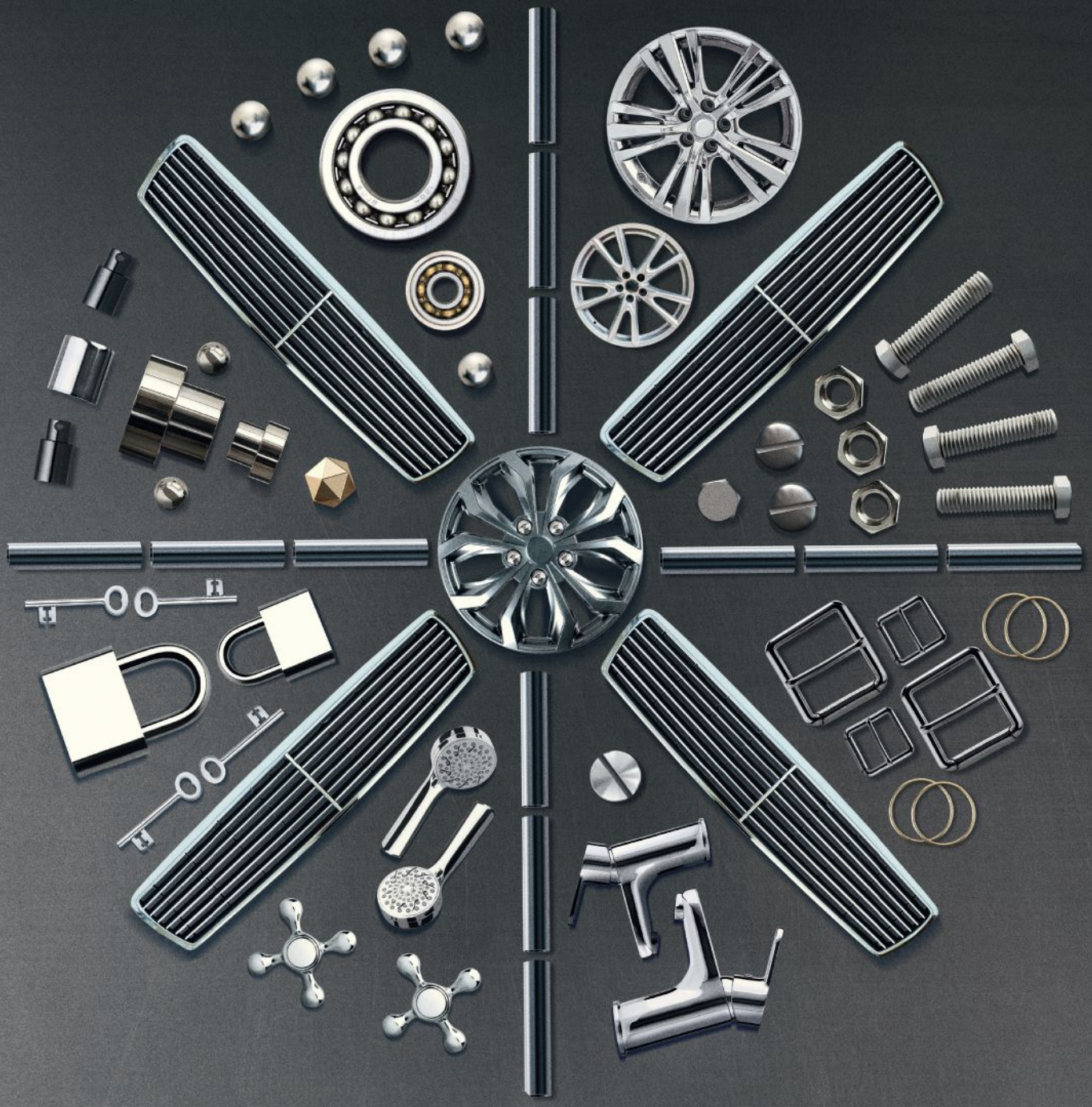
PF PRODUCTS FINISHING

PFonline.com

Electrocoating Heavy Castings

Powder Coater Installs Ecoat Line to Serve Agricultural, Industrial Markets

A property of Gardner Business Media DECEMBER 2020 / VOLUME 85 / NO. 3



Premium Quality Surface Treatment Chemicals

For more information visit: www.coventya.com

COVENTYA
Beyond the Surface

Speak!

AT

SUR/FIN®

Where Finishing Connects

July 13-15, 2021

Detroit, Michigan

The SUR/FIN Technology Advisory Committee seeks experts from around the world to give informative presentations about the latest in surface engineering and finishing technologies impacting business, and what might be on the horizon for tomorrow.

We are seeking exclusive, informative, noncommercial-focused presentations for SUR/FIN 2021. Recommended topics are new technology, equipment, advances with existing processes, environmentally-focused performance, improved performance, increased efficiency or greater throughput. We encourage specialists involved in academia, production, applications, engineering, research and development and testing covering all industry applications to apply. Industry applications can include, but are not limited to Automotive, Military, Aerospace & Defense, Machinery-Industrial Equipment, Electronics, Oil & Chemical, Molds & Dies, Plastics and many others.

Deadline to Submit Your Abstract

DECEMBER 11, 2020

For more information, Visit:

NASFSURFIN.COM

SUR/FIN | NASFSURFIN.COM

The Event for the Finishing Industry

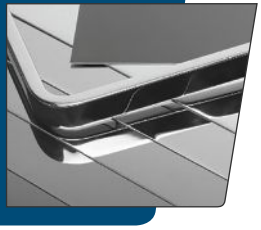
NASF National Association for Surface Finishing

CONTENTS

VOLUME 85 / NO. 3 / DECEMBER 2020

TECHNICAL EXPERTS

NEWS / COLUMNS



PRODUCTS FINISHING (ISSN 0032-9940) is published monthly and copyright 2020 by Gardner Business Media Inc. 6915 Valley Ave., Cincinnati, OH 45244-3029. Telephone: (513) 527-8800. Printed in U.S.A. Periodicals postage paid at Cincinnati, OH and additional mailing offices. All rights reserved.

POSTMASTER: Send address changes to *Products Finishing* Magazine, 6915 Valley Ave., Cincinnati, OH 45244-3029. If undeliverable, send Form 3579.

CANADA POST: Canada Returns to be sent to IMEX Global Solutions, P.O. Box 25542, London, ON N6C 6B2. Publications Mail Agreement #40612608.

NOW IS YOUR CHANCE!

PRODUCTS PF FINISHING

TOP SHOPS

2021

Take the 2021 Products Finishing Tops Shops Survey and see if your shop has what it takes to be a Top Shop!

NEW FOR 2021

- *Sourcing platform that showcases your performance to qualified purchasers*
- *More time to submit your survey*
- *Faster delivery of your custom report*

PF PRODUCTS FINISHING

SURVEY OPENS JANUARY 1, 2021

PFONLINE.COM/HASHTAG/TOPSHOPS

PLEASE NOTE: *In order to be considered for a 2021 Top Shop designation you must submit your survey by April 30, 2021. The survey will remain open the entire year for you to use for benchmarking purposes.*

PF PRODUCTS FINISHING

PFONLINE.COM

Products Finishing **is published by**

GARDNER Business Media, Inc.

6915 Valley Avenue
Cincinnati OH 45244-3029
Ph 513-527-8800 Fax 513-527-8801
gardnerweb.com

ALSO PUBLISHER OF

Products Finishing Mexico
Modern Machine Shop
MoldMaking Technology
Production Machining
Plastics Technology / PT Handbook
Additive Manufacturing
Products Finishing Directory
IMTS Directory
NPE Official Show Directory
AutoBeat
CompositesWorld

Subscription Inquiries: For questions or issues related to your subscription, please call 513-527-8800 or email *subscribe@PFonline.com.*

MEMBER OF

The Electrocoat Association · pci · NASF · aac · BPA WORLDWIDE

PRINTED IN THE U.S.A.

PRINTED WITH SOY INK

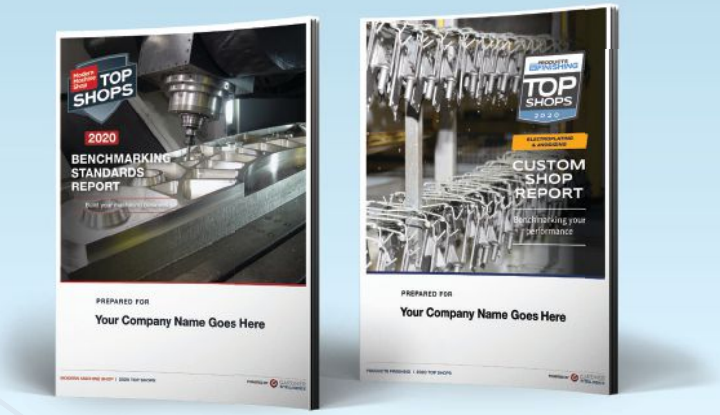
The Insight That Matters Most to Your Business

Whether you are a manufacturer, equipment supplier or finance professional, we provide deep, rich, actionable insights about durable goods manufacturing.

GARDNER BUSINESS INDEX

GARDNER BUSINESS INDEX

A business trends index measuring monthly changes in new orders, production, backlog, employment and other critical measures.

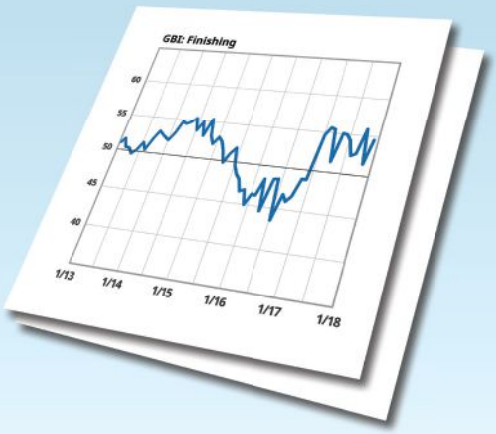


TOP SHOPS CUSTOM REPORTS

Enables shops to benchmark operational and financial performance, leverage strengths, and identify opportunities.

CAPITAL SPENDING DATA

Capital Spending data collected annually, regarding budgeted spending on machines, testing equipment, software and more, projected across industries.



CUSTOM RESEARCH

Forecasting, consulting, benchmarking, modeling and custom research that reveal insights on technology, business practices, advertising, and competition.

Leverage the power of industry-leading intelligence in your operation.

GARDNER INTELLIGENCE

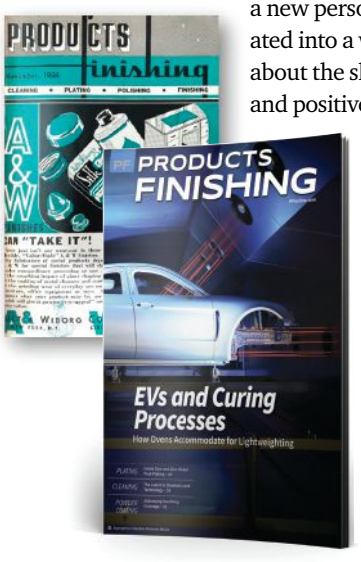
513-527-8800 | gardnerintelligence.com

Products Finishing Then, Now and Tomorrow

As 2020 comes to a close, *Products Finishing* editor-in-chief Scott Francis discusses upcoming initiatives for 2021.

SCOTT FRANCIS / EDITOR-IN-CHIEF
sfrancis@pfonline.com

I'm an unashamed science fiction fan. As a kid, my favorite television show was *Doctor Who* — a show filled with rubber monsters and terrible special effects. It only aired on public television and usually on Saturdays as part of fundraising marathons that always seemed to coincide with when my dad wanted me to mow the yard. To my amazement, the show was relaunched in my adulthood and gained mass popularity. The premise, of course, is about a time-traveling alien who wanders the universe getting into trouble and trying to do the right thing against incredible odds. Whenever mortally wounded, the Doctor is able to regenerate his body, in effect preserving his life but becoming a new person. In 2017, the Doctor regenerated into a woman, sending a clear message about the show's belief in equality, diversity and positive change. *Doctor Who*'s formula allows new actors to play the role and take the show into uncharted territory. (If you're not into sci-fi, you can sub in getting a new James Bond every decade or so.) When the new actor steps into the role it takes some getting used to, both for the fans and for the actor.



The point is that reinventing something takes some time and exploration. This year, *Products Finishing* got a new editor-in-chief (hello) and a whole new editorial team. We've changed our website. We've changed our voice. We've changed a lot and we've learned a lot. The stories we've told this year have helped us grow as a team and find out where we want to go next.

A new year brings yet more change, and not a moment too soon. Looking ahead, *PF* has updated programs, new events, new stories to share and even more new territory to explore. In 2021, *PF* will launch two new columns. "On the Line" will feature conversations with people in the industry — from trailblazing leaders who are helping shape the future of finishing to those working in the trenches with firsthand experience. We'll get a glimpse inside shops across the country and see the fantastic work that is being done with our new "Photo Finish" column, which will showcase images of real-world products, solutions and innovations captured by our readers. We're launching a podcast that will allow you to hear the voices of our industry. Our Top Shops Benchmarking Program is going strong and beginning in 2021, the program will include a new sourcing platform that allows survey values to be compared to a larger, cumulative database of results, expanding the benefits of participation.

While we've been working to freshen things up a bit, rest assured, *Products Finishing* will continue to bring you the programs and coverage you've loved over the years. As we wrap up 2020, the December issue of *PF* takes a look at the agricultural, industrial and construction markets. We learn about ways that companies like Winona Powder Coating are working to expand their capabilities even in the face of what has been a challenging time for everyone (read about the company's latest expansion on page 18). You'll learn about a farm equipment manufacturer's constant quest for improvement and their collaborative efforts with TIGER Drylac to achieve uniform coatings for their products (see page 24). Read about Chemetall's work to fine-tune chemistries on a pretreatment line for a lawnmower manufacturer (see page 22).

Products Finishing has been reporting on the surface finishing industry since 1936. The mission statement from that very first issue was about "searching out and disseminating the newest and best information available concerning metal finishing methods including cleaning, polishing, buffing, plating, [and] lacquering." Today that mission hasn't changed, only expanded. We cover electroplating, powder coating, liquid coating — as we always have. We also report on coating advanced materials, and emerging technologies, from new eco-friendly solutions to automation. From our Finishing Hall of Fame, which celebrates pioneers and those who have shaped this industry over the years, to our 40-Under-40 Program that recognizes emerging leaders, *Products Finishing* is a brand that builds upon its past and looks to the future. Like all of you, I'm eager to see what 2021 brings.

This year has been one that no one will likely forget anytime soon. As much as I am tired of writing about COVID-19, the virus is intertwined with every narrative that occurred in 2020. Everyone has been touched by this pandemic in one way or another. Many of us have lost someone. We've all had our routines disrupted and aspects of our lives overturned. But we've soldiered on and will continue to do so together. In the coming year, we must be understanding and empathetic, realizing there are ways to adjust our course and always strive to be better regardless of our successes or failures. One of my favorite episodes of *Doctor Who* is a Christmas special that aired in 2010. The Doctor explained that across the Universe, regardless of race or beliefs, life forms recognize the winter solstice as a time of hope. "On every world, in the deepest part of the winter, at the exact mid-point, everybody stops as if to say well done," says the Doctor. "We're halfway out of the dark."

Reliant

CLARIANT

Our architectural dyes give ordinary aluminum **EXTRAORDINARY DURABILITY.**

Anodal®

ELECTROLYTIC COLOR SYSTEM

Anodal Color TS-2 is a fully blended tin liquid that produces consistent color quality. You can produce a full range of colors from champagne to black that can also be overdyed to further expand your design palette.

Sanodal®

INDOOR AND OUTDOOR DYES

These durable dyes are the ideal solution for architectural applications demanding the highest weatherability. They can be applied alone or with an electrolytic coloring process.

ARCHITECTURAL ETCHES

Choose from alkaline and fluoride chemistries for a wide range of exterior finishes.

NON-NICKEL SEALANT

Anodal ES-1 is a mid-temperature nickel-free liquid seal for non-dyed coatings. It meets or exceeds specifications for AAMA 611 and ASTM test methods B136, B117 and B680.

ANODIZING CHEMISTRY

We offer the largest selection of specialized additives for enhanced surface finishing. Our products are designed especially for aluminum anodizing — many of them are patented and exclusive.

- » Anodizing Additives
- » Buffering Agents
- » Defoamers
- » Mist Suppressants
- » Cleaners
- » Deoxidizers
- » Etchants
- » Sealants

RELIANTALUMINUMPRODUCTS.COM · 866-574-0790

PPG Coatings Used for Raiders' Allegiant Stadium

PPG has provided an extensive roster of coatings to protect Las Vegas's new Allegiant Stadium and enhance its appearance.

PPG (Pittsburgh, Penn.) recently announced that its paints, coatings and specialty materials were used in the construction of interior, exterior and structural surfaces of Allegiant Stadium, home of the Las Vegas Raiders. The stadium, with its distinctive black and silver colors, was unveiled to a national television audience on September 21 in primetime on Monday Night Football.

PPG provided an extensive roster of products to protect the venue and enhance its appearance.

"It's been incredible to see a wide range of PPG coatings come together in the design and construction of Allegiant Stadium," said Bryan Iams, PPG vice president, corporate and government affairs. "We are extremely proud that our paints, coatings and specialty materials have played a central role in the design and construction of this extraordinary facility."

PPG products used on the stadium incorporate protective and decorative coatings demanding the company's full range of expertise in industrial, protective and architectural applications. The company's PPG AMERCOAT 68 HS and PPG PSX 700 coatings were selected for the project and custom-formulated to meet and match the team's iconic silver and black uniforms.

A three-component zinc-rich epoxy primer, PPG AMERCOAT 68 HS coatings provide corrosion protection and the ability to be top-coated quickly. As the finish coat, PPG PSX coatings deliver excellent adhesion and corrosion and chemical resistance, along with long-term gloss and color retention.

PPG also formulated the signature colors in PPG DURANAR XL coatings for the venue's glittering curtainwall. Based on PPG's proprietary 70% polyvinylidene fluoride (PVDF) formulation, the four-layer coating system delivers abrasion and chemical resistance and has the ability to retain its bright color after prolonged sun exposure.

Texas Finishing Company (Carrollton, Texas) participated in the painting of aluminum extrusions and panels for the curtain wall system using PPG's products. Steve Lockwood, Las Vegas Commercial Sales Rep for PPG, says applying the coating at Texas Finishing's plant worked well. "They're equipped with all the right support for beams of this weight and you have a controlled environment." Texas Finishing's horizontal paint line can coat up to a 30-foot extrusion. The company applies a chromate conversion coating pretreatment prior to painting.

Additional PPG products used throughout Allegiant Stadium include PERMA-CRETE interior/exterior alkali resistant primer and a SPEEDHIDE interior eggshell latex enamel. PITT-GLAZE WB1 acrylic epoxy coatings were selected to protect high-traffic areas. SEAL-GRIP alkyd universal primers protect numerous interior and exterior surfaces.

Nominations Open for Products Finishing's 40 Under 40 for 2021

Products Finishing is once again recognizing the finishing industry's emerging leaders through its annual 40 Under 40 awards program. *PF* has opened up nominations for the program's 2021 class. Nominees should be individuals under the age of 40 who are making a difference in finishing, both in their company and in the finishing community.

The program's emphasis is on leadership and potential leadership — whether for a current employer or overall involvement in the industry. 40 Under 40 candidates are potential leaders and trailblazers, but they also may be hardworking industry volunteers and community members who know how to give back to the finishing industry.

As the name implies, *Products Finishing* will select 40 individuals from those nominated for its 2021 class. Those selected will be recognized in *Products Finishing*, as well as at special events.

The deadline for nominations is February 1, 2021. Honorees will be chosen based on the quality of the nomination submitted, not the quantity of nominations. Nominees should be under the age of 40 as of February 1. Visit **pfonline.com/forms/40under40**.

Pneu-Mech System Enables Unique Footprint Powder Coating Line

ASTA America (Cartersville, Ga.) has specialized in commercial and industrial doors for more than 30 years. From rolling steel doors, to insulated service doors to slat doors, the company's product offerings and markets continue to expand. The company found itself seeking a simple yet effective powder coating line for long parts. However, the installation also faced the challenge of fitting within a set area of ASTA's facility, yet somehow still being able to accommodate the necessary long parts.

"We wanted a fully automated line and the longest part we could fit given the new addition we put on our building," says Jimmy French, president of ASTA America.

The space constraints were an important consideration. ASTA expanded its facility to accommodate the new equipment but was limited by buffers on its property. The new equipment could be 300 feet wide by 260 feet long. An additional challenge was accounting for building columns in the new addition.

ASTA selected Pneu-Mech Systems Mfg. LLC (Statesville, N.C.) for the line, which features a power and free conveyor with a continuous track through a blast machine and powder booth with an indexing oven and cool tunnel. The line is capable of handling parts up to 23 feet in length.

"[Pneu-Mech] had to get very creative," says French. "That's where the power and free conveyor system came in. It's a sophisticated system that jogs the materials around so we can maximize the size of the part."

"It's a unique layout," adds Jason Gatton, director of sales for Pneu-Mech. "The power and free system is used to get a lot of production through a Ssmall footprint."

The installation of ASTA's new powder line began in April during the height of the COVID pandemic lockdowns, further complicating matters. Nevertheless, the line was completed in July. In addition to the Pneu-Mech power and free system, the line also includes an inline wheel blast machine provided by Blastec Inc. (Alpharetta, Ga.) and an inline powder booth provided by Nordson Corp. (Westlake, Ohio).

Mayzo Facility Meets ISO 9001:2015 in Eight Months

In January 2020, chemical additive manufacturer Mayzo Inc. (Suwanee, Ga.) opened its new Operations Center in Walterboro, S.C., immediately beginning work to develop a robust quality control system that would satisfy ISO 9001 certification requirements before the end of 2020.

The Mayzo team exceeded this expectation by successfully passing all requirements of the ISO 9001:2015 certification audit in September 2020.

"We are proud of the effort it took to accomplish this challenging task, but we also realize that our journey does not end there," Tim Parrish, quality assurance manager at the Mayzo Operations Center, says. "This is just one small stepping-stone on our quest to consistently provide our customers with a superior business experience."

Large-Part Type III Hard Coat Anodizing Comes to Ace

Ace Anodizing & Impregnating Inc. (Hillside, Ill.) has increased the capabilities of its Type III hard coat anodizing process through the facility expansion it completed late in 2019.

Having noticed an increase in RFQ's for large-part Type III anodizing, Ace conducted a marketplace analysis and found this need was going largely unaddressed. Furthermore, conducting improvements on its hard coat line would allow the company to increase the throughput and flexibility of several process tanks on the line.

With this knowledge in mind, Ace expanded its Type III hard coat anodizing, Class I and Class II black line — now up to 282 inches by 38 inches by 60 inches where the company could previously only work with parts up to 150 inches long — to become one of the few companies on the market with capability for hard coat anodizing of large parts.

"Ace Anodizing & Impregnating Inc. has once again invested in the necessary improvements in order to keep pace with market demands and our clients' evolving requirements," Mike Battaglia, VP of sales and marketing at Ace Anodizing & Impregnating Inc., says. He went on to say "our focus continues to be on our customer's needs, and . . . we [will] continue providing exceptional service while keeping our employees safe and healthy during these unprecedented times."

FINISHING INDUSTRY

ON THE MOVE

Weyls

Dr. Thomas Costa, Coventya's (Brooklyn Heights, Ohio) founder and its CEO for 25 years, has passed the torch to **Erik Weyls**.

Weyls joined Coventya in 2007 and has held multiple senior executive management positions, most recently serving as the company's chief operating officer. Weyls has over 30 years of industry experience with time being spent between Europe and America. He will prepare Coventya's 15 affiliates worldwide for the post-COVID business environment and lead its future growth.

Costa will help move forward an ambitious program for full environmental social governance compliance and drive sustainability in the company before fully retiring in the fall of 2021.

Coventya is also shaking up its sales structure to enhance its top line sales in FY21 and beyond.

Sisti

Matt Sisti will move to strategic sales. His new role will allow him to spend more time growing market share at key, large target accounts.

Charlie Morris will transition to regional manager, East. As he is already familiar with the territory — spanning from Montreal down through the mid-Atlantic region — Coventya expects a smooth transition.

Doug Vogel will act as the new regional manager, West — this change should be smooth, as Doug has already spent significant time managing direct accounts on the west coast.

Joe Muncey will transition to regional sales and service, Midwest. He will grow market share within this territory, while also providing technical support to key existing accounts in other territories as needed.

Finally, Coventya would like to recognize the recent promotions of Matthew Wojcik, James Yahnke and Maurice Mills. All three started their new positions on Oct. 1, 2020.

Matthew Wojcik is now a senior R&D chemist. Wojcik has been with Coventya for almost 10 years, and has worked as an RD chemist and in staff RD chemist roles.

James Yahnke is now an instrumentation specialist, transitioning out of the technical service associate I position. Yahnke has been with Coventya for more than seven years.

Maurice Mills is now an application chemist, working closely with R&D and material science as well as sales to handle critical customer-related requests and projects. Maurice has been with Coventya for almost four years, and most recently worked in the technical service associate I position.

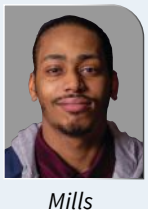
Morris

Vogel

Muncey

Wojcik

Yahnke



Mills

Parker Engineering of America (Westland, Mich.) has hired **Aaron Willis** as an engineering manager for the Parker Ionics team. Willis brings 40 years of sales, project management, equipment design and detail drafting experience — including 22 years of experience within the finishing industry — to the Parker team. He is excited to join Parker Ionics and provide customers with powder coating application and recovery booth solutions.

PF PRODUCTS FINISHING HALL OF FAME

Nominations are currently open for the 2021 *Products Finishing's* Finishing Hall of Fame program, recognizing individuals who have been instrumental in the development and growth of the finishing industry. **Visit pfonline.com/forms/hof**

ECF Earns MacDermid Enthone Quality Certification

In September 2020, MacDermid Enthone (Waterbury, Conn.) presented Electro Chemical Finishing (Grand Rapids, Mich.; ECF) with a DecoKlad license, authorizing the company as a chrome plating applicator for MacDermid Enthone Fashion Finishes.

To ensure consistent production around the globe of the high-quality finishes MacDermid Enthone offers to automotive OEMs and Tier 1 suppliers, the company certifies applicators through its stringent plating-focused DecoKlad program. This program is a unique, proprietary quality-performance system with different performance levels for interior and exterior automotive parts.

ECF's management team worked closely with the MacDermid Enthone DecoKlad team to achieve the distinction of being one of only three applicators certified in North America and the first plating-on-plastic (POP) finisher in the Americas to partner with MacDermid Enthone in this way. By combining its fully automated systems with MacDermid Enthone's chemistries and DecoKlad quality program, ECF promises the performance-based consistency that OEMs and Tier 1 suppliers demand.

Electro Chemical Finishing has the capability to plate hexavalent and trivalent chromium finishes, including Bright, Pearlescent Satin and Twilite and Starlite dark chrome, on both metal and plastic substrates.

RPW's Custom Chrome Takes on Unique Applications

Reliable Plating Works (Milwaukee, Wis.) created Custom Chrome to supply the ever-growing need for unique chrome jobs. While building his own Resto Mod, RPW president and CEO Jaime Maliszewski noticed how many hot rods, custom cars, race cars, car clubs, motorcycles, home garage mechanics, small builder service garages and restoration shops there were in Wisconsin.

The collector car hobby is big and so is the need for quality, original replacement and refurbished parts — including lots of chrome. Most of that chrome needs some kind of work, from simple polishing to reshaping to total repair. To assure the highest quality, Custom Chrome will work to utilize the support, expertise and advanced technology of RPW's Milwaukee facilities.

Custom Chrome will work with a wide variety of jobs from door hinges to semi-truck bumpers, rusted and tarnished pieces to cracked and blistered parts. The company says it will make these parts look fresh from the OEM with the longevity and durable appearance of today's chrome technology.

Even beyond cars, Custom Chrome plans to take on everyday chrome needs. With chrome parts in everything from appliances to plumbing fixtures, gun parts and even patio furniture, Custom Chrome expects much business from small businesses, hobbyists and creative decorators.

Custom Chrome is open to both small shops working with unique and unusual shapes and backyard mechanics and artists working on one project at a time. The company promises to deliver work with the same precision, process, professionalism and the talent of its parent company, Reliable Plating Works.

Dürr Joins UN Responsible Corporate Governance Initiative

Dürr AG (Southfield, Mich.) has joined the United Nations Global Compact, the world's largest and most important initiative for responsible corporate governance. Dürr has committed to the UN Global Compact's ten sustainable principles in the realms of human rights, labor standards, environment and anti-corruption.

"We are thus underlining once again that we align economic activity with ecology and fair working conditions," Dr. Jochen Weyrauch, deputy CEO of Dürr AG, says.

By joining the UN Global Compact, Dürr AG has become part of a worldwide network of over 15,000 companies and organizations from civil society, politics and science in more than 160 countries. Together, they are committed to a sustainable future for the benefit of all people, communities and markets.

The principles of the UN Global Compact include rejecting child labor and discrimination in hiring and employment, accelerating the development of environmentally friendly technologies and supporting the protection of human rights.

AkzoNobel Makes Deal to Buy Titan Paints

Paint and coating company AkzoNobel (Reading, Pa.) is set to acquire the decorative paints business of Spain's Industrias Titan S.A.U. (Barcelona, Spain). Completion of the deal is subject to regulatory approvals, but is expected before the end of Q1 2021.

Titan is one of Spain's best-known brands, and also has a sizable presence in Portugal. The business shares AkzoNobel's commitment to sustainable product innovation, with much of its portfolio recognized for environmental performance.

"The Spanish market has strong growth potential and this is an excellent opportunity for us to reinforce our position in the region," AkzoNobel CEO Thierry Vanlancker says. "The fact that a significant part of Titan's portfolio has been awarded the European Ecological label also offers exciting possibilities for combining our technologies and expertise, which will result in us developing better and more sustainable products."

Real-Time Alterations with Marposs' Remote Service

Marposs' (Auburn Hills, Mich.) new real-time Remote Testing and Acceptance Service enables customers to participate in live testing, review and acceptance of their machines, gauges and applications without traveling, supporting efficient work while saving time and money.

"The manufacturing industry is often criticized for a lack of modernization. With the pandemic preventing in-person meetings, companies must adopt new technologies," Matteo Zoin, Marposs' head of marketing and new market development, says. "We are living in a challenging time and staying competitive requires aggressively moving into the digital space."

Tests for North American customers take place in Marposs' Technology Labs in Auburn Hills, Mich. and Fremont, Calif.; or at Marposs' European headquarters. Video cameras and wireless equipment support the Zoom Conference livestreams to ensure a highly detailed and accurate experience. Customers can provide immediate feedback, allowing real-time alterations.

NASF TECHNICAL PAPERS *EDITED BY DR. JAMES LINDSAY, NASF TECHNICAL EDITOR*

A Novel Pretreatment Process for Direct Electrodeposition onto Aluminum Alloys

J. Xu,1 T.D. Hall,1 C. Crowley,2 S. Snyder,1 B. Skinn,1 M.E. Inman1 and E.J. Taylor1 1Faraday Technology Inc., Clayton, Ohio, USA
2Fermi National Accelerator Laboratory, Batavia, Illinois, USA

This paper discusses a novel pretreatment process for direct electrodeposition nickel-phosphorus (NiP) and nickel (Ni) from commercial electrolytes onto aluminum (Al) alloy (T6061) surfaces without the need for zincate or stannate pretreatment processes. The coatings properties are compared to conventional commercially applied electroless (NiP) using conventional pretreatment processes.

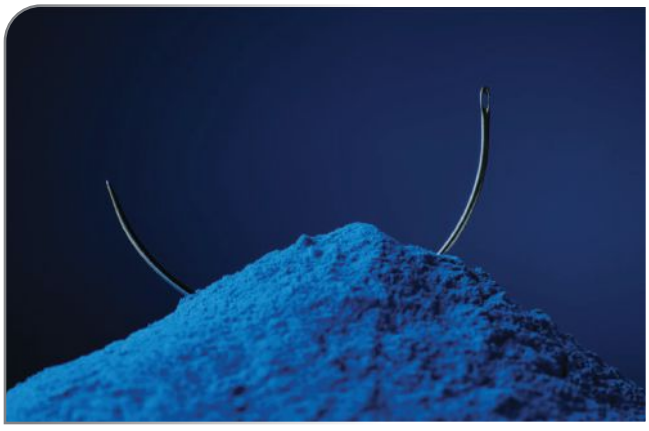
The direct electrodeposition of coatings onto Al and its alloys is difficult due to the formation of a strongly adherent passivating oxide film. Over the past 50 years there have been numerous publications on the subject, 1-7 each addressing the challenge of removing this passive oxide film such that the coating could be directly applied to the Al substrate. If this passive oxide is not properly removed, the applied coating exhibits poor adhesion, corrosion resistance, solderability or other critical performance properties. The full paper can be accessed and printed at **short.pfonline.com/NASF20Dec1.**

NASF/AESF Foundation Research Project #121: Development of a Sustainability Metrics System and a Technical Solution Method for Sustainable Metal Finishing: 2nd Quarterly Report

Prof. Yinlun Huang, Wayne State University, Detroit, Michigan, USA

The NASF Research Board has funded a research grant at Wayne State University on sustainability in the surface finishing industry, under the direction of Professor Yinlun Huang. The objective of the work is to create a surface-finishing-specific sustainability metrics system to measure economic, environmental and social sustainability and use it to identify problems and generate a road map for sustainability performance improvement and profitability assurance in plants. The reader is invited to contact Dr. Huang in identifying plating shops willing to participate in this program.

This NASF-AESF Foundation research project report (1) introduces the project and (2) covers the second quarter of project work (July-September 2020) at Wayne State University in Detroit The full paper on the second quarter work can be accessed and printed at **short.pfonline.com/NASF20Dec2.**



Experimental Powder Coating Passes Antiviral Protocol

Stardust Powder Coatings (L'Aquila, Italy) has successfully tested its first antiviral coating against standard protocol ISO21702, which the company says should indicate the coating's effectiveness against human Coronavirus NL63.

In March, Stardust Powder Coatings — a company specializing in the production of high added-value powder coatings that find application in many sectors — began developing and testing antiviral coatings. Its first successful result has arrived with the Metalgrey 1050k metallic epoxy powder, which sees wide use in the architecture and design sector.

The Virology Research Services (London, U.K.) laboratory conducted the tests, and continues to do so for other grades of powder coatings from Stardust.

"To meet the growing demand for coatings that can ensure greater surface hygiene, we have undertaken an intense research and development process that has led to the launch of Guardian AM, a range of antimicrobial coatings with integrated silver-ion technology which, in just two hours, can reduce up to 99.5 percent of the bacterial load on a product protected with the coating," Guido Pozzoli, CEO of Stardust Powder Coatings, explains.

Stardust and BioCote (Coventry, U.K.) developed the Guardian AM Architectural and Medical powder coating ranges to protect metal surfaces and stop the proliferation of microorganisms while providing tailor-made solutions for essential sectors.

Guardian AM powder coatings release silver ions in a controlled manner that reduces the presence of microorganisms on a surface and inhibits their proliferation while remaining non-toxic to humans.

Pozzoli adds, "The goal of Stardust is in fact to expand the range of Guardian AM coatings, combining antimicrobial and antiviral properties for any color, finish and for any field of application. This will further improve the permanent hygiene of surfaces and achieve an even more effective hygienic defense, alongside cleaning and hand hygiene."

BASF Unveils Tenth Annual Colors Trends Report

BASF's (Southfield, Mich.) 2020-2021 Automotive Color Trends CODE-X collection showcases a variety of shades and effects with reimagined whites, the darkest of jet blacks and a variety of vibrant color spaces in-between. The colors serve as an inspiration to automotive designers for vehicles in development to launch in three to five years. Many of these colors have effects or textures, making them a tactile experience as well as a visual and emotional experience.

The global key colors include a grayish green, a warm beige and a coarse gray. As new thinking drives big transitions in the values around society, identity and progress, this collection represents a hopeful and positive blend of physical and digital worlds.

The key colors of EMEA are distinct, yet soothing. There's a huge variety of effects in these colors that are inescapable, yet approachable — nostalgic, but new.

Asia Pacific's key colors are warm and emotional, reflecting a positive, flexible attitude for change, action and the future. The colors are not black or white, but more blurred and floating, like human emotion.

North America's future color designs build off advancing colorant technologies that exhibit a greater sensitivity to the environment, projecting techno-sophistication with responsible grace and simplicity.

South America's key colors combine a level of seriousness

with a free-spirited dimension of society. The colors are playful and unpretentious, with a wide array of dynamic effects to represent the knowledge that the stakes are high and full of purpose.

Every year, designers of BASF's Coatings division from around the world study future trends which they use as foundations for developing surface, texture and color positions. They draw inspiration from sources including industry, fashion, consumer products and nature. They share their research with BASF's customers — the automotive designers — and help develop the colors of the future.

Clemco Lab Equipped for Abrasive Blasting Research

Clemco (Washington, Mo.) opened its new 4,500-square-foot sample processing and R&D lab in February of 2020. The new facility more than doubles the size of the old facility, holds 13 machines instead of the old lab's six and uses four industrial dust collectors. The expanded facility reflects the growth of Clemco's business and its dedication to state-of-the-art sample processing and groundbreaking research and development for the abrasive blasting industry.

The new lab's sample-processing capabilities allow it to more accurately simulate a wide range of industrial blasting applications. After a customer sends part samples and details about the end results desired and their current process, the lab replicates the conditions of the customer's facility and researches solutions. The lab then recommends the best equipment, media and process required to solve the customer's blasting needs. Recommendations could range from modifications to the customer's current facility or process, purchase of standard or modified Clemco equipment, or a consultation with Clemco Engineering about custom-designing equipment for the customer. This service is free of charge to Clemco customers.

We live in an information age, and Clemco is committed to being the recognized source of information for the abrasive blasting industry. To this end, the new lab researches methods of enhancing equipment efficiency and productivity while improving equipment and safety equipment quality.

Lab manager Lucas Cahill, who has worked for Clemco for 15 years, has experience working in both welding's industrial and experimental sides: as a teenager and journeyman welder, he worked on his family's demolition derby hot rods. Cahill has managed Clemco's labs for five years, succeeding Herb Tobben.

Andrews Powder Coating Wins Community Award

The Chatsworth Award Program (CAP) has selected Andrews Powder Coating Inc. (Chatsworth, Calif.) for a 2020 Best of Chatsworth Award in the Protective Coatings category.

Each year, the CAP identifies companies that it believes have achieved exceptional marketing success in their local community and business category. These are local companies that enhance the positive image of small business through service to their customers and community, making the Chatsworth area a great place to live, work and play.

The judges gathered and analyzed various sources of information to choose the winners in each category. They recognized companies they believe have implemented programs and used best practices to generate competitive advantages and long-term value.

New Rapid Interpon Shipping Service Launches

While AkzoNobel (Reading, Pa.) prides itself on its variety of powder coatings, it also recognizes the importance of speed to busy powder job coaters. AkzoNobel's new partnership with Prismatic Powders (White City, Ore.) allows customers to order from nearly 500 Interpon Ready-to-Ship (RTS) powders and have them shipped within three business days or faster. This not only helps coaters in supporting their existing customers but also in taking on new business with urgent needs.

The new partnership between AkzoNobel's Interpon (Reading, Pa.) brand and Prismatic combines Interpon's powder coatings for a variety of industry sectors and products — including radiators, light fittings, refrigerators, freezers and dishwashers — with Prismatic's trusted, cost-effective e-commerce platform.

The ability to order quantities as small as 0.9 kg helps to significantly reduce waste — and therefore cost — and support a more responsible sustainability agenda.

Jim Clark, regional marketing manager of AkzoNobel in North America, says this combination of speed and flexibility should result in happy customers and non-stop production lines. "Our products not only support a coater's existing business but can help open new doors and start new conversations," he says. "Getting products to your door, in the quantity that you need, and in the time that you need it, will help keep you and your customers happy and your production line rolling."

While standard delivery will be 1-3 days, the premium Fast Pass service will allow customers to receive products on the same day as their order. The service is now available to customers in the U.S. and Canada.

A Focus on Heavy Castings

Winona Powder Coating invests in heavy-duty line and electrocoating to serve agricultural, industrial markets.

Winona Powder Coating serves as a Tier 2 supplier to numerous industrial and agricultural markets. Photo Credit: Winona Powder Coating

BY SCOTT FRANCIS EDITOR-IN-CHIEF

Nestled in the small town of Etna Green, Indiana, surrounded by farmland is the headquarters of Winona Powder Coating. With additional facilities in Elkhart, the company is a leading supplier of powder coating services to large industrial companies throughout the Midwest.

Founded in 1974, Winona started out as a small fabricator and added powder coating capabilities in 1979. Over time, the company zeroed in its focus on powder coating and was purchased by CEO Jamie Visker in 2002. With Visker at the helm, Winona Powder Coating expanded its 20,000 square foot location in Elkhart to a 50,000 square foot facility with two coating lines. A 25,000 square foot facility in Mentone, Indiana, was moved to a 167,000 square foot facility in Etna Green. The company has been continually working to expand its operations ever since. In 2019, Winona Powder Coating installed a second heavy-duty powder coating line and then completed the installation of an electrocoating line in the third quarter of 2020. Each plant is ISO 9001 certified and undergoes recertification on a regular basis. Suffice to say, the company is focused on growing its business and, despite the uncertain times surrounding the coronavirus pandemic, it continues to make strides.

Winona Powder Coating has carved out a good niche for itself as a Tier 2 supplier, serving the industrial, construction and agricultural markets. The company processes parts for such OEMs as Case New Holland and Parker Hannifin, and has numerous John Deere certifications, including the JDM F17 global paint spec approval. And while traditionally the company hasn't done a ton of work in the automotive sector, that is starting to change. The company is a certified top coater for Volkswagen parts and is pursuing electrocoating certification for VW parts as well. It has increasing commercial truck business, as well as recreational vehicle work — an area that is seeing upwards of 170% increase in demand.

Powder coating capabilities

One thing that sets Winona Powder Coating apart is its ability to process larger parts such as heavy industrial castings. The company is capable of coating parts up to 32 feet in length at both of its locations. Its new heavy-duty line in the Etna Green facility utilizes an I-beam conveyor line that can carry up to 200 pounds on each of its pendants that are spaced one foot apart. Visker explains that the line was installed out of necessity because Winona's casting business has grown pretty dramatically in recent years.

"When I bought the company in 2002, we were doing maybe 10% gray iron castings," Visker says. "As our business has grown, castings are now around 25-30% of what we process, and that continues to grow."

Overall, in terms of powder coating capabilities, Winona Powder Coating has four production lines — two at each plant.

Winona Powder Coating completed the installation of an electrocoating line in July of 2020.

25-30% of the parts Winona Powder Coatings processes are heavy castings. Photo Credit: Winona Powder Coating

Three of those lines have automated booths with oscillating guns. The second line at the Elkhart location has a hybrid booth with fixed guns. The average part window between all four lines is around 34 inches by 72 inches and parts up to 32 feet long can be run on the lines. The company handles a variety of castings, from ductile and gray iron to aluminum castings, and its substrates include galvanized steel, cold and hot rolled steel and aluminum extrusions. Five-stage pretreatment is used at both facilities.

Brian Bailey, president of Winona Powder Coating, stresses the importance of using the same pretreatment at both facilities. "It's made moving products between our two plants seamless," he says.

> "We were a customer of ecoating for the longest time ourselves, so we knew what the issues were."

Winona is constantly looking at ways to expand and improve its processes. The company is currently working with Americo Chemical for pretreat and Akzo Nobel and Axalta Coating Systems to meet AAMA 2604 and 2605 standards for architectural work. "Before too long, we expect to see quite a bit more aluminum extrusion business coming through here," Bailey says.

New electrocoating capabilities

The focus on heavy industrial parts drove Winona Powder Coating to its most recent expansion. The company was outsourcing its electrocoating for its powder-coated parts. But it noticed there wasn't a lot of capacity for electrocoating heavier parts, such as castings and large weldments, because of the curing requirements.

"A lot of the ecoating capacity that's out there doesn't have the oven time to cure heavy, dense parts," Visker says. "That's finally what really pushed us into this line."

Winona Powder Coating decided to invest in its own electrocoating line and selected Therma-Tron-X Inc. (Sturgeon Bay, Wisc.) for the installation. The line, which was completed in July of 2020, features a 102" by 48" by 48" part window and can handle up to 2,200 pounds and 500 square feet of coverage per load. Addressing the need for longer curing cycles, the oven affords 45 minutes of cure time and runs from 350°F-450°F. The line offers a 12-stage pretreatment with laser scale.

"Oxygen lasers used to cut the metal can leave a carbon buildup, so we offer laser scaler removal," Bailey explains. "The laser scale removal is completed in the first two stages of the line. If you don't need laser scale removal, we just simply keep the rack from indexing down into those tanks."

Other features of the line include Axalta EC 6100 Series Ecoat with zinc phosphate conversion coating and an RO (reverse osmosis) water system that is used for the majority of the line. The line allows for 15-degree indexing upon part entry into the tanks to minimize air pockets and ensure complete coverage.

Careful consideration went into the design of the electrocoating line. According to Visker, the team approached the expansion to build upon its strengths. "Our big advantage is that we can do heavier castings and we can do heavier weldments — items as large as engine mounts," Visker says. The line was set up to meet John Deere F17 cleaning specifications and with the intention of striving toward the automotive OEM standards.

"We were a customer of ecoating for the longest time ourselves," Bailey adds. "So we knew what the issues were."

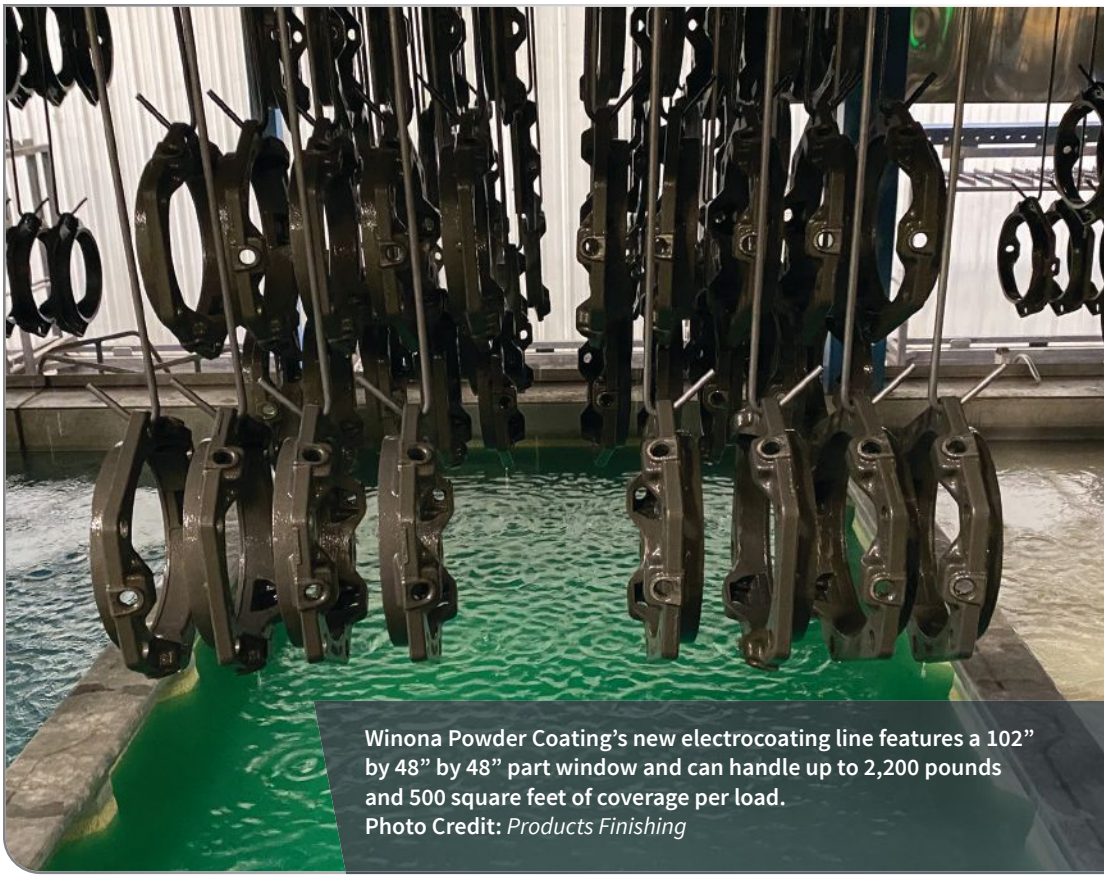
On the horizon

Winona Powder Coating's recent expansions offer a peek at how the company seeks continuous improvement. For example, the company also uses sand-bed stripping for cleaning its racks. "We've been able to reduce our gas usage by two-thirds by moving to sand bed stripping versus burn off stripping," says

Bailey. The company also has an expanded sand-blasting area (32 feet by 32 feet) and offers wheelabrating, masking and custom masking racks, and has small-batch capabilities where it can handle parts 32 feet by 8 feet by 8 feet.

As Winona Powder Coating forges ahead, it is taking its ability to process heavy parts to a new level. It's expanding automotive and OEM certifications and continuing to evolve its work with agricultural and industrial markets.

"A lot of our Tier 1 customers are either in automotive or becoming automotive suppliers," says vice president of Etna Green operations Larry Beals. "So, a lot of our disciplines and quality systems are actually morphing into the automotive standard levels of excellence."



Winona Powder Coating's new electrocoating line features a 102" by 48" by 48" part window and can handle up to 2,200 pounds and 500 square feet of coverage per load.
Photo Credit: *Products Finishing*

Dialing in Chemistries for a New Washer System

Excel Industries' new 10-stage washer features several innovative solutions from Chemetall, including a neutral pH descaler to eliminate flash rusting.

BY SCOTT FRANCIS *EDITOR-IN-CHIEF*

ABOVE: Mower manufacturer Excel Industries Inc. recently installed a new 10-stage washer from Therma-Tron-X with chemistries from Chemetall to pretreat parts prior to coating. Photo Credit: Excel Industries Inc.

Excel Industries Inc. (Hesston, Kansas) is, if you'll forgive the pun, on the cutting edge of mowing equipment. In 1964, the company partnered with inventor John Regier and began production of the world's first twin-lever, zero-degree turning radius mower — the Hustler. Today, the company continues to create outdoor equipment under the Hustler Turf Equipment and BigDog Mower Co. brands and has a global distribution network of more than 2,000 U.S. dealers and 30 distributors worldwide.

The company installed a new pretreatment system in August of 2019 to replace outdated equipment. The original washer was proving to be undersized for the company's increasing workload and unable to run advanced pre-treatments.

"Our old eight-stage washer system was designed to run at a maximum of nine feet per minute," explains Johnny Kotek, powder coating supervisor at Excel Industries. "As we increased production rates, we needed the capability to go up to possibly 14 feet a minute."

According to Kotek, the company was also experiencing some adhesion issues. The original washer's first stage was an

alkaline bath and parts with doubler plates welded together would allow the alkaline to seep into the crevasses. The alkaline would then boil out and dry on the part while in the dry off oven, ultimately causing paint defects and peeling.

"We wanted to have the first stage be more like a wetting zone versus a true alkaline cleaner so we wouldn't have any chemical creep inside the doubler plates," Kotek says.

Excel Industries selected Therma-Tron-X Inc. (Sturgeon Bay, Wisc.) to install a brand new 10-stage washer. The solution added two additional stages and set the stage for the desired improvements. However, Excel Industries began to experience some problems as they worked to dial in the chemistries for the washer system. At stage five of the pre-treatment, an acid pickle was being used, which was causing some problems with flash rusting.

"We had to raise our temperature and concentration to attack certain parts to get them clean, but by going that high, we realized that in a normal spray process like this, at this line speed, it was exceeding the limit," Kotek explains. "We'd have line stops and it would create a lot of flash rusting." Removing the flash rust was adding labor costs and introducing the potential for defective parts in the event the rust made it to the paint booth.

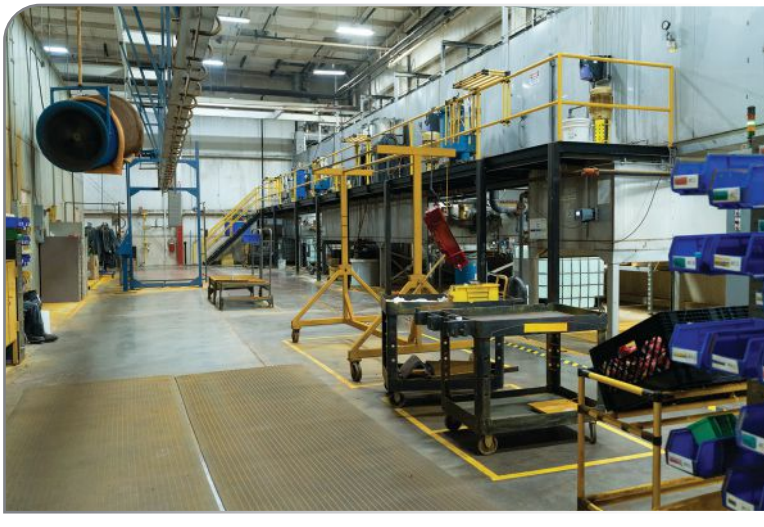
The company turned to Chemetall (New Providence, N.J.), Surface Treatment global business unit of the Coatings division of BASF, for a solution to the problem. "Running an acid deoxidizer at high temperatures for cleaning was causing dry down on the steel," Ladd Ojala, business development manager for Chemetall, says. "Whenever you get dry down on the steel, that's when flash rust can present itself."

Chemetall proposed changing the chemistry in stage five to a neutral pH descaler. The company's SCN-9194 is a neutral pH corrosion remover based on organic phosphate technology. It runs at a pH of 7 and is effective at removing weld smoke, which can cause adhesion issues. Chemetall ran a series of test panels for Excel Industries and was ultimately awarded the business. Steve Brentz, Chemetall district manager, stresses the importance of "constant communication and updates on quality and testing" in the company's approach to the project.

"We were able to remove the weld smoke at a neutral pH," Ojala says. "This basically solved the flash rust issue. Typically, you'd have to run an acidic product at a pH of 3 at that stage and then if you get any dry down, flash rust, of course, will be a major issue on any line."

Excel Industries' new pretreatment line features several of Chemetall's chemical solutions:

- The first stage employs a low pH cleaner (Gardoclean S 5219). Ojala explains that some parts were coming in with chlorinated paraffins on the steel, which typically require high heat — above 140°F — to remove. Gardoclean S 5219, which is designed to remove numerous difficult soils, including drawing, buffing and polishing compounds, is able to remove the chlorinated paraffins at 120°F.
- The second stage is an alkaline cleaner bath (Gardoclean S 5489), followed by a couple of rinse stages.



Excel Industries' new 10-stage washer features several chemical solutions from Chemetall/BASF.
Photo Credit: Excel Industries Inc.

- Stage five applies the aforementioned SCN-9194 neutral pH descaler (which replaced the acid pickle), followed by three rinses.
- Stage nine is a zirconium conversion coating (Gardobond X 4548), followed by a final RO (reverse osmosis) rinse.

Chemetall also contributed some mechanical solutions as part of its overall support of the project. "We call it our MOC strategy — mechanical, operational and chemical," Ojala says. The company installed an oil coalescer on the stage two alkaline bath that skims the oil off the top and provides a longer bath life. Two large glass media sand filters were also provided to remove iron from the conversion coating bath in stage nine.

Excel Industries has been running the new washer system with the updated chemistry since May. "Our new process has drastically improved our quality of paint adhesion," Kotek says.

Reaping the Benefits of **Powder Coating Expertise**

To achieve uniform thickness for its powder coated parts, farm equipment manufacturer Bridgeview Manufacturing turns to TIGER Drylac for support.

BY SCOTT FRANCIS *EDITOR-IN-CHIEF*

Bridgeview Manufacturing in Gerald, Saskatchewan, was formed in 1983 when founder Kevin Hruska set out to combine his love of farming with his welding skills and began building farm equipment for local customers. Today, Bridgeview produces such machines as the Bale King Bale Processor, Grain Express grain handling systems, the Bale King Rake V-Rake line, and its Pulldozer Land Shapers and Scrapers. The company boasts a 70,000 square foot factory and its machines are distributed throughout Canada, the United States, Eastern Europe and Australia. Bridgeview also offers custom manufacturing and its capabilities include precision CNC punch, CNC press brake, shearing and welding.

Bridgeview Manufacturing produces large farm equipment such as this Pulldozer Land Shaper. All of the company's products receive a powder coated finish.
Photo Credit: All photos courtesy of Bridgeview Manufacturing

Bridgeview powder coats its products and found itself looking for additional guidance and technical support. The company sought to improve the uniformity in coating thickness for its products.

"We needed help with how to best finish some of our large items," says Riley Apland, who handles purchasing and parts at Bridgeview. "Our powder wasn't getting baked properly."

Bridgeview turned to TIGER Drylac (Guelph, Ontario) for help improving film thickness uniformity, transfer efficiency, and Faraday penetration. In some instances, Bridgeview's powder was dripping down the edges of parts, yielding excessive film builds of 7.0 mils at the bottom of the part. TIGER Drylac sales engineers and application field specialists ran multiple production trials at Bridgeview, calculating

film thickness, gloss and transfer efficiency. Collaboration was required across production, process engineering and R&D teams in the facility. The result was powder that charged more consistently and ultimately established an even film build from top to bottom, averaging 4.2 to 5.0 mils over the areas in question.

According to Apland, the collaboration helped improve coverage on sharp edges of the parts, which is a critical requirement in the agricultural industry.

"With the color of our powder — which is a construction yellow — it's tough to cover edges," he says. "[TIGER] helped find the balance, giving us a nice smooth finish and still getting edge coverage."

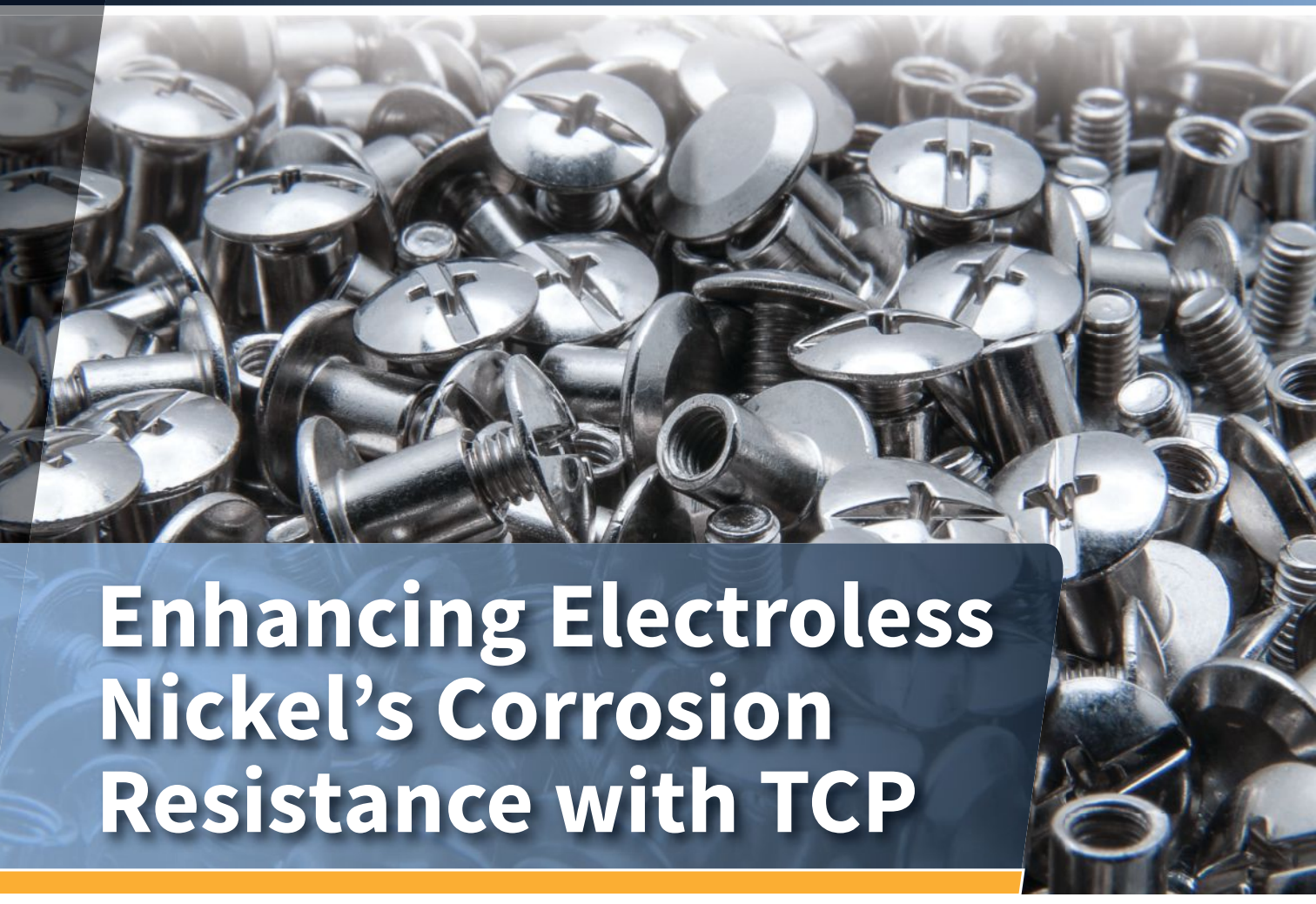
Bridgeview was also looking for ways to improve efficiencies. The company's massive agriculture blades require steel shot blasting and preheating before coating. Apland explains that before any powder is sprayed, the parts are pre-baked to remove the oils from the steel. This ensures that oils do not surface underneath the coat during the cure cycle, which can cause defects. However, Bridgeview's technicians found that if parts were sprayed at temperatures above 100°F, there was significant dulling of the finish. As a result, technicians would often find themselves waiting up to 60 minutes to allow the blades to cool. TIGER Drylac provided powder that allowed parts to be sprayed at warmer temperatures ranging from 130°F–175°F. This eliminated gloss loss, reduced orange peel and improved penetration into Faraday areas.

Bridgeview also wanted to minimize powder waste and reduce defects. With an optimal particle size distribution, TIGER Drylac powder stuck to parts and reduced re-work. The powder coating, combined with harmonization of electrostatic forces, airflow rates and part density/racking, helped Bridgeview improve first-pass transfer efficiency and reduced powder waste by 75%.

Ultimately what Apland says made the biggest difference was the expertise and support TIGER Drylac offered. "We needed someone to just spend some time with us and understand what we were trying to do," he says. ■

In addition to improving film thickness uniformity, Bridgeview was looking for ways to minimize powder waste and reduce defects and re-work.

Bridgeview Manufacturing turned to TIGER Drylac for support achieving uniform coating thickness and improved coverage for parts with sharp edges.



Enhancing Electroless Nickel's Corrosion Resistance with TCP

Ronatec and CHEMEON have achieved promising early results for bolstering electroless nickel corrosion resistance through the application of a trivalent chromium pretreatment (TCP) top coat.

SHAY DAVIS *CHEMEON SURFACE TECHNOLOGY*
JAMES WETHERALD *RONATEC C2C*
JOE ZABIELSKI *RONATEC C2C*

ABOVE: Photo Credit: Stockcraftpro/shutterstock.com - licensed by CHEMEON

Abstract

This report documents the evaluation of a trivalent chromium pretreatment (TCP), or trivalent chem film, as a "post coating," or top coat, to improve corrosion resistances of electroless nickel processes popular in the American, Canadian, Mexican, European, Asian and South American markets. Ronatec C2C Inc. has compiled and combined eighteen months of testing and data below for review.

All testing used an average of four panels plated/coated with the test parameters detailed below at 1-mil (0.001-inch or 0.0254-mm) thickness. The goal was to meet or exceed the specification-neutral salt spray requirements, and discontinue salt spray upon visible red rust formation for all tests — comparing each process with and without a TCP top coat.

Introduction

Electroless nickel (EN) plating is a method dependent upon a chemical solution as the catalyst for reducing nickel ions and the deposition of the resulting nickel alloy onto a substrate such as metal or plastic.

Electroless nickel plating has a wide range of capabilities and benefits in the oil and gas, aviation, automotive, decorative and electrical industries. Uniform coating deposition (regardless

of the substrate surface geometry), hardness and magnetic response are some of electroless nickel's unique properties. Electroless nickel has an ultrafine amorphous structure that protects against corrosion. The following testing was performed to further improve upon the natural structure.

Methods

Researchers conducted six tests with Restriction of Hazardous Substances Directive (RoHS)-compliant EN and 4130 steel panels. Each test utilized a Ronatec proprietary Panel Preparation Cycle (PPC) and RC100 Ronatec EN test panel rack.

These tests were largely similar. Each began with five minutes of soaking the plates with an agitated Ronatec ST-100 solution at 0.5 lb/gal, 150°F. From there, the plates underwent a 30-second rinse in non-agitated DI water at ambient temperature and a 60-second rinse in <1MSM water at ambient temperature overflowing to the Ronatec water recycling system. The tests then called for two minutes of a forward and reverse cyclical current in a 0.5 lb/gal solution of Ronatec E-100 ElectroClean solution at 120°F. After another rinse cycle identical to the first, the plates spent one minute in a 0.25 lb/gal Ronatec ST Act-1 Activator solution at ambient temperature.

Photo Credit: DenisProduction.com/shutterstock.com - licensed by CHEMEON

Photo Credit: patruflo/shutterstock.com - licensed by CHEMEON

After a third rinse cycle, the plates underwent process-specific treatments. The mid-phosphorus panels went through a 72-minute treatment of Ronatec EN1000 Mid Phos EN at full concentration, with a pH of 4.91, temperature of 189°F and 1-mil (10/10ths) build thickness. The high-speed, high-phosphorus panels without PTFE co-deposits went through an 87-minute treatment of Ronatec EN 1012 High Phos EN at full concentration, a pH of 4.89 for the control panels and 4.91 for the test panels, a temperature of 189°F and a 1 mil (10/10ths) build thickness. Lastly, the high-speed, high-phosphorus panels with PTFE went through a 135-minute process of Ronatec EN 1015 High Phos EN at full concentration, a pH of 4.88, a temperature of 191°F, a 1 mil (10/10ths) build thickness and 6 g/L of PTFE.

All the panels then went through another standard rinse cycle, with the control panels then undergoing an additional 60-second rinse in <1MSM water overflowing to the Ronatec water recycling system at 170°F. The test panels, meanwhile, began a six-minute CHEMEON TCP-HF

TABLE I RESULTS – Four coatings tested against ASTM B117 neutral salt spray exposure.

Test #	EN, Thickness	TCP	PTFE	Specification(s)	NSS Goal / Actual (hrs)	Top Coat TCP Improvement (%)
1	Mid-Phos, 1 mil, Ronatec RoHS EN1000	No	—	MIL-DTL-26074	100 / 210	—
2	Mid-Phos, 1 mil, Ronatec RoHS EN1000	Yes	—	MIL-DTL-26074	100 / 286	36
3	High-Phos, 1 mil Ronatec ROHS EN1012	No	No	MIL-DTL-26074, ASTM B733 Type 5	1000 / 1410	—
4	High-Phos, 1 mil Ronatec ROHS EN1012	Yes	No	MIL-DTL-26074, ASTM B733 Type 5	1000 / 1520	8
5	High-Phos PTFE, 1 mil, Ronatec RoHS EN1015	No	Yes	MIL-DTL-26074, ASTM B733 Type 5	1000 / 1560	—
6	High-Phos PTFE, 1 mil, Ronatec RoHS EN1015	Yes	Yes	MIL-DTL-26074, ASTM B733 Type 5	1000 / 1760	12.8

process at 28% concentration and a temperature of 80°F in a DI water solution. The test panels then finished with a 30-second rinse in <1MSM water overflowing to Ronatec's water recycling system at ambient temperature.

Results

Operators tested panels in accordance with ASTM B117 neutral salt spray (NSS) exposure, and terminated upon signs of red rust development. Please note that higher salt spray hours are difficult to monitor on an hourly basis, thus data uses the last time researchers viewed panels prior to the panels showing "red rust." Table I details the tests with corresponding data and results.

Table I Results – Four coatings tested against ASTM B117 neutral salt spray exposure.

Discussion

All tests passed specification requirements for neutral salt spray hours of exposure. The results support the theory that adding a trivalent chem film (CHEMEON TCP-HF) significantly increases the corrosion resistance of various electroless nickel coatings.

It is vital to note that the electroless nickel concentrations and cycles reflected a lab setting. Rinses were clean DI utilizing a pre-set microsiemens water quality standard. Optimal tank layout, filtration, ventilation and controlled heating ensured the best results. Please contact Ronatec for details. As a note, Ronatec's exact RoHS EN1015 process is proprietary to Ronatec customers only, and the full process is not as described above.

Based on the test data using Ronatec's electroless nickel processes for mid-phosphorus, and high-speed phosphorus with and without PTFE, CHEMEON concludes that its TCP-HF trivalent top coat is an effective addition to the EN process.

Future Testing

Ronatec is currently conducting testing to include the following parameters:

- Mid-Phos baked for hydrogen embrittlement, then top coat of TCP-HF
- Mid-Phos, coat of TCP HF, then PTFE post dip
- High-Speed High-Phos PTFE (PFOA free) with TCP-HF

Administrative Information

James Wetherald (Ronatec VP) and Joe Zabielski (Ronatec Technical Director) of Ronatec C2C Inc. in Oceanside, Ca. performed the work described in this report with the use of Ronatec's laboratory facilities and customer facilities.

Acknowledgements

CHEMEON would like to thank Ronatec C2C Inc. for performing all of the testing, and providing the data through completion. CHEMEON and Ronatec greatly appreciate and thank Ronatec's customer base for allowing the use of their facilities for testing.

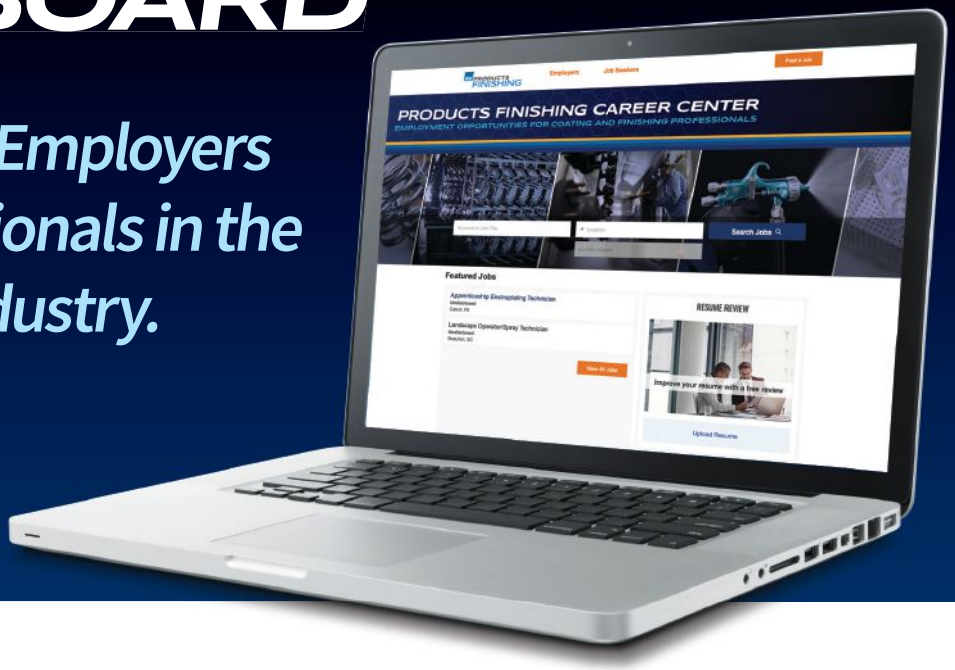
References

"Electroless Nickel Plating (EN Plating)." CORROSIONPEDIA, 28 Aug. 2014, updated 31 Dec. 2019, corrosionpedia.com/definition/438/electroless-nickel-plating-en-plating.

Parkinson, Ron. "Properties and Applications of Electroless Nickel." Nickel Institute, Nickel Development Institute, nickelinstitute.org/media/1769/propertiesandapplicationsofelectrolessnickel_10081_.pdf.

VISIT THE NEW PRODUCTS FINISHING JOB BOARD

Connecting Employers and Professionals in the Finishing Industry.



FOR EMPLOYERS
Find Your Next Great Hires

- **PLACE** your job in front of our highly qualified readers
- **SEARCH** our resume database of qualified candidates
- **MANAGE** jobs and applicant activity right on our site
- **LIMIT** applicants only to those who are qualified
- **FILL** your jobs more quickly with great talent

FOR PROFESSIONALS
Keep Your Career on the Move

- **POST** a resume or career profile that leads employers to you
- **SEARCH** and apply to hundreds of new jobs on the spot
- **SET UP** efficient job alerts to deliver the latest jobs right to your inbox
- **ACCESS** career resources, job searching tips and tools

GET STARTED TODAY AT
PFonline.com

PFONLINE.COM
PF PRODUCTS FINISHING

POWDER COATING WEEK 2021

Powder Coating Week 2021, hosted by the Powder Coating Institute, will take place April 27-30 at the Renaissance Orlando at Seaworld.

BY JENNY RUSH MANAGING EDITOR

Every year, the powder coating community looks forward to Powder Coating Week, hosted by the Powder Coating Institute (PCI). In 2021, it will include the Powder Coating Technical Conference and Tabletop Exhibition, the Powder Coating 101 Workshop and the Custom Coater Forum, all at the Renaissance Orlando at SeaWorld in Orlando, Florida. This series of events is dedicated to education, networking and building connections among powder coating professionals.

The Powder Coating 101 Workshop is a 1½ day workshop that provides education to those just starting out. It focuses on materials, application, reclamation, testing and evaluation, quality control and other essentials. Attendees can expect to learn from industry experts and network with speakers and other attendees. The workshop provides a foundation for the technical conference later in the week.

The Custom Coater Forum provides a space for custom coaters to network with peers and industry leaders. Attendees can expect to hear presentations on timely issues such as minimizing rejects, automation, crisis management, non-destructive testing methods and more. The forum will also include roundtable discussions for sharing information.

PCI's Powder Coating Technical Conference provides a variety of sessions and presentations on key topics. Attendees can pre-register for sessions they plan to participate in.

Topics include:

- Data measurement and management
- Purchasing an automated line
- Line improvements
- Raw materials
- Alternative substrates
- Safety and regulatory guidelines for powder recovery
- Masking, hanging and paint stripping
- New technologies
- And more

"PCI is excited to bring the industry back together at Powder Coating Week in Orlando," PCI executive director Kevin Coursin says. "Those new to the industry, as well as seasoned veterans, will benefit from the diverse topics covered in the Custom Coater Forum, Powder Coating 101 Workshop and the Technical Conference. There will also be an opportunity to network with industry experts at the Tabletop Exhibition."

Registration for each event is separate, however, PCI is offering discounted combination fees as well as lower early-bird rates. Get the full details and register now at **conference.powdercoating.org**.

Powder Coating Week 2021

LOCATION
Renaissance Orlando at SeaWorld
6677 Sea Harbor Dr., Orlando, Fla. 32821
DATES: February April 27-30
REGISTER: conference.powdercoating.org
The Tabletop Exhibition offers attendees the chance to meet with suppliers from across the powder coating industry.

Schedule of Events

TUESDAY, APRIL 27

Powder Coating 101 Workshop and Custom Coater Forum

10:00 AM	Registration Opens
1:00-5:00 PM	Powder Coating 101 Workshop: Powder Coating Done Right - The Basics
1:00-5:00 PM	PCI Custom Coater Forum
5:00-6:00 PM	Reception for Workshop Forum Attendees

WEDNESDAY, APRIL 28

Powder Coating 101 Workshop and Custom Coater Forum

7:30 AM	Registration Opens
8:00-8:30 AM	Breakfast for Workshop Forum Attendees
8:30 AM-4:30 PM	Powder Coating 101 Workshop: Powder Coating Done Right - The Basics
8:30 AM-4:30 PM	PCI Custom Coater Forum
Noon-1:00 PM	Lunch for Workshop Forum Attendees
4:30 PM	Workshop Forum Concludes

THURSDAY, APRIL 29

Powder Coating 2021 Technical Conference and Exhibition

7:00 AM	Registration Opens
7:30-9:00 AM	Opening Breakfast Keynote Address
9:15-11:00 AM	Breakout Sessions
11:00 AM-1:00 PM	Lunch and Tabletop Exhibition Open
1:15-4:30 PM	Breakout Sessions
4:30-6:30 PM	Tabletop Exhibits Open Reception

FRIDAY, APRIL 30

Powder Coating 2021 Technical Conference and Exhibition

7:00 AM	Registration Opens
7:30-9:15 AM	Breakfast with Roundtable Discussions
9:30-11:00 AM	Breakout Sessions
11:00 AM-1:00 PM	Lunch and Tabletop Exhibition Open
1:15-2:30 PM	Troubleshooting Jeopardy
2:30 PM	Powder Coating 2021 Technical Conference Concludes

Tabletop Exhibitors

AkzoNobel Powder Coatings
Arkema Coating Resins
Axalta Coating Systems
BASF/Chemetall
BYK-Gardner USA
Carlisle Fluid Technologies
Catalytic Industrial Systems
Chemical Coaters Association International
DeFelsko Corporation
Dinamec Systems, LLC
DuBois Chemicals
Elcometer, Inc.
Electrocoat Association
FAMIS, Inc.
Fischer Technology Inc.
Fostoria Process Equipment, Div. of TPI Corp.
Gema USA Inc.
General Fabrications Corporation
George Koch Sons, LLC
Global Finishing Solutions
Henkel Corporation
Heraeus Noblelight America LLC
IFS Coatings
IntelliFinishing
Magic Rack / Production Plus
Menphis s.p.a.
Midwest Finishing Systems, Inc.
Nordson Corporation
Omnirobotic
Parker Ionics
Pneu-Mech Systems Mfg.
Powder Coated Tough
Powder Coating Center
RADAR
Powder Coating Institute
PPG
Pretreatment Equipment Manufacturing, Inc.
Products Finishing
Richards-Wilcox, Inc.
RollSeal, Inc.
RTT Engineered Solutions
SAMES KREMLIN
Sherwin-Williams Company
Southern Fluid Systems
Sun Polymers International Inc.
System Technologies, Inc.
TCI Powder Coatings
Therma-Tron-X, Inc.
TQC-USA, Inc.
Trimac Industrial Systems, LLC
Wagner Industrial Solutions
Yaskawa America, Inc.
Motoman Robotics Div.

Plating With Zinc-Nickel: Benefits and Challenges

Q. Can you explain the benefits of zinc-nickel and provide an overview of alkaline versus acid zinc-nickel?

A. Zinc-nickel has increasingly become the finish of choice for many industries with high-corrosion and high-performance needs. It is a rapidly growing segment of the electroplating market, nearly quadrupling in usage in the last five years. The alloy has many properties that are appealing to manufacturers within the fastener, casting, automotive and heavy equipment industries. It is also gaining usage in the defense industry as a potential replacement for cadmium. Zinc-nickel offers superior corrosion resistance, with most deposits at a 12-to-15% alloy range producing a coating that can achieve 250+ hours to first white corrosion and 1,000+ hours to first red corrosion.

Hardness, heat resistance and high-alloy benefits

Zinc-nickel has a Vickers hardness of 400 to 500 HV — zinc-only deposits only have a hardness of around 100 HV. Because handling and assembly can be a destructive process for softer coatings like zinc and zinc flake, zinc-nickel's combination of hardness and overall corrosion protection make the alloy deposit ideal for fasteners or components that require further handling or assembly.

Another excellent benefit of the zinc-nickel alloy deposit is its overall resistance to heat. Many industry specs require baking, and the zinc-nickel deposit can withstand baking temperatures in excess of 200°C for four hours while still achieving 800 hours of neutral salt spray protection to first red rust. Zinc-nickel is commonly used on stampings and fasteners for barrel applications, and heavily used on brake component castings in rack applications.

Most available zinc-nickel systems produce a similar alloy deposit, with an average alloy range of 12-to-15% nickel content. Early systems included a lower alloy of 5-to-7%, but those systems are obsolete. The chemical technology available in today's higher-alloy systems produces a bright and ductile deposit with an even thickness and alloyed distribution over a wide current density range. Zinc-nickel is also the best coating choice when a black appearance is needed in the finished part, as the nickel in the alloy suits blackening.

Alkaline vs. acid zinc-nickel

Between alkaline zinc-nickel and acid zinc-nickel, alkaline zinc-nickel has a much larger market share — though acid zinc-nickel is rapidly gaining ground. Two main benefits of the alkaline zinc-nickel process are even distribution and ductility. Alkaline zinc-nickel offers a more even distribution across the current density ranges, making it ideal for plating complex geometries. The superior ductility of the deposit helps minimize cracking to maintain proper corrosion protection. As a result, manufacturers can subject alkaline zinc-nickel deposits to bending or crimping operations after plating. This is one of the primary reasons the automotive industry heavily uses alkaline zinc-nickel for brake lines.

One major benefit of acid zinc-nickel is that it provides superior activation compared to alkaline. This makes acid zinc-nickel a highly preferred method for plating over castings and other high-carbon, heat-treated steel components like calipers. In addition, acid zinc-nickel offers faster plating speeds due to its high efficiency, and acid zinc-nickel systems' general ease-of-use at a wide array of current densities provides plating shops increased flexibility. Platers can run an array of current densities and still get a good part.

CHAD MURPHY
Columbia Chemical

Chad is the technical account manager for Columbia Chemical.
Visit **columbiachemical.com**

New solutions for acid-zinc nickel difficulties

There are several important operational considerations to keep in mind when running an acid zinc-nickel process. When not in use, anodes must be removed and cleaned prior to reuse. Older technology systems also require dual anodes and dual rectifiers, resulting in added cost and maintenance. Newer systems can operate on a single rectifier with specific adjustments to the anode ratio.

Another important operational factor to consider when evaluating an acid zinc-nickel process is the amount of total chlorides in the system. In the past, platers frequently experienced issues with ammonium chloride and high salt content in the process, which resulted in harder-to-control parameters and required constant elevated temperatures to stop the baths from salting out. The higher-salt solutions could clog air lines, filters, anodes, heat exchangers and cooling lines, meaning the bath would often need costly maintenance downtime in the form of decanting or pumping out and cleaning to remove the precipitate.

Fortunately, newer acid zinc-nickel systems can operate at lower, more economical temperatures compared to the high-salt systems. These newer processes are lower in total chlorides and offer a large operating window in the temperature range to eliminate the common problem of the bath salting out if it cools down. The lower operating temperatures also reduce unnecessary energy costs. Check with your chemistry supplier to ensure the process you are evaluating utilizes the newer technology with lower chlorides to avoid the issues mentioned above.

Looking to the future

Due to its high corrosion protection and heat tolerance, zinc-nickel offers many benefits and meets the demanding specifications of automotive, heavy equipment and similar OEMs. These industries will continue to serve as catalysts for growth and opportunity.

An important factor for success when plating alkaline or acid zinc-nickel alloys is working with a chemistry supplier who deeply understands the characteristics of alloy components and the different "levers" the supplier can pull to dial in the chemistry to your specific plating needs.

LEARN MORE

Researching?

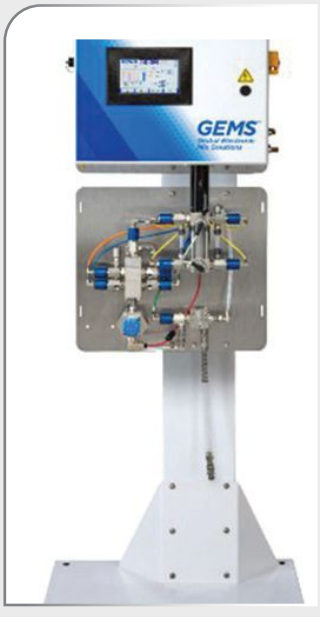
Searching for in-depth analysis of a plating process or technology? Look no further than *PF*'s Research and White Paper Zone, an entire section of our site dedicated to free papers and presentations from leading researchers in the finishing industry.
pfonline.com/zones/electroplating/whitepapers

How to Reduce Waste for Two-Component Coatings

Q. We are spraying two-component primers and topcoats onto wood cabinet doors. Despite our best efforts to properly estimate the amount needed, we end up scrapping 3-5 gallons of coating each day. In addition to the wasted paint, we also use a high volume of solvent to clean our tanks and guns. How can we reduce the amount of waste in our process?

A. The situation you have described is very common and is directly related to your process of "hot potting" or manually blending the "A" and "B" parts of a two-component material. Once the two materials are combined or activated, you have a fixed amount of time or "pot life" to apply the "hot" material. Hot potting is a very easy and cost-effective way to mix and spray two-component materials until it becomes a financial burden as you have described. Another disadvantage of "hot potting" that you may have noticed is that, over a short period of time, the viscosity of the material changes, which directly impacts the spray and finish quality.

There is a wide variety of mechanical and electronic fluid metering equipment that will resolve the issue that you are experiencing. These systems allow you to mix the material as it is being applied, which drastically reduces the amount of waste generated. Since the material is mixed on demand, you will also have much better consistency, which will improve the overall application process and finish quality.



The most versatile unit would be an electronically based unit. In addition to mixing the materials on demand, these units can store multiple recipes or settings for a wide range of coatings which may have different mix ratios. Once configured, most systems can provide reporting on material usage, which can be a great aid for environmental reporting and understanding of true finishing cost.

Additionally, the fluid section of the machine can be provided with a valve manifold that allows for multiple colors ("A" component) to be loaded up to the machine. The manifolds can be supplied from pressure pots, pumps or a combination of the two depending on the volume of material needed. The catalyst or "B" component is also fed to a separate manifold. The materials are then run from the manifolds through independent meters (which measure the volume of material) and regulators (used to adjust flow) to a mix-block assembly, at which point the two materials are combined. The outlet of the mix manifold supplies the activated material to the paint applicators. Multiple applicators can be supplied from a single machine.

JOHN OWED
Carlisle Fluid Technologies

John has over 10 years of experience in finishing, and is currently the finishing SBU director at Carlisle Fluid Technologies.

With this type of system, color change, flushing time and the amount of waste generated are greatly reduced. The amount of material lost per color change is equal to the volume of material within the system from the outlet of the manifold to the applicator. During the automated flushing process, solvent and air are used in combination to create a scrubbing action that can reduce solvent usage and cleaning time by up to 65%.

The purchase of a fluid metering system can typically be justified based on reduced paint waste alone. For example, you noted that you waste 3–5 gallons a day of mixed material. Let's take the average of 4 gallons and assume that even with a metering system you will still have some loss (material in lines), as noted above. For this example, we will use 3.5 gallons a day of waste and assume a price of $65 per mixed gallon: 3.5 gallons x $65./Gallon x 260 days per year = $59,150 in coating savings alone (910 less gallons per year wasted).

Additional justification can also be gained from:

- Reduced waste disposal costs caused by less waste
- Reduced solvent usage
- Reduce waste solvent disposal
- Reduced color change time. Typically, an automated color change can be done in less than 1 minute with minimal solvent usage.

I would certainly encourage you to reach out to your local equipment supplier and identify a fluid metering system that will meet your requirements. You should be prepared to provide the following information to aid in the specification of a machine:

- Number of colors
- Number of catalysts
- Viscosity of materials to be applied
- Mix ratio of materials to be applied
- Minimum and maximum flow rate required
- Number of applicators to be supplied

Based on the information above and some additional details about your process, you should be able to obtain an equipment proposal. Additional information on current solvent usage, disposal cost, color change time and related labor can be used to identify a more in-depth cost analysis for project justification.

LEARN MORE

Find More Answers to Liquid Coating Issues

Searching for in-depth analysis of a liquid coating process or technology? Look no further than the *Products Finishing* Liquid Coating Zone, an entire section of our site dedicated to solving your liquid coating issues and improving your efficiency.

pfonline.com/zones/painting

SIRE Method for Troubleshooting Powder Coating Issues

Q. What is the best or most efficient way to approach troubleshooting problems with a powder coating line?

A. I have heard it said that doing the same thing over and over expecting a different result is the definition of insanity. But what if you think you are doing the same thing over and over, but the outcome is a different result? Maybe this can drive you to insanity? The fact is, if the outcome is different, something in the process has changed — and there are right and wrong ways to track down the root cause. We are talking about troubleshooting.

Making a bad or out-of-spec part is common, the question is how we can systematically track down the cause of the issue and build or rebuild a process to avoid the problem's recurrence. I believe the SIRE method is one of the best tools for troubleshooting powder coating systems that create faulty parts.

It is tempting after rejecting a group of parts to immediately start turning knobs, moving levers or adding new processes based on a guess to get a "quick fix" and continue production. The problem with this approach is that oftentimes our guesses are wrong, and not only do we not get back on the right track, we often add one or more new variables that take us further from the proven process. Instead, you should respond to rejected parts by tracking down the cause of the problem using a process of elimination protocol.

The **S** in the SIRE system stands for "**Search**": systematically search out the potential cause. Let's assume that the problem is "trash" on the part. During the Search step we want to gather up and record our findings. How many parts include errors, what type of parts, on which shift did the error occur, where are they located on the hanging bar, what time of day did the error happen, what area on the part includes the problem — in the Search step we want to gather all pertinent information about the reject. What does the trash look like with the naked eye and under magnification? Cut into the trash to better understand its composition.

The **I** for "**Investigate**" step is where we want to investigate and isolate the cause of the problem. In the example scenario, does the entire part have trash or is it located on one section of the part? If it is only on specific sections of the part, we can virtually eliminate the powder itself. If the trash is not all over the part and only found on the top of the part, and the parts located at the top of the rack have more trash than the ones below, we can surmise the problem stems from falling trash or debris. We can then take a part before it enters the oven and cure it in a lab oven instead. This removes the cure oven from the equation, further narrowing down the source.

The following step, **R** for "**Recreate,**" is critical for proving that your theory about the source of the problem is correct. The fact is, your theory remains a hypothesis until you can successfully recreate the problem.

Once you have used all the data you have collected and are able to recreate the problem, you can move to the final step: **E** for "**Eliminate**," where you eliminate the problem.

STEVE HOUSTON
Vitracoat Inc.

Steve is the director of sales and marketing for Vitracoat Inc. Visit vitracoat.com.

PF PRODUCTS FINISHING INNOVATOR

Dürr Group | 866-387-7178 | durr-group.com/en

Paint Application Without Atomizer Eliminates Overspray

Dürr's EcoPaintJet applicator applies paint in continuous jets, eliminating overspray, enabling quick color changes and improving efficiency.

BY JENNY RUSH *MANAGING EDITOR*

Dürr (Southfield, Mich.) has focused in recent years on automation for liquid coating applications, particularly in the automotive sector. Its recent innovation, the EcoPaintJet, started primarily in automotive production. It is designed to apply paint over a large area or in simple patterns with high edge definition without any overspray, making it a sustainable solution that reduces waste. It also enables fast color changes. After a successful year on the market, the technology is available for integration into general industry applications beyond the automotive sector.

The EcoPaintJet's story began back in 2008, when engineers at Dürr began investigating how to increase transfer efficiency up to 100%. They explored different inkjet technologies and read dozens of patents. The first iteration was an attempt to create homogenous droplets, but with paint instead of ink. From 2010 to 2012, the company worked on this as part of a government-funded project, and in 2013 they made the decision to expand the project independently, increasing efforts and manpower.

The extended R&D and hard work has paid off. The EcoPaintJet won 2020's "Deutscher Innovationspreis" innovation award in Germany. As part of Dürr's overspray-free application set, the EcoPaintJet is designed to eliminate overspray, thereby reducing waste and the need for masking or film-wrapping to get a paint job with sharp edges. *Continued on page 38*

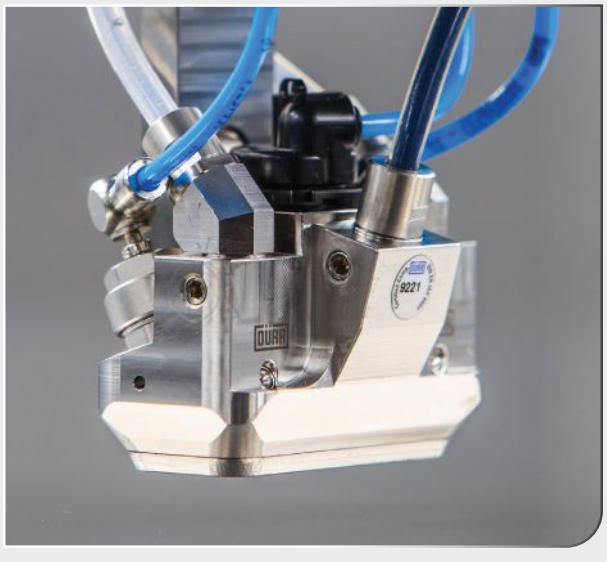
Continued from page 37

The most important component in the overspray-free application set is the paint supply, combined with the cleaning and pre-painting process. The EcoPaintJet controls this using three valves. The heart of the applicator itself is a nozzle plate with around 50 capillary nozzles that produce parallel paint jets, depending on the design. These can be activated or deactivated at any given moment to start or stop the coating process or enable quick color changes. It works without an atomizer, leaving no overspray to be filtered from paint booth air.

It's specifically designed to cover large surfaces, but it is customizable. The width of the painting path can be adjusted via the applicator's angle of application, enabling a path from 30-50 mm wide. Narrow widths can be produced by adapting the nozzle plate. The desired coating thickness is controlled via the applicator speed and solid content of the paint.

"The overspray-free application set enables application with high edge definition, fast color changes, and a custom surface design," according to Holger Beiersdorfer, vice president industrial products at Dürr. "This makes our technology attractive even in scenarios where an automated painting method was not previously conceivable." The company continues to expand application possibilities — it has currently experimented with coating fire helmets, champagne bottles and window frames, among many other parts.

The Austrian paint manufacturer Adler has developed colorless and pigmented coating solutions that are precisely tailored to work with this technology. "We developed innovative and environmentally friendly, water-based products that deliver maximum durability and at the same time visual individuality for more than just sheet material," says Dr. Albert Rössler, CTO at Adler.



Clemco Blasting Cabinet Offers 400% Efficiency Boost

The efficiency of Clemco's (Washington, Mo.) 4-Gallon Tumble-Basket Blast Cabinet impressed Felipe Salazar, owner of firearm accessory manufacturer Accu-Tac (Rancho Cucamonga, Calif.).

"We had been running two Raptor manual blast cabinets with two operators, with overtime and even nightshifts," Salazar explains. "But now with our new Clemco cabinet, it's so efficient that most days we run out of parts to put in it. It won't be long until the machine pays for itself."

Salazar goes on to explain that blasting that would take five hours with two operators each working one of the Raptor manual cabinets now takes one hour in Accu-Tac's new 4-Gallon Clemco Cabinet, a 400% increase in productivity. "And we've had the machine only a little over a week!" Salazar says.

Accu-Tac's 4-Gallon Tumble-Basket Blast Cabinet arrived the first week of August. It uses fine glass beads to finish batches of parts usually less than an inch long, many of the parts the size of marbles. In Accu-Tac's case, the parts are components in rifle bipods.

Typically, Accu-Tac's shop runs six 10-minute batches or four 15-minute batches of these parts per hour to remove machine marks and create a matte finish, for a total of about 1,300 parts an hour.

"We are still experimenting with the process," Salazar shares, "but it's important that we do everything in-house so we maintain control over quality and delivery time, and blasting is essential to our process. Blasting with our Clemco cabinet is a huge savings in labor costs, and the quality of the cabinet's construction and output are outstanding. I'm loving it."

Salazar went on to say that he "will be buying several bigger Clemco cabinets soon."

Clemco | 636-239-0300 | clemcoindustries.com/

Inlet Trap Suite Provides Options for Vacuum Pump Protection

Mass-Vac Inc. (North Billerica, Mass.) is offering a broad range of customizable vacuum pump inlet traps for production and research processes involving ALD, LPCVD, PECVD and related deposition processes.

These stainless steel MV Vacuum Pump Inlet Traps come in several sizes and are adjustable to user requirements for protecting vacuum pumps from the heavy particulate byproducts of ALD, LPCVD, PECVD and related deposition processes. Ideally suited for research laboratories, semiconductor fabrication and industrial coating facilities, the traps can provide up to 2,500 cubic inches of solids accumulation.

Users can select between stainless steel gauze; copper gauze; polypropylene in 2-, 5- and 20-micron sizes; Sodasorb; activated alumina; activated charcoal; and molecular sieve filter media for their traps. The 8-inch-diameter PosiTrap is ideal for research labs and the 12-inch-diameter MultiTrap, which has a first-stage knockdown baffle and two filtration stages, can be stacked to provide four stages of filtration.

Filter elements are sold separately.

Mass-Vac Inc. | 800-868-6700 |massvac.com

New Paint Stripping Bath Enhances Process Safety

ALIT Technologies (San Bonifacio, Italy) says its Fastrip T5 bath efficiently removes paint from ferrous metal and light alloy hooks, frames or pieces without compromising their surfaces.

The Fastrip T5 system is available in three versions, which combine a chemical and mechanical action for optimal stripping: one version uses ultrasound technology, another uses a mechanical mixer and the last uses a series of tanks in parallel with gantry-type handling.

Sturdiness and Safety

The Fastrip T5 system uses AISI 304 steel to ensure sturdiness, and uses an external hermetic tank as a safety basin for liquids. In addition, the system is insulated on all sides, features an interlocked cover and has fume extraction capability.

The machine comes with a separate electric panel featuring a touchscreen, which allows users to easily self-program process parameters. It is also equipped with a heating system and thermoregulator that enables it to adjust and reach temperatures up to 80°C — a higher-temperature version compatible with temperatures up to 150°C is also available.

Customizable Options

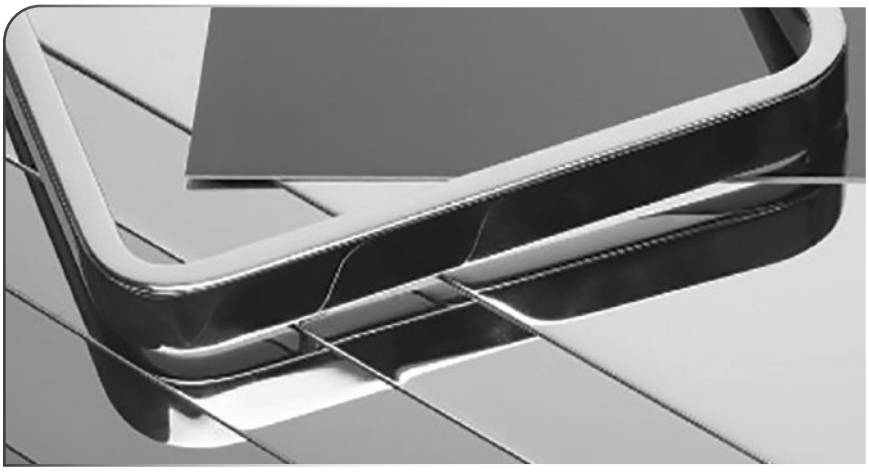
ALIT's design uses a new discharging method and facilitates transportation via forklift. The company says that these features, combined with the machine's process versatility and optional parts like customizable workpiece holders and a fume extraction system, make the Fastrip T5 a safe, effective and quick paint stripping solution.

Improved Waste Management

The Fastrip T5 features ALIT Technologies' Metalstrip Up&Down stripping range, which provides a formulation free of halogenated hydrocarbons, phenols, chromates, ammonia, amines and organic or inorganic acids. The machine also improves management of coating residues, making their separation more effective and extending bath life.

ALIT Technologies | +39-045-245-6638 | alit-tech.com

Simple, High-Quality Bright Acid Tin Plating with Technibrite



Since its launch in 2016, Technic Inc.'s (Cranston, R.I.) Technibrite HT 1000 has carved out a significant presence in the bright acid tin plating industry, with over 80,000 liters currently in production globally. The company says Technibrite HT 1000 has significantly raised the standard for rack and barrel bright tin plating through its advantages in efficacy, cost, quality and speed of deposit.

Based on a cost-effective sulfuric acid electrolyte, the Technibrite HT 1000 process has what the company calls an exceptional low-current-density bright range, even when the plating bath temperature and tin concentration parameters are higher than normal. The process can run without a chiller or at temperatures as high as 35C, and with tin concentrations as high as 40 g/L. Technibrite can achieve cathode efficiencies of up to 90 percent, whereas the industry standard of leading competitors is only between 60 and 70 percent. Cycle time improvements with Technibrite can also increase the productivity of a plating line by as much as 50 percent.

Technic Inc. says its Technibrite HT 1000 will improve the appearance and performance of bright acid tin-plated parts, especially parts with complex geometries that often show dull deposits in low-current-density areas. The Technibrite HT 1000 process is NPE-free and fully RoHS-compliant.

Technic Inc. | 401-781-6100 | technic.com

Hauschild SpeedMixer Produces High-Quality Adhesives

Hauschild Engineering's (Hamm, Germany) Hauschild SpeedMixer, first developed in 1974 and refined ever since, provides a specialized solution for mixing substances for adhesives and sealants in labs. This centrifugal mixer can mix different liquids and pastes, pastes with powders, one powder with another and various combinations of liquids and powders fast and bubble-free. It is even able to mix materials with different chemical and physical properties — like epoxy resins, lacquers, silicones, gels and oils — to form new products.

Leveraging centrifugal forces — The Hauschild SpeedMixer relies on dual asymmetric centrifuge (DAC) technology for its efficacy. The special feature of this mixing principle is the dual rotation of the mixing vessel. The combination of centrifugal forces working on different planes enables an extremely efficient mixing process, distinguished by a homogeneous result without the use of mixing blades.

Bubble-free simplicity — Hauschild says the mixing process achieves a degassing of virtually 100%. It eliminates even the smallest micro-bubbles, dispensing with additional degassing cycles. The Hauschild SpeedMixer featuring vacuum technology is also available for complete air extraction. Programmable cycles improve mixture repeatability, thereby speeding up the development process considerably.

"Thanks to its extremely fast bubble-free mixing, our Hauschild SpeedMixer shortens the product development, analysis and quality assurance process in the laboratory tremendously," Fabio Boccola, CEO of Hauschild Engineering, explains.

No cleaning required — As the Hauschild SpeedMixer mixes in disposable vessels without blades, there is no need for cleaning or the additional use of chemicals. The dimensions of the mixing vessels and mixing buckets range from a few grams up to 10 kg and from a few mL to a nominal capacity of up to 16 L.

Hauschild Engineering | +49 (0)238-148-205-17| hauschild-speedmixer.com

Mayzo Offers Flexibility With Optical Brightener Solutions

With a full line of UV-light-absorbing optical brightener (OB) products, Mayzo Inc. (Suwanee, Ga.) offers a solution to the challenges manufacturers may encounter when using OB products.

"Within our range of particle size options, we offer a fit for every customer's specific process," Mayzo director of sales, Eduardo Padilla, says. "In addition, our product has the highest purity in the market."

Particle size and purity have direct impacts on dispersion ability. Since manufacturing processes may require only a small quantity of OB, it is critical the powder is thoroughly incorporated throughout the material to which it is added. The Mayzo Benetex OB product line features swift dissolving and reduces processing time. Mayzo's finest-ground powder, Benetex OB Plus, even works in screen printing applications without risk of clogging equipment and in coatings requiring a silky-smooth finish.

Easy dispersion enhances manufacturing efficiency, with backend improvements when companies can buy additives in package sizes appropriate for their purposes.

"Manufacturers are increasingly buying OB in small quantities to be used as a tracer, as part of their quality control function," Padilla explains. "Mayzo can provide optical brighteners in quantities as small as 3-pound or 5-pound containers, in addition to larger drums. This packaging customization provides a big advantage in terms of cost-effectiveness."

Further benefits of the Benetex OB product line include a brilliant, bluish-white effect that compensates for yellowing; good light-fastness and low volatility; compatibility with a wide range of organic substrates and solvents; excellent resistance to heat; and certain product forms that are FDA cleared for use in polymers, adhesives and pressure-sensitive adhesives.

In addition to advanced product attributes, Mayzo provides customers with personalized technical consultations. "Talk to us about how we can help," Padilla says. "We are happy to tailor our products to your needs."

Mayzo Inc. | 770-449-9066 | mayzo.com

Dynatrol Density Systems Measure and Resist Acids

Dynatrol's (Houston, Texas) Density Systems provide specific gravity and percent concentration measurements while resisting corrosive caustics, acids, ammonia, sulfuric acid, hydrochloric acids and nitric acids. The Density Cell portion of the system utilizes unique vibratory principles to provide continuous measurement of liquids and slurries at on-line process conditions.

The company says its Density Cell is both weather-tight and explosion-proof, with no moving parts to shorten its long operating life. Dynatrol offers density cells with Tantalum media contact parts, as well as Hastelloy c-276, Carpenter 20, s316L stainless steel and other application-specific alloys.

Dynatrol's Series 2000 Digital Converter receives data from the Density Cell, using an on-board microcontroller and liquid-crystal display to report the measured variable, temperature, frequency and other calibration data. The Digital Converter has a 4-20mA standard output and RS-232 communication.

Dynatrol | 713-869-0361 | dynatrolusa.com

Color-Coding Brushes for Easier Identification

Weiler Abrasives (Cresco, Pa.) has introduced color-coding on its most popular brushes for stainless steel. The company believes this extra form of identification will help stop cross-contamination in operations working with both carbon and stainless steel by making it easy to identify the correct wire brush.

The color-coding is a visual update to an existing product line — it will not change the performance, part numbers or pricing of Weiler's stainless steel offerings. Product lines receiving color coding include the Roughneck Max stringer bead wheel, Wolverine stringer bead wheel, standard twist wheel with nut, standard twist wheel, knot wire cup brush, knot wire end brushes and crimped wire end brushes.

Customers can also purchase type 316 stainless steel brushes and degreased brushes by special order.

Weiler Abrasives | 570-595-7495 | weilerabrasives.com

ColorReader Spectro Provides Affordable Color-Matching

Datacolor (Lawrenceville, N.J.) is launching ColorReader Spectro, an affordable, Bluetooth-connected color-matching instrument designed to help paint retailers easily and accurately measure material colors.

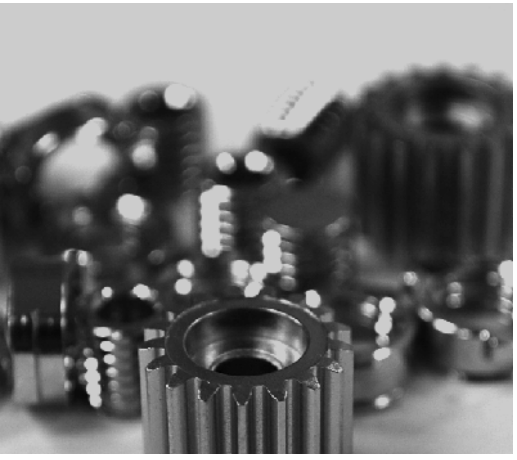
The company recommends ColorReader Spectro for paint and hardware stores looking for a cost-effective color-measurement solution allowing them to provide custom color-matching services to professional contractors. The instrument will sell for a fraction of the cost of a traditional benchtop spectrophotometer.

"We see so many dealers in the retail paint market relying only on fandecks or lookup devices, or in some cases nothing at all, because they can't justify the price points of current color-matching systems," Jason Loehr, product manager at Datacolor, says. "That's why we set out to develop ColorReader Spectro. With the introduction of this device, we are expanding accessibility in the market by offering more economical solutions to all."

Datacolor says ColorReader Spectro is also beneficial for those interested in adding a handheld device to their existing lineup of color-measurement instruments for added flexibility in measuring large, cumbersome samples that a traditional benchtop spectrophotometer is unable to handle. The company says ColorReader Spectro should integrate easily with customers' existing software or Datacolor's Paint software.

"Datacolor has always been innovating to provide all companies – big and small – with the tools to achieve the right color every time," Loehr continues. "Customer care is at the core of our business. ColorReader Spectro is backed by global Datacolor support. Our dedicated support team is located in more than 100 countries, allowing stores to spend more time selling and less time troubleshooting."

Datacolor | 609-924-2189 | datacolor.com



SHOW OFF YOUR WORK!

Products Finishing is looking for reader photos to highlight in our new column, ***Photo Finish***. Send us a picture of your part, project or process, along with a short description, and it may be published!

EMAIL SUBMISSIONS TO:

SFRANCIS@PFONLINE.COM

PF PRODUCTS FINISHING

Brushing up on Industry 4.0 Vocabulary

In this month's Never Finished column, Matthew Kirchner discusses Industry 4.0 technology commonalities across industries and what they mean for finishers.

MATTHEW KIRCHNER
Managing Director, Profit360
mkirchner@profit-360.com

This column is going to be info-heavy: today I'm talking about the commonalities of Industry 4.0 technology across industry sectors, how audio recognition technology is amazing and the importance of knowing Industry 4.0 vocabulary. Prepare to learn a ton.

At the request of a Midwestern community college, I recently participated in a virtual roundtable with experts in cutting-edge technology from across multiple economic sectors. Key among them were representatives from retail, insurance, distribution, manufacturing, hospitality, medical devices, heavy equipment and agriculture, but there were representatives from other sectors as well.

A discussion around technology education ensued, the premise being that as Internet of Things (IoT) and Industry 4.0 technology advances there will continue to be an acute shortage of skilled technicians trained on the implementation and maintenance of smart technology. We live in a world of smart sensors and smart devices that can communicate with each other and make their own decisions gathering hoards of data in real-time, sending pertinent information to control systems and computer networks and then to the cloud where highly advanced data analytics algorithms and machine learning software make sense of the data and send it back to us in a form we can use to drive continuous improvement. If this sounds confusing, you have some catching up to do. This is today's reality of advanced finishing technology.

The first conclusion of the group was that there is a high degree of similarity in how smart technology is disrupting their individual businesses. They all see the effects of smart sensors and smart devices, utilize some form of a control system (programmable logic controllers, or PLCs, in finishing), use computers and networks, utilize some form of a customer relationship management software (CRM), use lean and continuous improvement practices (such as Kaizen), have an employee safety program, have a standardized quality system (ISO for finishing), have an integrated management system (what we call ERP or MRP), use some form of data analytics for reliability (in finishing we call it predictive analytics) and so on. Based on the high correlation of technologies and systems, the group concluded that an employee with a base understanding of smart technology could efficiently transfer from sector to sector by learning how smart technology and systems manifest themselves in the individual sector's base systems. As an example, if a technician understands how smart sensors, programmable controllers, computer networks, data collectors and data analytics function in finishing, by learning a bit about medical monitoring equipment that same person could transfer to a career in healthcare. Fascinating!

But for me, it got even more fascinating from there. With the permission of the attendees, the host college recorded the entire discussion. Following the meeting, one of the college's team members utilized Microsoft Azure Software to analyze the meeting. He was literally able to ask the software what Industry 4.0 terms the attendees mentioned most often. The software utilized audio analytics technology and produced the desired data, resulting in a glossary of the terms with which manufacturers and finishers should be familiar as they plan for the future of their operations. It's a priceless list that I'm glad to share with our readers this month.

Data analytics and related terms ruled the day. It's time to get familiar with databases, SQL, process analysis, artificial intelligence and machine learning if you're not already.

Connectivity and networking expressions were mentioned second-most, with cybersecurity, network security, internet protocols, the fog and the cloud all high on the list.

Control systems and process control remain key facets of Industry 4.0. These expressions, along with programming, coding, access control, SCADA, proportional integral control, access control, temperature and flow control, motor control and process monitoring all received frequent mention.

I was heartened to see that base industrial success skills like troubleshooting, blueprint reading, standardized quality, continuous improvement, safety, measurement, ISO and QS are still key skills and competencies for those working across many economic sectors.

Finally, and not surprising, attendees often mentioned Industry 4.0 technology. Smart sensors, smart devices, telematics, robotics, automation and automated guided vehicles are key technologies that the group saw as integral to the future of their businesses.

So, three takeaways from this month's edition of Never Finished:

First, as Industry 4.0 technology advances, be open to porting talent from other sectors (such as retail, hospitality and healthcare) into the world of finishing. The technologies in other sectors have more in common with ours than one might think.

Second, audio recognition technology is really slick. I didn't even know it existed in this form until the host of this meeting demonstrated it to me.

Finally, if you're not familiar with the Industry 4.0 terms noted above, get going. This technology is already revolutionizing the finishing sector.

GBI: Finishing Continues to Set Highs in October

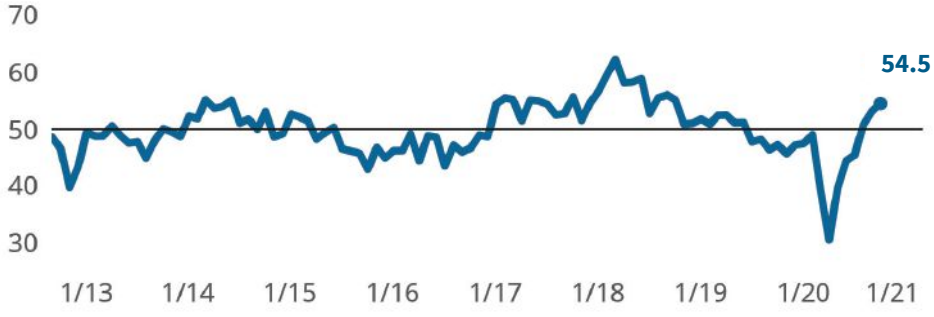
The October 2020 GBI: Finishing reports a 54.5, the highest reading since the fourth quarter of 2018. The is the Index's third consecutive month of expansion.

MICHAEL GUCKES, MBA
Chief Economist/Director of Analytics
Gardner Intelligence
Michael has performed economic analysis, modeling and forecasting work for nearly 20 years. Gardner Intelligence is a division of Gardner Business Media, publisher of this magazine.
mguckes@gardnerweb.com

The Gardner Business Index (GBI): Finishing established several new records in October as it finished the month at 54.5. The last time the Index posted a reading at this level or higher was two years ago in the fourth quarter of 2018. Readings above "50" signal an expansion in economic activity compared to the prior month; the higher a reading is above 50, the greater the proportion of respondents reported expanding business activity. Four of the six components which constitute the index reported expanding conditions, only exports and backlogs contracted during the month.

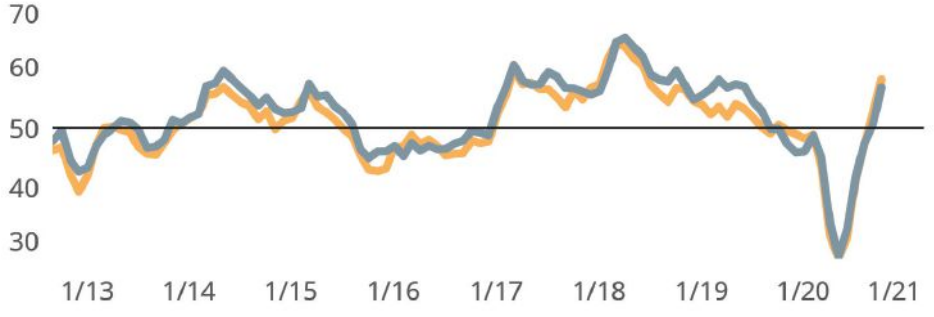
October's most notable event was the expansion of new orders and production activity above that of supplier deliveries. Since COVID was first classified as a national pandemic in March, disruptions to supply chains have resulted in lengthening delivery times of intermediate goods to finishers. This has both elevated supplier delivery readings -which are measured as a function of order-to-fulfillment times- and restricted production activity. The last time that new orders and production activity readings both surpassed supplier deliveries was at the start of 2018, during the peak of the last business cycle expansion for the finishing industry.

FINISHING INDEX



The Finishing Index reported a third consecutive month of expanding activity. Removing the inflationary influence of supplier deliveries from the Finishing Index would have resulted in a less expansionary reading of 53.8.

NEW ORDERS AND PRODUCTION SURPASS SUPPLIER DELIVERIES



Not since the first quarter of 2018 have both production and new orders readings exceeded that of supplier deliveries. Strengthening domestic order demand has offset weak foreign demand.

Production
New Orders

GARDNER BUSINESS INDEX

Stay ahead of the curve with **Gardner Intelligence**.
More information about the Finishing Index can be found at gardnerintelligence.com.

This issue of *Products Finishing* is being sent to nearly 28,000 subscribers in more than 19,000 plants—the largest circulation in the finishing industry.

A Conversation with …

Jody Richards *Process Technology*

Jody Richards is the second-generation owner of Process Technology (Willoughby, Ohio), which acquired Dynatronix Inc. (Amery, Wisc.) in 2018. Her long history in the industry has fueled her enthusiasm for what's to come. Her forward-thinking business strategies have gotten her noticed, too: Process Technology was named an Evolution of Manufacturing Award recipient for 2020, and she also won Ernst & Young's Entrepreneur of the Year 2020 East Central Award this year. We talked to Jody about growing up in the industry, the changes she's seen and her continuous improvement mindset.

Products Finishing: How did you first get involved in the finishing industry?

Jody Richards: I was born into the surface industry. My father, Tom Richards, started Process Technology, and he was very involved with the industry associations. NASF (the National Association for Surface Finishing) is the merger of three different organizations: AES, MFSA and NAMF, and he was national treasurer of AES and MFSA and president of the Cleveland chapter of AES. He was very dedicated to the surface finishing industry, and there was always discussion at the dinner table about it. There was also always a way for a kid to make money stuffing envelopes for industry events.

PF: Tell us a little bit about Process Technology.

JR: Process Technology was founded on innovative principles by my father in 1978. At the time, tanks came in 6" increments, but standard heaters started at 13" for a 1kW and increased in 6" increments. My dad adjusted the heater size to better fit the tank, and the industry followed. He also changed the thermal over-temperature device to a standard feature. In the surface finishing industry, monitoring tank temperature is extremely important to minimize risk. After studying the UL (Underwriters Laboratory) requirements, he redesigned different heaters and applied to have Process Technology immersion heaters UL listed. He had the first heater company in the surface finishing industry to do that.

PF: Did you always plan to work at Process Technology, or were there other aspirations?

JR: Ironically, I never planned to work at Process Technology, but it's been almost 15 years now. My father asked me to come and help out with some issues they were having. I came back to Ohio and I started working at the company and one project led to another. I saw many opportunities for improvement from where the company was at that moment. I had been working in software implementations at that time but I saw many ways to better the company. And it's kind of funny because after that, I never looked back.

PF: What changes have you seen in the finishing industry since you started your career?

JR: A lot of the changes are related to the drive to improve safety, and Process Technology pioneered many of the changes that have happened in terms of safety. Concerns about emissions have also increased. In addition, I also see huge generational changes. I remember talking to my IT guy one day and he said, 'Well, our customers won't use this digital application.' I asked, 'Who do you think our customers are?' He said, '50 or 60 year olds.' And I had to point out, 'What happens when those people retire and some 30 year old who comes in, who wants to do everything from their phone, or a laptop or a tablet?' We have to have different options, and if you look at our connectivity on the rectifiers, it's phenomenal. That's where I see things going: digitization, automation, more accuracy, more control, more efficiency. .

PF: You recently won the Entrepreneur of the Year 2020 East Central Award. Can you talk a little bit about how you achieved that and what the accomplishment means to you?

JR: I really think it's all about continuous improvement, constantly trying to be better and really looking at what's on the horizon. You have to be looking at not only your particular industry — not only looking at surface finishing — but also at what's happening in the world, and how that's going to impact you. What's on the horizon? How do you need to change? Disruption is everywhere. So really, you need to be the disrupter rather than being disrupted, right? And that's why you always need to be improving as much as you can.

PF: Describe a business decision you made that had a lasting impact, good or bad.

JR: I have two examples for you. One of those was acquiring Dynatronix Inc. We really didn't know a whole lot about rectifiers when we acquired Dynatronix. Now, we have expanded their portfolio and made it into a top-notch line of rectifiers. We are very excited about that and we've put a lot of time and effort into innovation and growing that segment of the business. Our latest power supplies bring connectivity to your fingertips. This is where the surface finishing industry needs to move.

The other thing that we've done, and this applies to both the heaters and the power supplies, is that we have introduced lean manufacturing to the entire plant. There's a lean event going on today at the Mentor facility, and we've really taken it to heart. People have bought in, and it's done great things for our business.

Read more of Jody Richards' responses at gbm.media/JodyR

SEARCH . . .

Q&A

EXHIBITOR SHOWROOMS

CONFERENCES & EDUCATION

DEEP DIVES

FIND SOLUTIONS TO HELP RUN YOUR BUSINESS.

INDUSTRY EXPERTS

LIVE DEMOS

NEW TECHNOLOGY

NETWORKING

FOR **YOU**.
FOR **YOUR TEAM**.
FOR **FREE**.

IMTS.com/spark

IMTS spark

NEW & ON-DEMAND
CONTENT AVAILABLE DAILY
THROUGH MARCH 15, 2021

POWERED BY AMT & GARDNER Business Media, Inc.

PARTS CLEANING CONFERENCE

APRIL 13-15, 2021
CLEVELAND, OHIO

AT PMTS 2021

Speak at Parts Cleaning in 2021!

Present your knowledge and expertise at the Parts Cleaning Conference at PMTS 2021!

Suggested Topics Include:

- Environmental Issues
- Assessing Cleaning Quality
- Cleaning Specifications
- New Cleaning Processes
- New Cleaning Technologies

Abstraction Submission

PartsCleaningEvent.com

More Information

ToriS@GardnerWeb.com

CO-PRESENTED BY: PF PRODUCTS FINISHING | Modern Machine Shop | PRODUCTION Machining