North Haven and Putnam, Connecticut are able to produce and deliver a wide range of packaging options to help control your costs and grow your business.

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[www.unilock.com](http://www.unilock.com)

PHONE: (845) 230-4500

Unilock, North America's leader in the manufacturing and distribution of high quality concrete landscape paving stones and retaining wall products.

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[www.unlimitedtomorrow.com](http://www.unlimitedtomorrow.com)

PHONE: (914) 489-2187

Unlimited Tomorrow's mission is to empower amputees with an intuitive scalable model to create custom devices from start to finish. We utilize the newest technologies such as 3D scanning, 3D printing and machine learning to make the next generation of artificial limbs at the lowest cost possible.

## **UNSHATTERED**

1064 Route 82, Hopewell Junction, NY 12533

[www.unshattered.org](http://www.unshattered.org)

PHONE: (845) 471-5010

Unshattered creates sustainable employment for those who have no safe community to return to after recovery from addiction and/or trauma. We are a community of like-minded women, expressing our value and purpose through work, and committed to ongoing personal and professional development.



This combination of community, employment, and personal development ultimately gives our women the opportunity to find their purpose and live an addiction-free life.

Unshattered is committed to demonstrating that the cycle of addiction can be broken and we are proud to be a facilitator of lasting, positive change.

### USHECO, INC

138 Maple Hill Road, Kingston, NY 12401

[www.usheco.com](http://www.usheco.com)

PHONE: (914) 658-9200

Usheco, Inc. is highly experienced in the manufacturing of custom plastic parts. We look forward to the opportunity to assist our customers from the initial part design and material selection, through the fabrication process, on to the complete product.



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[www.vma-llc.com](http://www.vma-llc.com)

PHONE: (845) 486-5044

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Manufacturer of custom corrugated boxes and inner packaging.

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# ASSOCIATE MEMBER DIRECTORY

## ACCOUNTING & PAYROLL

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### RBT CPA'S LLP

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www.cohnreznick.com  
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www.prwithimpact.com  
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PHONE: (518) 626-2750

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[www.rhinebeckbank.com](http://www.rhinebeckbank.com)

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Rhinebeck Bank is a local community bank, headquartered in Poughkeepsie with 11 branches conveniently located throughout the Mid-Hudson Valley. Rhinebeck Bank offers a full line of commercial products including Business Express Loans (vehicles/equipment), Lines of Credit, Commercial Mortgages and a full compliment of Cash Management services. Wealth Management and 401k services are also offered through our subsidiary, Rhinebeck Asset Management.

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For more information contact Antonio J. Vinciguerra, Vice President Commercial Lending at [Antonio.Vinciguerra@td.com](mailto:Antonio.Vinciguerra@td.com) or 845-220-2801.

### **TOMPKINS MAHOPAC BANK**

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[www.mahopacbank.com](http://www.mahopacbank.com)

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## COMMERCIAL FURNITURE

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www.alianzacorp.com  
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Along with Herman Miller, Alianza has a best in class portfolio of 100 furniture partners and manufacturers. We also work in CAD to design & layout, and we handle ordering/delivery/installation.

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www.fuzehub.com  
PHONE: (518) 768-7030

FuzeHub's mission is to provide NYS manufacturing companies with timely connections to reliable resources and expertise for business growth, technology commercialization and global competitiveness. As the statewide Manufacturing Extension Partnership Program (MEP) Center for New York State, FuzeHub works to better connect New York's small and mid-sized manufacturing companies to the resources, programs and expertise they need for technology commercialization, innovative solutions and business growth. We bridge the gap by providing fast access through a convenient, 24/7 online request service, numerous event opportunities for meeting with solution partners, and direct assistance from experienced manufacturing specialists every step of the way.

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www.ulsterboces.org  
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www.wdiny.org  
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#### Lower Hudson Region

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The Workforce Development Institute (WDI) is a statewide 501(c)3 non-profit that improves the lives of working men and women across New York State by providing targeted programs in workforce, economic, and community development. A focus on helping businesses become and remain successful is a key component of this programming. Healthy businesses provide employment opportunities for New York's citizens and, in turn, are dependent on a well-trained workforce and community support. The WDI works to ensure that investments in all three areas - workforce, economic and community development - are integrated and reflect the perspectives of working men and women. WDI's agenda is shaped by the needs of specific regions, businesses, or unions.

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Ethan Allen Workforce Solutions group of companies offers a full range of employment solutions including: temporary staffing, direct placement and professional employment services. This gives us the capacity and flexibility to provide the HR, staffing, and recruiting solutions our clients need. Ethan Allen's long tenure and diverse client base offer job seekers access to many excellent temporary and permanent job opportunities.

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[www.nyserda.ny.gov](http://www.nyserda.ny.gov)

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"Bimser International is a passionate enterprise software development company based in New York. Bimser has been developing enterprise software products since 1998.

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2. A Quality Management Software called QDMS that helps manage quality procedure documents, customer complaints,

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[www.bartonandloguidice.com](http://www.bartonandloguidice.com)

PHONE: (646) 660-0445

Barton and Loguidice is a multi-discipline engineering and environmental services firm serving Industrial, Private/ Commercial, Municipal and Institutional clients throughout New York State and the Eastern United States. Service divisions include Structural, Mechanical, Electrical, and Architectural Engineering, Energy, Water and Wastewater, Environmental, Industrial Hygiene, Solid Waste, Transportation, Land Planning/ Site Development and Construction Contract Administration. The firm's locations include Newburgh, Syracuse, Albany, Rochester, and Watertown, NY, and Camp Hill, PA.

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[www.ctmale.com](http://www.ctmale.com)

PHONE: (518) 786-7400

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### CHAZEN COMPANIES, THE

21 Fox Street, Poughkeepsie, NY 12601

[www.chazencompanies.com](http://www.chazencompanies.com)

PHONE: (845) 454-3980

Founded In 1947, The Chazen Companies is an employee-owned, multi-disciplinary firm providing civil engineering, land surveying, planning, environmental consulting, code services, landscape architecture, construction services, transportation planning and traffic engineering to clients in the private and public sectors. Chazen employees proudly collaborate with municipalities, state agencies, developers, landowners, utility companies, and industrial, healthcare, education, and nonprofit clients from project concept to completion, taking a customized approach to every project. With offices in Glens Falls, Troy, Poughkeepsie and White Plains, NY; Nashville and Chattanooga, TN; and Portland, OR, Chazen delivers world-class performance focused on creating effective, long-term partnerships with its clients.



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Construction Contractors Association is dedicated to the advancement of the construction industry in the Hudson Valley region. CCA seeks to promote the orderly development of the Hudson Valley, encourage a business friendly environment and help provide our members with the skills, resources and support to be competitive.

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257 Main Street, New Paltz, NY 12561  
[www.newpaltzchamber.org](http://www.newpaltzchamber.org)  
PHONE: (845) 255-0243

The New Paltz Regional Chamber of Commerce is blazing the way to help create and support an environment in which business can succeed and the quality of life in the community is enhanced. The New Paltz Chamber is a supporter of business in the region. Legislative advocacy, pro-active referrals, extensive member services, networking opportunities, seminars, special events and more make the New Paltz Regional Chamber a great investment.

### ORANGE COUNTY CHAMBER OF COMMERCE

40 Matthews Street, Suite 104, Goshen, NY 10924  
[www.orangenyny.com](http://www.orangenyny.com)  
PHONE: (845) 457-9700

With nearly 1,700 members, the Orange County Chamber is a leading advocate for business in the Hudson Valley region.

### PATTERN FOR PROGRESS

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### ULSTER COUNTY REGIONAL CHAMBER OF COMMERCE

214 Fair Street, Kingston, NY 12401  
[www.ulsterchamber.org](http://www.ulsterchamber.org)  
PHONE: (845) 338-5100 FAX: (845) 338-0968

The Ulster County Regional Chamber of Commerce provides services and advocacy on behalf of its membership and the community to advance the region's economic health and vitality. We are the Voice and Choice of business in the Ulster County region to stimulate and nurture sustainable economic growth.

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## Advertisers Index

BC	Access: Supports for Living
29	Ad Essentials
4	Allendale Machinery Systems
38	Ametek Rotron
6	Armistead Mechanical, Inc.
19	Arnoff Global Logistics
44	Belfor Property Restoration
6	Bell Flavors & Fragrances, Inc.
38	Bond, Schoeneck & King, PLLC
24	Chazen Companies, The
24	Comairco Equipment
53	Council of Industry, Apprentice Program
40	Direct Energy Business
37	Elna Magnetics
22	eMagin
41	Ethan Allen Workforce Solutions
27	Fair-Rite Products Corp.
35	Fryer Machine Systems
21	Here's Help Staffing
16	Hudson Valley Community College
8	HV Pathways Academy
43	Kingston Local Development Corporation
29	Marshall Sterling Insurance
6	Metcar
12	Orange & Rockland
IFC	Orange Bank & Trust Company
66	PKF O'Connor Davies
29	SELUX Corporation
24	SUNY Ulster
10	Thompkins Mahopac Bank
67	Ulster Savings Bank
57	Westchester Community College





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