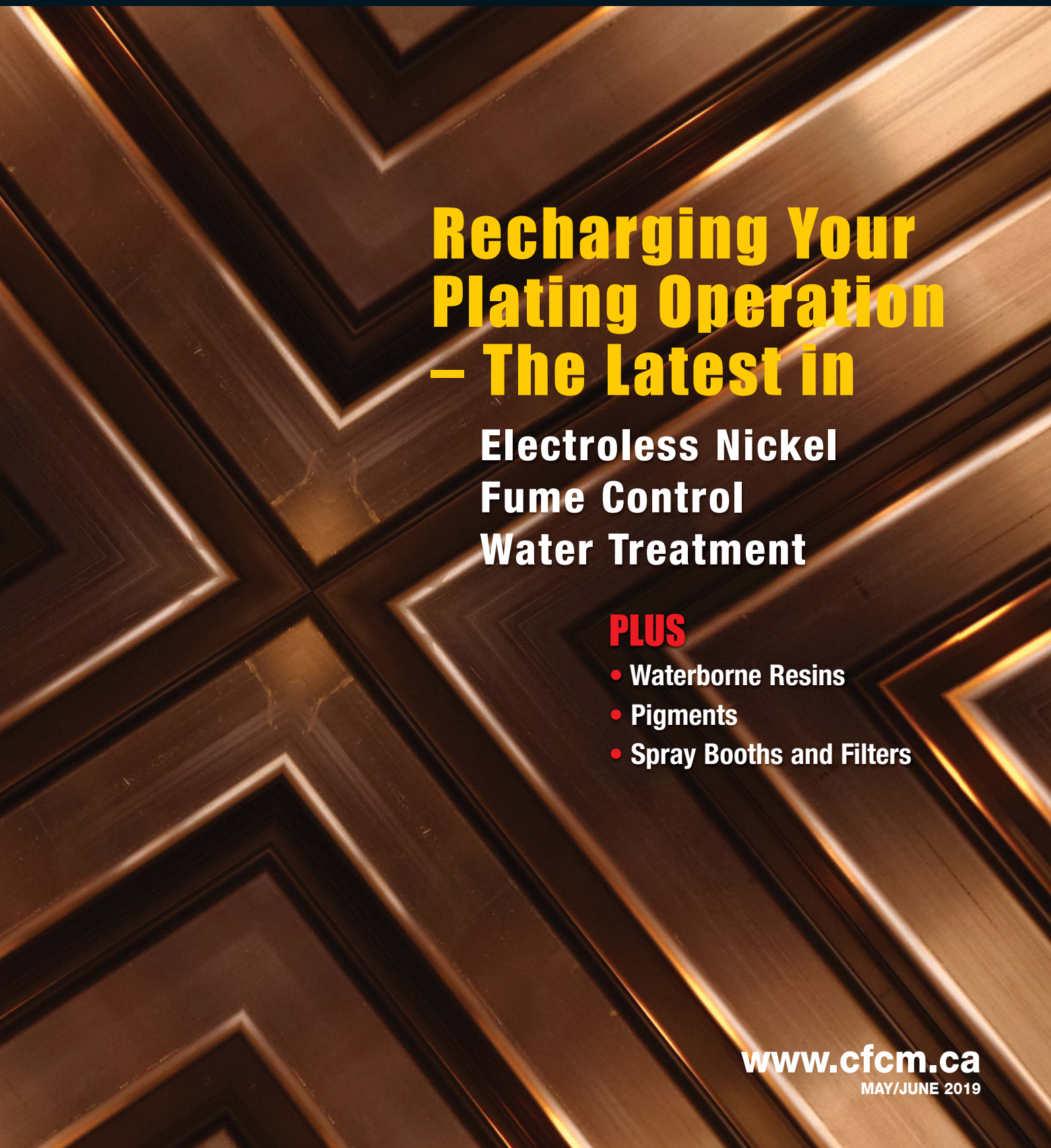
CFCM
CANADIAN FINISHING & COATINGS MANUFACTURING MAGAZINE



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MAY/JUNE 2019

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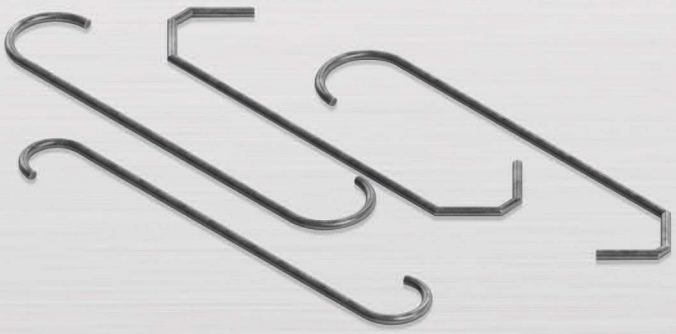

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Volume 13 Number 3

EDITOR
Theresa Rogers
416-201-1975
theresa.rogers@cfcm.ca

SENIOR EDITOR
Edward Mason
edward.mason@cfcm.ca

CONTRIBUTORS
Terry Knowles, Donald C. Lawson III, Gary LeRoux, Harneet Mehar, Radhika Poshakwale and Rhys Rajan

PUBLISHER, ACCOUNTING, CIRCULATION AND SALES
Pete Wilkinson
705-296-3030
Cell: 416-428-7838
Fax: 705-296-3031
pete.wilkinson@cfcm.ca

ASSOCIATE PUBLISHER & SALES
Gillian Thomas
416-277-1269
gillian.thomas@cfcm.ca

GRAPHIC DESIGN
Allan S. Bates
Green Apple Prepress
allan.s.bates@sympatico.ca

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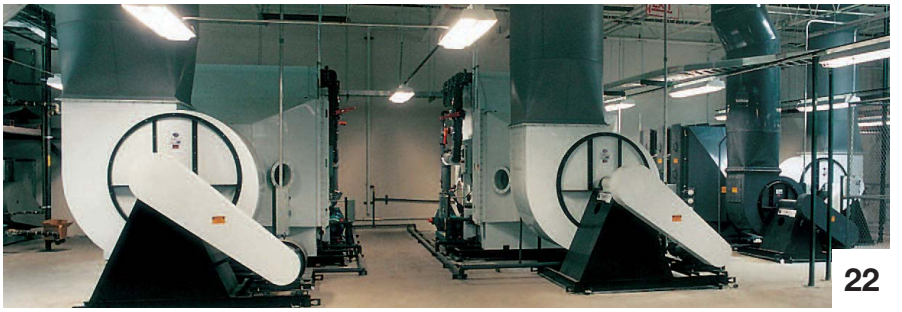


Passion for Plating

SINCE STARTING at this magazine last fall, my greatest source of education has been through attending various industry shows and speaking directly with all of you.

The categories of paints and coatings manufacturing, and industrial finishing, comprise a lot of real estate on show floors. These exhibitors offer endless new tools, colors and processes for getting the job done. They're probably a lot more, dare I say, exciting, than plating and anodizing where the majority of processes and products are tried and true.

That's why I am really looking forward to SUR/FIN. Monday has a number of keynotes and panels that directly relate to topics covered in this issue; a great opportunity to learn more about this part of the industry.

For example, Dr. Janet Anderson is a leader in unregulated and emerging contaminants in the U.S., such as per- and polyfluoroalkyl substances (PFAS), 1,4-dioxane, and 1,2,3-trichloropropane. She tracks regulatory changes for emerging contaminants internationally, offering clients the technical basis for developing guidelines worldwide. She is going to talk about emerging concerns for PFAS as well as the latest developments. The National Association for Surface Finishing is also going to give an update on PFAS. See our story on Fume Control and PFAS on p.

Markham, Ontario's Dynamix, is just one Canadian manufacturer of specialty products for the metal finishing industry. I talked to Dynamix for the fume control article since one of the company's products, Dynaprep FCA, does not contain any PFAS or PFOS. Dynamix is also on our minds as the company said goodbye to President Dennis Rogers who suddenly passed away in early May.

I truly appreciate the passion with which you speak about the industry. I hear it in your voices and I see it in the work that you are doing. Please continue to live with that passion. It helps us newcomers to the industry and I'm sure Dennis Rogers wouldn't want it any other way.

Theresa Rogers
theresa.rogers@cfcm.ca

Axalta Introduces New Edition of "Wood Vibes" Trends

Axalta introduced a new edition of its industrial wood coatings trends campaign, "Wood Vibes: Terra", a series of color collections focused on home fashion trends.

The company says the new collection is inspired by elements of nature with earth tones emerging in popularity throughout 2019. The collection is filled with colors that exude empowerment and confidence and is composed of rich color palettes.

"Our global team of color specialists and our expertise in advanced color forecasting, helps us formulate the next generation of colors to stay ahead of the market," says Wade Arnold, Vice President of Industrial Wood Coatings for Axalta. "Wood Vibes is a powerful resource designed to enable our customers to grow their business and meet consumers' expectations for new color choices."
axaltawoodcoatings.com

In Memory of Dennis James Rogers

It is with sadness that we share the news of the sudden passing of Dennis James Rogers, President of Dynamix, a great friend of CFCM and the paint and coatings industry.

Dennis's family has shared the following words: DJ will forever be remembered as the life of every party but moreover as the reason for the party. Loving husband to Tracey (nee Westbrook), father to Jenna (Matthew), and Gregory. Cherished son of Norma Rankin (Frank Carter) and Robert and Marilou Rogers. Much-loved brother to David (Lisa), Jay and Jon. Outstanding uncle to Jacob (Carly) and Jessica. Step-uncle to Tiana, Ciara, and Keisean. Dennis's extended families from Dynamix and Miskwabi Lake will forever feel the loss of their treasured friend.

Toyota's Regional Contribution Award is One of the Most Prestigious in the Automotive Sector

Axalta recently received Toyota's Regional Contribution Award, which recognizes the supplier that meets the highest performance in terms of quality, delivery and costs.

Axalta Brazil was the only company within the automotive paint and coatings industry to receive this award in a ceremony held in late February in Japan. Axalta Brazil has partnered closely with Toyota for several years to successfully meet the stringent requirements and be approved as a supplier of premium performance products and outstanding service.

"We are honored to receive this award," says Mateus Aquino, President of Axalta Brazil. "At Axalta we focus on delivering the highest quality services and products to ensure we provide significant value to our customers. Being recognized by Toyota for these efforts is deeply gratifying and provides even more motivation to continue to perform better every year. This award reinforces Axalta's vision on being the preferred coatings partner for our customers and we will continue to focus on innovating and meeting their needs."
www.axalta.com

Clariant Grows Sales Despite a Slow Start in Plastics & Coatings

Clariant announced first quarter 2019 sales of CHF 1.715 billion compared to CHF 1.722 billion in the first quarter of 2018. This corresponds to 2 percent organic growth in local currency, driven by higher pricing in all business areas.

"In the first three months of this year, Clariant delivered continued organic sales growth despite the challenging macroeconomic environment," says Ernesto Occhiello, CEO of Clariant. "Our focus on customer experience and fast, reliable customer fulfillment is particularly noticeable in the progression of the Business Areas Care Chemicals, Catalysis and Natural Resources. Despite Plastics & Coatings being negatively impacted by the current economic and business environments, we are confident in our ability to progress throughout the year. We will continue to identify and address the next challenges and future demands of our customers, leading to above-market growth, higher profitability and stronger cash generation."

On a regional basis, the sales developments in Latin America, Europe and the Middle East & Africa all reflected single-digit growth in local currency. Both North America and Asia reported slightly negative growth of 1 percent. The continued weaker demand in China negatively influenced sales development in the first quarter.

In Plastics & Coatings, sales declined by 2 percent in local currency, largely as a result of the weaker than anticipated automotive and plastics markets as well as the further economic slowdown, particularly in China. However, the underlying demand in China remains solid and Clariant expects to see a gradual improvement throughout the remainder of 2019.
www.clariant.com

SSPC and NACE International Explore Unified Efforts on Behalf of Stakeholders

The Society for Protective Coatings and NACE International, The Worldwide Corrosion Authority, two non-profit professional associations in the field of corrosion and coating standards, training, and certification, have initiated exploratory discussions about synergistic opportunities which may exist between the two organizations. The discussions were initiated by the board officers of each organization who recognize the complementary nature of each respective organization's mission, products, and services. Both boards have approved further evaluation of the concept, and preliminary discussions have been started.

"NACE and SSPC have a long history together going back to 1950 when SSPC was founded. NACE was part of the initial group, along with AISC and others that established the original charter for SSPC. Although we've competed in some areas in recent years," says Garry Manous, President of the SSPC Board of Governors. "Overall we share a common goal of bettering society through the development and delivery of education and information that makes the professionals we serve the best they can be. It only makes sense that we explore whether we can better serve our mutual constituencies as partners than as separate organizations."

"Our organizations really are complementary in many ways," says Terry Greenfield, NACE International's 2019-2020 President. "This is an opportunity to see if bringing together the best parts of each organization will make it easier for the stakeholders we share to access everything they need in one place vs two. If we combine our best services and products, our members and customers won't have to move between two organizations and they'll know they're getting the most comprehensive options available."

Over the next few months, SSPC and NACE member leaders and staff will convene to discuss possible benefits and challenges of the concept. Both organizations will communicate regularly about progress and further plans.
www.sspc.org

Eight Individuals to be Honoured at CPCA's 106th Annual Conference & AGM

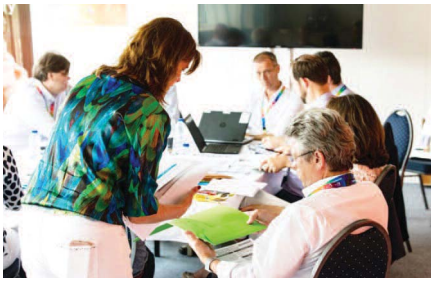
At this year's 106th Annual Conference & AGM at the Sutton Place Hotel in Vancouver, CPCA will continue its longstanding tradition of recognizing excellence by honoring innovation and CPCA support via its annual awards program at the Royal Vancouver Yacht Club on May 24, 2019.

The Roy Kennedy Award will be presented to an individual who epitomizes Roy Kennedy's dedication to the Association, its members and the paint and coatings Industry. This year's recipient will be a valued staff member, Lysane Lavoie, CPCA's Director of Regulatory Affairs and Management Information. "I cannot think of anyone who exhibits more than Lysane the well-known dedication of Roy Kennedy with respect to the work of the association," says Gary LeRoux, CPCA President and CEO.

The Industry Achievement Award is presented to an individual or an organization that has demonstrated exceptional achievement in advancing the interests of the industry and the association's objectives. It will be presented to two deserving individuals who have been involved in the coatings industry for many years, CPCA says. Fred Veghelyi of OPC Polymers and Mannie Cheung of Product Care Association will receive the award.

In addition, the Industry Distinction Award will be presented to five outstanding individuals who are retiring but who have made a significant contribution to their respective companies and the industry generally. These are Claude Brosseau (PPG Canada), Kamlaish Mudhar (Univar), Mike Lynch (Cloverdale Paint), Steve Wolinsky (Rustoleum Canada) and Luc Pepin (PPG Canada). "The contribution of all the award recipients is indeed well deserved and I'm looking forward to formally honouring their contribution at this year's conference in Vancouver," says Tim Vogel, CEO of Cloverdale Paint and CPCA's Chair.
www.canpaint.com

Nouryon announces 2019 Imagine Chemistry Finalists



Nouryon (formerly AkzoNobel Specialty Chemicals) has announced the 13 finalists, including two from Canada, for the 2019 edition of its Imagine Chemistry collaborative innovation challenge. Imagine Chemistry was launched to tackle chemistry-related challenges and uncover new ways to create value for customers. The 2019 edition generated more than 160 innovative ideas from startups, scale-ups, university spin-outs, and other potential partners.

The finalists will participate in an intensive three-day event in May at the company's RD&I center at Deventer, the Netherlands, where they will work with Nouryon experts and business leaders to further develop their ideas into a joint value case.

Winners are granted awards ranging from joint development and research agreements to dedicated support from Imagine Chemistry partners such as Unilever.

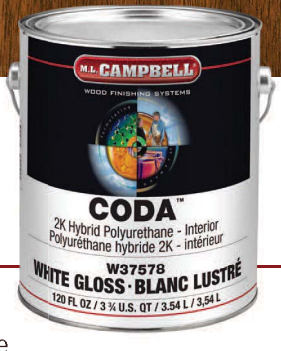
"Imagine Chemistry is part of our focus on partnerships to drive growth and help us develop the essential solutions our customers need," says AB Ghosh, Managing Director Surface Chemistry at Nouryon. "I'm impressed by the quality of submissions and the ideas of this year's finalists are highly interesting. I'm looking forward to see who we'll be working with to help drive sustainable growth in the future."

In three years, Imagine Chemistry has generated more than 500 solutions, and several are entering the commercial phase.
www.nouryon.com

IMCD Named Exclusive Distributor of Polynt Coatings Resins in North America

Polynt-Reichhold and IMCD, a distributor of specialty chemicals and food ingredients, announced that effective June 23, 2019, IMCD will become Polynt-Reichhold's exclusive North American coatings resin distributor with the expansion of the existing distribution agreement to include the southern United States.

Polynt-Reichhold brands available from IMCD include ACRYLAMAC, ADMEROL, ALCURE, AMBERLAC, AQUAMAC, ARCHEMIS, AROFLINT, AROLON, AROPLAZ, AROTUF, BECKOSOL, BECKOSOL AQ, CARBAMAC, CHEMACOIL, DURAMAC, EPOTUF, FINE-CLAD, FINE-TONE, HYDREAU, KELSOL, MACOPOL, POLYMAC, REZIMAC, UROTUF and SYNTHEMUL.



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Alessandro Verde, Polynt-Reichhold's Business Manager of Coatings, says, "Polynt and IMCD are committed to providing the highest level of product access to all customers throughout North America. IMCD offers strategic warehouse locations, provides top level customer support, and has increased their coverage throughout the region. We have great expectations that our broadened relationship with IMCD will further strengthen our service to our valued customers."

"The expansion of our business with Polynt reflects IMCD's commitment to provide coast-to-coast technical sales expertise for all our core market segments in North America," says Marcus Jordan, IMCD Americas President. "IMCD's collaboration with global leaders like Polynt, enable us to deliver best-in-class solutions that not only address formulation challenges, but inspire marketplace innovation. We are pleased to continue this journey with Polynt throughout North America."
www.imcdgroup.com

AkzoNobel Invests in Major Upgrade to Strengthen Position in U.S. Wood Coatings

A multi-million-dollar investment by AkzoNobel is set to transform its wood coatings facility in High Point, NC, into a best-in-class manufacturing site. The company says this will further strengthen the company's market position in the U.S.

The transformation will involve reorganizing manufacturing operations at the site and will include the addition of automatic dosing unit technology to produce paint more efficiently. A new raw materials warehouse, research lab and technical application center are also being built. Construction began in April, with rolling projects expected to be completed by 2020.

"This is a significant investment, which will further enable us to meet and exceed our customers' expectations," says AkzoNobel CEO Thierry Vanlancker. "The U.S. is a key market for our Wood Coatings business, and our customers trust us to deliver world-class products and services.

"Investing in High Point will increase our comprehensive North American supply capability for wood finishes, which also includes our plants in Roanoke, VA; Salem, OR; Warwick, QC; and Port Hope, ON. It will enable us to remain ahead of market trends, so we can continue to provide the visionary service our customers have come to expect – and it will solidify our position as a frontrunner in the wood coatings industry."

Today, the High Point facility covers 30 acres and employs more than 250 people. The site produces a wide range of products, including UV, solvent-based and water-based wood coatings, such as paints, stains and lacquers.

"This investment in High Point will enable us to ensure the satisfaction of all our customers and partners, including our direct OEM building product customers and our Chemcraft distribution partners," adds Simon Parker, Managing Director of AkzoNobel's Industrial Coatings business.

"We'll be able to provide current and future customers with even more flexibility through the delivery of small batch sizes; higher accuracy in stains and solid colors; more water-based products and a rapid response to requests."

This investment follows last year's opening of a newly-constructed mega-warehouse in La Porte, TX, which serves as a central regional hub for the company's Marine and Protective Coatings business. It also comes just weeks after the inauguration of a state-of-the-art R&D innovation campus at AkzoNobel's Felling site in the UK.
www.akzonobel.com/en/corporate-product/wood-coatings

People

Axalta Announces New Leadership Of Industrial Coatings Business

Axalta Coating Systems Ltd. announced that Michael Cash has resigned as Senior Vice President and President of Axalta's Industrial Coatings business, effective May 31, 2019, to pursue an opportunity outside of the coatings industry. Cash will be succeeded by Rajeev Rao, who currently serves as Axalta's Vice President, Global Powder and Business Development/ Strategy, Industrial Coatings, and David Heflin, who currently serves as Axalta's Vice President, Global Industrial Coating Systems.

Rao will continue to run Axalta's powder business, and Heflin will be promoted to Vice President, Global Industrial Liquid Coatings, where he will oversee Axalta's general industrial, coil coatings, wood coatings and energy solutions businesses. Together, Rao and Heflin will serve as co-heads of Axalta's Industrial Coatings business and report directly to Robert Bryant, Axalta's Chief Executive Officer.

"Rajeev and Dave are both seasoned executives with extensive industry experience and a deep understanding of the strategic direction and future growth opportunities across our Industrial Coatings business," says Bryant. "Their leadership and guidance will help build upon the strength of our business and our talented team in a manner consistent with our strategic imperatives prioritizing people, innovation, growth and performance. I am confident that Rajeev and Dave will position the business and Axalta for sustained growth."

Bryant continues, "I also want to thank Mike for his dedication to Axalta over the past six years. He has helped meaningfully shape and grow our Industrial Coatings business, and we wish him all the best in his future endeavors."
www.axalta.com

Kemper System America Names Directors of Sales


Joseph Hoekzema


Brian McGuire

Kemper System America, Inc. announced the promotion of Joseph Hoekzema and Brian McGuire to Directors of Sales with joint responsibility for the company's liquid-applied roofing and waterproofing products for the building envelope.

Hoekzema, based at the company's New York metro sales office in Hasbrouck Heights, NJ, oversees sales and distribution across Canada, and several states. McGuire, based in Cary, NC, leads sales and distribution across the remainder of the U.S., and Mexico.

The directors set sales strategy with a focus on developing industry relationships and the company's sales structure, and improving customer service throughout the organization.

Hoekzema joined Kemper System in 2014 as New York Regional Sales Manager, and brings

more than 25 years of sales and management experience to his new post. McGuire brings more than 25 years of experience in the construction industry to his role, serving most recently as Southeast Regional Manager.

Kemper System specializes in cold liquid-applied, reinforced roofing and waterproofing, having invented the technology and holding the first patents. The company offers a full range of building envelope solutions to protect against weather, preserve the integrity of surfaces, and enhance the energy savings, comfort and value of buildings. The company portfolio of products encompasses roof coatings, construction sealants, traffic coating systems, and more.
www.kempersystem.net

Darren Birkelbach Appointed President Of American International Chemical


Darren J. Birkelbach

Effective May 15, Darren J. Birkelbach became President of American International Chemical, LLC (AIC), a subsidiary of LBB Specialties.

Birkelbach joins AIC after a successful tenure at Brenntag Specialties, where he played a key role in the company's growth since its inception. A seasoned industry executive with more than 25 years of experience in specialty chemical distribution, Birkelbach brings broad functional expertise to AIC. Prior to joining Brenntag, Birkelbach spent 13 years in the specialties industry at Mineral and Pigment Solutions and Crozier Nelson, with responsibilities spanning operations to sales. He earned a bachelor's degree in Accounting, with a minor in Marketing, from the Stephen F. Austin State University. Throughout his career, he has consistently driven transformative business growth in diverse roles that include sales and marketing, operations and finance.

"The Board of LBB Specialties and I are thrilled to appoint such a highly qualified individual to this role," says Charles Hinnant, CEO of LBB Specialties LLC. "We have the utmost confidence that Darren has the talent and leadership capabilities to take AIC to great heights."

Birkelbach says, "I am excited to join the LBB Specialties and AIC families, where I will have an incredible opportunity to lead a talented organization, partner with industry-leading suppliers, and

serve an ever-growing and robust customer base. I look forward to accelerating AIC's growth by building on the company's exceptional heritage."
www.aicma.com

Greg Taylor Celebrates 30 Years at Gema

Greg Taylor, Regional Sales Manager at Gema, is celebrating 30 years of service with the company. Having worked in the finishing industry for several years, Taylor joined Gema in 1989 as a territory manager for the Ransburg Gema division. His focus was on liquid finishing and infrared curing equipment within the Canadian market. Taylor eventually moved over to a territory manager position focused solely on powder coating equipment, and is now Regional Sales Manager for Canada and the Eastern United States. Taylor has won numerous sales awards and has been an important contributor to the success of Gema.
www.gemapowdercoating.com

Greg Taylor

Uni-Select Welcomes Brent Windom to Board

Uni-Select Inc. announced that President and Chief Executive Officer, Brent Windom, has been formally appointed as a member of its Board of Directors, effective May 2, 2019.

Windom was appointed President and CEO on April 29, 2019. He brings more than 30 years of experience of transformational change in the automotive aftermarket industry. During his career, he held various leadership roles and served as President and Chief Executive Officer of Auto Plus Pep Boys, an important automotive aftermarket parts distributor in the U.S. His previous experience includes the positions of President and Chief Operating Officer of Uni-Select USA, Inc., Senior Vice President, Sales and Marketing for the North American operations of Uni-Select, Senior Vice President, Sales and Marketing of Uni-Select USA, Inc. and Vice President of Marketing and Merchandising for Middle Atlantic Warehouse Distributor, Inc.

"We are proud to have Brent joining the Uni-Select Board of Directors," says Michelle Cormier,


Brent Windom

Calendar of Industry Events

June 3-5, 2019: Sur/Fin 2019, Rosemont, IL.
www.nasfsurfin.com

June 19-20, 2019: Biobased Coatings Europe 2019, Dusseldorf, Germany.
www.wplgroup.com/aci/event/biobased-coatings-europe

October 1-3, 2019: AAC Aluminum Anodizers Council Conference, Houston Royal Sonesta in Houston, TX.
www.anodizing.org

October 2-3, 2019: Canada Woodworking West, Tradex, Abbotsford, BC.
www.canadawoodworkingwest.ca

October 31-November 2, 2019: WMS Woodworking Machinery & Supply Conference and Expo, International Centre, Mississauga, ON.
www.woodworkingnetwork.com

November 11-14, 2019: Fabtech 2019, Chicago, IL.
www.fabtechexpo.com

November 13, 2019: Canadian Association for Surface Finishing Conference, Hilton Garden Inn, Vaughan, ON.
www.casf.ca

Feb. 17-20, 2019: Powder Coating 2020 conference and tabletop exhibition, Orlando, FL.
www.powdercoating.org

March 9-11, 2020: BIG IDEAS for UV+EB Technology Conference, Orlando, FL,
www.radtech.org

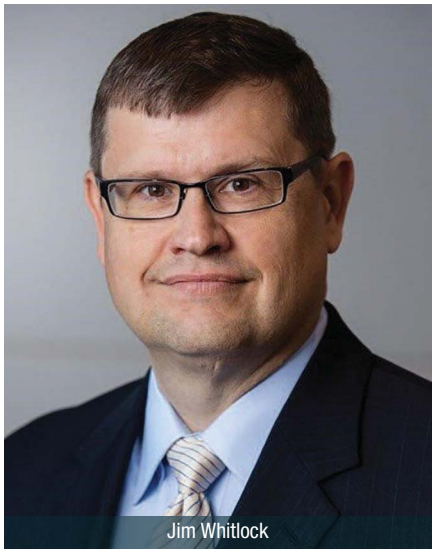
April 23-25, 2020: Salon Industriel du Bois Ouvre' (SIBO), Drummondville, QC.
harry.urban@woodworkingnetwork.com

October 22-23, 2020: Canada Woodworking East, Espace St-Hyacinthe, St-Hyacinthe, QC.
www.canadawoodworkingeast.ca

Chair of the Board. "As we progress with the strategic alternatives review, Brent's extensive operational and change management experience will be highly valuable and will complement our Board expertise."

Headquartered in Boucherville, QC, Uni-Select is a leader in the distribution of automotive refinish and industrial paint and related products in North America, as well as in the automotive aftermarket parts business in Canada and the UK. The company says the announcement is part of an ongoing board renewal process that has seen 50 percent of the directors having joined since May 2017. With the appointment of Windom, Uni-Select now has 12 board members.
www.uniselect.com

Gelest Appoints Jim Whitlock COO


Jim Whitlock

Gelest Inc. has appointed Jim Whitlock to the newly created position of Chief Operations Officer, to deepen its senior leadership team in conjunction with the company's continuing growth.

"Jim has over 30 years of experience in the silicone business, including roles as senior vice president and corporate vice president with Dow Corning in its Core Products Business and Global Manufacturing & Engineering Operations, and he is joining Gelest at a pivotal time," says Ken Gayer, Chief Executive Officer of Gelest. "The expansion of our senior leadership team reflects Gelest's commitment to operational excellence and growth as a globally recognized leading innovator and manufacturer of highly value-added advanced materials. With Jim's appointment, we look forward to improving customer satisfaction and operational performance in every respect and accelerating our growth in advanced technology end markets with the support of our partners at New Mountain Capital."

Whitlock joins Gelest from Honeywell, where he served as Vice President of Integrated Supply Chain for the Performance Materials & Technology business Group.

Gelest, Inc., headquartered in Morrisville, PA, is an innovator, manufacturer and supplier of silicones, organosilanes, and metal-organics for advanced technology end markets including medical device, life sciences, microelectronics, personal care, and advanced coatings, adhesives, sealants, elastomers (CASE) markets.
www.gelest.com

BIG IDEAS for UV+EB Technology Conference

The BIG IDEAS for UV+EB Technology Conference took place March 19 and 20, 2019, in Redondo Beach, CA. The event focused on the big ideas like 3D printing, additive manufacturing, UV LED, printing, automotive, data-driven materials, and more. The conference offered the industry a forum to discuss the future of UV and EB technologies while learning more about the applications and science that will enable developments in the near future. Check out some of the photos and mark your calendars for March 9-11, 2020 in Orlando.

Photos: Theresa Rogers

BIG IDEAS
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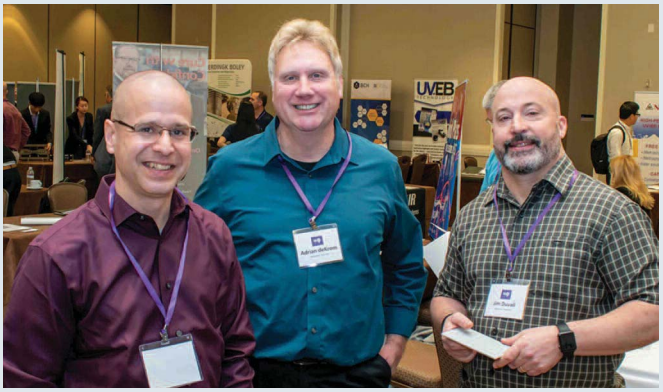
200 mW/cm²
365 nm
UV light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APPLICATIONS
- Metal Treatment
- Corrosion Inhibitor
- Coatings

BIG IDEAS

FOR UV+EB TECHNOLOGY

CPCA CORNER

Chemicals Management in Canada

There is always much to do to ensure chemicals remain in commerce for the paint and coatings industry in Canada. CPCA's work with federal and provincial governments on important assessments will determine whether or not chemicals are designated toxic and if so whether they are restricted or banned. More than 500 substances are now being assessed at the federal level for coatings, with more to come in future. The final decisions for all of them are based on the relevance of the robustness of data provided by industry. The end result will be whether or not critical substances are permitted for use in a wide range of coatings products in Canada. Over the past several months, CPCA has been actively engaged with members in an effort to monitor ongoing work in this regard. Some of the areas on current chemical assessment by the federal government require the attention of the entire coatings industry in Canada. These include:

- the Code of Practice developed by Health Canada in concert with CPCA is now being evaluated with a view to either continuing with the Code or possibly further restricting MEKO or banning it outright for use in Canada;
- the government is also looking at the significant new uses for ethylbenzene and how it may need further controls to be applied in future;
- new pollution prevention plan (P2) for TDIs was published and any facility releasing more than 100 kg of TDI will have to develop a P2 plan;
- CPCA is actively reviewing ongoing assessment of a sub-grouping for flame retardants and there will likely be several candidates considered for prohibition in the coming months, yet others seem to pass the toxicity test;
- the federal government is seeking to reduce ketone concentrations for MEK, MIBK and 2,4-PD in certain paint and coatings products, including DIY products that are available to consumers in Canada such as lacquer removers, adhesive removers, paint thinner/remover, adhesives and PVC cement/primer;
- CPCA is closely watching the review of nine different groupings of substances containing compounds used in a wide array of CASE products, which could present a challenge for industry depending on the outcome related to that assessment;
- after months of discussion CPCA was pleased to see that assessment of copper and copper compounds will not target the paint and coatings sector;
- CPCA continues reviewing final assessments of chemicals in a number of product categories for substances used in CASE formulations, most recently for two specific groups of substances used in a number of product formulations.

Information on all of these issues, and many more, are posted for members on the Canada CoatingsHUB. There are some chemicals and groupings of chemicals requiring further feedback from companies using those substances in Canada. It is critical that companies provide the data to CPCA to ensure a fully informed assessment can be made, which will likely lead to a positive outcome for all.

VOC EMISSIONS

VOC emissions and air quality continues to be a strong focus of the current government. The federal government is conducting a comprehensive study related to broad national VOC content for architectural coatings in Canada. Industry should be prepared to respond to the study especially as it relates to impacts on coatings products used

across a wide spectrum of industry sectors. The data collected will form the basis of future negotiations on VOC limits and it is critical that government fully understands the impact on product formulations and related performance over the long term. As such, CPCA will be fully engaged with the industry throughout the course of this study as it could have dramatic, long-term effects on industry as much as the first round of VOC limits for AIM and auto refinishing has.

Staying on the air side of the ledger, industry should note that the final environmental emergency regulations will come into force later in 2019. In addition to that the National Pollutant Release Inventory (NPRI) reports from companies are due in June with more than 30 substances impacted in one way or another and several thresholds changed, which will impact reporting requirements for companies who must remain compliant.

The Canada Gazette Part I publication for the Third VOC Regulation scope and definitions is still not clear, but it will likely see the light of day before summer sets in. CPCA recently posed a number of questions to officials to gain further clarity on key matters related to paint and coatings consumer products, but those will now be laid out in the Gazette that is already in process. When published, CPCA will have time to provide further comment and clarification as and if needed. Industry should watch out for this clarity when it is published and provide views or concerns to CPCA.

The federal government has just completed a survey of the one-liter exemption under the architectural VOC regulations. CPCA has made the case that the exemption should remain in place as it does generally help reduce VOC emissions overall as consumers who need to use smaller quantities can easily do so with the one-liter as per the original intent of this exemption. It is incumbent upon industry to call out those who abuse this positive feature of the regulations for industry generally.

BIOCIDE PRESERVATIVES IN PAINT

The biocide OIT (Octhilinone) used in paint and coatings manufactured or imported into Canada is banned for use as an in-can preservative effective May 31, 2019. The OIT ban for paint and coatings relates only to OIT added after production as an in-can biocide preservative. It does not include other ingredients in the paint or coating, which may contain minimal concentrations of OIT. In such cases OIT will still be permitted in paint and coatings as part of the ingredients added to mixtures per label limits. CPCA has recently been actively engaged with federal officials and registrants to determine if the ban might be stayed

pending a review of a study to be submitted by registrants related to exposure for airless paint sprayers. CPCA manufacturers remain hopeful that the "raw exposure data" will be provided by registrants as soon as possible and that it will be sufficient to alter the ban.

Given this situation CPCA urges members to take necessary actions in order to remain compliant with respect to products sold in Canada containing OIT used for in-can paint and coatings preservation. Should the ban remain in place, CPCA will work with federal officials to negotiate a reasonable sell through period for existing stocks.

MUNICIPAL HOUSEHOLD & SPECIAL WASTE IN ONTARIO

As part of the new zero waste legislation in Ontario, the MHSW program under Stewardship Ontario for 9 categories of waste, including paint, must be wound up over the next year. This wind up should not impact the paint recycling program under Product Care as that was resolved in mid-2015 when program operations for paint recycling was transferred to Product Care after extensive effort by CPCA to establish an industry stewardship plan. However, there were a number of unresolved issues under the old program such as the accumulated surplus still remaining on the books at Stewardship Ontario. That surplus is more than $17 million for paint stewards. The surplus was created from overcharges to paint stewards while managed under Stewardship Ontario, despite the fact the Act clearly states that costs were not to exceed direct costs related to recycling. Some of that surplus was only recently revealed to the paint industry.

Paint stewards in Ontario are essentially CPCA members representing 99 percent of the volume of recycled paint. As part of the required wind up plan the Ministry of Environment directed the reimbursement of surplus funds to the obligated stewards, the paint companies from which they were collected. Those funds were in fact part of the provincially mandated "internalized costs" for paint products sold by manufacturers in Ontario. They were required to absorb those costs as part of their ongoing operations. The paint program was not permitted to charge "visible fees" for recycling as in the case of other product categories, thus forcing producers to absorb the costs of recycling within their cost structure.

That total surplus for paint represents the production of approximately one million gallons of paint or approximately $40 million in forgone revenue by the paint industry in Ontario. It is clearly a contravention of the Act and clearly a harsh administrative and regulatory burden for the paint industry in Ontario. CPCA expects this situation to be addressed, while the paint industry continues to meet and exceed waste reduction targets in the province. ■

www.canpaint.com

DICTATING SUCCESS

Taking Control of the Electroless Nickel Process

ELECTROLESS NICKEL (EN) plating is an auto-catalytic reaction that deposits an even layer of nickel-phosphorus or nickel-boron alloy on the surface of a solid material. It is a process most commonly used for its ability to deposit a uniform thickness regardless of a component's geometry. It leads to high corrosion resistance, as well as high surface hardness and natural lubricity, which gives components an extremely high wear resistance. These characteristics make EN coatings extremely functional and therefore useful for many different applications in a wide range of industries.

Although the receiving surface for electroless nickel is usually aluminum, steel, copper, brass, titanium, or zinc, it can, with the appropriate catalyst, be plated onto plastics and other non-conductive substrates. For many applications, it is an excellent replacement for chrome.

Electroless nickel has evolved substantially over time. Today's best formulas have greatly improved brightness, hardness, and adhesion properties, as well as process advantages (fast plating rate, high bath stability, long bath life) that make it easier and more efficient to run.

The process of adding electroless nickel plating to a metal surface is an autocatalytic chemical reduction, says Electro-Coatings, which has more than 70 years in the business. This means that instead of using an outside source of electricity like in the similar electroplating process, the electroless nickel plating process uses a chemical bath to deposit a nickel/phosphorous layer onto the metallic surface. A surface coated in electroless nickel can even be used on non-conductive surfaces which allows for plating of a wider variety of base materials. This process greatly improves the object's resistance to galling and leaves a predictable, uniform nickel coating for high-precision parts, which can be applied to both ferrous and

non-ferrous surfaces of any geometry or intricate shape.

Electro-Coatings says few metal coatings can match the thickness uniformity of EN plating. Because these protective coatings are chemically applied, they create deposits of highly consistent uniform thickness across all surfaces, including edges and complex interior geometries. Each option in the Electro-Coatings family also delivers bonus properties that improve component performance.

"The wisest first step in coating selection is a call to an applications specialist," the company says. "Drawing upon years of electroless nickel experience, we can pinpoint the coating technology that strikes the best balance between performance, quality and cost effectiveness."

Electro-Coatings offers various options including Kanigen, where the coating is transferred to the substrate by chemical reaction rather than an electrical charge (as in electroplating) or spraying/dipping (as in painting), resulting in less build-up along edges and complete coverage on complex component interiors. "We maintain careful control over the chemical reaction in the Kanigen bath, which allows us to deliver coating thicknesses to an accuracy of plus or minus 10 percent."

Electro-Coatings can also supply Nye-Tef, an advanced, proprietary electroless nickel coating that delivers exceptional lubricity, hardness and corrosion protection without sacrificing conformity to tight tolerances. Its exclusive Nye-Carb coating is a chemically applied coating that suspends microscopic, highly consistent uniform sized particles of silicon carbide in a matrix of electroless nickel (90-93 percent nickel, 7-10 percent phosphorous). "Few surfaces of any type can match the wear resistance of Nye-Carb," Electro-Coatings says.

"The extreme hardness of silicon and nickel carbide makes Nye-Carb plating a wise choice for components that bear heavy loads in the absence of consistent lubrication." For comparison, Nye-Carb is approximately 9 on the Mohs scale, almost matching the hardness of diamonds which reads 10.

Uyemura uses a few different EN processes. With NBB Electroless Nickel, the process is bright and robust despite being free of lead and cadmium. It is a mid-phos process in the range of 6 to 8.

Uyemura says KTY Electroless Nickel, which originated in the company's lab in Japan, is the world's first "heavy metal–free" EN. Lead, cadmium and other heavy metals traditionally used for adding brightness and stability have been eliminated.

Uyemura says its ANP Electroless Nickel process substantially improves plating onto aluminum. Plating electroless nickel on aluminum has been problematic and costly due to short bath life. "A normal EN bath can plate steel for six to eight MTOs (36-48 g/l nickel plated)," the company says. "Plating into aluminum reduces that bath life by about 50 percent. The typical failure is poor adhesion of the nickel to the aluminum, resulting in blisters or nickel peel when the aluminum is bent."

Technology developed to address this problem of short bath life used an

Although the receiving surface for electroless nickel is usually aluminum, steel, copper, brass, titanium, or zinc, it can, with the appropriate catalyst, be plated onto plastics and other non-conductive substrates.

Palm Technology's ENControl 3300 measures both nickel and pH and features a user-friendly seven-inch touchscreen.

alkaline nickel strike after zincating and prior to the regular plating bath. Drawbacks to that approach include extra tanks, process steps, and control over an additional plating bath. Failures have also been seen with nickel-to-nickel bonding. A further application-specific problem is that strike baths always deposit magnetic nickel, thereby limiting their use to applications where magnetism is not a factor.

To solve these issues, Uyemura says its EN for aluminum provides excellent adhesion through at least six MTOs. It does not employ a strike and adds no additional steps compared to normal aluminum preparation double zincating. "This important development uses Uyemura's lead and cadmium-free electroless nickel in concert with proprietary cleaning, etching and zincating technologies."

Barbara Reaman, Uyemura spokesperson, says these kinds of efficiencies strike at the heart of what customers are looking for. "They are also looking for the most uniform deposit without wasting material."

Customers also want auto sample analysis. Along those lines, Uyemura recently introduced the Starline-DASH 4-NP, its newest and most advanced EN process control technology.

DASH 4-NP builds on the successful track record of NP-3 - with additional features that EN platers have rated as "most important" for effective, consistent plating performance.

DASH 4-NP samples the electroless nickel plating solution, analyzes nickel and pH values, and replenishes automatically. As a result, baths can be maintained continuously at 2-4 percent of optimum, nickel can be controlled within plus or minus 0.05 g/L, and overall plating rate can usually be increased. Operators review system history, establish sampling schedules, calibrate bath sensors, and specify tolerances; the system does the rest.

DASH 4-NP offers other important advantages including pre-programming with parameters applicable to specific EN chemistries, a simple to use HMI and immediate display of real time analysis. The system precisely tracks chemical use, bath age and replenisher inventory, and archives analysis and error records so bath history can be evaluated as charts or numerical values.

Starline DASH 4-NP is also greener, with plating rinse water being used to cool sampling solutions, for example, eliminating the need for additional cooling water. And because it reduces the amount of chemistry used, and rejects, adds Uyemura, it is a solid strategy for pollution prevention.

Palm Technology also offers EN systems and instrumentation. Its proprietary EN plating systems start with ENtank, an electroless nickel plating tank designed to stand up to the demands of the plating solution. The tank is custom-built based on the customer's requirements. To this system, customers will add ENHeat, a very compact, lightweight, heat exchanger with a unique, patented, enhanced surface designed to combine high heat transfer coefficients with low pressure drops; ENBag, filters made from high-quality woven polypropylene felt, and carefully sized for particle removal; ENControl, state-of-the-art,

Technology developed to address this problem of short bath life used an alkaline nickel strike after zincating and prior to the regular plating bath.

Uyemura's Starline-DASH 4-NP EN plating controller offers automated sampling, analysis and replenishment.

automatic controllers specifically designed for electroless nickel plating baths; and ENStat 3, an electrochemical system for continuously passivating the stainless steel components used in electroless plating baths.

Palm's ENControl unit or automatic bath controllers, can be used to monitor and maintain an electroless nickel plating bath. The ENControl system receives a measurement of the bath's condition from the sensor, and decides what corrective action is needed. If the bath parameters are within their accepted limits, it will start the pumps to make an addition proportional to the difference between the optimum and the sensor's measurement. Then, after a delay to allow the bath to be completely mixed, it will repeat the measurement to check that the solution's concentration and pH have returned to their normal level. If the bath parameters are outside of their accepted range, the controller will sound an alarm, but take no other action.

Palm says the ENControl system will also record all of the readings it has received and any action it has taken. In addition, the system tracks chemical usage, bath age, and the remaining supplies of replenisher. Importantly, the company states, "The operator can communicate with the system to access recorded information, to revise sampling periods and control ranges, and to calibrate the sensors." The ENControl system can also print a hard copy of the data it has collected or oftentimes transmit it to a personal computer for further analysis.

"The primary advantage of an ENControl automatic controller is the effect on the bath's plating rate and production," says Palm. The plating rate of electroless nickel solutions is dependent upon the bath's concentration, pH and temperature. As they fall, so does the amount of deposition. Thus, the bath's rate is not consistent, but declines as the solution is used and increases when it is replenished. The more a solution is allowed to decline, before an addition is made, the lower its average plating rate will be.

"With manual additions, seeing baths plated down by 15 or 20 percent is common before they are replenished, especially under conditions of high bath loading," Palm adds. "With closed loop control, however, this cannot occur. The concentration and pH of the solution will be maintained within 2 to 5 percent of optimum. With some baths, this can increase the plating rate by 20 percent."

By maintaining the bath in its optimum range, a control system helps extend the life of the EN solution. Controllers also help maintain the quality of the deposit and reduce rejected parts. They can also provide more complete bath records and allow the plater to better manage his operation. ■

Fume Control Regulations Continue to

Drive Innovation

FUME CONTROL is a major issue for the plating industry and there is constant action on the regulatory front in both Canada and the U.S., with decisions coming this year and next in both countries.

The issue is with per- and polyfluoroalkyl substances (PFAS), a group of manmade chemicals characterized by a strong bond between fluorine and carbon. Because of this strong bond, PFAS provide resilience and durability. These properties are critical to the performance of hundreds of industrial applications and consumer products such as carpeting, apparels, upholstery, food paper wrappings, and wire and cable coatings and in the manufacturing of semiconductors.

One chemical in the group of PFAS is perfluorooctane sulfonic acid (PFOS). PFOS is one of the most extensively produced and studied among PFAS chemicals. Small amounts of PFOS were historically used by the plating industry as part of a recommended practice to effectively control air emissions of chromium.

REGULATORY HISTORY

PFOS is no longer manufactured in Canada or the U.S. PFOS also is no longer used by the U.S. plating industry and was voluntarily phased out though it is still produced internationally and may be imported in some consumer goods. PFOS may also be found in firefighting foam for flammable liquid fires that was manufactured years ago.

Beginning in 1995, the U.S. Environmental Protection Agency recommended the use of PFOS as a fume suppressant in the chromium electroplating process. It's estimated that one-third of surface finishing facilities have chromium electroplating processes, but not all of these may have used PFOS fume suppressants.

The amounts of PFOS used in the plating industry represented a tiny fraction of all commercial uses. It's estimated that the use of PFOS in the surface finishing industry represented less than one half of one percent of U.S. and global PFOS use.

In 2007, the State of Minnesota found PFOS in the wastewater of chromium plating operations. The industry immediately engaged with the state to end the use of PFOS in Minnesota.

In 2008, EPA Region 5 released a study that found PFOS in chromium plating operations' wastewater effluent in Chicago and Cleveland. NASF proactively approached EPA and began a process that led to the industry itself requesting a national, industry-wide ban from EPA on the use of PFOS in chromium plating operations, which was finalized under a new federal Clean Air Act rule in 2012.

The surface finishing industry is the only industry to have proactively requested and received a ban on PFOS use in a USEPA regulation. The ban came into full effect in 2015.

The industry had adopted safer, EPA-approved, commercially available alternatives for fume suppression, including both EPA-approved fluorinated and non-fluorinated based alternatives as fume suppressants.

So why is PFOS turning up in wastewater discharge from

plating facilities? As analytical testing technology became far more sensitive, PFOS detection values shrank from parts per million, to billion, to trillion. Tests today can measure the equivalent of a single drop (1 part per trillion or ppt) in 20 Olympic-sized swimming pools. More sensitive testing revealed trace amounts of legacy residual PFOS in wastewater effluent discharges from some Michigan plating facilities, even though the surface finishing industry no longer uses PFOS.

In Canada, the story is a little different. PFOS, its salts and its precursors are not manufactured in Canada. Since the voluntary phase-out of the production of these substances by the primary supplier in the United States in 2002, importations have been significantly limited.

In 2006, Canada's Minister of the Environment and the Minister of Health published, in Part I of the Canada Gazette, their final decision on the assessment of PFOS, its salts and certain other compounds. The ecological screening assessment concluded that PFOS, its salts and certain other compounds are or may be entering the environment in a quantity or concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity. The human health assessment concluded that current levels of PFOS exposure are below levels which might affect human health. Based on the conclusions of the assessment of PFOS, an Order was published in Part II of the Canada Gazette adding PFOS, its salts and certain other compounds to the List of Toxic Substances in Schedule 1 under the Canadian Environmental Protection Act, 1999 (CEPA). The final regulations were published in Part II of the Canada Gazette in 2008.

In 2009, the Regulations Adding Perfluorooctone Solfonate and its Salts to the Virtual Elimination List were published in the Canada Gazette, Part II. Also in 2009, PFOS was added to the Stockholm Convention on Persistent Organic Pollutants (POPs).

In 2018, a consultation document describing proposed amendments to the Prohibition of Certain Toxic Substances Regulations, 2012 was published on the Canadian Environmental Protection Act Registry for a 60-day public comment period. The proposed amendments would seek to further restrict the manufacture, use, sale, offer for sale and import of certain toxic substances, including PFOS.

Comments and information received in response to the Notice of Intent and

the consultation document will be considered in the development of proposed regulations to amend the Prohibition of Certain Toxic Substances Regulations, 2012, is targeted for publication in winter 2020.

ALTERNATIVES

While the industry is keeping an eye on these developments, great alternatives exist. Tri-Mer offers an all-mechanical fume scrubber in the form of a fan/separator. This fume scrubber is widely used for sulfuric acid, pickling, metal plating and battery charging operations.

The fan/separator is a two-stage fume scrubber that is highly efficient at removing H2SO4 and other contaminants from the airstream.

Tri-Mer says a scrubbing liquid wets the contaminant as it enters the fan, allowing it to be centrifugally spun out of the fan scroll through dynamic mixing. The centrifugal action, using the fan wheel as part of the scrubbing process, eliminates approximately 55 percent of all airstream contaminants. The scrubber has dynamic scrubbing as the first stage and impingement as the second stage.

The impingement process causes the air to change direction as it passes across the rigid packing media. The packing media also acts as a mist eliminator section. The packing media is supplied in framed packs and provides 99 percent removal efficiency of 20 micron and larger liquid droplets under a continuous duty load.

Contaminants enter the eye of the fan where they are treated with a fog mist of scrubbing liquor.

Tri-Mer says its fume scrubber was engineered for simple installation and start-up, and start-up costs are low. "It operates with 20 percent less brake horsepower than conventional fume eliminators." It adds that the high efficiencies are possible due to its "unique use of the fan as a centrifuge in the scrubbing process."

Fan velocity is precisely controlled so that air crossing the rigid packed media stays within design parameters. The system is positively pressured, working the reverse of conventional "negative air" scrubbers. Thus, air is pushed, rather than pulled, through the system.

Tri-Mer says 55 percent of system performance results from contact between the contaminant-laden air and the rigid tube packing, while 45 percent results from the centrifugal action of the fan wheel. The unit is extremely effective in eliminating corrosive contaminants, with outlet near saturation. Finally, total energy consumption is generally 15 to 20 percent less than comparable wet scrubbers with a negative pressure design.

Markham, Ontario's Dynamix has a new product offering called Dynaprep FCA which substantially minimizes corrosive fumes released to the environment of a plating shop from the hydrochloric acid or sulphuric acid tanks, Marketing Manager Mike Black says. This helps prolong the life of surrounding equipment (tanks, ventilation

units, hoists, etc.) as well as minimizing risks the operators and staff face from the corrosive fumes.

"Dynamix is the largest Canadian manufacturer of specialty products for the metal finishing industry and our dynamic nature allows us to respond to our customers' demands," he says. "Customers are always looking for ways to save costs and improve the efficiency of their existing processes. Our Dynaprep FCA will help prolong the life of the acid used as well as save money on the heating costs by reducing ventilation requirements."

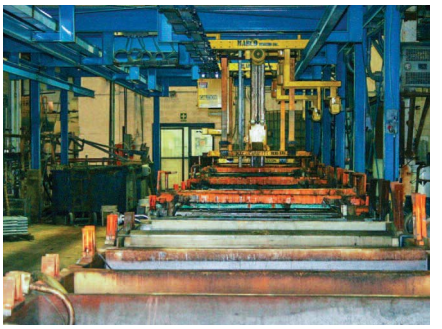
Already in use in 10 shops, Dynamix will be promoting Dynaprep at SUR/FIN 2019 in June.

It's a low dosing formula, only dosed at 0.5 percent to one percent of acid content, and manufactured locally at the Markham site.

"In the past, there have been fume control products introduced into the industry but they typically needed the assistance of a foam blanket, or the product formulation contained amines which in turn would cause problems on subsequent plating processes," says Black. "Dynaprep FCA is amine-free, does not require a foam blanket and has no adverse effects on subsequent plating processes."

Dynaprep FCA does not contain any PFAS or PFOS. There are other PFOS/PFAS and fluoride-free fume suppressant options for hexavalent chrome plating solutions as well.

"Fume control has always been an integral part of maintaining a safe work environment," Black says. "This product helps improve the air quality and atmospheric conditions in a plating shop. You can't put a price on the safety of your employees." ■



Before and after using Dynaprep FCA.

Wastewater Management

CONTROLLING WATER OUTFLOWS is an ongoing challenge in plating and anodizing. Capturing toxic waste streams is both expensive and essential, and keeping filtration and purification equipment up to scratch is not an area of the business to cut corners.

Chemical isolation and filtration is a proven approach to eliminating various metallic materials from the wastewater stream. Bentonite clay-based formulations, for example, have long been used to separate the oily contaminants from wastewater and to precipitate metallic hydroxides.

These react ionically with non-precipitated heavy metals and encapsulate the contaminants to form non-hazardous waste. The procedure is simple and can be accomplished with either manual or automatic equipment.

ALAR Auto-Vac unit.

ALAR Water Pollution Control Systems builds versatile filtration systems that are capable of handling a variety of problem wastes generated by the metal finishing industry such as plating rinse water, anodizing, aerospace processing, and cleaners. The company offers a variety of mechanical and chemical systems to customers.

ALAR says the Auto-Vac Rotary Vacuum Drum Precoat Filter is its flagship dewatering technology. The micro-filtration design handles a wide range of volumes with various solids loadings. A self-cleaning feature maintains consistent filtration rates without clogging, blinding or bottlenecks.

The Auto-Vac utilizes a liquid ring vacuum pump that pulls water through a precoat drum filter while sucking moisture out of the suspended solids. When activated, and before filtration, the drum surface is coated with a "cake" of diatomaceous earth (DE) or Perlite. This consumable filter media is porous, allowing air and water to pass through while capturing micron size particles.

Once a fill cake is built on the drum, the wastewater is pumped into the pan at a controlled rate. The vacuum sucks the water through the drum and pumps it away. Suspended solids; precipitated metals; or de-emulsified fat, oil, and grease larger than one-micron will accumulate on the filter cake surface. These solids will build with each revolution of the drum until the vacuum cannot draw any more water through. At this point, a stepping motor activates a variable speed knife blade that removes the top layer of solids with lathe-like precision. The knife also shaves off a slight amount of filter aid cake as it advances toward the drum, leaving a clean layer of media to grab more solids.

ALAR's Flex-O-Star is a pneumatically controlled chemical batch and dewatering system. The treatment and filtration equipment is pre-piped, pre-wired and mounted on a structural steel skid. A Flex-O-Star incorporates a two-step chemical and mechanical filtration process and the system can be built in more than 16 different sizes, the company says.

The ALAR Clar-O-Floc Clarifiers are recommended for operations that generate high volumes of industrial wastewater contaminated with suspended solids and metals. These systems are often used in conjunction with chemical pretreatment methods such as pH precipitation, coagulant and flocculent polymers. The chemical separation increases solid particles for enhanced settling and

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Economic, Financial & Commodity Markets Outlook

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Environmental Law and Surface Finishing

PFAS/PFOA

National Association for Surface Finishing Update and Canadian-American Policy

CASF Update and Canadian Environmental/ Regulatory Outlook

Sustainability

Confirmed Speakers

Alex Greco Director of Manufacturing Policy, Canadian Manufacturers & Exporters (CME)

Lisa Bolton Lawyer, Sherrard Kuzz LLP

Natalia Moudrak Director of Infrastructure Adaptations, Intact Centre on Climate Adaptation

Mark Jasper Senior Specialist, GHD

Barry Weintraub Partner, Rueters LLP

Matt Schroeder Senior Environmental Engineer, Dragun Corporation

Christian Richter President, The Policy Group, Washington D.C. and Director, NASF

Stephanie McCallum Environmental Compliance Coordinator/Government Relations, KEI/CASF

Who Should Attend?
Business owners, supervisors, managers, continuous improvement and environmental systems personnel, sustainability managers, and employees, consultants or professional service providers responsible for reducing costs and liabilities through innovative surface finishing technologies.

CASF
Canadian Association for Surface Finishing

effluent water quality.

The clarifier uses mechanical liquid and solid separation to remove a continuous flow of incoming sediments. The solid particulates or suspended solids are removed from the liquid for clarification or thickening. The clarified water is often discharged, and the concentrated sludge is hauled away or dewatered. The solids concentration that is removed from the wastewater reduces the volume and ultimately tons of water weight for liquid disposal. ALAR recommends sludge-settling clarifiers for high liquid volumes and low percent solids. Concentrating the solids could help decrease capital and operating costs for dewatering equipment such as the Auto-Vac Rotary Vacuum Drum Precoat Filter, the company says.

TTX Environmental wastewater treatment systems recycle cleaners, neutralize acids and alkalis, precipitate metals, detackify paints, clarify output water, and concentrate solids for disposal. Systems can be operated on a batch or continuous basis, depending on volume.

TTX Environmental uses wastewater minimization technologies and process bath reclamation to help bring facilities into compliance with federal, provincial and local discharge standards. The company focuses exclusively on water and wastewater treatment products, paying close attention to changing regulations and new environmental concerns. Engineers from TTX Environmental evaluate the wastewater stream before recommending the best wastewater system for the customer. A wide variety of modular system components are easy to install and provide flexibility for future expansion including reverse osmosis, deionization, filter presses, clarifiers, mixers, pump

Penguin 30-inch filter housing.

TTX Environmental reverse osmosis unit.

skids, iron removal units, and water reuse units.

The TTX Environmental reverse osmosis (RO) units, for example, generate pure water for use in nearly every process and have the ability to separate dissolved solids from water. Commercial RO systems can be installed nearly anywhere due to their small footprint and 115V, 20 amp power requirement. Industrial units prevent scaling when used as a medium in heat exchange functions, automatically compensate for temperature and integrate a chemical feed system for antiscalent and chlorine reduction. Commercial units are rated at 77 F and in industrial units are rated at 45 F. All TTX Environmental reverse osmosis units require minimal operator oversight.

Filter Pump Industries has been offering metal finishing and fluid management systems for more than 40 years. Products include high-performance pumps, filter systems and filtration media manufactured in the U.S.

The company says its stainless steel filter systems offer durability and corrosion-resistance across a wide variety of industrial and commercial applications. Constructed from 304SS or 316SS, the housings can either accept cartridge or bag filters as needed for varying specifications. Filter Pump SS Filter Systems feature a band clamp closure that makes cartridge/bag change-outs quick and easy.

The vertical sealless pump series PSS is offered along with horizontal centrifugal pump with single seals or optional "HK" Double Seal arranged with a thermal transfer oil-filled seal chamber where oil lubricates and cools the mechanical seals. The "HK" feature eliminates continual flush water from entering the waste stream. The pumps' seal expansion chamber provides a cavity with an air space to expand into during the pump operation. The units are available with silicon carbide stationary seats for improved hardness, wear resistance, and superior thermal properties compared with older ceramic components.

Dealing with toxic effluent is a necessary expenditure of the business. Available technologies broaden each year, though, and working with a partner to select the right ones for your business can offer surprising economies in wastewater management. ■

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Publisher & Sales
Pete Wilkinson
1-705-296-3030
Mobile: 1-416-428-7838
pete.wilkinson@cfcm.ca

Associate Publisher & Sales
Gillian Thomas
1-416-277-1269
gillian.thomas@cfcm.ca

Editor
Theresa Rogers
1-416-201-1975
theresa.rogers@cfcm.ca

cfcm.ca

Off-road Liquid Coatings Market IN NORTH AMERICA

By Radhika Poshakwale

TO OUTSIDERS, the coatings industry might seem like a small sector, with a limited role to play in the automotive and construction verticals. The growth of the coatings industry is also assumed to be sluggish as compared to the ever-advancing automotive and aerospace segments. However, the coatings industry is a hidden giant which has been witnessing steady growth and is further set to grow at a remarkable pace in the coming years.

Practically, coatings are applied in a vast number of industries. Several varieties and forms of coatings and paints are applied in end-use segments such as industrial components, construction, automotive and transportation, and heavy machinery, among others.

Industrial coatings are one of the most prominent and innovation-driven segments in the global coatings market. Practically, industrial coatings are thin films deposited on components and materials, to enhance the properties of the material, such as wear resistance, corrosion resistance, and increase conductivity. Industrial coatings are being applied to numerous industrial components such as piping, tanks, wood panels, paperboard, and finished assemblies such as vessels, trucks, and aircraft. Apart from applying paints and coatings to the exterior surface, they are also applied to the internal components for enhanced durability.

Given the vast range of machinery/components used in the industrial sector, a wide variety of paints and coatings, in different forms, is applied in order to suit the component requirement. Industrial coatings can be classified into a number of categories depending upon their formulation and application. The industrial coatings segment is comprised of different chemicals and resins, which are applied based on their properties and the component requirement. Acrylic and alkyd resins are among the most common category of coatings. Aluminum coatings, ceramic coatings, epoxy, fluoropolymers, polyurethanes, silicone, silver, zinc, glaze or glass coatings are examples of some of the most frequently used resins/chemicals used for industrial coatings.

Industrial coatings is large segment including several formulations of coating such as lacquers, liquid paints, powder coatings, thermoset coatings, thermoplastic coatings, preparatory coatings (primers), sealers, stains, and varnishes. This article is focused on liquid paints and coatings used for off-road applications in the ACE sector (Agriculture, Construction and Earthmoving equipment).

AGRICULTURE

The advent of industrialization has impacted and evolved almost every industry, including the traditional agriculture industry. The agriculture sector has evolved to large-scale farming with the development of agriculture machinery and modern equipment. As agriculture machinery is subjected to constant exposure to external environmental conditions along with wear and tear, coatings for these machines are specifically designed for withstanding these conditions. Agriculture equipment is prone to face stains, chemical attacks, abrasions, temperature fluctuations, and warping. Liquid coatings protect the machinery or equipment from wear and tear, thereby increasing the active lifespan and achieving greater productivity. Fluctuating temperatures can lead to rusting of the machine, ultimately leading to premature deterioration of the machinery. Industrial coatings are a necessary element to protect the machine.

Apart from weather protection, fertilizers and pesticides can also cause corrosion to the machinery. Liquid coatings make it easier to clean the equipment and prevent the machine from harboring grease and mud. Liquid coatings for these purposes are specifically formulated which can stand up to daily scratches and nicks from trees and rocks. Overall, liquid coatings hold significant importance to the agriculture industry.

In North America, the number of farms has been on a decline, although the size of farms has increased over the years. According to the U.S. Department of Agriculture's 2017 census, the total number of farms in the U.S. declined 3% from 2012 to 2017, however the average size of farms was 441 acres, up from 434 acres in 2012. The number of large and small agriculture operations has increased, whereas middle-sized farms declined.

A similar trend has been observed in Canada. The total area under farm decreased 4.1% in 2011 from 2006, which was a reported 160.2 million acres in 2011. Despite the decrease in farm size, the average size of farms increased 6.9%, from 728 acres to 778 acres in 2011.

This is one of the key indicators of the rise of corporate

Area Harvested Under Agriculture Statistics in Canada, by Crop Type

Area harvested by crop type (kha)	2016-2017	2017-2018
Grains and Oilseeds	24,618	26,337
Pulses and Special Crops	4,377	3,897
All Principal Field Crops	28,995	30,233

Source: Agriculture and Agri-Food Canada
Note: kha: kilohectares of land

farming where larger farm area has spurred the demand for bigger and more advanced agriculture equipment. In North America, the agriculture equipment segment is highly consolidated with a handful of companies accounting for significant market share. With the increase in the farm area and corporate farm business, the agriculture equipment industry is set to witness lucrative growth opportunities, thereby propelling the demand for liquid coatings.

With the advancements in agriculture equipment, coating technology for this segment has also evolved significantly. Historically, alkyd and acrylic coatings have been widely used for agriculture equipment such as seeders, tractors, balers, fertilizer spreaders, plowing and mowing equipment and harvesters. With the advancement in the material technology, traditional steel components in the machinery structure have been largely replaced by advanced composites such as dicyclopentadiene (DCPD) and sheet molding compound (SMC) owing to its several benefits such as easier molding, greater visual impact, and cost-effectiveness. As the usage of plastics and composites has increased, innovations to the coating products were also brought to improve the adhesion to the material. Due to this, the use of polyurethane has seen increasing usage in the manufacturing of agriculture equipment. Two-component polyurethane coatings have witnessed several enhancements lately, owing to the development of modern composites. Overall, liquid coatings for off-road applications have significantly developed since the past decade.

CONSTRUCTION

Heavy-duty equipment coatings have to meet several requirements such as cost efficiency, compliance with OEMs and environmental-friendliness. Because of this, waterborne coatings have largely replaced solvent-borne coatings in the past few years. Coating products such as undercoats, topcoats, basecoats, and clearcoats are specially formulated with different resins to fulfill the coating requirement of heavy duty equipment. Global companies

Heavy-duty equipment coatings have to meet several requirements such as cost efficiency, compliance with OEMs and environmental friendliness. Because of this, waterborne coatings have largely replaced solvent-borne coatings.

such as Axalta and PPG are offering 1K and 2K single layer paints that are applicable to small but crucial components such as shock absorbers, plastic parts or gas springs. Axalta's product offerings for the ACE sector include its waterborne product range, PercoHyd, which includes waterborne primers, epoxy primers, and topcoats. PPG's liquid coating segment for heavy duty equipment includes the Spectracron series that offers liquid coating products of different technologies such as quick-dry enamels and two-component epoxy and urethanes. Alkyds, epoxies, and urethanes are some of the prominently used products in coating heavy duty construction equipment.

The construction equipment industry is broadly categorized into earth moving equipment, construction vehicles, material handling equipment, and construction equipment. By far, North America is one of the most valuable markets in the construction equipment industry. Crawler excavators, wheeled loaders, and mini excavators are highly used. Skid steer loaders, compact tracked loaders and backhoe loaders have also witnessed increased sales in recent years. The U.S. is one of the major exporters of construction equipment across the globe, while Canada is the largest export market for the U.S. With the rebound in the construction sector after the backdrop of recession, the construction machinery industry in the U.S. is witnessing steady growth, which in turn, will boost the liquid coatings industry in the region. Overall, heavy-duty equipment coatings are projected grow steadily.

MINING

Coatings required for mining are fairly specific and depend on geological variations. Environmental conditions in underground mining, surface mining and dredging are some of the most extreme environmental conditions known and therefore require liquid coatings that fit accurately. Coatings for mining machinery and equipment also need to be more durable than other end-use industries, thereby reducing unplanned maintenance along with delivering increased productivity. Coatings used in mining machinery exhibit stress and impact resistance, minimal spray dust, and low-temperature curing. Different segments of the mining industry require a unique type of coating. Material handling equipment, mining machinery, and structural steel are some of the key segments of the mining industry which employ various types of liquid coatings depending upon the material and operational requirement.

Canada holds a special place in the global mining industry. Owing to its rich geology, the country is one of the largest mining nations in the world with production of more than 60 metals and minerals. The mining industry contributed $97 billion to Canada's Gross Domestic Product (GDP) in 2017 and the industry accounted for 19% of the value of Canadian goods exports in 2017 [ ]. The mining industry prospects for Canada are projected to be strong in the long term, owing to growth in demand from end use industries. The aim for a low carbon world is also a significant factor boosting the demand in Canada, which in turn, is projected to fuel the related industries, including the liquid coatings industry.

CONCLUSION

The off-road liquid coatings segment is a niche industry that is witnessing significant innovations owing to the rapid advancements in machine structures. Growth in corporate farming is anticipated to fuel the demand for agriculture equipment in North America, while steady growth in residential construction and mining will further boost the demand for off-road liquid coatings in the region.

Canada should witness an incremental growth owing to the significant demand from agriculture and mining. Canada has been one of the most open countries for investments and trade and the presence of a large number of in-demand metals and minerals also helps. Apart from being an attractive spot for investors in mining industry, Canada's construction industry has also been expanding, owing to the increase in commodity or resources, transportation and infrastructure projects. These factors positively influence the related industries, with liquid coatings being one as demand for machineries and vehicles depends on it. Overall, Canada is set to offer lucrative growth opportunities for the liquid coatings industry in coming years. ■

Radhika Poshakwale is research analyst at Adroit Market Research. She has vast experience in the market research of chemicals, coatings and materials and has worked on complex projects in this domain.

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TO ERR IS HUMAN
Automatic Spray Guns To The Rescue!

By Rhys Rajan

THE PRESENT WORLD manufacturing environment is embedded with automation in its processes. This trend of process automation is being spearheaded by small and medium-sized shops/businesses in order to compete with their larger counterparts. The perception that robotic automation is a hefty investment that requires deep pockets has now been sidelined, thanks to the tremendous technological advancements being achieved over the recent years. These advancements have proven automation is accessible, easy to use, and above all, affordable.

Affordability is the major factor that has enabled the transition from manual to an automated process in small and medium businesses. The global stock of operational industrial robots is expected to witness a monumental rise form 2,050,000 units in 2017 to approximately 3,053,000 units by 2020. With the inception of cheaper and easy-to-install robots, the efficiency of U.S. factories is reaching new heights. The soaring number of industrial robots sold globally is a testament to this phenomenon. The global sales of industrial robots in 2017 increased 31% from the previous year and surpassed an astounding 387,000 units by 2018. The annual shipments of multipurpose industrial robots in Canada were more than 3,500 units in 2017.

Industrial automation around the world is receiving tremendous impetus from the sustained research and development being carried out on by industry stalwarts as well as emerging players. Globally, automation was mainly concentrated in the industrial factory and process segments. If we break down the level of automation on the basis of the end user, the automotive industry commanded a lion's share in the global demand for industrial robots where the global sales stood at 125,000 units in 2017. The metal industry stood second, followed by the electrical/electronics industry.

AUTOMATING THE AMERICAN INDUSTRY

The American industrial automation scenario showcases an increasing level of process automation across states. However, the concentration of industrial robots population is in just 10 states in the Midwest and South. The state of Michigan has almost 12% of the country's overall robot population, followed by Ohio and Indiana. Automation is not an alien concept in the U.S., especially in the automobile industry which has been a pioneer in automation since the 1960s. The carmakers progressed to robots to simplify mechanization - General Motors was the first to introduced Unimate, the world's first industrial robot. According to the International Federation of Robotics, U.S. automakers purchase one in two robotic units sold globally. So, what has caused this rapid transition to robots by the U.S. carmakers?

Automobile sales in the U.S. dropped to 17 million in 2017 from the previous year's sale of 17.6 million units. This had serious consequences for the industry, which in spite of being highly effective in manufacturing, is outdated in its selling practices. The U.S. carmakers do not have the capability to produce against the order and instead manufacture cars on the basis of demand forecast. This leads to stockpiling at dealerships and therefore substantial losses for the manufacturers. In order to do away with such discrepancies and bottlenecks in the processes, the industry has resorted to the automation of its process to achieve faster and efficient output. Car manufacturing robots provide a competitive edge to the manufacturers offering improved quality and reduced warranty costs. The car assembly plants primarily use robots for spot welding and painting.

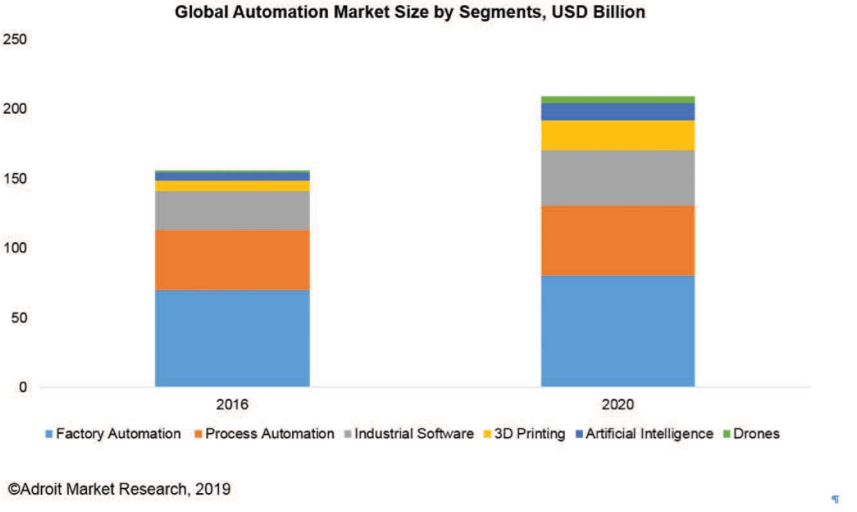
CANADA KEEPING PACE WITH THE U.S.

Canada houses a small cluster of automation companies specializing in a wide array of industry verticals. It is estimated that annually the country's industrial automation sector generates approximately $2 billion (US). Among the provinces, Ontario accounts for nearly 50% of the industrial automation companies, followed by around 23% in Quebec. Ontario is the center for industrial automation due to the large manufacturing base and world class research and development environment. The province's automotive industry accounts for almost 57% of the robots used in Ontario. The automotive industry accounts for nearly 16.8% of the country's GDP. Robotic automation is being used to replace human workers, especially in the painting industry, which has increased productivity. Factory floors with limited floor space have resorted to automatic painting robots which provide the ability to work in close proximity with the help of anti-collision software.

AUTOMATING THE PAINT AND COATING SPRAY PROCESS

The notion that integrating robots into the manufacturing processes is a costly affair has lost steam due to the various benefits to the industrial finishing operation achieved

through automation. These benefits outweigh the costs accrued in installing robotic units, especially in the paint automation processes. The integration of automatic spray guns has provided many benefits, the primary ones being cost reduction, improved quality, increased flexibility, and reduced labor costs. The small and medium industries have many financial aspects to consider before upgrading their manufacturing processes, but with the emergence of advanced technologies and more user-friendly robots, automation has become accessible to these industry segments. The main challenged faced by industries in North America lies in improving the efficiency in their operation and production, as well as mitigating risks and reducing costs. These have resulted in numerous industries across the region to adopt automation in their painting and coating processes.



Robots are programmed to follow a specified path consistently, thus rendering them an impeccable tool for the purpose of painting cars, as well as spraying coatings such as sealants, adhesives and primers. Automatic spray guns attached to the robots help in laying a uniform bead of sealant prior to the assembling process. Conventional spray guns have a low level of transfer efficiency. This results in more wastage of material than its deposition on the targeted part. This situation can be further aggravated if the operator has a poor technique. This is where automatic spray guns can help manufacturers gain an edge in their production processes. Automatic spray guns have high transfer efficiency which helps reduce the consumption of expensive materials. These guns ensure the reduction in overspray and facilitate optimum production courtesy of the regular and reliable spray quantity.

Automatic spray guns come in various types; high volume low pressure (HVLP), low volume low pressure (LVLP), and electrostatic spray guns, among others. HVLP spray guns make use of a compressor for air supply and require low pressure. This results in a larger proportion of paint being deposited on the target surface with minimum overspray and wastage. LVLP spray guns operate at low pressure as well as use a low volume of air when compared to HVLP, and are instrumental in increasing the transfer efficiency. Electrostatic spray guns electrically charge the particles, resulting in an even spreading of the material as it exits the nozzle. This method helps in painting areas that are hard to reach with the other spray gun types.

BRINGING AUTOMATIC SPRAY GUNS TO THE AMERICAN MARKETS

DeVilbiss, for example, manufactures low pressure automatic and manual spray guns as well as related spraying accessories for the industrial finishing markets. The company is widely recognized for the first "Compliant" spray guns, which significantly reduce overspray and volatile organic compounds (VOCs) into the environment. The AG-360 series automatic spray guns are water solvent

DeVilbiss parts.

borne compatible and ideal for robotic and machine applications. These guns come with a Quick Clean gun body coating for easy cleaning.

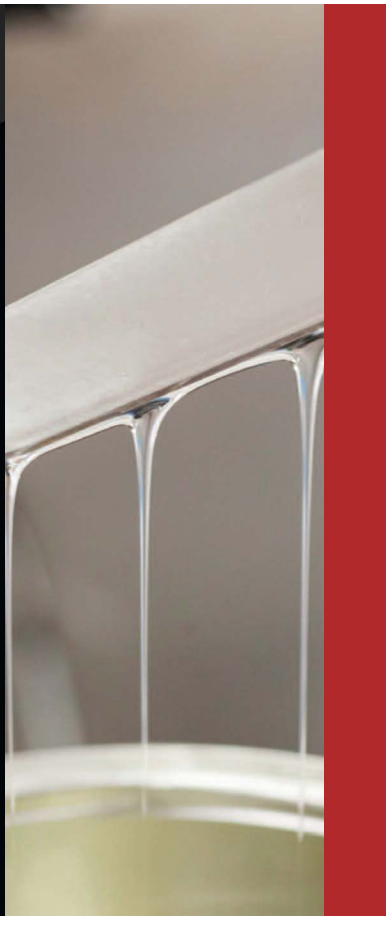
Ransburg, specializes in designing, manufacturing, and marketing of automatic and manual electrostatic finishing products, offering solutions to key automobile manufacturing and industrial market. The company's ESTAQUICK and AEROBELL 168 guns deliver Class A finish as well as reduce VOC emissions by providing atomization and transfer efficiency.

WHAT LIES AHEAD?

There is little merit arguing automation when compared to conventional spray guns, especially in the automotive industry. Painting is a very complex process and painting robots are built differently from the standard robots. These robots have explosion-proof arms which allow them to safely spray coatings which possess combustible gasses. The integration of automated spray guns offers numerous quality benefits in terms of consistency across all the production lines. The benefits are numerous, but the adoption process is expedited due to advancements made by industry pioneers. The automation ecosystem is expected to further advance from the progress achieved in related technology such as Artificial Intelligence. Overall, as technologies advance and ownership costs recede, robotic coating and painting are expected to spread across various industry verticals which aim to minimize their costs via reduced overspray and VOC emissions. ■

Ransburg Aerobell 168 Rotary Atomizer.

Rhys Rajan is a research analyst working with Adroit Market Research. Having secured a master's degree in Economics, he specializes in providing insights in the chemicals and materials, paints and coatings, and consumer goods domain. He is also an avid follower of the trends driving automation among varied industry verticals.



Choosing a Spray Booth and Filtration System

A large equipment, pressurized side downdraft spray booth from GFS.

A SPRAY BOOTH AND FILTRATION SYSTEM seems easy enough, but appearances are often deceiving. A spray booth is basically a box, yet proper design from the outset will set the tone in ensuring your needs are properly met and money is not wasted.

The sole purpose of a paint booth is to establish a controlled environment in which to complete finishing.

Callum Gilchrist, owner of Core Spray, a distributor of Global Finishing Solutions (GFS) booths in Ontario, recommends customers design their booths based on 90 percent of the work they expect to do. He helps customers consider their building design, layout, and what finish they're trying to achieve.

"If I'm talking to a customer, I'm going to look at the product that they're painting, unless it's a car or something where you know they want an automotive booth and where those booth dimensions typically stay the same."

Industrial clients represent approximately 95 percent of Core Spray's business. Prices range from less than $10,000 for a small booth to hundreds of thousands for a railcar booth.

Once Gilchrist has determined the client's finishing needs, he will visit the client site to look at processes. How will the product be transported in and out of the booth (cart, crane, etc.)? He asks questions such as how high is the roof of the facility, where should the booth be situated and what is the finishing requirement? A mining client, for example, will not be looking for high-end finishes like an auto finisher will.

GFS categorizes booths into various categories: automotive, dry filter, general purpose, large equipment, aircraft, recirculating, water wash, and by desired airflow (downdraft, side downdraft, semi-downdraft, and crossdraft). The airflow designs can then be pressurized or non-pressurized.

Aside from the end use product, deciding what you need is also based on your facility.

Gilchrist says the most popular type of booth is a crossdraft. With a non-pressurized version, there are doors on the front of the booth, while the air comes from the cus-

Spray Booth Shopping? 7 Questions to Ask

Answer the follow questions to make the best-informed decision about a new spray booth:

1. Does the spray booth meet your company safety policies? Fumes from most paints, thinners and coating materials are always a concern for an employer. Ensure your new spray booth will meet Canada Safety compliance issues. Fumes must be vented out of the spraying area, lowering the risk of fire hazard.

2. Does the spray booth meet your Worker Safety Compliance? Training is always key. Booth sprays are a controlled work environment and work flow area. Better equipment keeps your HR happy. Happy workers equal happy customers. You can look at options and upgrades when purchasing your new spray booth. You want to make sure that your spray booth is well lit and provides optimal visibility to the operators and painters.

3. Does the spray booth allow you to produce a quality product? A spray booth carries volatile fumes and paint overspray away. This means the possibility of costly overspray damage to already sprayed products is reduced. At the end of the day, this helps you produce a better quality product.

4. Are we reducing our environmental footprint? If your goal is to help reduce ozone emissions, then a good booth spray can do this for your eco-conscious company. Keeping the fumes contained and vented properly contributes to more fresh air in the environment, as well as the health and well-being of the painter.

5. Are we increasing productivity and profits? By reducing disposal costs, cleanup times, painting cycles and faster curing, you are increasing your ROI.

6. Can our supplier offer us high-quality spray paint-line products?

7. Can your supplier meet your timelines?

Source: Core Spray

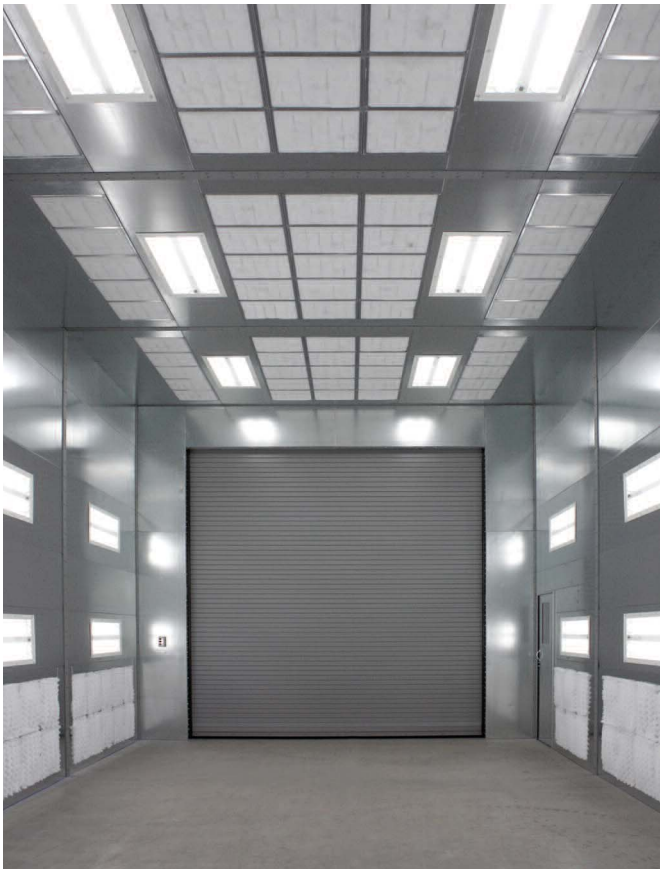
tomer's building and runs through the filtered doors. This means the air coming into the booth is clean and exits through the exhaust filters at the other end. "The filters pick up all the overspray for the removal of VOCs so it's not exhausted into the atmosphere," he adds.

With a side downdraft booth, there are multiple exhausts located on the sides of the booth along the floor. "The air comes in from the ceiling, goes down and then out the side walls but now you've got your plenums outside so the footprint is bigger," Gilchrist says.

A full downdraft booth is typically seen in an industry where the profile of the product being painted stays similar, such as vehicles with similar profiles. "If you're going to paint a car with a downdraft and then the next thing is to wheel in a cart with all these widgets on it, your air is going to be all over the place," Gilchrist says.

DIMENSIONS ARE CRITICAL.

For example, one of Core Spray's clients in Timmins needed a booth for painting structural steel I-beams. "He wanted a 30-ft wide booth by 12-ft high," says Gilchrist. "He wanted to be able to pick the beam up with a forklift, drive it in and paint it." After doing the calculations for the air exchange system based on those booth dimensions, Gilchrist was able to save customer thousands of dollars by suggesting the product enter the booth end-first, so the booth did not need to be as wide. "It doesn't matter how long the booth is. The airflow won't change. It's the width



Interior pressurized side downdraft spray booth from GFS.

and height. So knowing dimensions is crucial because at the end of the day it's all energy and that costs money," he says.

Filter changes are entirely dependent on how an operator paints, the triggering of the gun, and what type of equipment they're using.

By NFPA 33 code, however, all booths must have a visual or audible means of measuring filters. Some will have a pneumonitor gauge, which provides a good visual. "As the filters load up with paint and overspray, that static pressure increases, that liquid moves higher and the indicator tells you when you should change them out," Gilchrist says. "But usually the painters have a good understanding of their booth and they know when they want to change the filters out."

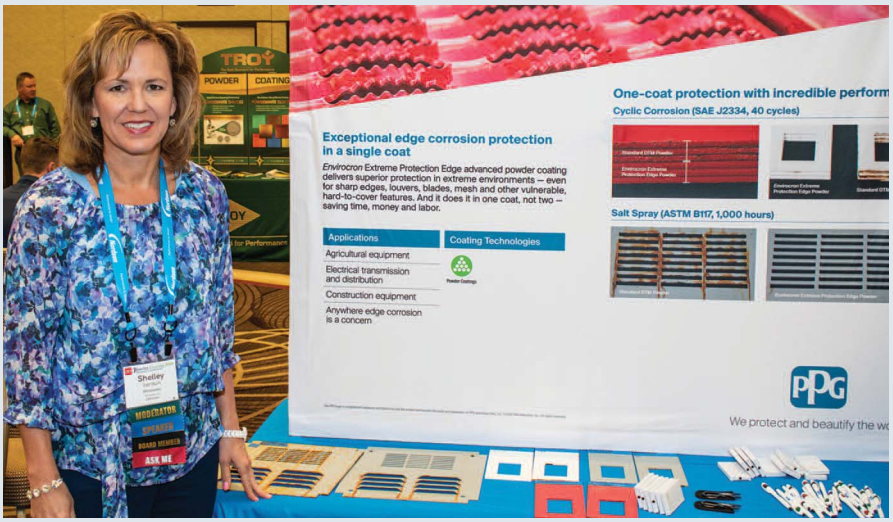
Gilchrist says the entire finishing industry is working in concert to waste less material, increase energy savings, produce more environmentally friendly consumables, and increase product throughput. It benefits everyone.

"It's the whole industry. It's all about conserving energy, increasing safety and having that controlled environment to do your finishing. It's a win-win." ■

Powder Coating 2019

PCI's Powder Coating 2019 included powder coating workshops, a custom coater forum, and two-day technical conference and tabletop exhibition. Attendees enjoyed a great week of education and networking in Orlando in April. Mark your calendars for Feb. 17-20 in Orlando.

Photos: Theresa Rogers

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Innovation IN PIGMENTS

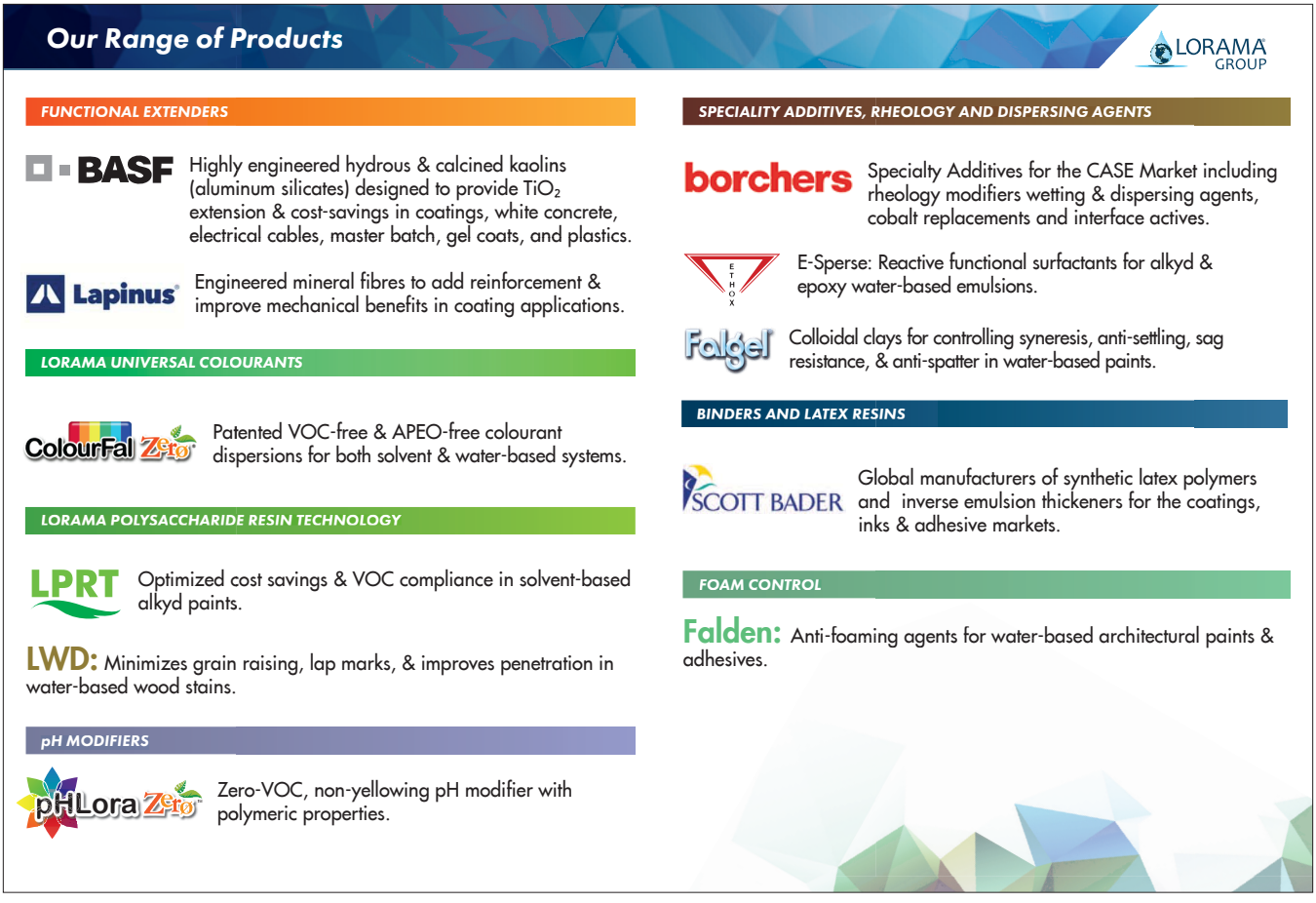
THERE ARE SO MANY great quotes about color. And why not? Color can directly affect our thinking, change actions, and cause reactions. It can irritate or soothe the eyes, raise blood pressure or suppress an appetite, and say volumes about personality. When used in the right ways, color can even decrease energy consumption.

Achieving colors is both art and science and a never-ending flow of new products and formulations is proof of the multitude of choices available to manufacturers.

Dominion Colour Corp (DCC) makes pigments for the coatings, plastics and ink industries worldwide. New products are always developed to create efficiencies and value for customers, the company says. Its range of Bismuth Vanadate pigments, designed and synthesized over the last few years, is more opaque and result in better hiding power. This means the user can obtain fuller hiding in their coating application whilst using less paint, which ultimately saves on costs.

"At the same time, we were able to increase their color strength and cleanliness of shade, which means our customers can incorporate less pigment into their application and still obtain the same color strength, which again, generates value in use," says Dr. Bruce Howie, Global Product Marketing Manager. This also has a positive impact on the environment as DCC ships less material, resulting in less packaging waste, as well as less labor and fuel costs.

"We are also developing more organic pigments due to the increasing demand for these highly chromatic products with intense shade and strength characteristics," he adds. "Innovation is crucial to the success of our company to stay ahead of our competitors so we are always trying to improve the technical performance of existing products,



Orion Engineered Carbons' COLOUR BLACK FW310 is used for automotive basecoats, refinish coatings and high-end industrial applications.

while also introducing completely new technologies."

Howie says DCC has taken considerable measures to ensure that its pigments are environmentally friendly, while also meeting sustainability requirements to improve the company's carbon footprint. "Over the last year we've taken significant strides toward this goal. We've decreased our air emissions, our electricity consumption, our heavy metal waste [by 50 percent], eliminated lead nitrates in our effluent treatment system, and so much more."

Jake Jevric, VP at Lorama, says environmentally friendly, true Zero VOC performance is the standard the company lives by, adding, its patented SmartTint™ was Lorama R&D department's response to the application and environmental challenges posed by customers.

Lorama's ColourFal Zero™ liquid colorant dispersions were designed to provide superior compatibility and performance across a variety of coating applications and exterior environments. "The selection of pigments is a crucial step as they must work synergistically with our patented SmartTint technology to provide the expected superior performance that is synonymous with ColourFal Zero colorants across 52 countries," he says. "The SmartTint chemistry is patented as it's truly unique in the industry, merging bio-based environmentally friendly

DCC has taken steps to ensure its pigments are environmentally friendly.

components with organic and inorganic pigments to produce a cost-effective colorant that can withstand the harshest exterior durability requirements."

Late last year, Engineered Polymer Solutions (EPS) and Color Corporation of America (CCA) launched NovoColor Superfine (SF) waterborne dispersions for in-plant tinting of coatings and stains where a high degree of color transparency is desired.

Jon Remissong, CCA's Global Commercial Director, says, "The launch of the NovoColor SF line again demonstrates our long-term commitment to offering new and unique compliant technology to our customers and the industry. By developing colorants and resins that work together to optimize performance, we are supporting our customers' needs both now and in the future."

Key Features of NovoColor SF include: high transparency; non-resinous; ethylene and propylene glycol-free; lightfast and durable; compatible in a wide range of waterborne coating systems, including acrylic emulsion and water-reducible alkyd stains; and a wide range of pigment choices to meet coating systems requirements for durability, chemical resistance, and color space.

NovoColor SF colorants were developed for use in a variety of architectural and industrial coatings formulations, as well as wood stains, concrete stains, deco foil, inks and glass coatings.

In January, UL Environment awarded its UL GREENGUARD Gold Certification for the NovoColor® HP II 8600 line of waterborne pigment dispersions specifically engineered for use in architectural and waterborne industrial coatings systems to help customers meet stringent VOC restrictions.

A new product from ECKART is its EDELSTEIN Topaz Orange, which the company says "enriches the newly introduced EDELSTEIN portfolio by the highest chroma in the orange space available on the worldwide market so far."

The synthetic pearlescent pigments are based on layered silicates and on patented coating technology. Both Topaz Orange and the existing EDELSTEIN Ruby Red shade combine strong color intensity with excellent chemical and shear stability. ECKART says it saw a market demand for higher chroma earth tone pigments therefore created the high-intensity Edelstein Ruby Red and Topaz Orange shades.

EDELSTEIN products can be used in extrusion, injection molding, blow molding, blown film and cast film, and are also suitable for all kind of plastics. They are easy to formulate with and incorporate well into all types of coating systems. They exhibit superior sheer stability, durability, chemical resistance and weatherability so their uses are limitless for coatings. They additionally have humidity resistance, outstanding intercoat adhesion as well as ideal optical performance – including with pneumatic and electrostatic application techniques. They have unique chromacity, colour intensity, with powerful sparkle and gloss which is desired by designers in many different fields.

Chromaflo Technologies introduced a host of new technologies at the European Coatings Show in Nuremberg in March.

It introduced volumetric tinting of solid colorants with

Colortrend Pearls 2020®, a solid colorant concept consisting of 11 colorants for waterborne architectural and industrial applications. The technology is biocide-free and can be volumetrically dosed due to the narrow particle size distribution of the product. "We are continually looking for ways to meet specialized requirements of our customers and address the ever-changing regulatory environment," says Holger Spieckermann, Vice President & Managing Director EMEA. "Colortrend Pearls 2020 is an exciting step forward for specific applications in volumetric tinting and we are pleased to be introducing the concept at the ECS."

The latest version of Innovatint was introduced, as well as a greater range of colorants for in-plant tinting. The new Solvasperse™ IND line, designed specifically for industrial, in-plant tinting systems is a versatile tinting solution that meets the demanding performance needs of industrial coatings. Chromaflo also introduced a range of toners to enhance the appearance of final coatings that require a clean, visually pleasing shade of white. The Tint-Ayd® Toners range can be used to reduce yellowness or increase hiding power, depending on the desired effect on the white product.

Colorants that enhance performance are also a big theme in the market. Chromaflo now has high jet black colorants available in the Temacolor™ T and Temacolor HP colorant ranges. The colorants deliver high jetness with bluish undertones that can be used in a wide range of industrial applications with tough performance requirements. Chromaflo's Temacolor W and Chroma-Chem® WAB are excellent solutions for industrial waterborne applications, performing consistently and reliably in diverse end-products.

Finally, the company has changed the biocide package used in its waterborne colorants, ahead of regulatory changes concerning methylisothiazolinone (MIT) in the EU. The company says all of its waterborne colorants will be based on the new biocide package with MIT levels <15ppm as of January 1, 2020. And in cooperation with raw material suppliers, the goal is for all colorants produced as of May 1, 2020, to be completely MIT-free.

From market trends to end user applications to regulations, it clearly takes an entire supply chain to push the envelope of color science and innovation. ■

DEVELOPMENTS IN WATER-BASED 2K FEVE COATINGS FOR APPLICATIONS REQUIRING Ultra-Weatherability

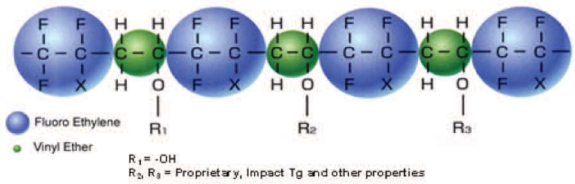
By Donald C. Lawson III

FLUOROETHYLENE VINYL ether (FEVE) resins were developed in Japan in the late 1970s and entered the commercial market there in 1982. FEVE resins are amorphous A-B type copolymers with repeating units of fluoroethylene and substituted vinyl ether. Unlike pure fluoropolymers, FEVE resins are soluble in solvent due to the vinyl ether groups. Solvent solubility transforms FEVE resins from high-performance polymers into high-performance backbone resins for paints and coatings.

Fluoropolymers, like PVDF (polyvinylidene fluoride) were used in paints prior to the introduction of FEVE resins to the market. In fact, PVDF resins are still used widely today. In order to utilize these more traditional fluoropolymers, like PVDF, in liquid coatings, blending with other resins such as acrylics is needed. Special solvents are required to solubilize the blends, and ultimately heat is used to help the system flow and form a thermoplastic coating film. In contrast, the FEVE polymer was designed to have inherent solubility in conventional, widely used solvents via vinyl ether monomers. The chemistry of the FEVE polymer also is fully amorphous, unlike the PVDF-acrylic systems that are semi-crystalline. This amorphous morphology allows FEVE resins to form films without heat. The implication of this property is considerable. The introduction of FEVE fluoropolymers to the coatings industry brought extremely durable fluoropolymer coatings out of the factory and into the field.

The fluoroethylene groups are the strength of the FEVE resin. These groups are what make this class of polymers so resistant to UV degradation. The C-F bond is strong. The energy of this bond is ~486 kJ/mol2, while the energy of UV radiation at 300 nm is ~399 kJ/mol. The alternating pattern, shown in Figure 1, is critical for the extreme UV resistance properties. The chemically stable and UV resistant fluoroethylene unit sterically and chemically protects the neighboring vinyl ether unit.3

Figure 1. Alternating Structure of FEVE Resins



The vinyl ether groups make FEVE polymers useable as resins for paint. Without the vinyl ether groups, FEVE resins would not be soluble in solvent. This solubility is what allows FEVE resins to be used in a wide array of coating formulations that can be applied in factory or field settings.4 The vinyl ether groups also contribute to high gloss and allow for functional groups, like hydroxyl groups, to be incorporated into the structure. Table 1 below shows typical properties of FEVE resins.

Table 1. Typical Properties of FEVE Resins3

Fluorine Content	25-30 wt%
OH Value Range	47-170 mg KOH/g
COOH Value Range	0-15 mg KOH/g
Molecular Weight	M_w = 15,000-1,000,000
T_g Range	T_g =20-50°C
Structure	Amorphous
Solubility (Fedors, calculated)	8.8

Weathering tests have shown that coatings based on FEVE resins have superior performance. This data has been discussed extensively in a previous study.1,3

Figure 2. QUV Exposure of an FEVE-Based Coating

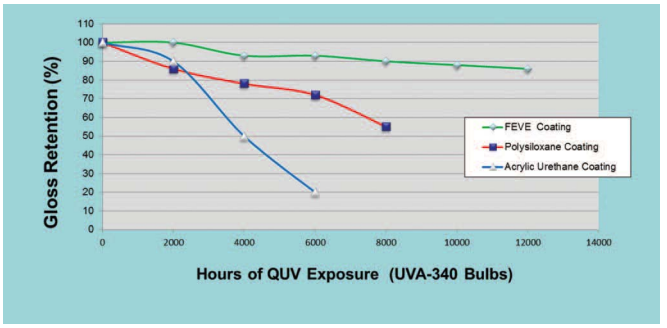


Figure 3. EMMAQUA Exposure of an FEVE-Based Coating

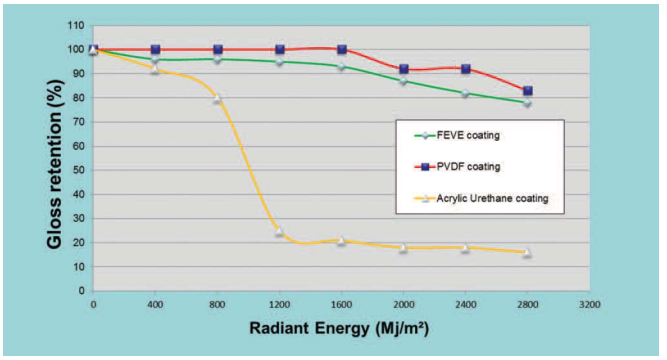
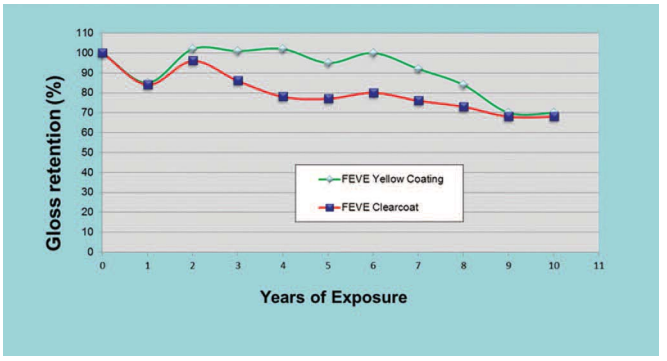


Figure 4. South Florida Exposure of an FEVE-Based Coating



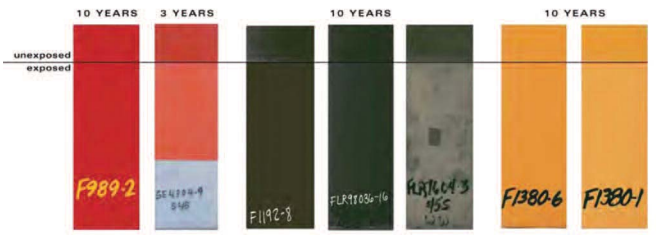


Figure 5. A Comparison of Various Coatings in South Florida Exposure

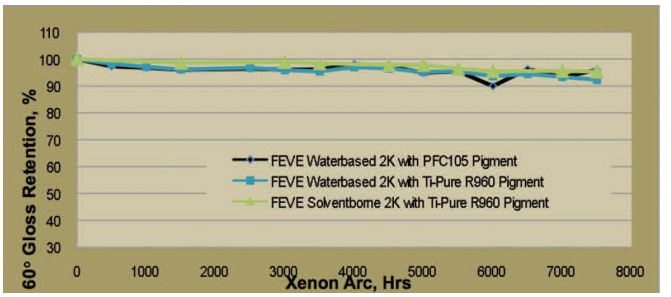


Figure 6. Xenon Arc Exposure of Water-based FEVE Coatings

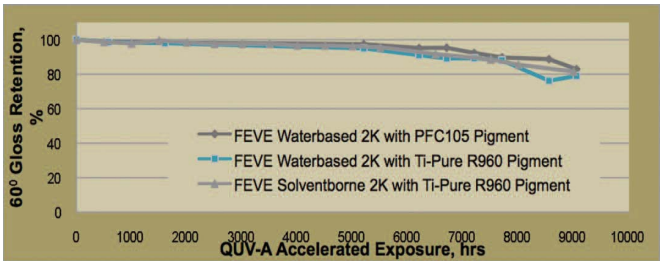


Figure 7. QUV-A Exposure of Water-based FEVE Coatings

Water-Based FEVE Resins for Highly Weatherable, Heavy-Duty Coatings

Weathering testing has shown that 2K water-based coatings based on FEVE resins perform comparably with solvent-based 2K FEVE coatings. As VOC regulations continue to tighten, the demand for heavy-duty water-based coatings will rise. The results of South Florida testing illustrate the high level of performance that can be achieved with FEVE 2K coatings.

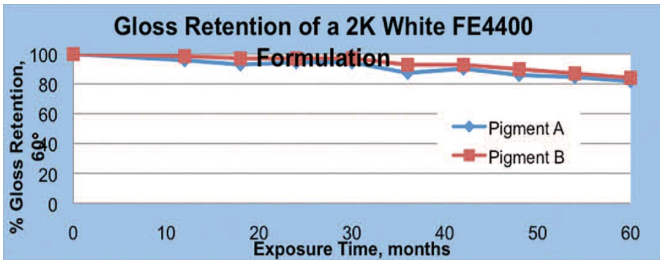


Figure 8. S. Florida Exposure of a 2K Coating Based on an FEVE Emulsion

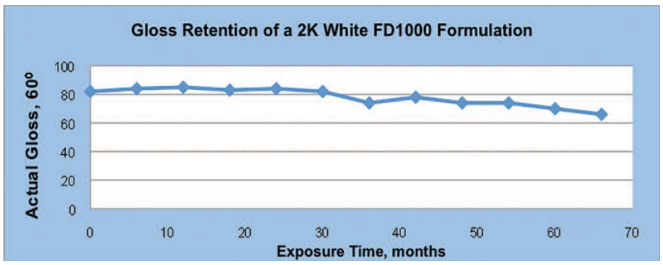


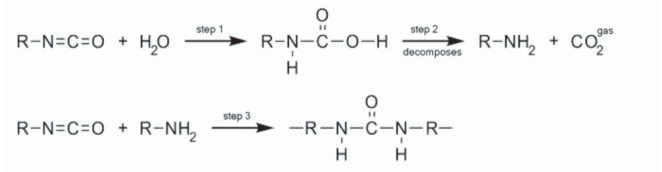
Figure 9. S. Florida Exposure of a 2K Coating Based on an FEVE Dispersion

Formulating 2K water-based coatings is a challenge because of the competing reactions of polyol with NCO and water with NCO.

Equation 1.

The reaction between water and polyisocyanate can result in the formation of polyurea instead of polyurethane. The equations below illustrate the reaction mechanisms involved.

Equation 2.



Another issue resulting from the reaction of water with polyisocyanate is the formation and evolution of carbon dioxide gas. If this occurs, it tends to happen throughout the pot life of the coating. This results in initial applications that appear nice but subsequent applications that may appear hazy. In severe cases, the gas bubbles can actually be seen with the naked eye.

Several approaches are available to overcome these challenges. One method is to use increased levels of polyisocyanate, often called over-indexing. The theory is that enough NCO will be available to react with water and the polyol. Another, less common approach is to use catalysts specifically designed for water-based 2K systems.

Previous work showed the results of both of these approaches. The results yielded excellent weathering and corrosion resistance, but limited MEK double rubs. This indicated that the cure of these systems might not be optimal. A study (see Figure 10 below) was designed to better understand the factors affecting performance in MEK double rubs. The results suggest that many factors impact performance in this test.

Figure 10. Design Matrix for MEK Double Rub Study

Formulations were made and MEK double rubs were tested over the course of the pot life of each system. Analysis of the impact of NCO:OH index and the presence of catalyst were performed first.

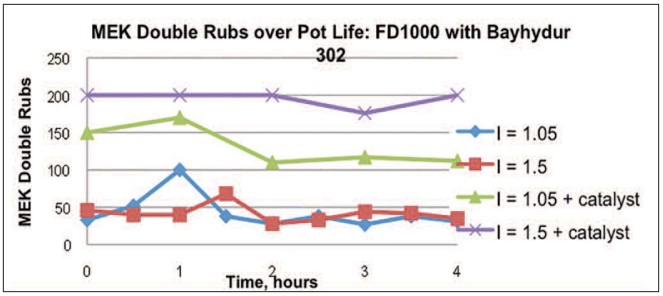


Figure 10b. MEK Double Rubs of an FEVE Dispersion with an HDI NCO

The graph in Figure 10b shows clearly that the addition of catalyst significantly improves MEK double rubs. An increase in index makes a difference in combination with catalyst but not alone. This was seen in a study done previously1 with the FEVE dispersion, shown in Figure 11.

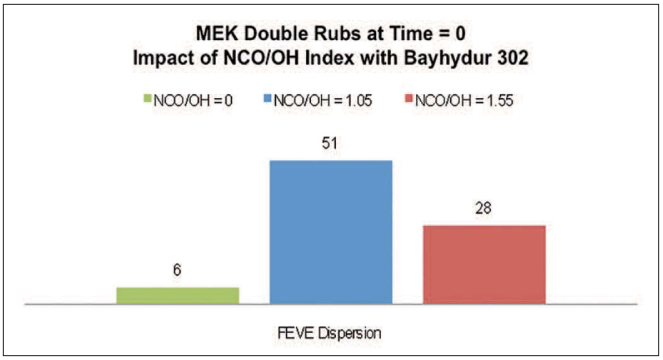
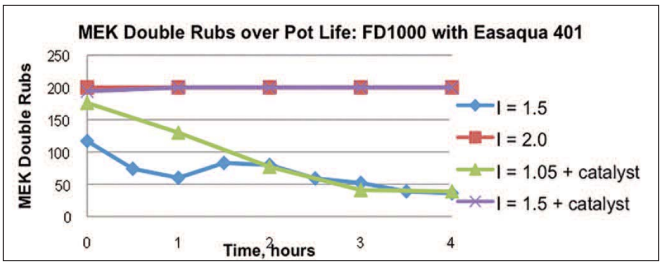
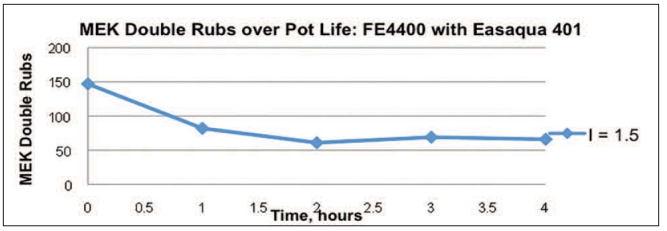


Figure 11. MEK Double Rubs of an FEVE Dispersion as a Function of NCO:OH Index



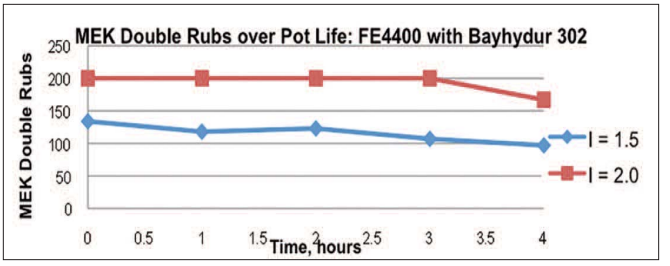
When testing the FEVE dispersion with a different isocyanate, the impact of NCO:OH index seems more critical than the use of catalyst (Figure 12).

Figure 12. MEK Double Rubs of an FEVE Dispersion with an HDI/IPDI NCO



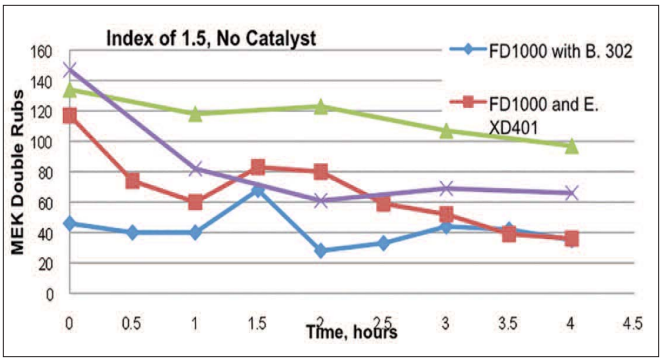
Similar tests were done with the hydroxyl functional FEVE emulsion. The emulsion in combination with EasaquaTM XD401 had slightly better initial MEK double rubs but followed a similar trend as the FEVE dispersion with Easaqua XD401 over the course of the 4-hour pot life study.

Figure 13. MEK Double Rubs of an FEVE Emulsion with an HDI/IPDI NCO



The FEVE emulsion fared much better with the Bayhydur® 302 isocyanate, even surpassing the FEVE dispersion with Bayhydur 302.

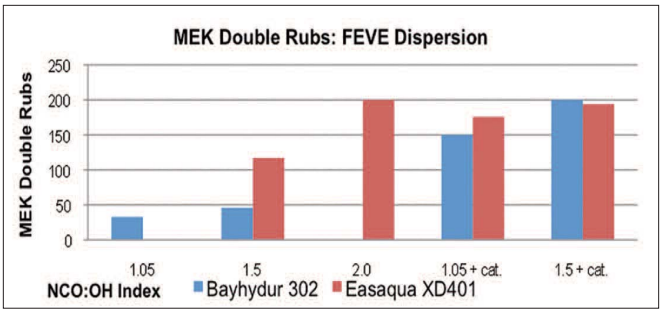
Figure 14. MEK Double Rubs of an FEVE Emulsion with an HDI NCO at Two Different Indexes



The previous analysis of the data looked at the impact of index and catalyst. In Figure 15, the impact of resin chemistry is reviewed at a constant index without catalyst.

Figure 15. MEK Double Rubs as a Function of Formulation Chemistry at an Index of 1.5

The results indicate that all systems, save the FEVE dispersion with Bayhydur 302, have respectable initial MEK double rubs. However, over the pot life, the FEVE emulsion with Bayhydur 302 clearly outperforms the other systems.



The previous analysis showed the results of MEK double rubs over the course of the pot life. The results of the FEVE dispersion with Bayhydur 302 raise the question of whether an appreciable "sweat in" time is needed in the uncatalyzed systems because the highest MEK double rubs were not always seen initially but after 30 minutes to an hour of pot life. This was not the case with the FEVE dispersion with Easaqua XD401 or with any of the emulsion systems.

It is important to note that the FEVE dispersion formulations did not require cosolvents, while the FE emulsion formulations did require cosolvents due to the higher Tg of the emulsion. It is also worth noting that the Easaqua XD401 is 85% solids in solvent while the Bayhyur 302 is 100% solids. It is possible that the systems with cosolvent are very stable and well blended immediately after mixing, while the FEVE dispersions without cosolvent need time to blend well post-mixing. This needs to be studied further.

Common practice is to study degree of cure using MEK double rub testing right after mixing. The following graphs show the performance of all the systems at time zero. In Figure 14 the clear trend is that increasing index and the use of catalyst significantly improves initial MEK double rubs with the FEVE dispersion. In Figures 16 and 17 the trend of increasing index improving performance follows with the FEVE emulsion systems.

Figure 16. MEK Double Rubs at Time = 0 for an FEVE Dispersion

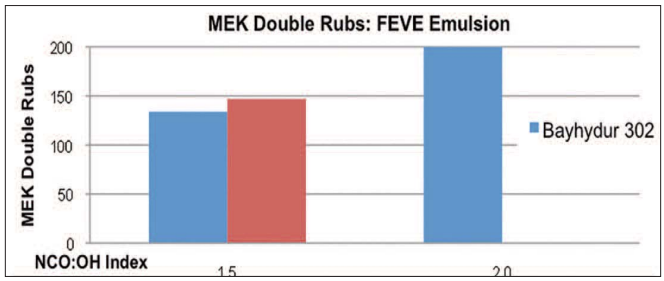


Figure 17. MEK Double Rubs at Time = 0 for an FEVE Emulsion

Table 2 shows the formulation used for the FEVE dispersion followed by the properties of that formulation.

The aforementioned study shows that crosslinker, index, catalyst and possibly cosolvent level impact performance in MEK double rubs. All systems tested in this study have been put into QUV-A and Xenon Arc accelerated testing. Heavy-duty coatings used on metal substrates must also prevent corrosion; therefore, the formulations tested in this study are also being analyzed by EIS spectroscopy to determine barrier properties that are indicative of likely performance in corrosion testing. A physical property testing is also in progress.

SUMMARY

FEVE fluoropolymer resins offer ultra-weatherability to solvent-based and water-based coatings. As VOC regulations continue to increase, the need for heavy-duty, water-based coatings also increases. However, formulating water-based 2K coatings presents many challenges. Though the results of accelerated and real-world, South Florida exposure testing were excellent, early analysis of degree of cure as measured by MEK double rubs was concerning.

Unlike the high levels that typical, high-performing solvent-based 2K coatings exhibit, preliminary testing of water-based 2K FEVE coatings were lower. Heavy-duty coatings for metal substrates need more than weatherability; they also need corrosion resistance. A better understanding of the factors affecting the cure in water-based 2K

Table 2. 2K White FEVE Dispersion Based Formulation at an Index of 2.0

Trade Name	Type	Parts by Weight
LUMIFLON® FD1000	FEVE Dispersion	28.66
Surfynol® 465 (Air Products)	Surfactant	1.34
Disperbyk® 190 (Byk)	Dispersant	2.27
Surfynol® DF75 (Air Products)	Defoamer	0.37
Byk® 024 (Byk)	Defoamer	0.37
Optiflo® H 3300 VF (Byk)	Defoamer	0.86
Tipaque® PFC105 (Ishihara)	TiO_2 Pigment	18.96
Total		52.8

Part A: *Add all ingredients under agitation*

Trade Name	Type	Parts by Weight
LUMIFLON® FD1000	FEVE Dispersion	28.67
White Dispersion	Pigment Paste	52.8
Total		81.5

Part B: *Add all ingredients under agitation*

Trade Name	Type	Parts by Weight
Part A		81.5
Easaqua™ XD 401	Polyisocyanate	18.51
Total		100.0

Property	Result	Property	Result
Solids Content, wt%	60.7	NCO/OH Index	2.0
Volume Solids, %	47.1	VOC g/L	72

coatings was needed.

This study reviewed analysis of several formulations based on an FEVE emulsion and an FEVE dispersion. Results indicated that both the use of excess isocyanate (over-indexing) as well as specially designed catalysts for water-based 2K polyurethane coatings improve cure as measured by MEK double rubs. Formulations are currently being evaluated for weathering, corrosion resistance and physical properties. ■

Donald C. Lawson III is Technical Service Chemist, and Robert Parker, Technical Service ChemistAGC Chemicals Americas, Inc.

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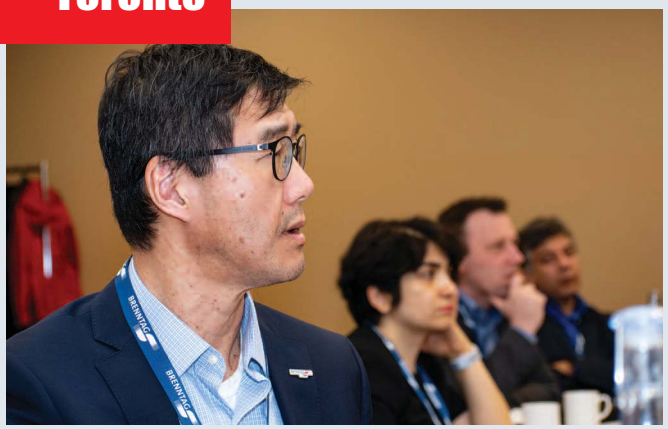
Brenntag Canada Specialties 2019 Industrial Coatings Technical Symposium

Brenntag Canada Inc. - Specialties Group, in collaboration with key raw material suppliers, held its first Industrial Coatings Technical Symposium in both Toronto and Montreal in early May. The symposium provided customers with a unique opportunity to learn about new industrial coatings technologies and trends through lectures and a table-top exhibition session with suppliers and technical presenters.

Toronto Photos: Theresa Rogers

Toronto

Toronto



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Toronto, ON M8Z 2G6
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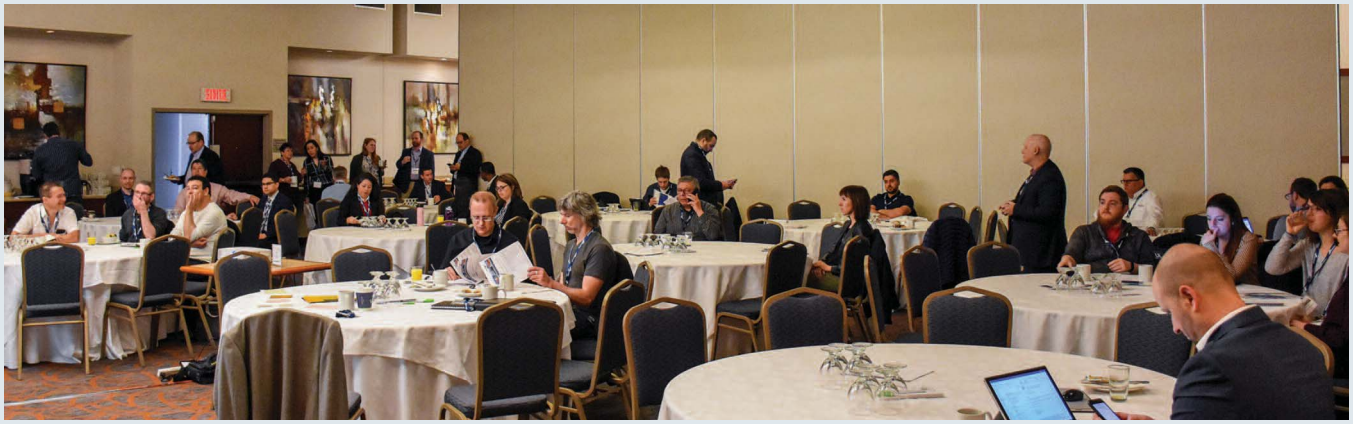
(800) 387-7324
Fax: (416) 259-5333
email: sales@brenntag.ca

www.brenntag.ca



Montreal

Brenntag Montreal Photos: Jean Martel

Why Chemicals Assessment is Important to Industry

By Gary LeRoux

CANADA'S ONGOING ASSESSMENT of chemicals management has been discussed from time to time in many forums. It has been an important subject matter for more than a dozen years in Canada. The federal Chemicals Management Plan (CMP), a program under the *Canadian Environmental Protection Act* (CEPA), is still with us and will be for the foreseeable future. One cannot underestimate the impact it has on all companies in Canada doing business in the chemical industry. The number identified for possible assessment in 2006 was 23,000 chemicals in commerce, used in literally tens of thousands of products. Those chemicals are used in everyday life by millions of Canadians, most of which were deemed of "no concern" to human health and the environment and therefore requiring no risk assessment.

There were, however, 4,300 chemicals deemed to be "of concern" and it prompted the federal government to budget $500 million for each of the three phases of the CMP, over 15 years. That is $1.5 billion for chemicals assessment to the end of 2020. The intent was to fully assess the potential impact of those chemicals on both human health and the environment. Now it its third phase, this program continues to assess the remaining 1,540 chemicals of concern in commerce in Canada, 540 of which are used in coatings, adhesives, sealants and elastomers (CASE).

While it is indeed a major government investment and undertaking, the 25 chemical sectors impacted have also invested tens of millions of dollars in complying with the requirements under the CMP, as required under the Canadian Environmental Assessment Act. Industry continues to provide the necessary data for government assessors to conduct science-based assessments. In that way industry has been instrumental in ensuring that the chemicals used in products are safe for human health and the environment ensuring the protection of consumers.

Over the past 15 years there have been very few toxic designations for those chemicals and where there has been, it is important to note that they have been entirely evidence-based. Both government and those in the coatings industry, one of the most implicated sectors for chemical assessment, are to be acknowledged for the positive work they have done to ensure safe and sustainable products for Canadians.

The third and final phase of the Chemicals Management Plan is now nearing an end and there is still significant work to do. Clearly, with so many substances and the demands imposed by the data gathering process for thousands of substances, it has taxed the resources of many companies and company associations seeking to ensure compliance. CPCA has always been vigilant in ensuring companies are fully informed of the requirements to comply with this rigorous chemical assessment process.

The risk assessment part of the process is the critical part as it ultimately determines whether a chemical can remain in commerce or not. Chemical risk assessment determines whether or not a chemical is designated toxic under the Act (CEPA-toxic) and what risk management measures will be imposed for those designated as such. The highest form of risk management is of course a regulation. However, in the risk management toolbox there are also Codes of Practice, pollution prevention plans, environmental compliance agreements, etc. In all cases, a company will have to adjust business strategies if a substance is banned outright or have concentration levels reduced to the point of being useless in critical product formulations, which is then effectively a ban.

Over the past 15 years, the decisions taken on risk assessment and risk management have been reasonable for the most part. They have been based on sound science per the chemical assessment regime employed that references multiple sources of data and consults a very credible CMP Science Committee to supplement efforts related to research and monitoring, compliance promotion, stakeholder engagement, and information gathering and reporting. Suffice it to say it is a credible and robust program, which ensures all final decisions are based on a fulsome screening assessment of chemicals in products ensuring a healthy home environment.

In addition to the planned re-assessment of existing substances already assessed, the federal government is now looking at broadening the actual scope of how assessments are done. This includes consideration of what is called "informed substitution," which may require a full

and complete assessment of alternative substances deemed to be of less concern to human health and the environment. As such, there is now some discussion as to how far such a determination can go with respect to mandating that alternatives be substituted for existing substances if and when available. Industry has expressed a number of concerns with this approach, the main one being the fact that alternatives, if they in fact exist, may cost several times more than current substances. Secondly, extensive testing of alternatives would be required to determine if they are feasible in existing product formulations. Finally, at what cost? There is the cost of raw materials, formulation, reformulation using alternatives, and the impact on consumer pricing to consider. Any one, or a combination of these cost impacts could kill a number of successful product lines.

There is also no assurance whatsoever that such alternatives or substitutions would work or substantially improve human health or environmental impacts. This is but one example where industry must be vigilant and ensure future actions are based on evidence-based information, with full consideration of the potential impacts on trade and commerce. This is supposed to be guaranteed by the federal government's regulatory policy directive to consider cost impacts vis-à-vis benefits of regulating, which is often overlooked.

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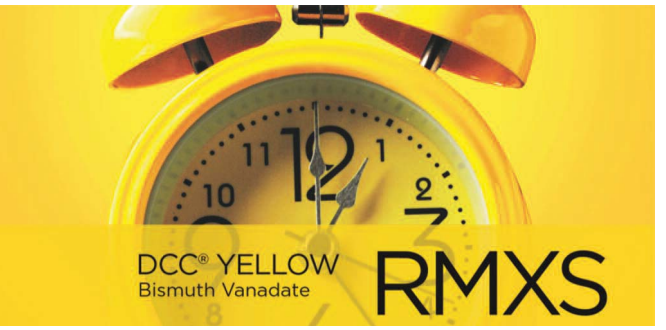
Fair and evidence-based assessment is something CPCA demands when chemicals are assessed. It seeks to do so by working closely with members via CPCA's technical committees. Increasingly this effort is being done via enhanced digitalization with the recently launched Canada CoatingsHUB for members. The goal is to ensure companies can indeed mitigate risk, while remaining in full compliance with the law in the most optimal manner available. ■

Gary LeRoux is President and CEO of the Canadian Paint and Coatings Association www.canpaint.com

Materials and Technologies Update

By Terry Knowles

AS THE COMBINATION of acquisitions and exhibitions in and around the coatings industry continues to respectively broaden and focus innovation and technology, this is a chance to highlight a raft of recent raw material and coating innovations which have been unveiled in spring 2019. Some of the ongoing trends within the industry are doing more with less (superior hiding power, multifunctionality and refinement of raw materials) as well as the evolving needs for superior protection and technology.



DCC Lansco recently launched the world's strongest Bismuth Vanadate with its Yellow RMXS offering. Photo: DCC Lansco

INNOVATIONS IN PIGMENTS

Starting off with Canada and hot on the heels of the Dominion Colour Corporation/Lansco merger, the new DCC Lansco has just launched what it claims as the world's strongest Bismuth Vanadate pigment, a new yellow offering over 20 percent greater color strength when compared to conventional grades.

The new DCC Yellow RMXS is a bright lemon shade yellow pigment with outstanding hiding power, exceptional durability and superior dispersibility that can be incorporated into a multitude of coatings systems. Because of these key features, this pigment offers maximum value in use requiring less pigment in formulations, thereby creating significant cost savings for customers and reduced environmental impact.

Also on the pigment front, Sun Chemical has recently been highlighting its new Benda Lutz COMPAL PC aluminium preparations for powder coatings. Developed for dry blending and bonding to deliver excellent appearance and performance, the groundbreaking technology's pelletized form virtually eliminates dusting to minimise housekeeping, simplifies equipment clean-up and reduces worker exposure. The pellet form can be shipped in compact bag-in-box packaging that is eco-friendly and recyclable.

Further still, as Sun Chemical continues to widen its performance pigments offering, the new Palomar Blue 15 248-4848 pigment is a high-strength phthalocyanine blue specifically developed for automotive OEM applications. Palomar Blue 15 248-4848 offers a highly desirable green flop color in metallic coatings. It is non-flocculating, non-crystallizing and has excellent rheological and light-fastness characteristics. These recent developments in the yellow and blue areas reflect the ongoing pursuit of lead chromate replacements for yellows and a race for automotive blues which are expected to be the next big thing in the OEM sector.

CURING AGENT DEVELOPMENTS

Refinements in amines and curing technology are another common R&D focus for industry. Recently, Ascend Performance Materials of the USA introduced some new high-purity grades of its Hexatran and FlexaTram-DAM high-performance amines for the paints and coatings industry. Hexatran-110 is a 99%-pure grade of the company's unique trifunctional aliphatic amine, and FlexaTram-DAM-950 is > 95% pure grade of 1,2-diaminocyclohexane (DCH).

- With high amine values, low odor and low vapor pressure, both Hexatran-110 and FlexaTram-DAM-950 are effective as epoxy curing agents to improve the workability, flexibility and chemical and heat resistance of industrial coatings.

- Hexatran-110 is also a potential triisocyanate precursor, providing alternate routes to carbamates and isocyanates. In urethane coatings, triisocyanate made with Hexatran helps to resist yellowing and withstands harsh conditions, even at reduced thickness.

Top: Ascend Performance Materials recently debuted its new Hexatran and FlexaTram-DAM high-performance additives.
Photo: Ascend Performance Materials

Bottom: PPG's Envirocron Extreme Protection Edge powder coatings target the protection of the most vulnerable parts of metal substrates.
Photo: BusinessWire

The two new grades offer routes to the production of stronger, more resilient coatings that withstand harsh environments without sacrificing workability.

Even more desirable are developments based on renewable or natural raw materials, and Cardolite, which works with cashew-origin chemicals, is now offering LITE 5262, an amine curing agent for 2-K epoxy coatings. LITE 5262 is a low-viscosity and very high-solids phenalkamine that provides excellent anticorrosion properties to various metal substrates, including non-blasted surfaces. LITE 5262 enables low-VOC coatings that can cure very rapidly even in cold weather and adverse conditions. This new curing agent is suitable for a variety of coatings in marine, protective and industrial applications.

TWO FINISHES FOR THE FUTURE

Industry giants PPG and AkzoNobel have both introduced new coating systems which step up the technological aspects of their offerings. PPG has recently launched its Envirocron Extreme Edge Protection powder coating system for superior edge coverage in industrial finishing, while AkzoNobel has launched a new exterior wood finishing system in Europe which it plans to roll out globally.

PPG Envirocron Extreme Protection Edge coatings are specially formulated to the cover the sharp edges of parts created during metal fabrication. These edges have historically been vulnerable to corrosion when exposed to salt, moisture and other environmental hazards.

As one-coat systems, PPG Envirocron Extreme Protection Edge coatings can be applied without modification to existing coating lines while eliminating the need to finish edges with mechanical edge-rounding or blasting equipment. The coatings are fully reclaimable and offer manufacturers the potential to reduce warranty claims and improve resale value by extending the life of coated parts.

Featuring a patent-pending, advanced powder coating formulation developed by PPG, the coatings mark a significant technical advancement by combining uniform edge coverage and exceptional corrosion protection in a primerless, one-coat system.

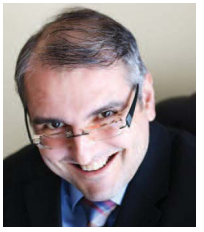
Meanwhile, the AkzoNobel offering targets the sought-after benefit of better fire protection for wood. The company's new fast-drying system, sold under its Sikkens brand, is a technological innovation designed to meet the challenges set by the world's most extreme conditions. It offers exceptional fire resistance, lasting beauty and major improvements in

production efficiency.

The key component in the new system is the ultra-effective fire-retardant primer. Thanks to its excellent application properties, as little as 250 g per square metre is needed to create an even and attractive appearance, and that translates into around 29 percent less primer required than is the case with comparable products.

The coating – which dries in less than two hours – is suitable for airless and air-assisted high pressure spraying in a production line environment, with no additional investment in special spraying equipment required. Cladding (siding) manufacturers can take full advantage of its extraordinary efficiency and effectiveness, while homeowners can take advantage of the company's expertise in providing lasting color performance and protection.

Approved in Europe in line with the required standards for reaction to fire, ignitability and durability, the system is classified as B, the highest fire-retardant rating that can be expected for an organic material such as wood. Initially introduced in Europe, a phased global launch for the new Sikkens system will follow. ■



Terry Knowles holds two degrees in Chemistry from the University of Surrey, in England. He has worked as a writer and editor for the paint and raw material sectors for more than 20 years. Terry has been the author of many reports for the paints and coatings sector and continues to be a regular freelance contributor to a number of coatings journals. He can be contacted at paintwriter@gmail.com.

new PRODUCTS

Venjakob Connects with Wood

At LIGNA 2019 in Hannover, Germany, Venjakob invited visitors to "get connected".

The company wanted to focus on technical capabilities, displaying a spray coating machine while utilizing RFID tags to set up the machine parameters. The Venjakob dashboard supplemented by the tapio solution demonstrated how to make use of machine data to monitor the production process, to predict maintenance or to provide analysis for management decisions.

The company also demonstrated how easily and fast customers can access service support without an on-site service technician. The operator can receive targeted support from a Venjakob specialist using the Venjakob service app in combination with a smart phone, tablet or data glasses.

A "future-area" forecast digital solutions Venjakob will realize in the near future.

www.venjakob.com

Powder Coating Extruder has Many New Features

Baker Perkins recently introduced its new generation of MPX production-scale powder coating extruders. Alongside the MAX³ feed system, other features increase capacity, improve quality and control, reduce maintenance time and cost, improve access, and upgrade feeding.

Baker Perkins' extruders are specifically designed for all types of powder coating formulations, including epoxy, hybrids, polyester, acrylics and fines recycling. They provide continuous production at outputs from 100 to 2,900 kg/hour.

The company says tests at customers' sites have shown that Baker Perkins' patent-pending MAX³ feed system can lead to a throughput increase of up to 40%. A redesign of the feed port and screws improves the flow of material into the extruder barrel and air out of it, eliminating the material build-up in the extruder feed port that restricts output and causes torque surges. Because of this, low-density materials and fines often required a side feeder: this is no longer necessary.

The surface area of the new multi-directional barrel cooling channels has been increased by 138 percent to increase cooling capacity, while the channels are now closer to the material being cooled to decrease response times.

The stuffing box - where the shafts enter the barrel – is now split with the top and bottom halves opening with the barrel to provide instant access for maintenance. The old-fashioned gland packing has been replaced by bronze bushes that are easily lifted out when replacement is required, and the wear sleeves on the shafts are a simple push-fit that may be replaced as easily as changing an agitator element. The sleeves are now made from a harder metal and with a PVD (Physical Vapour Deposition) coating for longer life.

A control system with recipe setup stores up to 50 formulations and ensures exact, unvarying repeatability of every product; historical trending is also standard. Remote Internet access enables Baker Perkins engineers, with the customer's permission, to log

in to a machine anywhere in the world for fault-finding and software updates. All Baker Perkins powder coating extruders are Industry 4.0 ready.
www.bakerperkins.com

PosiTest PC Powder Checker Measures 4x Faster

Affordably measure uncured powder coatings using non-contact ultrasonic technology to predict a cured thickness. The PosiTest PC Powder Checker is a dedicated standalone unit and ready to measure right out of the box.

This unit can test coatings up to four times faster making it ideal for moving lines and swinging parts (versus the previous generation PosiTector PC Powder Checker). No calibration adjustment is required for most powders. Store up to 999 readings with onscreen averaging and the stored readings can be downloaded to PosiSoft Desktop Software. The scan mode continuously takes measurements making it ideal for analyzing large areas. Conforms to ASTM D7378.

The unit features an easy-to-read digital display with a simple, icon-based menu; hand-held, battery operation; ergonomic and lightweight design; target grid simultaneously displays distance to the part and alignment, making measurements easy; and the Reset feature instantly restores factory settings.
www.gardco.com

Gema Launches New Manual Spray Units

Gema recently introduced its new OptiFlex Pro Series of manual spray units. The company says OptiFlex Pro provides the highest charging power in the industry at 110,000 V / 110 µA using PowerBoost technology,

allowing for a faster and more efficient powder coating process.

Gema says customers can achieve greater productivity by optimizing the coating process, increasing total powder coverage and achieving quicker best-in-class finishes. Comprehensive, real-time management of the powder application can be accomplished from the palm of your hand through the total connectivity offered by the Gema E-App.

The OptiFlex Pro is available in a variety of different models, offering the versatility to satisfy a wide range of powder application requirements. Standard features include:

A lightweight, ergonomically designed OptiSelect Pro spray gun with on-gun remote control

PowerBoost technology offering the highest powder charging capacity available at 110,000 V / 110 µA

Intuitive OptiStar 4.0 control interface to manage application parameters

Gema E-App for real-time productivity information and analysis through connectivity

OptiFlow injector or OptiSpray application pump for optimized and precise powder delivery control

Assortment of nozzles offering a range of spray patterns and characteristics
www.optiflexpro.com

Heraeus Launches New Generation of Semray UV LED Series

Heraeus says its new-generation Semray UV4103 stands out with more power and, due to smart engineering, lighter weight resulting from innovative material combinations. The company calls it "a faster and more powerful system with quiet operation and even further enhanced robustness, opening the door for more dynamic processes and new applications." It is now even easier, Heraeus says, to integrate into complex set-ups, portable machines or onto movable machine parts. The combination of higher power and lighter weight enables higher production speed, saves energy and enhances productivity. In addition, the curing process speeds up due to a more powerful UV LED solution increasing overall production efficiency.

The new generation is based on the successful Semray UV LED system that offers the flexibility to combine 75mm segments to cover different curing widths – from single lamps on moveable set-ups to wide curing widths exceeding 250cm.

"We listened to our customers. We understood their requirements and wishes for a product evolution and implemented those changes accordingly while keeping the flexibility of set-up and integration," says Dr. Jasmin Zahn, head of UV LED Product Management at Heraeus.
www.heraeus-noblelight.com/semray

SATA Launches Spring Promotion

SATA is launching a new spring promotion whereby a free fitness tracker will be included with every new SATAjet X 5500 spray gun purchased. The promo includes the X-nozzle system in HVLP or RP technology, non-digital or digital version.

The fitness tracker records heart rate, calories burned, steps taken, and even sleep, allowing the wearer to track health and fitness goals. The fitness tracker can also be connected to a smartphone, enabling incoming calls, text messages, social media activi-

ties, as well as calendar events via vibration and on-screen messages.

Contact a SATA dealer as of May 1.

www.sata.com/fitnesstracker

PPG Introduces its Next-Gen Flexible Passive Fire Protection Coating

PPG has launched PPG PITT-CHAR NX, which it says is its most advanced passive fire protection coating. The epoxy intumescent coating offers reduced coating thickness, lower weight and faster application, while providing outstanding strength and durability, the company states.

An intumescent coating system designed to protect against the most severe hydrocarbon hazards including pool fires, jet fires and explosions, PPG PITT-CHAR NX is suited to both onshore and offshore environments in the oil, gas and petrochemical industries.

"PITT-CHAR NX is a major advance in passive fire protection technology, combining higher safety performance in a thinner, lighter coating that is faster to apply," says Richard Holliday, Global Product Manager at PPG's protective and marine coatings business. "We have drawn on over 35 years' experience to develop, in our own state-of-the-art laboratories, this unique technology which brings major advantages to owners, engineers, fabricators and applicators."

The oil and gas industries are facing ever more complex fire scenarios that can potentially involve pool fires, jet fires and explosions in both onshore or offshore environments. These projects also demand fast throughput during fabrication and application to maximize efficiency. Because it is lighter than alternative PFP coatings and cementitious systems, PPG PITT-CHAR NX delivers substantial material savings and reduces both transport and construction costs.

"We designed PPG PITT-CHAR NX to reduce uncertainty by ensuring it is capable of protecting against the full range of hydrocarbon hazards. Owners and designers no longer need to choose between solutions optimized for jet fire or pool fire; PITT-CHAR NX does both," adds Holliday. "Our system is comprehensively tested to comply with internationally recognized fire test standards for all types and sizes of structural steel and safety critical equipment."

Extremely tough, yet uniquely flexible, PPG PITT-CHAR NX is designed to eliminate the risk of cracking and delamination during fabrication, transportation and construction. This is critical in today's global market where transportation and vastly varying climatic conditions can cause challenges for coatings on steel.

Testing has proven PPG PITT-CHAR NX to be suitable for industrial, marine and offshore exposure without any degradation in fire resistance. It is extensively tested by third parties to the toughest and latest standards from ASTM, ISO, NORSOK and UL.

www.ppgpmc.com

New CPVC Piping System Offers Alternate Solution for Corrosive Fluid Transport

GF Piping Systems has introduced the ChlorFIT Schedule 80 CORZAN CPVC (chlorinated polyvinyl chloride) Piping System to handle highly aggressive chemicals. Because ChlorFIT reliably handles tough chemicals without corroding, minimal maintenance and replacement costs provide an improved, long-glasting solution over other types of existing piping materials.

ChlorFIT pipe and fittings are extruded /molded from premium grade chlorinated polyvinyl chloride Corzan compound. This compound creates a material that is highly resistant to nitric acid, sodium chloride, sulfuric acid, phosphoric acid, hydrochloric acid, and many other corrosive materials.

The Corzan CPVC compound also has superior fire-resistant qualities and holds the ICC-ES PMG E84 25/50 plenum fire rating. Using high-quality raw materials and industrial-grade manufacturing, ChlorFIT features a thicker wall than some plastic piping, such as CTS SDR 11, making it more durable with higher pressure ratings. Because ChlorFIT is a lightweight material, handling is easy and requires minimal mechanical equipment at the job site, reducing installation costs.

Today, different thermoplastic piping systems can be specified for corrosive chemical transport. Unlike other thermoplastic materials, ChlorFIT can reportedly operate 100 per cent of the time at temperatures from 32 deg. F to 200 deg. F (0 C – 93 C). The ChlorFIT system handles higher temperatures than most plastic piping systems and is much lighter and easier to handle than metal solutions.

Typical ChlorFIT applications include production facilities, blending operations, reagent processes, air scrubbing and wastewater treatment/demineralization operations in a variety of markets. Available in sizes ¼-in. to 24in., pipe joining is accomplished using solvent welding, threaded joints and full pressure flanges.

www.gfps.com

PPG Introduces PPG Spectracron 385 Polyurethane Primer

PPG has introduced its two-component PPG Spectracron 385 Poly-lothane high solids primer, which is formulated to provide outstanding durability in severe and corrosive environments. With an unlimited recoat window, the polyurethane primer is designed for operations that require fast topcoat times.

Its wet-on-wet (WOW) capabilities increase shop throughput when paired with a PPG Spectracron two-component polyurethane enamel, with which it shares a hardener.

Tint capable and available in white and grey, PPG Spectracron 385 Poly-lothane primer reportedly has excellent flexibility, chemical resistance, and direct and indirect impact resistance. It has maximum volatile organic compound (VOC) emissions of 3.5 pounds per gallon.

The primer is suitable for industrial equipment, material handling equipment, building materials, telecommunications and heavy-duty equipment applications.

www.ppgtruefinish.com

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