PF PRODUCTS FINISHING

PFonline.com

The State of Auto Finishing

Finishing's Role in Modern Mobility

A property of Gardner Business Media

FEBRUARY 2026 / VOLUME 90 / NO. 5

MacDermid Enthone
INDUSTRIAL SOLUTIONS

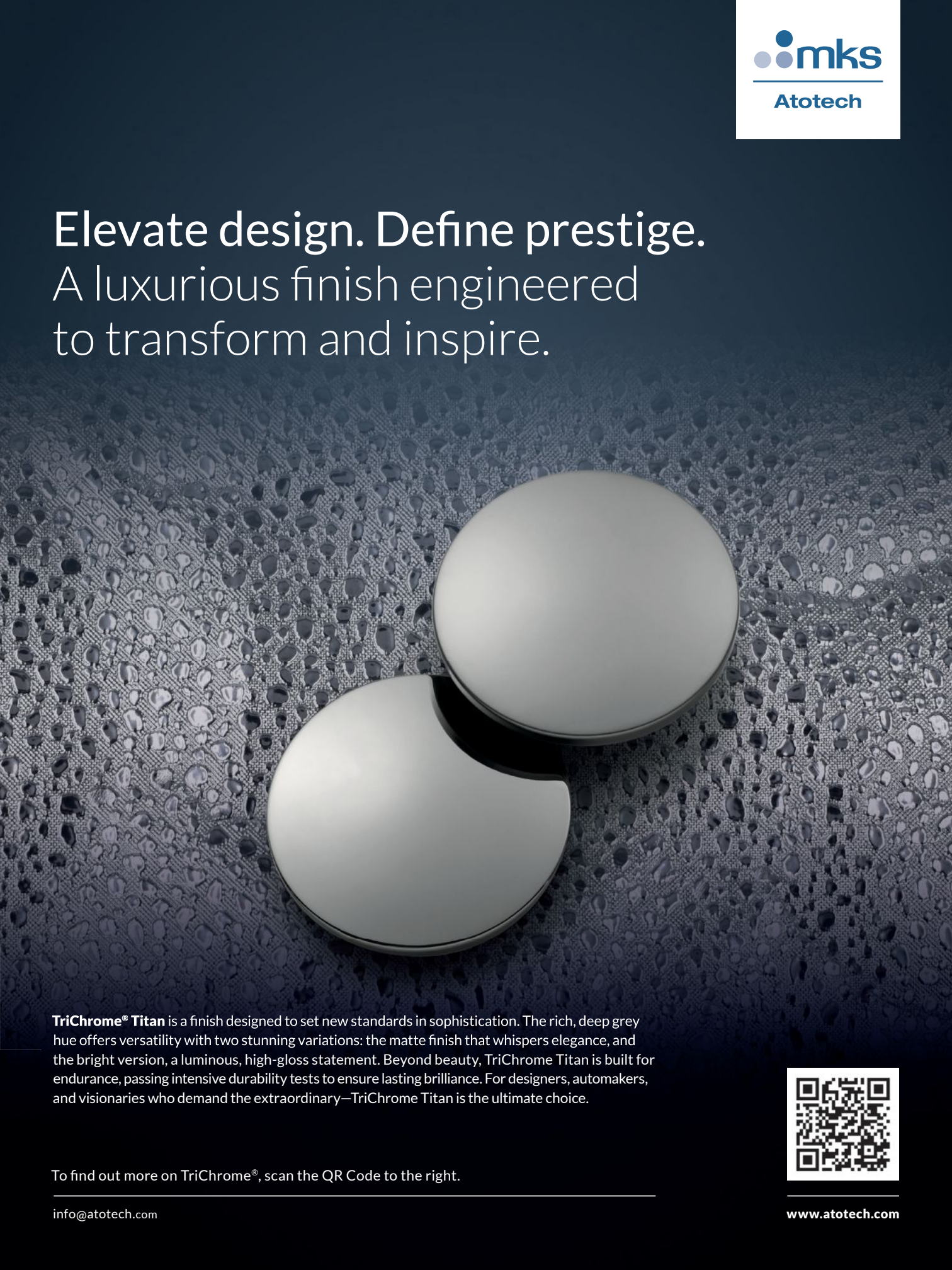
At MacDermid Enthone, we do more than provide surface finishing solutions; we build lasting partnerships. Helping to solve today's challenges while preparing for the demands of tomorrow with industry-leading solutions, service, and support.

Because success isn't just about where you are —
it's about where you're going.

Scan to connect with our team today or
visit **macdermidenthone.com**

mks
Atotech

Elevate design. Define prestige.
A luxurious finish engineered to transform and inspire.



TriChrome® Titan is a finish designed to set new standards in sophistication. The rich, deep grey hue offers versatility with two stunning variations: the matte finish that whispers elegance, and the bright version, a luminous, high-gloss statement. Beyond beauty, TriChrome Titan is built for endurance, passing intensive durability tests to ensure lasting brilliance. For designers, automakers, and visionaries who demand the extraordinary—TriChrome Titan is the ultimate choice.

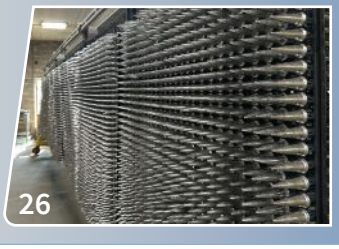
To find out more on TriChrome®, scan the QR Code to the right.

info@atotech.com

www.atotech.com

CONTENTS

VOLUME 90 / NO. 5 / FEBRUARY 2026



TECHNICAL EXPERTS

INNOVATIONS

NEWS / COLUMNS

On the Cover Source | Getty Images

PRODUCTS FINISHING (ISSN 0032-9940) is published monthly and copyright 2026 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.


THERMA-TRON-X, INC.
Heat Processing Solutions | Material Handling Innovations | Advanced Water Recovery Technologies
POWDER COATING WEEK 2026
JOIN US!
March 2nd - 4th, 2026
Indianapolis, IN
ECOAT 26
April 7-9, 2026
Orlando, Florida
TTX
INDUSTRIAL FINISHING EQUIPMENT EXPERTS

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

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

MEMBER OF

Registration is *Open!*

Reserve Your Spot at the Premier Event for Electrocoaters.

ECOAT26 connects the electrocoating industry's leading businesses, technical experts and suppliers. Join fellow business owners, executives, managers and operators for three days of education, exhibits and networking, all aimed at delivering product, process and management strategies for impacting every aspect of your electrocoating business.

PRESENTED BY PF PRODUCTS FINISHING | CO-PRESENTED BY The Electrocoat Association

Learn More! WWW.ECOAT.EVENTS | **Register Now**

Celebrating Surface Finishing's Vital Role in 2026

Here's a quick look at several programs PF has lined up for 2026 designed to connect, inspire and elevate the finishing community.

SCOTT FRANCIS / EDITOR-IN-CHIEF
sfrancis@gardner.media

The first month of the New Year always feels like a time to take stock of where we've been. Then by February, we truly begin to look ahead at what the year has in store. As 2026 begins to materialize, I'm excited to share some of the initiatives *Products Finishing* has lined up to celebrate the important roles that surface finishes play in our world — from the planes, trains and automobiles that move us to the electronics and infrastructure that connect us. Here's a quick look.

First up, mark your calendars for National Surface Finishing Day (NSFD) on March 4. This annual event is your chance to highlight the amazing innovations and contributions happening in your finishing facility, spread awareness about the essential role of surface finishing and spark interest in future professionals.

There are numerous ways to participate — virtually or through in-person visits — for the public or your community. Ideas for NSFD include offering student tours for nearby trade schools, welcoming local leaders for facility walkthroughs or celebrating you team and posting highlights on social media using the hashtags #NationalSurfaceFinishingDay or #NSFD. We'd love to hear about your plans — make sure to share your event photos and stories and tell the world about the important work you do.

Next, *PF*'s Top Shops Benchmarking Survey is an opportunity no finishing shop should miss. Participating in this annual program provides helpful insights into your operation's performance — you'll receive a customized report filled with benchmarking data to help you evaluate your key operating metrics and identify areas for improvement. Top Shops is an invaluable tool to help you plan for success in the year ahead. The survey is open from Feb. 1 to March 31, 2026. Don't miss your chance to participate!

Plus, companies that meet a set list of criteria are celebrated as *PF* Top Shops in the pages of *PF*, through our various media channels and at industry events. Throughout 2026, you'll find profiles of qualifying shops via our Top Shops Insider column.

PF also continues to shine a spotlight on the outstanding individuals who move this industry forward through our awards programs. Each year, we recognize the surface finishing industry's next generation of emerging leaders through the 40 Under 40 program. Our newest class of up-and-coming industry leaders will be announced in the April issue of *PF*. Meanwhile, *PF*'s Champions of the Industry award recognizes industry veterans who act as stewards of the industry by continuing to pave the way with their dedication and expertise and through industry advocacy. Throughout the year, you'll find announcements and profile stories of those selected for this special recognition. In fact, in this issue you'll find a profile on our latest Champion Vince Noonan, vice president of strategic operations at Sheffield Platers Inc. and president of the NASF Foundation.

Process Technology celebrates its employees on National Surface Finishing Day. *Source | Process Technology*

As we embark on this new year, I encourage you to take advantage of these programs as tools for realizing your continuous improvement goals and celebrating your team's accomplishments.

Finally, as we look ahead, taking stock of some of the trends and developments within the industry that stood at the forefront in 2025 can serve as a jumping off point for your plans as you navigate the year ahead. To that end, the February issue of *PF* features a roundup of some of our most-read stories of 2025 — make sure to check it out as you set your course.

On behalf of everyone at *PF*, I wish you a 2026 filled with innovation, collaboration and success!

National Surface Finishing Day

YOUR DAY TO SHINE
MARCH 4, 2026

Products Finishing partners with hundreds of finishing operations in the U.S. to commemorate National Surface Finishing Day each year. Celebrate Wednesday, March 4, 2026, as we showcase the industry to trade schools, businesses, officials and the media.

PF PRODUCTS FINISHING

FOR CELEBRATION IDEAS, VISIT: **PFonline.com/topics/nsfd**

An Interview With … BRANDON ACKER, Titan Abrasive Systems

Kicking off 2026, *PF* explores some of the latest trends in media blasting and surface prep. Brandon Acker, president of Titan Abrasive Systems (Ivy, Pennsylvania), a manufacturer of media blasting equipment and custom engineered blast rooms, took some time to sit down with us and talk through the latest.

Scan the QR code to listen to the complete interview:

▶ *Products Finishing* (*PF*): Give us some background about Titan and the markets you serve.

Brandon Acker (BA): Titan manufactures abrasive air blast equipment, media blasting equipment, blast machines, reclamation and dust collection systems. We serve a wide variety of end customers including aerospace, defense, farm equipment manufacturers, tank manufacturers — pretty much anyone who is making steel components that need coated.

***PF*: Most finishers have had some sort of experience using blasting, or at least are aware of its role in prepping surfaces for the final finish, but can you speak to some of the ways that blasting has evolved in recent years, including different approaches or different blasting media?**

BA: While blasting has evolved quite a bit, it doesn't change a whole lot from year to year. Most recently, there has been the integration of automation into the blasting process to try and keep the human element to a minimum.

Of course, automation is a little tricky, because for it to be successful it needs to be a repetitive process. For many customers, the process is manual due to constantly changing products — in those cases, training robots would be cost-prohibitive.

Another big trend has been the development of different medias. It used to be sand blasting. Now there are a wide range of different medias that can be used, from plastics to steel grit to engineered products. Getting longevity out of the media is key — especially in the reclamation process. We want medias that last long and are therefore more cost-effective. In addition, the longer-lasting medias create less dust.

***PF*: What are some common misconceptions about blasting?**

BA: It seems to be the common fear that putting these systems into a facility will be a dirty, dusty operation that's going to make a mess. I'd say that that's a pretty big misconception. We go to great lengths to control everything with dust collection systems and media reclamation. It is a fairly clean operation in terms of what the equipment can do, as long as it's maintained properly and you use good housekeeping — common sense type of stuff — like making sure you're not tracking media out of the blast room, or opening doors during someone's blasting or immediately after they've stopped.

***PF*: Let's talk about reclaimable media. What do you need to be aware of if you want to reclaim and reuse media?**

BA: Some of the blasting medias that people are trying to reuse aren't recoverable. You can't just shovel nonrecoverable medias back into a machine and use them multiple times. It's not cost-effective. So, you really want to stick with good, reclaimable medias and not try to recover things more than they can be recovered.

The main thing to keep in mind when you're selecting media is to look at your product, the material you're blasting and the desired end result, and then select a media that will achieve that.

A sand particle [for example] is kind of soft. When it hits a hard substrate like steel, it explodes into dust. What's left on the ground may look like media, but it's actually just a bunch of dust — not something you'd want to reclaim. On the opposite end of the spectrum would be something like steel grit. Rather than break into dust, it hits the surface and bounces off. It does its job and then falls on the floor and can be reclaimed. It takes a long time for steel grit to break down and become a smaller particle.

In addition, because highly recoverable media doesn't break down as quickly, you'll have less airborne dust. Most of the dust will be coming from whatever you're blasting, so, you also benefit from a much cleaner environment.

Obviously, reclaimable medias are more expensive as an upfront cost, but in the long term, they end up being cheaper.

Prioritizing Industry Education: How a Surface Finishing Steward is Opening Doors for Aspiring Professionals

After taking a nontraditional path to success, *PF* Champion of the Industry Vince Noonan is using his expertise to provide educational and training resources to professionals with varying learning and occupational backgrounds.

BY JESSICA POMPILI, ASSOCIATE EDITOR

For Vince Noonan, vice president of strategic operations at Sheffield Platers Inc. (San Diego, California), the path to success was nonlinear and nontraditional. With a career spanning three decades, Noonan learned the finishing industry with the help of mentors and firsthand experience. As the president of the NASF Foundation, a non-profit 501(c)3 organization created by the National Association for Surface Finishing (NASF, Washington D.C.), Noonan is working to provide access to mentorship, training and educational resources for surface finishing professionals nationwide.

Building expertise with hands-on experience

Noonan's career began in electronics manufacturing labs: first, with a solder-dipping job, then as a technician in a chemical analysis lab for printed circuit board manufacturing. After being recruited by Chuck Hirbour and Rich Armstrong from Technic Inc. (Cranston, Rhode Island), which offers specialty chemicals, surface finishing equipment, analytical control tools and engineered powders, Noonan fulfilled the latter role until it evolved into a technical field engineer position, then eventually into a sales engineering role. Without a high school diploma or four-year degree, Noonan learned chemistry entirely through experience.

Noonan then joined Enthone-OMI, now part of MacDermid Enthone (Waterbury, Connecticut), as an R&D field engineer for memory disk manufacturing. Noonan says his mentor at Enthone-OMI, John Commander, "saw potential, not pedigree. John was a true plating chemist, the kind of person who could troubleshoot a bath, write a patent and teach you the chemistry behind both. He taught me that success in

PF PRODUCTS FINISHING
CHAMPIONS OF THE INDUSTRY
2026

VINCE NOONAN

COMPANY: Sheffield Platers Inc.
TITLE: Vice President of Strategic Operations
LOCATION: San Diego, California
ASSOCIATIONS: NASF, the NASF Foundation

Inside Sheffield Platers' San Diego facility. The company provides metal finishing and plating services for various industries. *Source | Sheffield Platers Inc.*

finishing comes from understanding every variable — not just in the beaker, but on the line."

When many of the company's pre-treatment and nickel operations began moving to Asia, Noonan was asked to write a job description to assist in training his overseas replacement. Instead, he volunteered to go. He trained engineers and supported sales and operations in Japan, Korea, Taiwan, Singapore, Malaysia and mainland China for three years.

Noonan then returned to the U.S. and became a regional manager for Enthone-OMI's West Coast sales team. For promotion, he earned a bachelor's degree in business administration from the University of Phoenix at age 38. "Training in your degree, no one can take that away from you. With your job, sure, they can take that away. But no one can take your degree," says Noonan.

Working through the NASF Foundation

After 13 years with Enthone-OMI, Noonan was approached by Dale and Mark Watkins from Sheffield Platers, after having been in touch for years. Noonan has since spent 17 years at Sheffield Platers, stating that the company's resilience, adaptability and leadership set it apart. The company, and Dale and Mark Watkins, led him to join the NASF and have offered him the flexibility to work with the NASF Foundation, the educational arm of the NASF.

"Because I was the guy who didn't have access to training. I know what it's like to want to learn but not have the means — or to struggle because the material didn't fit how you learn best," says Noonan. "I asked to be part of the education side of the Foundation Board because that's where real change happens. I wanted to help rethink not just what we teach, but how we teach it — to make our courses accessible, modern and adaptable for every learning style."

Noonan is part of the NASF Foundation's education committee, which reevaluated and evolved the foundation's digital learning platform, Catalyst. All Catalyst courses are offered to NASF members as a benefit; members can give these courses to employees.

Catalyst offers multiple options for learning: fully online, online with a facilitator, classroom sessions at SUR/FIN or completely self-paced. It also offers select paid courses and preparation courses for CEF certification.

"We're adapting and growing to make sure anyone in the finishing industry can find a learning environment that works for them, no matter how they learn. That's how we build not just skills, but opportunity," says Noonan.

Beginning in 2026, Catalyst's educational courses and resources will gradually continue to be introduced to the public.

A career-spanning curiosity

Now, Noonan is working to pass his knowledge on to a new generation. He is motivated by the leadership of Dale and Mark Watkins, "leaders who understand that when one of us gives back, the entire industry moves forward."

He attributes his success not to having had all of the answers, but to listening — to asking questions, to learning from his mentors in real time and staying curious about the future of the industry.

"This award isn't about perfection. It's about persistence," he says. "Looking back, every step from solder dipping to global technical support taught me something about culture, resilience, humility and continuous learning. It's proof that where you start doesn't define your ceiling; your willingness to adapt does."

SOMETHING HE WOULD DO DIFFERENTLY

"I don't believe I'd be where I am today unless I took the path I did. It's allowed me to have a better understanding of the ways we can keep sustainability in our industry by providing pathways for anyone who wants to work in surface finishing. I guess I wouldn't change anything. Having said that, I'm making sure my kids stay in school and finish college. It's a different world we live in now than when I was younger. It's critical today to have the ability to get your foot in the door, either with a certificate or with a degree."

CCAI Women in Finishing FORUM Promotes Professional Growth in 2026

The 2026 Women in Finishing FORUM, taking place May 4-6, inspires and supports women across the finishing industry with dynamic sessions and networking opportunities.

The Chemical Coaters Association International (CCAI, Lakewood Ranch, Florida) announces that registration is now open for the 2026 Women in Finishing (WiF) FORUM, taking place May 4-6 at the Hilton Garden Inn in Perrysburg/Toledo, Ohio.

Designed to support and inspire women at all career stages across the finishing industry, the WiF Forum blends professional development with industry-focused learning through a mix of sessions, tours and networking opportunities. The event is open to all women, from the finishing line to executive management, who are looking to strengthen their professional skills, expand their networks and gain fresh insight into the latest trends in finishing.

The 2026 program features presentations on building stronger internal teams to break down silos, practical ways to integrate AI tools for greater efficiency and a forward-looking session on an all-electric paint line that highlights the industry's sustainability momentum.

Attendees will also gain leadership and career development insights from a 20+ year PPG executive who shares real-world lessons on turning failure into growth, advocating for oneself and building visibility. The "My Journey to Leadership" panel will further explore diverse career paths and the challenges and opportunities women encounter along the way.

A plant tour of PPG Coatings Services will provide a first-hand look at multiple finishing and coating processes in action. A charitable team-building activity and several networking events round out the experience, creating meaningful opportunities for connection and collaboration.

WiF FORUM participants consistently walk away with new strategies to improve effectiveness in their roles and an expanded network of peers who share their passion for finishing.

Sponsorship opportunities are available, offering organizations a chance to support women's advancement in the industry while gaining visibility among engaged professionals.

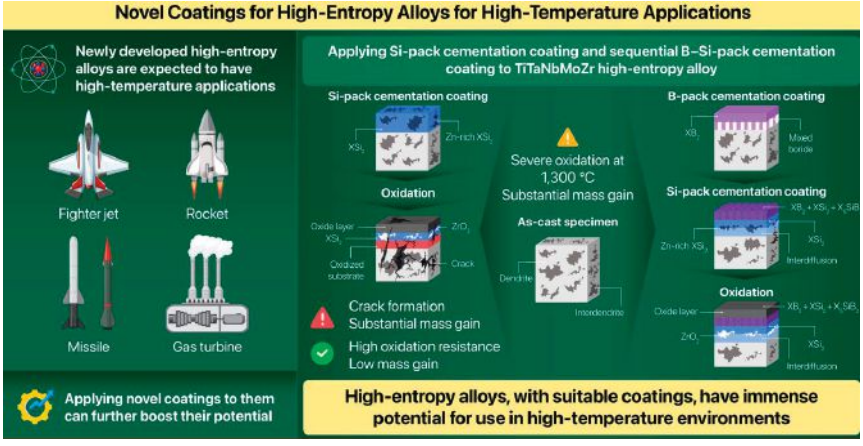
In addition, the Elizabeth Teska WiF FORUM Scholarship Program is accepting applications and nominations through March 16, 2026. The scholarship honors the memory of one of WiF's first official members and covers registration fees and accommodations costs for selected recipients. To nominate or apply, visit **ccaiweb.com/page/WiFForumScholarship**.

Hanbat National University Studies Aeroengine-Applicable Stable, Oxidation-Resistant Coating Layer

Recently, a team of scientists from Hanbat National University (Daejeon, South Korea) has come up with a stable oxidation-resistant coating layer on a TiTaNbMoZr high-entropy alloy using a sequential two-step B-Si pack cementation process. This materials science technology is expected to advance the defense and aerospace sectors.

In aerospace, as the operating temperature of metallic materials increases, the speed of aircraft can be enhanced and fuel consumption can be reduced. Therefore, research on high-temperature materials has been directly linked to the improvement of aircraft performance and has been actively conducted worldwide since the 1940s.

For more than 80 years, Ni-based alloys have been the primary materials used for high-temperature applications. To enable their use at even higher temperatures, ceramic coatings have been applied to the Ni alloys. However, due to the intrinsic softening of Ni-based alloys, their operating temperature cannot exceed approximately 1100°C. In recent years, high-entropy alloys — a concoction of various metallic and other elements with desirable properties — have emerged as a highly promising alternative for use in such extreme scenarios. Notably, applying novel coatings to the newly developed high-entropy alloys is expected to enable these materials to be used at significantly higher temperatures.



The team of researchers from the Republic of Korea, led by Joonsik Park, a professor of materials science and engineering at Hanbat National University, has demonstrated the optimal oxidation behaviors of stable nanograin-sized coating layers produced via sequential two-step B and Si pack cementation coatings of TiTaNbMoZr high-entropy alloys. Their novel findings were made available online in August 2025 and were published in Volume 38 of the *Journal of Materials Research and Technology* in September-October 2025.

In this study, the researchers compared the application of Si-pack cementation coating and sequential B-Si-pack cementation coating to the TiTaNbMoZr alloy. They found that not only did the as-cast untreated alloy experience extreme oxidation at 1300°C, but the Si-pack cementation-coated high-entropy alloy also showed crack formation due to the oxidation of Zr-rich XSi2 to ZrO2, comprising coating integrity. Interestingly, the B-Si-pack cementation-coated TiTaNbMoZr alloy developed a structurally stable surface layer comprising XB2, XSi2 and X5SiB2, demonstrating high oxidation resistance even at very high temperatures.

Moreover, while the as-cast alloy and the Si-pack cementation-coated alloy demonstrated high mass gains after oxidation at 1300°C for 10 hours, their B-Si-pack cementation-coated counterpart exhibited significantly lower mass gain under the same conditions. Furthermore, the parabolic rate constant was found to be quite small after the protective oxide layer formation.

The key point of this study is that even after being exposed to a remarkably high temperature of 1300°C, the coating layer of the recently developed high-entropy alloys maintains its nanostructure while effectively protecting the substrate.

"Currently, the Ni-based alloys used in missiles can operate at around 1100°C, but the results of our study show that the newly developed material can withstand temperatures far exceeding that limit," highlights Park.

This material can be applied to components exposed to high-temperature flames, such as those in fighter jets and missiles. Using the coating on various high-temperature structural materials, it offers broad applicability for defense purposes as well as other high-temperature engineering fields.

"Overall, our results confirm the potential of high-entropy alloys for use in high-temperature environments and emphasize the critical role of selecting suitable coating strategies tailored to the alloy composition," concludes Park.

FINISHING INDUSTRY

ON THE MOVE


Adriana Macouzet

PPG (Pittsburgh, Pennsylvania) announces that Adriana Macouzet, VP of PPG Latin America and general manager of protective and marine coatings (PMC), Latin America, will retire, effective April 30, 2026. With Macouzet's retirement, PPG will make the following leadership changes:


Jennifer Solcz

Jennifer Solcz, VP of protective and marine coatings, U.S. and Canada (USCA), will serve as VP of protective and marine coatings, Americas, which will include USCA and Latin America, effective April 30, 2026. Solcz will continue to report to Amy Ericson, senior VP of protective and marine coatings.


Javier Sosa Mejia

Javier Sosa Mejía, VP of architectural coatings, Latin America and president of PPG Comex, will expand his responsibilities as president, PPG Latin America, effective Jan. 1, 2026. Sosa will continue to report to Henrik Bergström, senior VP of global architectural coatings.

Netherlands-based directors Erwin Wild and Ruud van der Eerden are joining the **ChemQuest Group** (Cincinnati, Ohio). Erwin Wild is an experienced international business manager with a 30-year track record in the chemical industry. Ruud van der Eerden is a driven strategic executive with more than 35 years of leadership experience.


Erwin Wild


Ruud van der Eerden


Scott Stalzer

The Paint Project (Medfield, Massachusetts) appoints Scott Stalzer as VP of industrial products. Stalzer began his career in 1987 at Lennox Heating & Cooling as an e-coat paint technician, where he played a pivotal role in the company's expansion into powder coating.


Jeff Mills

Cleaning Technologies Group LLC (CTG, Cincinnati, Ohio) promotes Jeff Mills to president of Ransohoff and Blackstone-Ney Ultrasonics. His background at Ransohoff, along with his advancement throughout the organization provides confidence in his ability to guide both divisions.

NASF Technical Papers

Edited by Dr. James Lindsay, NASF Technical Editor

Sustainable Approaches to Zinc Nickel on Electrical Vehicles

Tony Oriti, MacDermid Enthone Industrial Solutions, New Hudson, MI, USA

This paper is based on a presentation originally given at SUR/FIN 2025 in Rosemont, Illinois, on June 3, 2025, in "Session 5: Corrosion Control in Automotive II."

The presentation discusses the use of rack alkaline zinc-nickel for electric vehicle (EV) battery boxes and the membrane anodes associated with the process. The battery box is a major component of EVs. As zinc-nickel is increasingly employed for this type of finishing, the use of rack zinc-nickel plating operations and high-efficiency options become increasingly desired for sustainability. The full paper can be accessed and printed at **short.pfonline.com/NASF26-Feb1**.

Advancing Nickel MMC Coatings: Electroplating Models and Tooling Innovations for Hard Chromium Alternatives

Romain Baudson, Robrecht Belis, Bart Van den Bossche and Paulo Vieira, Elsyca NV, Wijgmaal (Leuven) Belgium; Luca Magagnin, Politecnico di Milano, Milan, Italy; Alexandros Zoikis Karathanasis, Kata Berkesi and Angeliki Nikolaou, Creative Nano, Athens, Greece

This paper is based on a presentation originally given at SUR/FIN 2025 in "Session 4: New Techniques in Nickel." The MOZART project is an EU-funded research project where nickel dispersion coatings with nanoparticles are investigated as a hard chromium alternative. Nanoparticles are not electrically discharged at the cathode. One challenge with co-deposited nanoparticles comes with their tendency to self-agglomerate, leading them to precipitation out of solution. The risk of precipitation onto the workpiece may lead to uneven particle distribution in the coating.

To investigate this risk, electrochemical characterization of the plating bath chemistries is being evaluated in different surface orientations. This presentation highlights the ongoing efforts to couple electroplating models with co-deposited particles and explores the developed plating tooling for different demonstrator parts.

The full paper can be accessed and printed at **short.pfonline.com/NASF26-Feb2**.

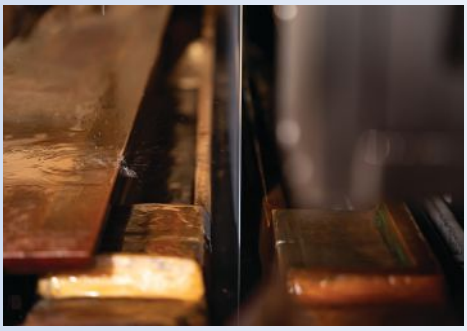
NASF

For more information or to become a member, visit nasf.org.

Salzgitter AG, Umicore Collaborate on Iridium Recycling Technique

Steel producer Salzgitter AG (Germany) and Umicore's Metal Deposition Solutions (MDS, Schwäbisch Gmünd, Germany) business unit have jointly established a process that enables the recovery of the rare precious metal iridium from anodes used in the continuous electro-galvanizing process. In this way, the partners are contributing to resource conservation and the circular economy.

In electro-galvanizing, mix-metal oxide (MMO) anodes are used to apply a thin layer of zinc to steel strips as corrosion protection. Galvanized steel strips find use, for example, in the automotive and household appliance industries. The anodes, which are coated and customized by Umicore MDS, feature a precious metal coating containing iridium as the most important component. These coatings must be renewed regularly. So far, existing coating residues could not be recycled cost-efficiently before re-coating.



Iridium ranks as one of the rarest non-radioactive metals and is considered a strategically crucial raw material for transformation processes, for example as an electrode material for hydrogen electrolyzers. Its annual production volume worldwide only amounts up to 10,000 kilograms, the partners report. This combination recently led to a massive upsurge in the price of the precious metal on the global market. Consequently, it is even more relevant that novel processes now make it possible to return iridium from coating residues to the material cycle.

"And this is exactly where our idea comes in, which — to put it simply — is about recovering the iridium used in the anodes. Here, we are talking about up to one kilogram per year," says Dr. Marc Debeaux, expert for electroplating processes at Salzgitter Mannesmann Forschung GmbH.

In a joint project involving the anode manufacturer Umicore Galvanotechnik GmbH, Salzgitter Flachstahl GmbH and Salzgitter Mannesmann Forschung GmbH, processes and interfaces were created that enable iridium to be returned to the material cycle in a cost-efficient manner.

"Recycling iridium is very demanding and difficult. At present, there are only a few providers on the market who specialize in this complex process," explains Frank Friebel, head of electrocatalytic electrodes at Umicore MDS. "Thanks to our many years of expertise in the field of precious metal recycling, we were able to act as an intermediary. By conducting joint trials and developing internal processes, we ultimately succeeded in integrating the process into everyday operations at Salzgitter Flachstahl GmbH."

Sherwin-Williams Wins Two Energy Awards for Heat-Flex AEB

Building on the success of its award-winning Heat-Flex CUI-mitigation coatings, Sherwin-Williams Protective & Marine (Bolton, U.K.) has earned two notable energy industry awards for its industrial thermal insulative system, Heat-Flex Advanced Energy Barrier (Heat-Flex AEB).

This thermal insulative system offers optimal thermal efficiency while eliminating the costly and dangerous phenomenon of corrosion under insulation (CUI). The honors for Heat-Flex AEB include a 2025 Gulf Energy Information Excellence Award for "Best Coating/Corrosion Advancement Technology" and a 2025 Vaaler Award from *Chemical Processing*.

By eliminating insulation and the threat of CUI, Heat-Flex AEB offers a solution that is less resource-intensive than traditional insulating production systems. In addition, it offers a more sustainable approach to insulating assets, providing a highly efficient solution for maintaining optimal operating temperatures.

Heat-Flex AEB works by building a thick film of highly insulative material onto assets required to maintain operating temperatures up to 350°F (177°C), with excursions to 400°F (204°C). The thermal insulative system retains process heat inside the applied assets, enabling them to continue operating even in extreme environments. It also reduces burn risk for employees working in close proximity to hot assets.

The thermal insulative system is reported to rival the in-service thermal performance of traditional mineral-based insulation systems due to their tendency to absorb and trap moisture that infiltrates their exterior cladding. This moisture dramatically reduces the insulating capacity of the insulation — with losses of up to 85% of its R-value when 10% water by volume is present in the mineral wool — and contributes to the acceleration of CUI. Heat-Flex AEB doesn't face the same issues, as its closed-cell film structure minimizes moisture absorption.

Gulf Energy announced its award winners Oct. 16, 2025, during its event gala in Houston, Texas. *Chemical Processing* announced its winners on Nov. 10, 2025. The Sherwin-Williams Heat-Flex CUI-mitigation coatings previously earned a 2023 Vaaler Award and a 2025 MP Corrosion Innovation of the Year Award from *Materials Performance*.

"Winning two big industry awards is a testament to the system's ability to reduce costs associated with corrosion, improve carbon footprints and enhance efficiencies for operators in the energy industry," says Neil Wilds, global product director, CUI/testing, Sherwin-Williams Protective & Marine.

AkzoNobel Completes Sale of India Business Unit to JSW Group

In December 2025, Akzo Nobel N.V. (AkzoNobel, Amsterdam, Netherlands) completed the sale of Akzo Nobel India Ltd. (ANIL) to the JSW Group (Mumbai), one of India's leading diversified conglomerates. The closing marks an important milestone in the execution of AkzoNobel's strategic portfolio review announced in October 2024.

As previously communicated, the transaction includes AkzoNobel's liquid paints and coatings business in India. The India Powder Coatings business and the International Research Center remain under full ownership of AkzoNobel and continue as part of the company's global network. The transaction is based on a total enterprise value of approximately €1.4 billion, representing an EV/EBITDA multiple of 25 times.

"The closing is an important step in sharpening our strategic focus and positioning AkzoNobel for long-term value creation," Greg Poux-Guillaume, CEO of AkzoNobel, says. "We are grateful to our colleagues in India for their many contributions and are pleased to see the business transition to JSW, an ambitious and committed partner in the region's fast-growing paints and coatings market."

This move is believed to mark one of the largest acquisitions in India's paints and coatings market. Through the Dulux paint brand and JSW Paints, the conglomerate will bring global quality to homes and industries across India and build lasting value for stakeholders.

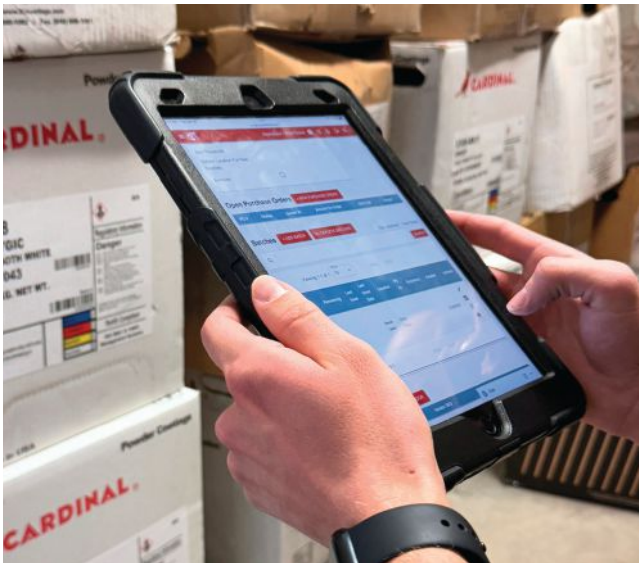
Steelhead Technologies Receives $84 Million Growth Capital Investment

Steelhead Technologies (Calumet, Michigan), an all-in-one ERP software purpose-built for metal finishers, announces a $84 million growth investment from Mainsail Partners, a growth equity firm that specializes in partnering with vertical Software as a Service (SaaS) businesses. The funding will be used to expand the platform's capabilities and Steelhead's suite of AI-driven tools that are designed to help shops maximize efficiency and profitability.

Steelhead was founded in 2021 to solve a long-standing gap in the market: manufacturers want to grow, but struggle with manual processes and outdated systems that add time and cost to each transaction. Instead of spreadsheets and paper travelers, Steelhead's cloud-based platform digitizes the shop floor, streamlining quoting, scheduling, inventory, production tracking, quality and accounting into a single, easy-to-use system.

"With Mainsail's investment, we hope to share our platform with thousands of more shops so they can get ahead — and stay ahead," says Jeff Halonen, co-founder and CEO of Steelhead.

Customers have processed more than 1.6 billion parts on the platform, and their revenue trends indicate a 17% annual growth rate. Customer D&K Powder Coating tripled in revenue and size over four years since digitizing production with Steelhead, and Houston's Precision Spray and Coatings cut its average production cycle time from 35 days to seven. "If you told me a few years ago that our guys would be walking around with iPads — in *my* shop — I wouldn't have believed you," says Dana Schnepf, president of D&K. "Technology has been a game-changer for our industry, and our business is stronger than ever."



THE STATE OF AUTOMOTIVE FINISHING:

Automotive Finishing's Role in Modern Mobility

As the sector navigates a current of change, corrosion, thermal management and aesthetics remain key finishing targets for ICEs, BVEs and EVs alike.

BY SCOTT FRANCIS EDITOR-IN-CHIEF

Automotive finishing encompasses a range of surface treatments that improve durability, corrosion resistance and appearance. These are essential for components exposed to harsh conditions like road salts, moisture and mechanical wear. The market for automotive coatings and platings is showing signs of steady growth amid demands for sustainable and high-performance solutions. According to several market reports from resources such as Grand View Research (San Francisco, California) and Fortune Business Insights (Pune, Maharashtra, India), the global automotive coatings market was estimated at around $23 billion in 2023 and is projected to grow at a CAGR of 5.5% to exceed $30 billion by 2030.

With that in mind, the automotive industry is constantly evolving, and numerous market factors including trends in

vehicle electrification and evolving regulatory policies are pushing the industry to explore a variety of material solutions across a range of vehicle components. Automotive finishing — the processes that protect, enhance and aestheticize vehicle components — plays a critical role in this evolution, to help ensure vehicles withstand environmental rigors while meeting aesthetic and performance demands.

For example, finishing technologies are adapting to support lighter, more efficient vehicles, as well as electrification. Some of these methods include traditional plating, electroless nickel (EN) plating, electrocoating (ecoat) and powder coating. And while electric vehicle (EV) powertrains have roughly 60% fewer components than internal combustion engine (ICE) powertrains, they demand innovations in electrical conductivity, thermal management and corrosion resistance:

- **Busbars** and **connectors** enable high-current transfer and structural rigidity in battery modules. Plating enhances connectivity and protection in these applications.
- **Heatsinks** are critical for dissipating heat from power electronics; innovations include plating facilitate adhesion and thermal transfer.
- Additional advancements include finishing solutions for direct bonded copper (DBC) substrates, lead frames, batteries, e-motor and electronics housings.

Are we still excited about electric cars?

Recent years saw a surge in EV sales, driven by interest in reducing emissions and dependence on fossil fuels, and bolstered by incentive programs. While EV adoption in the U.S. has slowed because of policy changes implemented by the Trump administration, global momentum continues. According to Bloomberg NEF's (London, U.K.) annual "Electric Vehicle Outlook (EVO)" report, global EV sales were projected to reach around 22 million in 2025 (up 25% from 2024). And according to the International Energy Agency's (IEA, Paris, France) "Global EV Outlook 2025," global EV sales exceeded 17 million units in 2024, marking a 25% year-over-year increase that captured more than 20% of new car sales for the first time. China is the undisputed leader in the global EV market, with more than half of its automotive sales represented by new energy vehicles (NEVs) and accounting for nearly two-thirds of global sales.

In the U.S., EV adoption has slowed according to the U.S. Energy Information Adminstration (EIA), with battery-electric vehicles (BEVs) comprising between 7-8% of automotive sales in 2025. Policy shifts under the Trump administration have introduced headwinds, including potential repeals of federal EV tax credits, tariffs on imports and relaxed Corporate Average Fuel Economy (CAFE) standards. These changes, such as eliminating credit trading and reclassifying vehicles, could continue to slow EV adoption, favoring gas-powered vehicles, per Bloomberg NEF analyses.

Meanwhile, hybrid options are surging as a transitional technology, appealing to consumers wary of full electrification. According to Deloitte's (New York, New York) "2025 Global Automotive Consumer Study," interest in hybrids has risen as a way to cut fuel costs without relying on extensive charging networks, with plug-in hybrids (PHEVs) outpacing BEVs in some regions for their versatility. Deloitte noted consumer intent at 16% for hybrids versus 9% for BEVs, driven by concerns like range anxiety, charging time and price premiums. Globally, hybrids and PHEVs are expected to continue growing, especially in markets transitioning from ICE vehicles, bridging the gap to widespread BEV adoption.

Trends in lightweighting

Reducing vehicle weight through the use of advanced materials helps not only extend range in EVs but improve fuel

Various market factors including vehicle electrification trends and changes in regulatory policies are pushing the automotive industry to explore a variety of coatings and finishing technologies to enable diverse material solutions.

efficiency and cut emissions for ICE vehicles. The impacts can be profound — the U.S. Department of Energy estimates that a 10% weight cut could boost ICE fuel economy by 6-8% and boost EV range by 4-6%. Many of the automotive lightweighting trends focus on electrification, including gigacasting — an automotive manufacturing process using large, high-pressure die-casting machines to form large, single-piece aluminum components, aimed at replacing smaller stamped and welded chassis parts — structural battery packs and cell-to-pack designs, which can yield 10-40% weight savings.

Metals like aluminum (30-70% weight savings), advanced high-strength steel (AHSS, 10-28% weight savings) and magnesium are currently the most widely used, while composites such as carbon fiber (25-75% weight savings) are experiencing growing use for battery enclosures and body panels. Of these substrates, aluminum currently dominates the U.S. market due to its availability, strength-to-weight ratio, conductivity and natural corrosion resistance via an oxide layer, though it is increasingly supplemented by recycled (secondary) aluminum and other materials.

What does this mean for finishers and coaters?

As the mix of substrates used in automotive manufacturing evolves, various coating challenges emerge. A variety of substrates means diversity of properties. Substrates vary in conductivity, thermal mass, melting points and surface tension, leading to issues like uneven adhesion and inconsistent electrostatic application (e.g., paint favoring conductive steel over plastic). Different substrates will behave differently with regard to adhesion and corrosion resistance.

Aluminum has become a pivotal material in components like structural castings and mega/gigacastings. However, this shift introduces significant surface finishing challenges, including ensuring low contact resistance for reliable welding, high dielectric resistance for EV insulation and thermal management, strong adhesion for bonding and coatings, and robust corrosion protection, particularly with recycled aluminum's higher contaminant levels like iron and copper.

Innovative surface finishing solutions address these needs through meticulous cleaning and degreasing to remove organic and inorganic contaminants, followed by advanced passivation and conversion coatings which enhance performance without compromising weldability or adhesive integrity.

With regard to pretreatments, zirconium-based options are increasingly replacing phosphates for sustainability, offering corrosion resistance. Meanwhile, trivalent chromium or titanium passivates enhance unpainted surfaces and support welding/adhesive bonding.

Electroplating

Traditional electroplating involves depositing thin metal layers (zinc, nickel, chrome, gold or palladium) onto substrates using an electric current in an electrolyte bath. This process enhances corrosion resistance, wear protection and aesthetics, and is still a staple in automotive manufacturing.

In vehicles, traditional plating is widely used for body parts, underhood components, power steering systems, chassis hardware, brake systems, fuel systems and electronics. For instance, zinc-nickel alloys provide sacrificial barriers against rust, enduring more than 500 hours of white rust and 1,000 hours of red rust in salt spray tests. It's also crucial for metallizing plastics in bumpers, grilles, wheel rims, emblems and door handles, improving electrical conductivity in connectors and aiding catalytic converters with palladium.

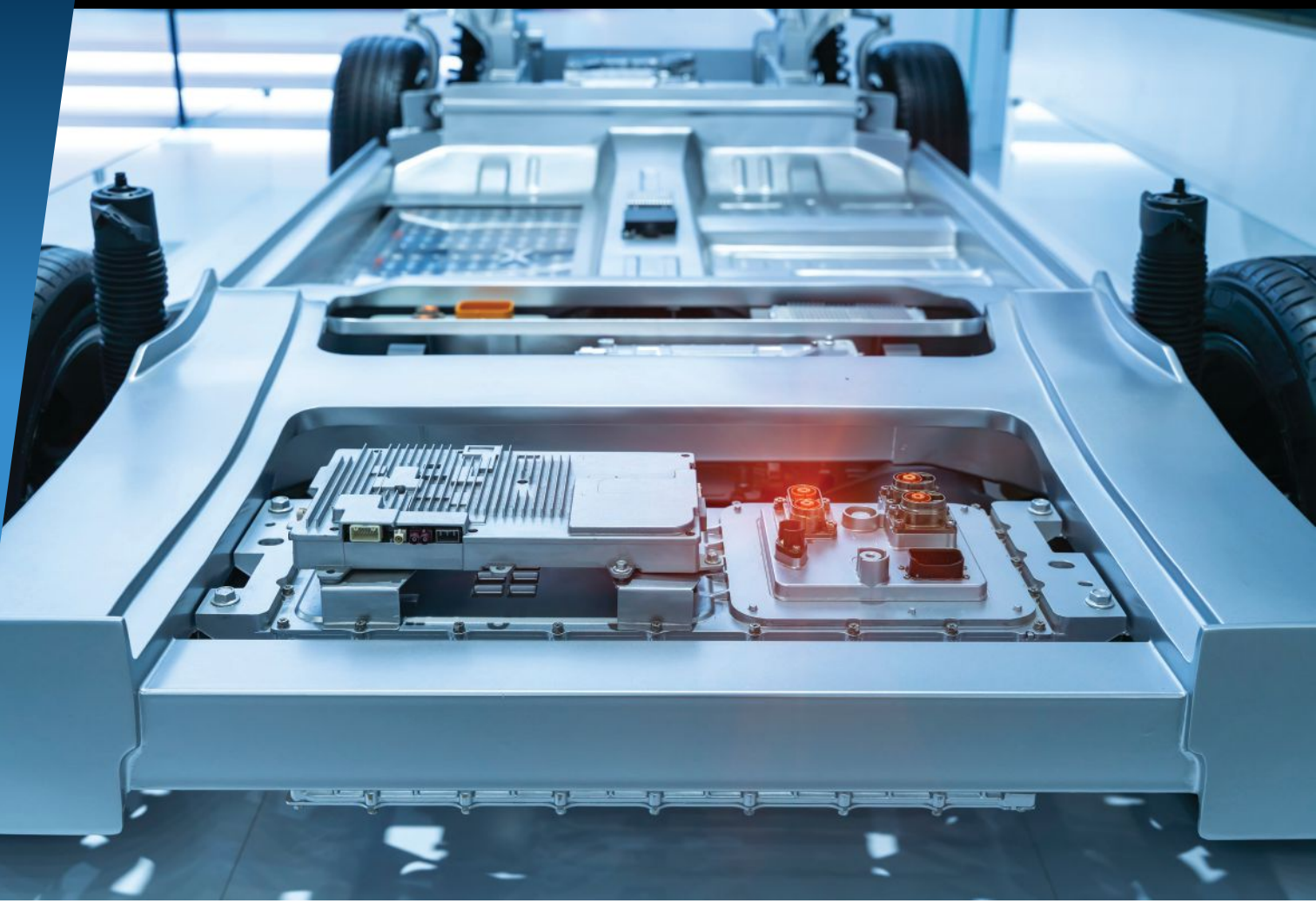
Recent developments emphasize sustainability and performance. Innovations include exploring trivalent chromium as a replacement for hexavalent chromium for decorative plating on plastic interiors, nanotechnology for nanocomposite coatings with improved hardness and conductivity and environmentally friendly ionic liquid baths. Hybrid electroplating combined with physical vapor deposition (PVD) creates dual-layer durability.

Electroless nickel plating

EN plating is a chemical autocatalytic process that deposits uniform nickel-phosphorus or nickel-boron alloys without electricity. It is ideal for complex geometries, such as blind holes, ensuring even coverage where electroplating might falter.

EN is used to coat high-wear parts like brake pistons, shock absorbers, gears, fuel injectors, heat exchangers and EV battery connectors. For lightweight aluminum components, it offers wear resistance, corrosion protection and conductivity, often aiding plastic metallization. The technology is thriving in electrification, with hybrid systems addressing evolving needs.

In 2024-2025, developments focus on bath chemistry advancements, automation and sustainability to meet EV demands. For example, the Electroless Nickel Conference (ENC 2025) highlighted high-phosphorus variants for



While EV powertrains have fewer components than traditional powertrains, they demand innovations in electrical conductivity, thermal management and corrosion resistance.

corrosion resistance and low-phosphorus for hardness.

Ecoat

Electrodeposition coating, better known as ecoat, applies charged paint particles from a water-based suspension onto conductive parts via voltage, forming uniform films. Primarily used as a primer for corrosion and UV protection on car bodies, underbodies and structures, ecoat is often paired with powder topcoats for optimal durability. Recent innovations include high-build systems for thicker coatings with fewer dips, lower-temperature curing for broader substrate compatibility and PFAS-free options.

Powder coating

Powder coating is a versatile and increasingly vital automotive finishing solution in today's market. Powdered resins are electrostatically applied and then cured under heat to form a durable, uniform film, offering corrosion resistance, scratch protection and aesthetic appeal with minimal volatile organic compounds (VOCs). In the context of electrification, powder coatings are used on EV components such as battery enclosures, heatsinks and electronics housings, where they provide essential thermal management, electrical insulation and protection against harsh conditions without compromising conductivity or adding unnecessary weight. For lightweighting initiatives, innovations like low-temperature curing powders enable application on heat-sensitive substrates including composites.

On the horizon

From a global perspective, the automotive industry continues to transform with trends toward electrification and lightweighting at the forefront of environmental and sustainability goals. The future of the automotive finishing industry looks promising, with projections indicating robust growth driven by the ongoing shift toward electrification, lightweighting and sustainability. Despite potential headwinds from policy uncertainties and economic fluctuations, the industry's resilience and adaptability position it well to support a more sustainable and efficient automotive landscape, where finishing technologies not only enhance performance and durability but also contribute to reduced emissions and extended vehicle lifespans.

CONTRAX

AMERICA'S CONTRACT MANUFACTURING EXPOS

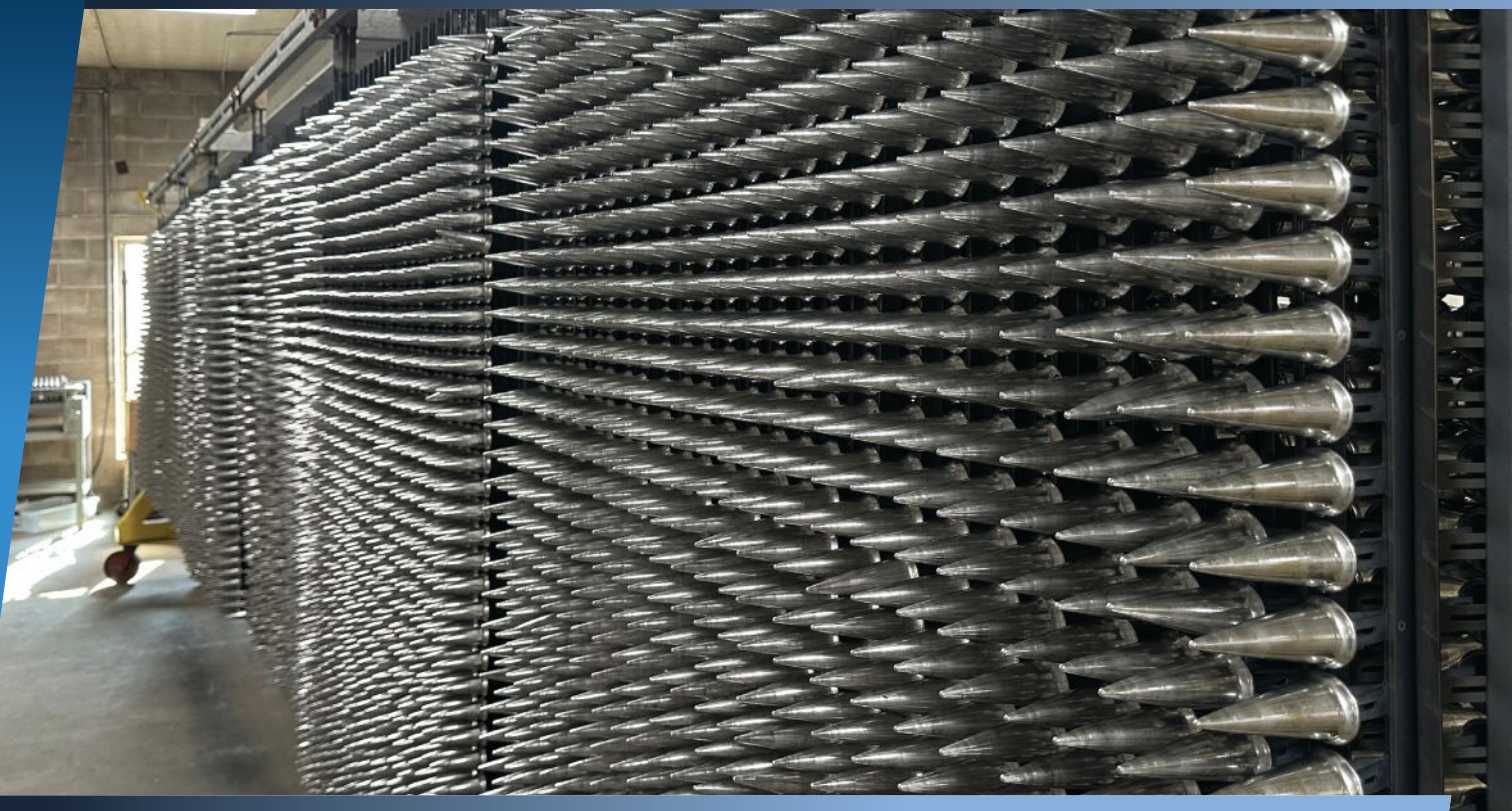
Introducing CONTRAX

Where American Contract Manufacturing Connects

CONTRAX is a new event series connecting buyers and sellers of American contract manufacturing services. From concept to contract, CONTRAX showcases leaders in design engineering, CNC machining, 3D printing, injection molding, metal forming and fabricating, surface treatment, parts finishing and more. CONTRAX attendees will find solutions for expanding their supply base, taking product or market, or addressing their existing industrial production or services needs.

FOR EXHIBIT AND ATTENDEE INQUIRIES VISIT:
CONTRAXShows.com

POWERED BY GARDNER Business Media



AaCron Anodizing: Forging Durability, Beauty in Aluminum Finishing

From its humble beginnings anodizing window trim and railing extrusions to its pivotal role in landmark projects, AaCron continues to forge resilient partnerships and sustainable solutions.

BY SCOTT FRANCIS EDITOR-IN-CHIEF

In the heart of Plymouth, Minnesota, nestled within the Minneapolis area, stands AaCron Anodizing — an aluminum anodizer with a legacy of precision and purpose. Founded in 1968 as a family-owned enterprise, AaCron has grown into one of North America's premier providers of anodizing services. Anodizing, an electrochemical process that enhances aluminum's natural oxide layer, is a popular finish for numerous applications requiring resistance to corrosion, wear and fading while allowing for vibrant, customizable colors. AaCron specializes in various anodizing types and is dedicated to enabling aluminum parts to withstand the rigors of extreme environments.

What sets AaCron apart is its unwavering commitment to quality. The company processes millions of parts annually, from 40-foot-long extrusions to high-volume small components. Serving a global clientele across sectors like architecture, defense, transportation and medical, AaCron's story is one of resilience, innovation and customer service.

AaCron Anodizing got its start in the 1960s as a spin-off of a Minneapolis-based aluminum extrusion company. The company needed the capability to process its aluminum

LEFT: AaCron's anodizing expertise serves a variety of markets including architectural, industrial, aerospace, defense, automotive and marine.
Source (All Images) | Products Finishing

extrusions, which included window frame components. The small, family-run operation soon found itself providing high-quality anodized finishes for local manufacturers, emphasizing durability, weatherability, corrosion resistance and aesthetic appeal.

By the 1980s, the company had expanded its capabilities, installing what it says are two of the largest anodizing lines in the industry. This enabled the company to handle oversized extrusions — up to 40 feet in length — a capability that positioned AaCron as a go-to for architectural projects requiring scale without compromising quality.

In the 1990s, AaCron achieved critical certifications, including compliance with AAMA standards for architectural anodizing (AAMA 611-24) and MIL-A-8625F for military applications, opening doors to defense and aerospace contracts.

A host of anodizing capabilities

AaCron's capabilities cover a range of anodizing techniques and part sizes. At the heart of its operation are two anodizing lines, one among the largest in North America, enabling the company to process everything from intricate small parts in the millions to large 40-foot extrusions. This dual-line setup ensures flexibility: The smaller trim line is designed to handle high-volume runs of tiny components, while the other tackles larger architectural pieces.

Equipped with two anodizing lines, AaCron is capable of processing a wide range of parts from high-volume batches of small parts to large 40-foot extrusions.

AaCron's anodizing services include:

- Architectural anodizing in weather-resistant colors for parts up to 40 feet long, 60 inches high and 14 inches wide.
- Bright dip anodizing for a glossy, reflective finish for parts up to 21 feet in length, 72 inches high and 32 inches wide.
- Hard anodizing (Type II and III) for wear-resistant coatings ideal in abrasive environments.
- Caustic/acid etching for textured surfaces.

The company offers a wide range of colors, from subtle nickel and light bronze to bold black and custom-matched hues. Precision color control is achieved through advanced tools like colorimeters, ensuring variations stay below 1.04 ΔE, even across large batches.

The finishes the company offers in the architectural range include bronze colors using two-step coloring, as well as a couple of different etch products. AaCron also has the capability to over-dye, meaning parts go into a two-step tank for a certain amount of time, and then are put into another dye tank to achieve another range of color shades.

"So we can put the light bronze base and then put it in a dye tank, say a red or a gold, and achieve other shades as well," says AaCron's director of sales and marketing, Mark Spencer.

To ensure quality, an in-house laboratory conducts daily titrations, XRF metallurgical analysis, gloss measurements and seal testing to monitor every aspect of the process. Value-added services include custom packaging, flexible scheduling and project-specific color standards.

Serving diverse industries

AaCron's anodizing expertise serves a variety of markets. It supports OEMs, fabricators, architects and contractors, adapting to sector-specific needs — like tight tolerances for defense or sustainable practices for green building certifications.

Within the architectural market, AaCron serves architectural firms and extruders, providing finishes for building facades, window systems and structural elements that demand both beauty and endurance.

Spencer cites examples of architectural projects that use components anodized by AaCron including Epcot Center and Sofi stadium. "The longevity factor in those kinds of projects is key. We can't have anodized aluminum panels out in the field that are going to corrode or fade in 15, 20 or even 30 years," he explains.

In aerospace and defense, the company's hard anodizing meets MIL specs for components exposed to extreme conditions, enabling ordnance, aircraft parts, military hardware

and even spacecraft that must resist corrosion in harsh environments. Spencer says that meeting specs for some of the existing applications has paved the way for future projects.

"We currently have product that's on the International Space Station [ISS]," says Spencer. "In a couple years it's going to come down to Earth, and the companies that are making the new space stations are sending product over to us to anodize."

Meanwhile, the transportation and recreational sectors benefit from marine-grade finishes for boats, vehicles and outdoor equipment, where AaCron's wear-resistant coatings extend product lifespans. Industrial and agricultural markets rely on AaCron for durable parts in machinery, power distribution cabinets and farming tools. And, within the medical field, the company provides finishes for devices requiring sterile, repeatable seals.

A culture of loyalty, reliability and trust

AaCron's company culture is rooted in loyalty and expertise. The company currently has more than 70 employees, with many staff members boasting 20-40 years of service. This collective experience has fostered institutional knowledge within the company, with anodizing veterans mentoring newcomers in the nuances of chemical baths, color matching and quality inspections. The company's technicians are empowered as the final quality inspectors, fostering ownership and pride. This purpose-driven ethos attracts talent and retains veterans, creating a family-like atmosphere in a technical field.

> At the heart of its operation are two anodizing lines. This dual-line setup ensures flexibility.

Spencer says that at the heart of this work ethic is the idea of "treating others like you'd like to be treated." He says this approach carries through everything from customer service to quality control. For example, if the team notices a defect, it will stop processing and send images to the customer prior to resuming the job.

"Our customers are king around here. We're constantly in communication with them with what's going on with their orders," Spencer says. "That's what customers appreciate — that kind of dialogue."

AaCron excels in forging long-term partnerships by treating customers as collaborators. Proactive communication and consistent results — evidenced by testimonials on color matching and high-volume precision — build trust. OEMs praise the company's ability to protect against variations, ensuring flawless performance.

Spencer credits the team's work ethic and the company's capacity for high-volume work and for its broad reach. "Anodizing is labor-intensive. Parts have to be racked and unracked, you have to check for surface defects. We're fortunate in that we have a labor pool here [in Minnesota] that is very receptive to doing this type of labor."

Mark Spencer, director of sales and marketing, AaCron Anodizing.

"And because of the high volume that we can handle for small parts, we can basically go anywhere here in the U.S.," he adds. "With our lead times and ability to analyze a lot of parts and have them come off consistently with the same color and same oxide thickness, we have customers that ship to us from the East Coast to the West Coast to down in Texas — in many cases, we've earned the right to ship directly to their customers, which is a big advantage as well."

Looking to the future

AaCron believes that the potential for anodizing is growing in several manufacturing sectors. The company has set its sights on educating various industries about the benefits of anodizing as an alternative to many other coatings targeting corrosion and weather resistance. For example, because there are no PFAS chemicals involved in anodizing, the approach could offer an alternative to traditional architectural coatings that may be facing difficulties because of PFAS regulations and legislation.

"If the current legislation stays the way it is, PFAS could have a big impact on the architectural market; these chemicals are widely used in high-performance paints," says Spencer.

In recent years, AaCron has been embracing thought leadership to educate manufacturers about the benefits of

AaCron Anodizing fosters a culture of ownership, empowering its employees as stewards of quality.

anodizing and to address misconceptions. More recently, the company launched a LinkedIn series exploring the science of anodizing colors and minimizing variations.

"Anodizing itself is a very natural process," explains Spencer. "If the aluminum is consistent in its makeup, color consistency shouldn't be an issue. When we look at the alloy makeup — that's what is driving color differences. There's a bit of education that's going on to ensure that manufacturers out there understand alloy is a critical factor in color consistency."

According to Spencer, there are plenty of additional things on the company's mind as it looks to the future. AaCron has always prioritized transparency and has worked to foster communication with its customers. The company is currently exploring a new ERP system with the goal of reducing paper and improving data traceability, ensuring every job can be audited for precision.

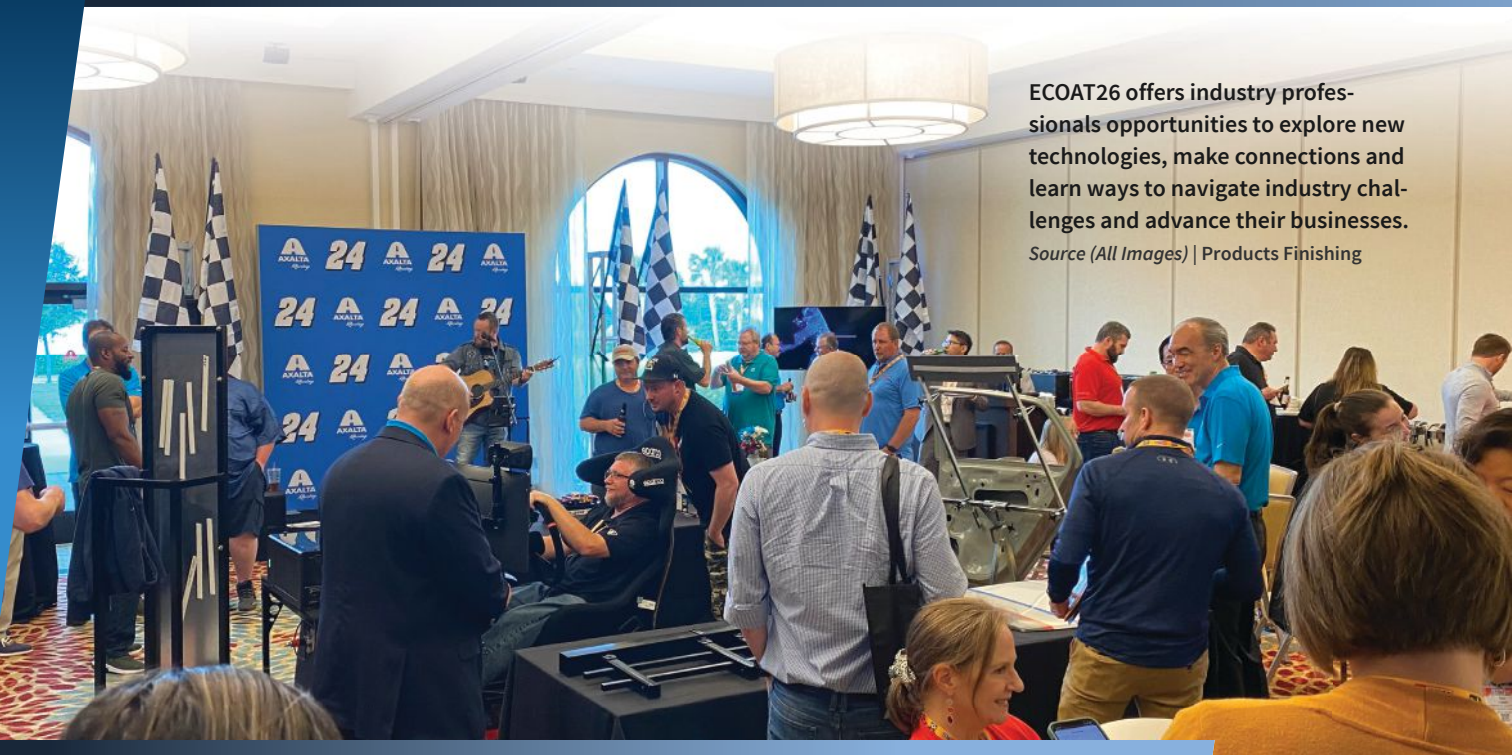
In terms of industry trends, Spencer says that customers are increasingly demanding more of consistency from part to part. "There is demand for high-quality, high color consistency of anodizing, as well as on-time and complete communication," he says.

With this in mind, and with potential increased demand promised by efforts to reshore manufacturing, AaCron is also exploring other ways to implement automation solutions to continue meeting increasing demand and help ensure consistency. "How can we use robotics with high-volume small parts to support the team that we have?" he questions, "And how can we use AI to further build our communication?"

AaCron's business strategy blends heritage with forward-thinking practices to remain relevant in a rapidly evolving industry. The company invested early in process controls to minimize waste and ensure consistency, setting a foundation for long-term sustainability. Today, it emphasizes scale with quality, investing in labs and automation for efficiency, and works to optimize processes to reduce water consumption and align with global environmental trends. By optimizing rinse cycles and chemical formulations, AaCron has minimized environmental impact without sacrificing performance. In fact, in August 2025 the company achieved a sustainability milestone, reducing water consumption by 6 million gallons.

As it looks to the future, the company's plans for growth and improvement focus on regulatory alignment, real-time testing, data traceability and thought leadership.

"Our primary focus right now is on high-volume processing of small parts," says Spencer. "We want to get out there in front of Tier 1 OEM manufacturers to let them know what our performance capabilities are. And for the architectural line, we're looking to put together a program for architects, designers and general contractors, to say, 'Here's why you should use anodizing.'"



ECOAT26 offers industry professionals opportunities to explore new technologies, make connections and learn ways to navigate industry challenges and advance their businesses.
Source (All Images) | Products Finishing

ECOAT26: Six Questions About the Conference

In this Q&A, executive director of The Electrocoat Association Karen McGlothlin shares her insights leading up to the ECOAT26 conference.

BY JESSICA POMPILI ASSOCIATE EDITOR

Presented by *Products Finishing* and The Electrocoat Association (Cincinnati, Ohio), ECOAT26 takes place April 7-9, 2026 in Orlando, Florida, spanning recent trends, technologies, educational objectives and regulations in the electrocoating sector. Below, executive director Karen McGlothlin shares her insights and anticipations for this year's show.

Q. What are some trends you're observing right now in the industry, and how might they be represented at ECOAT26?

A. Sustainability is at top of the list at this time. Ecoat products are under the same demand in all industries. We all want to be operating at maximum efficiency and capacity for a long time, while also protecting our environment! We have a few speakers that will touch on this topic from a cost perspective, while others will speak about equipment and energy optimization strategies. Additionally, others will discuss ways to meet changing demands as the environment continues to change. We will also hear about how ecoat

Karen McGlothlin is the conference director of ECOAT26 and executive director of The Electrocoat Association.

products are being made to fit into the electric vehicle market around the world.

I think that another trend we are seeing is the gathering and utilization of data from automated systems in order to improve efficiency and reduce costs. As ecoat processes are highly automated, there is a real opportunity to use data because there is significantly less "human impact" throughout electrocoating processes. Engineers can use the data from the controlled process/environment to operate at peak efficiencies while delivering the quality levels required by the process. There will be several afternoon sessions relating to this topic for our guests to select for their program.

We have many companies converting to thin-film pretreatment technology. So, we will also offer sessions covering best practices when converting to this technology, the impacts on the paint and other opportunities for sustainability surrounding this technology.

I think we can all acknowledge that navigating tariffs is a challenge right now. They create uncertainties regarding the supply chain of raw materials and goods used in manufacturing. We may not have a session specific to this topic, but the conference is a great opportunity to bring OEMs, suppliers and end users together to both gain insights into and work together to navigate the challenges that tariffs present for everyone in the electrocoat industry.

Q. What particular industry challenges and opportunities will be addressed?

A. It is always a challenge to be the most efficient. We are always trying to find ways to save money and time with minimal resource use. ECOAT26 will address process efficiency from many different angles, starting with a panel discussion on day one dedicated to this topic. We don't stop there. We also have breakout sessions surrounding topics like the true cost of operating an ecoat line, sustainable paint shop operations and various others regarding running equipment, as well as using paint and pretreatment chemicals efficiently.

Troubleshooting is another area that is a challenge, but necessary in any operation when things go awry. The ECOAT26 program will address this topic head-on, beginning with line operations, monitoring, problem-solving, automation and much more. We also have speakers that will discuss specific industries like automotive, aerospace, farm and lawn. They will cover future opportunities in those markets, as well as things they're doing to adapt to overall industry changes.

Myriad speakers with a variety of expertise in the ecoat sector will cover topics like reskilling strategies, troubleshooting, wastewater treatment methods and more.

Attendees are able to meet new business partners, future customers and learn about other resources in the industry.

Our speakers will propose opportunities like methods for saving water, reducing downtime on ecoat lines, ultrafiltration, wastewater treatment and using tin-free, high throwpower ecoats.

Q. Which of this year's speakers and/or experiences are you anticipating the most, and why?

A. Our keynote speakers always bring great worldly topics to our audience. This year is no exception. We have John Deere exploring digital paint solutions for the entire enterprise and PPG's discussion on adapting ecoat for the dynamic electrification market through the lens of automotive, though it is applicable to other industries. Jim Gezo, technical support consultant with JRGezo Consulting LLC, will be joining us to close out the conference, speaking on driving excellence in coatings by exploring critical operational challenges, compliance, workforce skill gaps, reskilling strategies and more in today's ecoat market. Matt Kirchner, president of LAB Midwest, is joining us to facilitate our "Leadership Breakfast: Eleven Innovations Totally Disrupting Manufacturing and Finishing." There are so many other great topics and speakers in the afternoon sessions and panel discussions, it's hard to narrow it down to a few!

Q. Tell us more about the collaboration/networking opportunities for both sponsors and attendees.

A. ECOAT26 is full of networking opportunities, providing visibility for our sponsors as industry leaders. It allows our guests to meet new business partners, future customers and other resources in the industry.

We begin the event with a golf tournament on an Omni course where hole sponsorships are offered. This event enables our golfers to spend time with others in the industry and collaborate and discuss business with new people, or just relax before the event begins. We will offer an ECOAT Boot Camp at the same time for those who are not as familiar with ecoat technology, in order to "catch them up" before they enter the conference program.

We will open the conference with an opening networking reception, attended by all those at the event. Attendees can see old friends in the industry, make new connections, talk business and see who will be attending sessions with them for the next few days!

We will also have our supplier-hosted Exhibit Time, which sets ECOAT26 apart from the rest. It is the perfect opportunity to discuss specific product and process issues with knowledgeable sale professionals in a no-pressure, fun environment! Exhibitors provide food, beverages, decor and entertainment. It is an attendee favorite each conference.

Q. What kinds of new technologies or innovations should attendees expect to see?

A. There are so many new things we are excited to share, so it is hard to speak of only a few. There will be sessions on water conservation, innovations in processes like pretreatment, paint and equipment, performance innovations through coatings and so much more. Our exhibitors will also bring their newest technologies and innovations to their room or table during Exhibit Time for attendees to see, touch and learn about.

Q. Tell us more about The Electrocoat Association and its objectives for ECOAT26.

A. The Electrocoat Association was formed by companies in the electrocoating industry, with the objective of being the leading authority dedicated to improving both the industry itself and the businesses of our members. In 2027, we will be celebrating our 30-year anniversary. We are so appreciative of our members and the industry for that success.

Part of that objective is met by hosting events like ECOAT26. We bring supplier base and end users together to learn, collaborate and share about their daily experiences to make processes more efficient and cost-effective. Many attendees return each year to see what's new in the industry, which is how we gauge success.

We like to meet and talk with our members at this event. It gives us the opportunity to learn what they need from us in order to be successful and efficient when conducting business. This event also allows us to promote those businesses through sponsorship, exhibit and speaking opportunities, so everyone knows who the industry experts are and how they can be used as a resource.

Learn more and register for ECOAT26 at **www.ecoat.events/**.

MOVING THE FINISHING INDUSTRY AHEAD, ONE STORY AT A TIME

The Official Products Finishing *Podcast for Coaters and Finishers*

Products Finishing's ON THE LINE podcast presents stories from the world of finishing told from the perspective of the pros in the trenches doing the work every day. ON THE LINE features expert interviews with leaders in our industry and stories about critical business topics and current issues. Growing in popularity since its inception in 2021, ON THE LINE enjoys hundreds of downloads each edition and is archived at PFonline.com/podcast for continual access 24/7/365.

Listen right now and hear who we have ***ON THE LINE!***

Stream Now At
PFONLINE.COM/PODCAST

Download on the App Store

GET IT ON Google Play

PFONLINE.COM/PODCAST

PF PRODUCTS FINISHING

LOOKING BACK AT 2025:

Navigating Challenges and Embracing Innovation

While 2025 was a challenging year for many reasons, some of the trends seen across surface finishing continue to prove its resiliency and ability to evolve.

BY SCOTT FRANCIS EDITOR-IN-CHIEF

2025 was a busy year for the surface finishing industry, and for *Products Finishing* (*PF*), filled with its share of ups and downs. Uncertainty surrounding numerous market factors — from supply chain disruptions due to fluctuating tariff policies to workforce concerns driven by changing immigration policies to changes in environmental regulations — have made business conditions unpredictable. Typical areas of growth, such as electric vehicle (EV) and renewable energy markets, have slowed, while defense and space business is ramping up.

Meanwhile, automation, AI and machine learning continue to be transitioned into the manufacturing landscape, offering new ways to enhance precision, repeatability and efficiency. As the industry faces challenges related to workforce shortages, stringent regulatory requirements and the push to streamline production processes and cut costs, adopting automation solutions and AI-driven technology is increasingly seen as essential for maintaining a competitive advantage. In 2025, *PF* explored some of the ways surface finishers are implementing these solutions.

Automation and AI

Achieving maximum efficiency on a powder coating line has long been a challenge for finishers relying on trial and error or manual adjustments. Featured in our January 2025 issue, an AI platform from Switzerland-based company coatingAI, called Blueprint OS, seeks to change this. This system automates and optimizes coating lines, delivering precision-adjusted settings for uniform coatings, reduced powder waste and improved quality while cutting costs by at least 10% — with some users reporting savings up to 30%. Featuring six modules like HealthCheck, Powder Equalization and Predictive Maintenance, Blueprint OS integrates seamlessly with any automated booth, regardless of brand or powder type. As coatingAI bridges the gap between art and science in powder coating, its technology promises maximized uptime and minimal rejects, paving the way for a more predictable and efficient future in advanced manufacturing.

CoatingAI's Blueprint OS has a closed-loop optimization system that analyzes part thickness measurements and adjusts process settings in real time. It eliminated the need for manual intervention, as displayed by this operator. *Source | coatingAI*

Another trend explored in 2025 was the integration of collaborative robots (cobots) into the powder coating and liquid painting industries. The use of cobots in painting and coating applications has been limited due to the risk of explosions caused by volatile organic compounds (VOCs) or powder coating dust. *PF* reported on novel innovations launched in 2025 that address the problem: An explosion-proof CRX-10*i*A/L Paint cobot from FANUC and AI Automation's explosion-proof 20XP model (a modified version of Universal Robots' UR20 cobot).

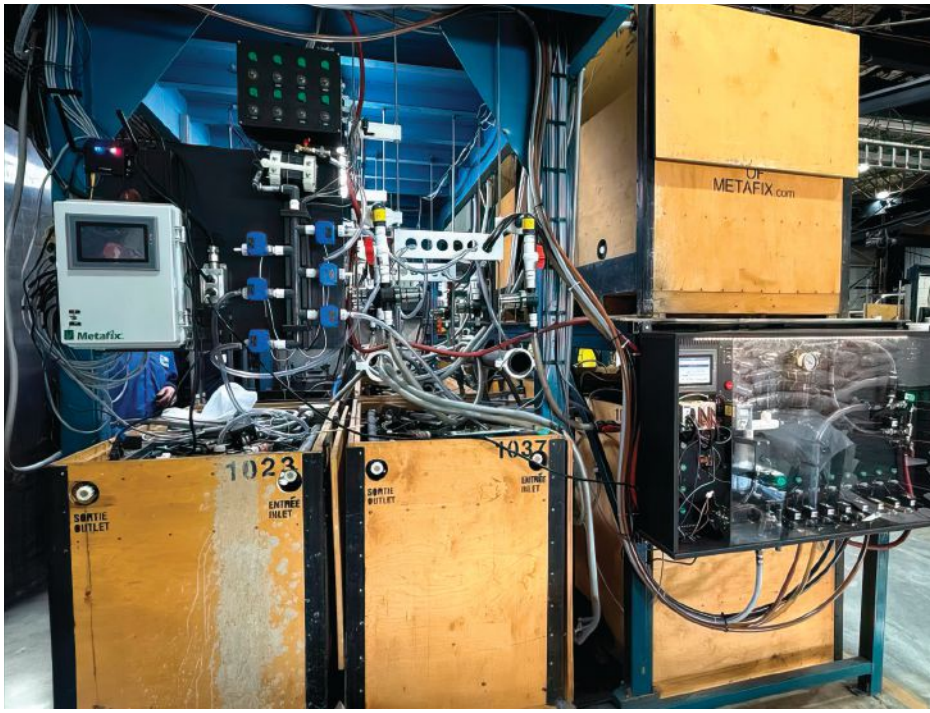
Sustainability

While political shifts in the U.S. have deemphasized some efforts toward environmental regulatory efforts and renewable energy solutions, the need for sustainable practices, such as mitigating material waste and streamlining processes, remain.

An article featured in the March 2025 issue of *PF* details several metal reclamation methods:

- **Recycling back to commerce.** Companies like Advanced Plating Technologies (APT) recover metals such as nickel, copper, gold and silver from rinse water, offsetting future metal purchase costs.
- **Zero-valent iron filtration.** Metafix's metallic ion exchange technology captures metals from wastewater, producing recyclable scrap metal and compliant, neutral pH water.
- **Evaporative tank.** Poly-Products' system concentrates plating solutions or minimizes wastewater volumes, offering a chemical-free, cost-effective solution.

Despite their advantages, many plating companies have yet to adopt these metal reclamation practices due to challenges in understanding and implementing systems. However, with growing innovation and a focus on simplicity, metal reclamation is becoming more accessible, especially for valuable metals like gold and palladium.



This Metafix metallic ion exchange system application is integrated at a company that does surface finishing and treatment for the aerospace industry. *Source | Metafix*

Workforce

Workforce development is a ongoing challenge for manufacturers. Finding skilled workers remains a concern, particularly as companies look to the future and carrying their businesses forward. On top of that, today's workforce concerns are amplified by the evolving role of automation and AI in workforce development. As manufacturing jobs evolve, it is increasingly essential to leverage educational initiatives to foster a new generation of talent and keep industry veterans up to date on the latest trends and technologies.

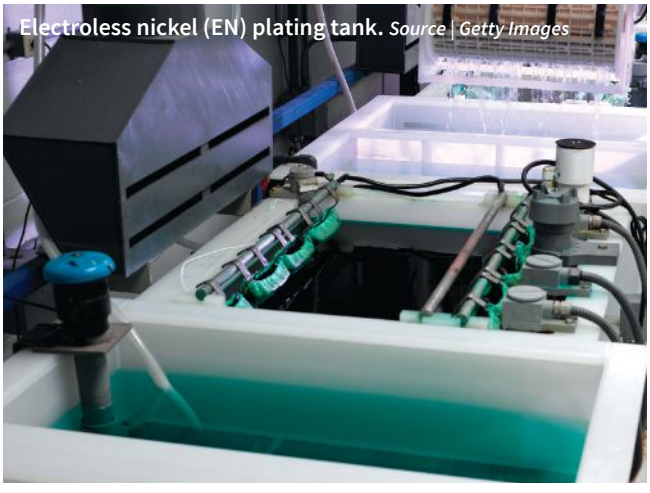
In an industry education roundup article in the April issue of *PF*, we explored new opportunities for finishing industry training as well as updates to tried-and-true programs.

A finishing camp in Wisconsin at Madison Area Technical College uses virtual reality to teach students about powder coating systems. The virtual reality game also has assessment tools that point out where the powder was sprayed too heavy, too thin or just the right thickness. *Source | CCAI*

Electroless nickel

In recent years the popularity of electroless nickel (EN) plating has grown, driven by its usefulness in a range of applications from aerospace to electronics. It provides corrosion resistance, uniform coating thickness on complex shapes, and increased hardness and wear resistance that can be further enhanced with heat treatment. It is also helpful for shielding electronics from electromagnetic interference (EMI) and radio-frequency interference (RFI).

In 2025, *PF*'s biannual Electroless Nickel Conference (ENC) was held in Cleveland, offering platers insights into the latest trends and innovations in this unique area of surface finishing. ENC conference director Brad Durkin also offered an overview of hybrid applications driving interest in EN plating.

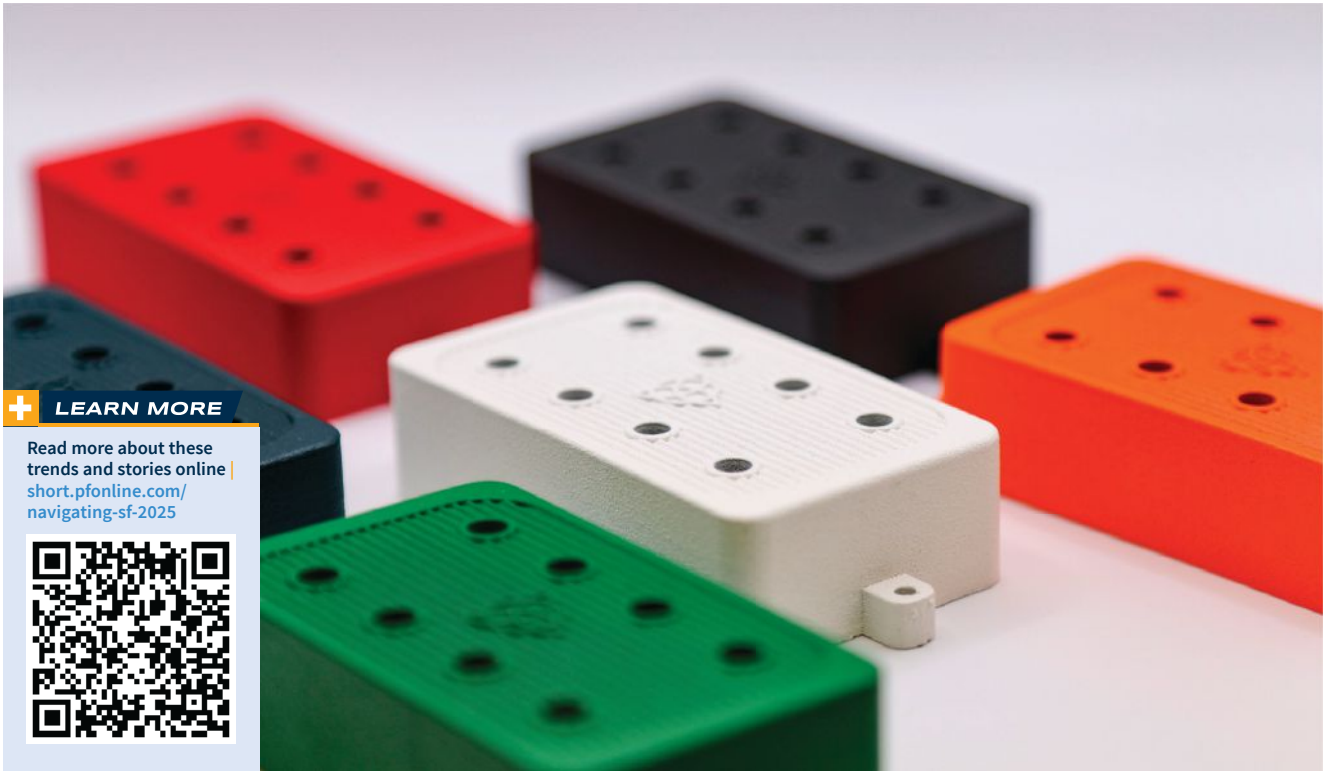


Electroless nickel (EN) plating tank. *Source | Getty Images*

Shot peening provides parts with a beneficial compressive stress layer several thousandths of an inch deep. The process is used for a wide array of aerospace parts, including rivets to landing gear bogies, struts and actuators, engine fan blades, structural brackets and wing panels. *Source | Curtiss-Wright Surface Technologies*

Aerospace

As commercial aerospace demand continues to grow and the industry looks ahead to next-generation aircraft programs, as well as the qualification of urban mobility aircraft such as flying taxis, the need for high-rate production processes is increasing. The role of finishing processes is an important part of that, enabling landing gear manufacturing, strengthening aerostructures, primers for various aircraft components and much more.



LEARN MORE

Read more about these trends and stories online | short.pfonline.com/navigating-sf-2025

Powder coated 3D printed parts. *Source | Streamline 3D*

Alternative substrates

The very heart of manufacturing is about finding new ways to make things. Innovation never stops as designers and engineers explore new materials and processes for making new kinds of structures and parts. Additive manufacturing (AM) is one such process that continues to reach new levels of production capability. High-performance plastics and composites are increasingly being turned to as manufacturers seek ways to make lighter, stronger and more durable parts. Thusly, the mix of parts that need a final finish is evolving, presenting new opportunities for finishers.

In a recent story, *PF* explored an additive manufacturer who is using UV powder coating to offer a range of color options and drive customer satisfaction.

Power outages in the wake of Hurricane Helene threatened to stall Augusta Coating and Manufacturing's (ACM) business operations and damage assets. The company banned together with its community and industry colleagues to continue serving its customers. *Source | ACM*

On resilience

Recent years have been challenging for many manufacturing businesses, finishers included. From post-COVID business recovery to navigating the unpredictability of tariffs to wildfires and natural disasters, times haven't been easy.

But, there are stories that remind us of the human element in the finishing community — of the interconnectedness with our friends and colleagues. Stories about resilience and hope.

In an article from early 2025, I wrote about a Georgia-based finisher's experiences as they worked to recover from Hurricane Helene, which tore through the South in September 2024. The resourcefulness and kindness of industry colleagues, and the surrounding community who pulled together to help with recovery efforts, was nothing short of inspiring. Looking to the new year ahead, I've no doubt there will continue to be challenges, but I also believe in the surface finishing community's ability to band together and rise to meet them.

Wishing you a successful and prosperous 2026.

Balancing Cost, Precision and Speed in Label Application for Manufacturers

Q. *What masking solutions exist for part identification labels?*

A. Manufacturing professionals have long understood the myriad benefits associated with individually marking parts for identification purposes, including enhanced traceability, inventory monitoring and improved process control. This is why most facilities label parts well upstream in the overall product manufacturing process.

But what if, further downstream, that process includes an intricate finishing step, up to and including, high-temperature curing ovens? In such scenarios, manufacturers have historically delayed the application of labels until after the finishing process. Refreshingly, though, that cumbersome situation is becoming less commonplace.

An increasingly popular approach involves the use of industrial labels with removable paint masks. This process enables manufacturers to simplify and standardize a complicated, often onerous task by first printing the label, applying the mask, then adhering that assembly to a component prior to finishing. The mask is then easily removed following finishing, revealing the still-pristine label underneath.

Adopting this type of product into the production process brings challenges. The manual application of the mask onto the label is an additional manufacturing step, which inevitably adds time and cost. Another consideration is the precision with which the mask must be placed onto labels. The closer the mask is to the label size, the more intricately an operator must work to properly apply and center the mask. Additionally, care must be taken to align the mask as well as possible with the label; if the mask is askew or not parallel with the label, the final, visible label can look off-center and hastily assembled. Understandably, then, while no additional machinery or capital investment is required, manually applying masks is generally best suited for low-volume production lines, or in geographies with lower labor costs.

To counteract such issues, a more recent solution integrates sophisticated semi-automated systems capable of both printing the label and applying the mask. Still, this option also brings its share of challenges, first and foremost being the cost of the equipment itself. Typically running tens of thousands of dollars per system, the capital investment can quickly become prohibitive — especially for plant floors with multiple print stations.

However, the benefits of such systems can be quite compelling. Not only do they complete the step of installing the mask onto the label, but they perform this step faster and far more precisely than a human can. These modules are also exceptionally repeatable, ensuring proper and uniform mask placement and label attachment. The result is a consistent assembly process and reliable product quality.

Still, cost concerns remain. Fortunately, there is another option: laser-etched labels with pre-installed masks. Laser-printable labels have been around for decades. Typically scribed by standard industrial fiber, Vanadat or Nd:YAG lasers, such labels are not only durable, but also resistant to the high temperatures, paints and chemicals common to finishing processes.

Compatible mask materials allow the laser to precisely "print" on labels directly through the mask without damaging it. This unique combination enables manufacturers to use preformed labels and masks that can be quickly scribed and applied to parts, completely eliminating the step of manually applying masks to labels. For those instances where manually applying the mask better fits a manufacturer's needs, both the laser labels and masks are available in this format as well.

A nod to ever-improving line speeds, laser printing also has a higher speed ceiling than traditional printing methods. A typical industrial laser can scribe up to 200 inches of text per second — more than fast enough to prevent it from becoming a bottleneck point along a modern production line.

And while laser labels and masks can be ideal solutions in some applications, the lasers required to scribe them are frequently the highest capital investment of all printing/applying solutions in this space. While lasers are becoming increasingly common in manufacturing plants, a single laser system can be an investment of $60,000 or more. Considering this, the benefits inherent in laser labels and masks must outweigh the required capital investment to justify their utilization.

As discussed, paint masking amounts to a significant late-stage production challenge with no one-size-fits-all solution. However, a clear-eyed view of the various modern day options available, combined with a keen understanding of individual product needs, will help manufacturers land upon a masking protocol that truly covers all bases.

ABOUT THE AUTHOR

DOUG STUBBS is sales account manager for Schreiner ProTech, which develops and supplies film-based functional components such as die-cut parts, industrial marking and security solutions. The company's capabilities include thermal transfer printable and laser markable labels for industry, RFID solutions and pressure compensation seals.

CONTACT: schreiner-protech.com

How to Streamline Production When Line Space, Oven Capacity Are Limited

Q. We're running a powder coating line with limited floor space and one cure oven. Cycling heavy parts through the oven twice requires a lot of material handling and it's slowing us down. Is there a way to increase throughput without major equipment investments?

A. Yes. Many small shops and even large manufacturers face a similar challenge. Historically, high-volume powder coating operations faced major constraints due to limited conveyor lengths and oven capacities, particularly when handling large or heavy-gauge metal. Overcoming these challenges often required costly solutions like extensive line changes or equipment investments.

The good news is that the coatings industry has been working to solve this challenge since around 2010, when a surge in edge corrosion failures prompted the need for more durability in heavy equipment coatings. Around the same time, the trailer market was pushing to improve process efficiency, leading formulators to reexamine the traditional two-coat process.

These resulted in the development of dust-on-dust powder coating technology, also referred to as dry-on-dry, which allows the primer and topcoat to cure together in one bake. Removing the first cure step can free up significant line space, reduce handling and conveyor movement, and cut overall occupancy time. In most applications where reclaimability is not required, the primer and topcoat can be applied in the same booth. We've heard from customers that this gives them a key advantage in the market.

Eliminating the first cure cycle also reduces total thermal processing time, translating to more parts per shift and lower energy use. Consider a part that normally must heat to ~345°F. It can take significant time to heat up, cure and cool down to ~125°F. Then, painters must repeat that same cycle for the topcoat. Dust-on-dust removes roughly half of that thermal cycle while reducing material handling.

Advancements in formulation and charge control have also improved transfer efficiency by 30-40%, making it easier to coat complex geometries without the risk of back ionization.

Because these systems run on standard powder application equipment, most operations can integrate dust-on-dust with minimal process changes or retraining and no capital expenditures beyond normal maintenance.

At Sherwin-Williams, the OneCure powder coating portfolio represents the largest patented dust-on-dust portfolio in the industry. It allows the primer and topcoat to stratify and interbond during co-curing, forming a continuous, well-integrated film that resists delamination.

Originally developed for applications facing extreme environments and wear, dust-on-dust formulas frequently outperform traditional two-bake systems in edge protection and corrosion resistance. Unlike some big efficiency improvements where quality is sacrificed for speed, OneCure customers consistently improve performance when switching from two-coat systems.

When vetting dust-on-dust systems, primer selection depends on a number of factors including desired corrosion resistance, application flexibility, reclaimability and appearance. Systems that offer multiple primer options provide flexibility to optimize performance and appearance, which can make a significant difference in results. The OneCure portfolio includes:

- **Polyester Primers:** Provide strong edge coverage, good aesthetics, reclaimability and application flexibility; typically used in heavy equipment applications.
- **Hybrid Primers:** Deliver the best overall appearance of all systems, with improved corrosion resistance compared to polyesters.
- **Epoxy Primers:** Provide higher corrosion resistance than hybrids, with a slight trade-off in appearance.
- **Zinc-Rich Primers:** Offer the maximum level of corrosion protection, with good appearance; commonly used in transportation applications.

When considering a shift in coatings technologies, the best first step is to contact the coatings supplier. A good supplier is able to evaluate line constraints, oven capacity, part geometry and performance requirements, then recommend if a dust-on-dust primer/topcoat pairing would align with production goals and specifications.

From there, run a targeted trial on representative parts — especially heavy-gauge components that currently require the most handling — to quantify the impact in the areas that matter most: oven occupancy time, touches per part, first-pass yield and rework. Many shops also find scheduling becomes simpler.

When line space and oven capacity are limited, dust-on-dust can be a straightforward, high-impact way to increase throughput without major equipment changes or capital investment. With the right primer/topcoat pairing, facilities often see faster throughput, lower energy use and fewer opportunities for damage during transport and cooling, all while achieving the durability they need.

ABOUT THE AUTHOR

TOMMY RENO is the global product director of powder coatings for Sherwin-Williams.

CONTACT: industrial.sherwin-williams.com

Optimizing Lubricity in Plated Fasteners

Q. We currently plate fasteners for an automotive OEM, and we are looking to expand our capacity. When it comes to torque tension modifiers, I am wondering why I can't use a single torque modifier for all applications? Can't I just dilute the solution to adjust the coefficient of friction (CoF) value?

A. This is an understandable question, and it would certainly make things easier if one torque modifier could be used for all applications. From the standpoint of electroplated fasteners, torque tension modifiers are oftentimes the final piece of the puzzle. They are typically applied following passivation of the electroplated deposit. These coatings provide a number of different features including enhanced gloss, better durability, greater corrosion resistance and a more uniform finish. The most important property of these topcoats is their ability to provide the proper amount of lubricity (or slip) for fastener installation.

When fasteners are tightened, a certain amount of torque (rotational force) is applied to them. As torque is applied and the assembly is being tightened, the bolt is being stretched. The amount that the bolt is stretched is a function of the friction that is being generated. If the friction within the coating is exceedingly high, then a lot of the input torque is being used to overcome that friction. This leaves only a very small portion of torque to induce actual assembly tightening. As a result, the fastener has the potential to self-loosen. On the other hand, if the coating is too lubricious, or slippery, and the friction is very low between the fastener and the nut/bearing surface, this can lead to excessive fastener stretching and even fracturing (tensile overload). Torque tension modifiers are *specifically designed* to provide a defined amount of lubricity to ensure the bolted joint is adequately tightened. This will vary by substrate, which is why, to answer your question, one torque tension modifier will not work for all scenarios.

Different electroplated finishes possess different material properties, which impact torque tension performance. For the purposes of this article, we will be focusing on zinc and zinc alloy finishes. It's often not appropriate to use the same torque-modifying topcoat for zinc and zinc-nickel (Zn-Ni) due to their need for differing levels of final lubricity to meet many OEM requirements. All else being equal, when treated with the same topcoat, Zn-Ni (12-15% Ni) will possess a higher CoF than zinc. This is primarily due to the differing levels of hardness between zinc and Zn-Ni. Relative to zinc, the inclusion of a harder metal (nickel) in Zn-Ni alloys will lead to a higher CoF for a given topcoat.

All major OEMs have published exact specifications that include CoF requirements. Within these specifications, the fastener type, bearing surface and test nut that are mandatory for testing are also listed. This helps standardize the assessment of topcoats and their ability to achieve a specific CoF. Maintaining that tight CoF range ensures the bolted assembly is optimized for a given torque value.

While we've discussed factors such as topcoat choice and deposit type playing a part in your eventual CoF, there are other factors as well:

Topcoat concentration. During dip spin applications, coating retention and viscosity are affected by the topcoat concentration. Low concentrations can cause a wider statistical spread or high CoF as the coating is too diluted to adhere well to the fastener during basket spinning. High concentrations can cause thread fill and other noncompliant finishes.

Spin speed. During the dip spin process, your basket rotation will impart a specific amount of rotational force on the fasteners. High RPM may shear off too much of the coating, leading to higher-than-anticipated CoF and inconsistent spread, while low RPM has the danger of causing buildup within the threads and fasteners adhering to each other during curing.

Passivate. Surprisingly, your passivation choice can affect your CoF as well. The thicker passivates tend to have enhanced porosity and greater hydration, which can lead

ABOUT THE AUTHOR

CHRISTIAN KISSIG is a research chemist for Columbia Chemical.

CONTACT: columbiachemical.com.

to better topcoat uptake. Likewise, this may contribute to a lower CoF relative to a thinner passivate. This is the case for black Zn-Ni passivates compared to clear/blue Zn-Ni passivates as well as iridescent zinc passivates compared to blue-bright zinc passivates. Certainly not all passivates are created equal. One supplier's black Zn-Ni passivate may be thicker than another. Yet, all else being equal, the thicker passivates can result in lower CoF.

Heat treatment. Electroplated fasteners are commonly subjected to heat treatment (baking) for the purposes of preventing the detrimental effects of absorbed hydrogen within the coating structure. In many instances, this baking procedure is often performed following electroplating and passivation of the fasteners. This protocol often leads to increased CoF, especially for thicker passivates compared to fasteners that are not heat-treated. This is likely due to the chemical and physical changes that high-temperature baking induces such as dehydration, changes in passivate porosity, increased hydrophobicity and so on.

Bearing surface and test nut. Lastly, recall that different OEMs have different testing protocols for torque-tension modifier assessment. This includes the use of different bearing surfaces and test nuts, as well as different fastener types. The interaction of these test surfaces all impact the eventual CoF. For example, the use of a hardened steel washer will physically abrade and shear off portions of the zinc fastener. Furthermore, passivate differences are magnified in these cases as well. Where one might not see a large CoF difference for thick- and thin-film zinc passivates when using zinc-plated test washers and nuts, the CoF difference will be magnified when using hardened steel test washers and nuts. Similarly, the use of softer metals like aluminum leads to significantly higher CoF values when testing Zn-Ni fasteners due to contributions from ploughing friction.

As referenced above, OEMs designate what material and physical properties need to be achieved for a specified finish type. This includes everything from corrosion resistance, appearance, coating thickness, galvanic compatibility and of course coefficient of friction requirements (which will vary by substrate).

To reiterate, the most critical property of torque modifiers is their ability to provide the proper amount of lubricity (or slip) for fastener installation. Torque tension modifiers more or less have the final say on what CoF you attain on your plated deposit, but they aren't the only important variable. As we reviewed, a number of different factors affect that final friction value including passivate choice, testing nut/washer, topcoat concentration, dip spin rotational speed and basket size, high-temperature baking and your plated deposit of choice. Your chemical supplier should have ample knowledge of these conditions and how they affect your CoF. It's important to consult their expertise concerning process variables to ensure you are consistently meeting OEM requirements.

PF PRODUCTS FINISHING INNOVATOR

Dürr Systems Inc.
durr.com/en

Dürr Low-Pressure Spray Gun Improves Industrial Paint Application

The EcoGun Ace Pro has been redesigned to be 23% lighter, more ergonomic and require fewer parts than its predecessor.

BY GRACE STUBBINS SENIOR MANAGING EDITOR

Dürr Systems (Southfield, Michigan) launches the completely redesigned EcoGun Ace Pro, a 23% lighter, more ergonomic version of its predecessor that needs fewer parts. The low-pressure spray gun design simplifies handling and increases operational reliability.

The EcoGun Ace Pro's quick-change system for the color channel enables the user to change color in just a few seconds, with no flushing and virtually no solvent. The nozzle inserts, designed for quick replacement, promote a clean spray pattern, high transfer efficiency and reliable results — whether the user is working with small batches or frequently changing colors, from automotive applications to wood finishing and yacht and boatbuilding.

Dürr has also significantly improved the spray guns' operation with larger adjustment elements and optimized haptics for easier control. A more ergonomically correct rotary knob replaces the previous lever for regulating the spray air. This prevents accidental adjustments and can be completely closed if necessary. The optimized air valve enables the user to reliably set the pressure right from the first trigger pressure point.

The EcoGun Ace Pro requires just four air cap variants. Two conventional and two low-volume, low-pressure air caps cover all diameters from 1.2-2.5 mm across seven different nozzle sizes. This simplifies storage and reduces the risk of mix-ups. Plus, to make handling easier and avoid loose parts, the air cap and union nut remain connected after removal.

Visually, the EcoGun Ace Pro stands out with a bronze-colored housing and black controls. The design signals a new generation without changing the proven system principles. Dürr continues its line of low-pressure spray guns, offering robust industrial quality, precise spray patterns, fast color changes, improved ergonomics and cost-effectiveness.

Be a *Products Finishing* Innovator: Contact *Press@PFonline.com* to highlight your latest innovations in finishing.

Quaker Houghton Adds to QH Fluid Intelligence Platform for Fluid Management

Quaker Houghton (Conshohocken, Pennsylvania) has launched new hardware within its QH Fluid Intelligence platform. The QH FluidControl XMS 100 and 200 systems deliver automated monitoring and control of fluid parameters with accuracy, exceeding traditional hardware, while the QH FluidMonitor GQ provides precision monitoring for demanding grinding applications.

The QH FluidControl XMS 200 incorporates spectroscopy-based sensors that accurately measure direct carbon content of water-dilutable fluids. These sensors also offer a new indicator of "fluid health," important for predicting when a fluid is nearing its useful life. QH FluidControl XMS 100 delivers similar continuous, automated monitoring and control capability using traditional sensor technology. Both units are ideal for operations with centralized or noncentralized, multi-sump fluid systems. Use of these systems eliminates the need for manual sampling and laboratory analysis, improves labor efficiency and reduces EHS risks.

QH FluidMonitor GQ introduces a durable three-in-one sensor specifically engineered to withstand the demanding conditions of grinding applications via fast-flowing, abrasive media.

Quaker Houghton | quakerhoughton.com

Saint-Gobain Mini Flap Discs Enable One-Operation Finishing in Hard-to-Reach Areas

Saint-Gobain Abrasives (Worcester, Massachusetts) expands its Norton Vortex Rapid Prep nonwoven flap disc line with the introduction of 2" and 3" "mini" sizes featuring custom Vortex agglomerate grain that provides a practical solution from roughing to finishing in one operation for difficult-to-reach, uneven areas.

Norton Vortex Rapid Prep flap discs last longer while simultaneously producing increased cutting rates and smear-free finishes. Norton Vortex agglomerated grain technology enables the cutting power of a coarser grit while producing a finer finish in one abrasives disc solution.

Suitable for light blending stripping edge breaking and surface prep applications, Norton nonwoven flap discs feature 3D nonwoven abrasive layers. This design promotes uniform finishing with consistently low surface finish Ra. In addition, multiple layers of surface conditioning material provide added life, fewer disc changes for better efficiency and reduced vibration. The discs also feature Clean Bond resin technology that provides smear-free finishes and reduced loading. Norton Vortex Rapid Prep flap discs are suitable for cleaning light deburring and processing TIF-welded seams on stainless steel.

Norton Vortex Rapid Prep "Type TR" flap discs are offered in 2 and 3 sizes and "Type 27" discs are offered in 4-½ × ⅞ and 4-½ × ⅝-11 sizes.

Norton | Saint-Gobain Abrasives | nortonabrasives.com

Coatmaster AG Intelligent Coating Control System Enables Real-Time Line Optimization

By capturing coating thickness immediately after application and integrating with any system via Flex-Apps, coatmaster AG's (Winterthur, Switzerland) Flex OS V7 system enables a robust, outcome-based control loop for industrial coating lines. The operating system brings together noncontact coating thickness measurement, advanced connectivity and integrated AI tools.

Transfer efficiency is never constant. Regulating the process upstream at the spray gun cannot compensate for these fluctuations. Only a measurement taken directly after powder application provides a reliable basis for process control. By using this value as the control variable, Coatmaster Flex allows the coating line to adjust itself automatically, stabilizing film build regardless of external influences.

Flex OS V7 introduces Flex-Apps — modular, customizable software components that run directly on Coatmaster Flex. They enable system manufacturers and end users to create tailored control logic, connect seamlessly to any PLC or fieldbus system and automate powder output adjustments in real time. Combined with built-in AI analytics, the system continuously learns from process data and supports predictive, adaptive optimization — promoting consistent quality, reduced material consumption and improved process stability.

The versatility of OS V7 is already being demonstrated through close collaboration with partners across the coating industry. MS (Binks) has integrated OS V7 into its Close-Loop with the MS Remote Control solution, enabling real-time process feedback and fully automated powder output adjustment. CoatingAI has developed Blueprint+, an intelligent application connected to OS V7 that uses AI-based process modeling to guide operators toward optimal coating parameters and consistent film quality. Further collaborations are underway with partners including Erzinger in Brazil, Parker Ionics in Japan, Syntema i Arbrå in Sweden and Electron in Turkey.

Coatmaster Flex OS V7 is now available. **coatmaster AG | coatmaster.com**

Pursuing the Way of the Polymath

To excel in the current world of manufacturing, to achieve breakthroughs, attain innovation and succeed, mimicking the attributes of the polymath must become a key strategy for the modern business leader.

MATTHEW KIRCHNER
Host of the TechEd Podcast
mkirchner@labmidwest.com

I read a host of books in 2025 and at the top of my list of favorites sits "Genesis," a work of nonfiction authored by the late Henry Kissinger, former Google CEO Eric Schmidt and former Microsoft VP of strategy Craig Mundie.

This book, subtitled "Artificial Intelligence, Hope and the Human Spirit," is notable for many reasons, but a key takeaway for me was the concept of the polymath. I'm now convinced that to compete and prosper in the present and future age of business, one in which applied AI, physical AI and rapidly advancing technologies are the norm, successful business leaders must assume the persona of the polymath.

I once heard an expert defined as "a person who knows more and more about less and less until they know absolutely everything about nothing." The polymath is the exact opposite. A polymath has deep knowledge across myriad subjects and disciplines and uses this wisdom and cross-disciplinary expertise in ways that drive novel problem-solving and innovation. As "Genesis" puts it, a polymath is "an extraordinary individual whose mastery spans multiple disciplines."

True polymaths are highly uncommon. Count among their ranks Leonardo da Vinci, who mastered such subject areas as art, science, human anatomy and engineering, or scientific pioneer, literary figure, civic innovator and political scientist Benjamin Franklin. Perhaps known best for the Theory of Relativity, Albert Einstein excelled in physics, math and philosophy and was a noted advocate for civil rights and international cooperation. Many believe that Bill Gates is a genuine polymath.

While most of us will never gain the wide knowledge or notoriety of individuals like these, mimicking the attributes of the polymath must become a key strategy for the modern business leader.

An indication as to why was promulgated in the 2004 book "The Medici Effect," authored by Frans Johansson, whose concept is that breakthroughs in innovation and advancement take place not deep in an individual discipline, but where various market sectors, cultures, fields, cognitive styles and mindsets intersect and overlap.

For instance, in a recent speech I delivered at a meeting of the National Center for Next Generation Manufacturing, I argued that there are 11 technologies that will transform manufacturing in the coming years. Examples include advanced materials, biomimicry, electrification, telemetry, vision systems and, of course, AI. My point was that breakthroughs in manufacturing will come not from innovation in these areas individually, but at the points at which these technologies converge. Take for example humanoid robotics, which are a product of all of these and more.

In the past, to excel in the world of manufacturing it was enough to be an expert in a single discipline; mechanical or industrial engineering to name just a couple examples. Going forward, innovation and leadership in manufacturing will require more polymaths. I'm not saying I have cracked the code, but in a quest to maintain tip-top knowledge in a wide variety of disciplines I'm pursuing my own polymath journey.

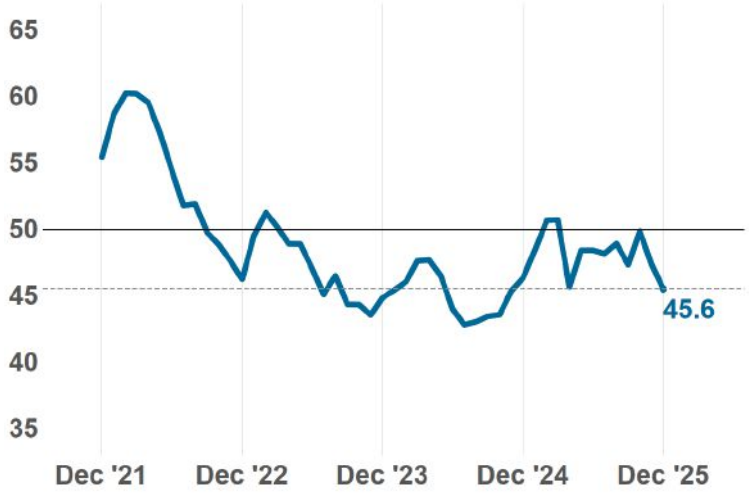
I read several publications including the *Wall Street Journal*, *Politico*, *Reuters* and *The Hill* daily, selecting from headlines across politics, real estate, opinion, sports and human interest. Most weeks I listen to eight separate episodes of two political podcasts. I'll share that I dive deep into several Gardner Business Media publications every month as well.

I spend more time than I should on LinkedIn, X and YouTube Shorts but the content that AI curates specifically for me helps me keep my edge on topics of interest. I serve as a board advisor or board director to 10 organizations. I also have a soft spot for video games. In 2025, I found myself spending a little too much effort on online backgammon so in 2026 I've disciplined myself to pick up a book every time I'm tempted to play.

The strategies go on. In 2025, I spent a week in China, a week in Canada, a week in the San Juan Islands, attended 30-plus education and manufacturing conferences, delivered almost 20 keynote addresses, met with more than 50 technology companies, looked at dozens of private equity and venture capital deals, met with many elected representatives including the Speaker of the U.S. House of Representatives, spent several days in meetings in Washington D.C., visited numerous museums, libraries and bookstores and recorded 52 episodes of The TechEd Podcast with really fascinating guests from whom I learned a ton. Anything and everything to expand my knowledge across disciplines.

Success in manufacturing in 2026 and beyond will require a wide range of interests and knowledge. In short, it will require all leaders to pursue the way of the polymath. This is my polymath strategy. Yours will and should look much different. Do you have one?

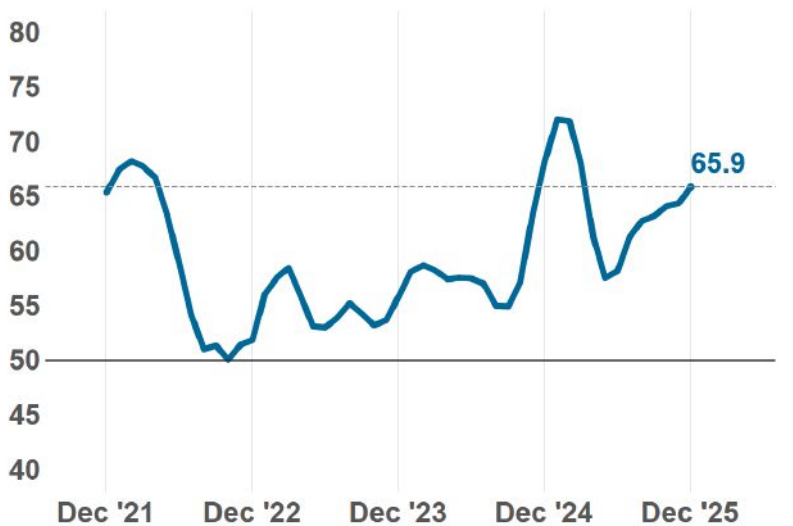
FINISHING INDEX



COMPONENTS SCORECARD

	Change vs Month Ago	Change vs Year Ago
Supplier Deliveries	▼	▲
Employment	▲	▲
Production	▼	▲
New Orders	▼	▲
Backlog	▼	▲
Exports	▼	▼

FUTURE BUSINESS INDEX



MIKE SHIRK
Senior Market Research Analyst
Gardner Intelligence
Mike has been an essential part of Gardner Intelligence for over six years, and has led research and analysis in various industries.
mshirk@gardner.media

The Gardner Business Index (GBI) is an indicator of the current state of finishing industry activity considering survey responses regarding new orders, production, backlog, employment, exports and supplier deliveries. Over 50 is expansion. Under 50 is contraction.

The GBI Components Scorecard reports the monthly change rate of primary finishing industry market factors contributing to the overall monthly index reading.

Reading the Scorecard: **Color** indicates where a component value falls relative to 50 for the current month. **Shade** indicates a value's distance from 50 — the darker the shade, the farther from 50. **Direction** indicates a value's change versus the previous time period.

The GBI Future Business Index is an indicator of the future state of composites fabricating considering industry respondents regarding their opinion of future business conditions for the next 12 months. Over 50 is expansion, under 50 is contraction.

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 more than 28,000 print & digital subscribers — the largest audience in the finishing industry

PF PRODUCTS FINISHING

EVENTS & WEBINARS

MEETING

NASF

FEBRUARY 12, 2026

Connecticut Chapter of NASF Meeting

Part of the Connecticut Chapter of NASF meeting schedule for 2025-2026, taking place in Southington, Connecticut. Contact Sgt. At Arms Larry Ryan at **RYANL46@cox.net** for reservations.

CONFERENCE

POWDER COATING WEEK 2026

MARCH 2-4, 2026

Powder Coating Week 2026

For more than 30 years, the Powder Coating Institute (PCI) has hosted an annual event that focuses on providing education for all those using powder coating and those interested in learning more about the technology.

conference.powdercoating.org

ANNUAL EVENT

National Surface Finishing Day

MARCH 4, 2026

National Surface Finishing Day

Products Finishing partners with thousands of surface finishing operations in the U.S. annually to celebrate National Surface Finishing Day (NSFD). Facilities are encouraged to host events and work with local media to build awareness about the contributions made by the surface finishing industry.

www.pfonline.com/zc/nsfd

CONFERENCE

ECOAT 26

APRIL 7-9, 2026

ECOAT 2026

ECOAT26 delivers a high-quality industry event complete with a loaded educational schedule, the industry-famous Exhibit Night and other exciting networking opportunities.

www.ecoat.events

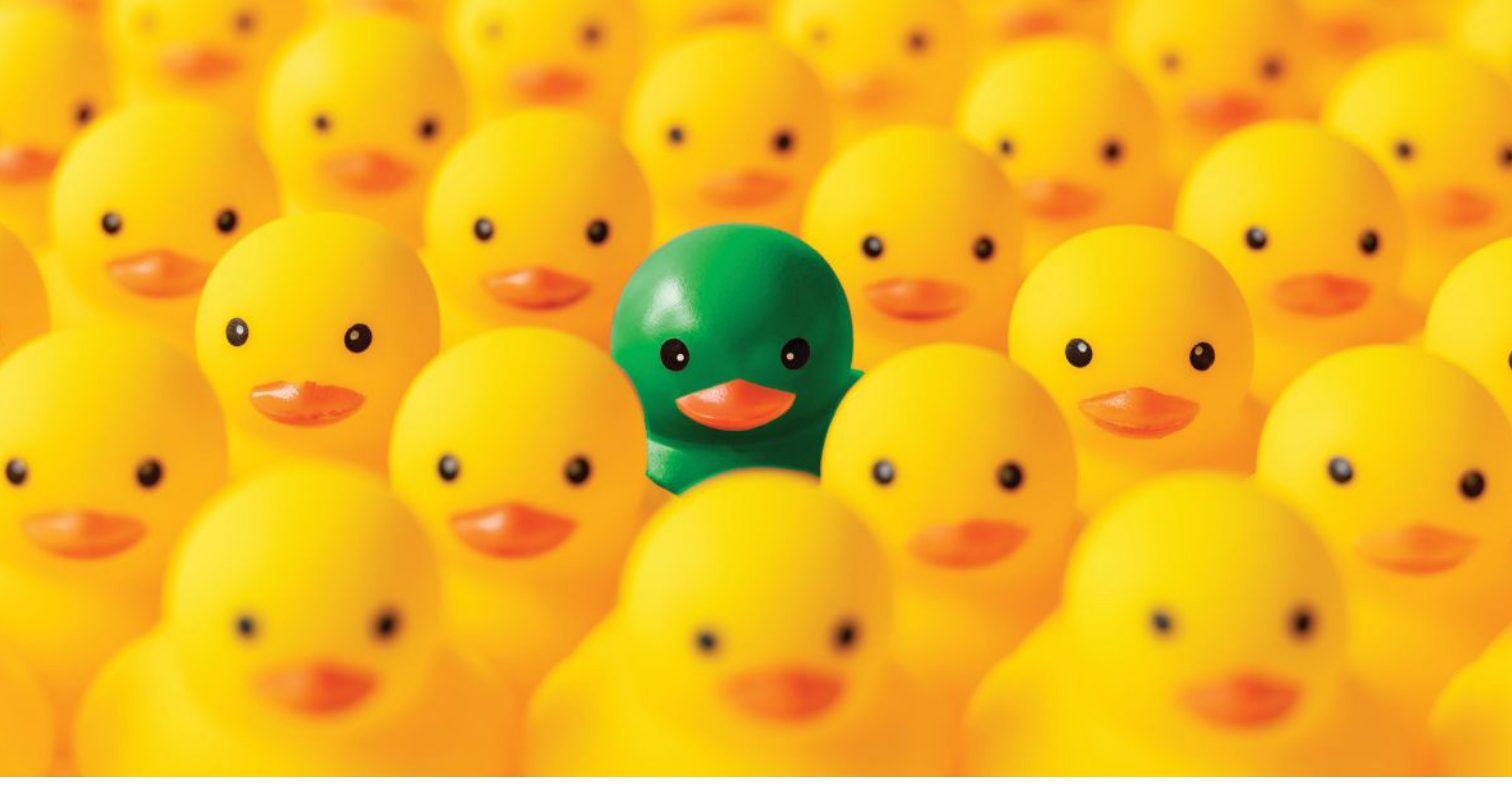
Actionable Insights, Deep-Dive Reporting

Manufacturing Connected is built on Gardner Business Media's foundation of brands and deeply researched technology reporting, but engineered to deliver concise, original and actionable insights. We help you see the big picture and connect your business processes across traditional manufacturing boundaries.

Manufacturing Connected

Join us at MFGconnected.com

Modern Machine Shop · AM Additive Manufacturing · Production Machining · MoldMaking Technology · PT Plastics Technology · CW CompositesWorld · PF Products Finishing



One Choice Stands Out:
98% Emulsified Oils Removed

AquaEase Infinity is engineered to operate across wide pH and temperature ranges, removing emulsified oils to prevent cleaner saturation. This helps reduce dump frequency and maintain consistent soil removal under high-throughput, heavy-loading conditions.

35% less waste generation | 60% chemical use reduction

Make the choice that sets you apart.

18.49
Hh
Hubbard-Hall

certified WBENC WOMEN'S BUSINESS ENTERPRISE

www.hubbardhall.com/aquaease-infinity