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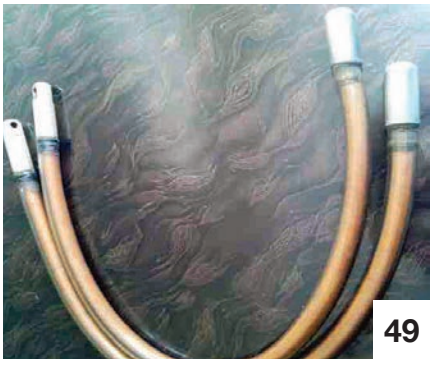

Paint and Coatings Manufacturing

Industrial Finishing

Paint and Coatings Manufacturing

Departments

Bruising Experiences in AUTOMATION

Automation causes me concern. And it's not only me.

At a trade show last year, I talked with a woman whose husband works with robots. She remarked jokingly that people wondered if she beat him up, because sometimes he was seen with bruises on his face.

The problem was a robot his company had bought, which was harder to time than the manual, or the salesman's pitch, claimed. Occasionally, as he set up a new program through the teach-pendant, it missed its timing, and struck him in the face, neck or arm.

It was a good thing it didn't operate fast.

I'm partly a robotics fan, having read and written about industrial automation for decades. But I know it isn't all perfect, and the coming Industrial Internet of Things, or IIOT, makes me nervous. Ditto Internet 4.0, which is almost a synonym for IIOT.

Maybe it's all the stories about North Korean or Russian malware we read about, finding its way into corporate networks; or that time I downloaded a bad virus and needed a whole new computer. Whatever the reason, I always feel I'm being glibly oversold on this subject.

My inner Luddite has an ongoing squabble here with my inner editor. The editor-self, as I said, likes robots on principle, and sees them not just as money-savers, but also people-savers.

Perhaps the most suspenseful ten minutes I ever spent was on a plant tour in a Middle Eastern country, listening to a translated explanation of a process while watching a young woman pluck parts from a rapidly cycling machine, and hoping it wouldn't amputate her fingers while I was watching. Or, for that matter, ever.

But it didn't look promising. A simple extraction robot was overdue.

Then again, I've been through the CNC phase of the future, the lights-out future-factory fad that followed, and other predicted realms of automated perfection that were never completely realized. Computerized manufacturing makes strides all the time, but IIOT bothers me as a buzzphrase, and that inner Luddite of mine thinks changes will all arrive more piecemeal than the enthusiasts predict. Automation is too complex for human oversight to be discarded, and IIOT, like any system, is only as good as its programming. Also, by their nature the software may never show much initiative in the face of unusual problems.

The lesson here is that companies to invest carefully and slowly. Just don't fall for the total sales pitch when all you need is to avoid injuries and lost production arising from employee fatigue or distraction.

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CASF Sees Double-Digit Growth

The Canadian Association for Surface Finishing has seen double-digit growth in the past year. Speaking at the February board meeting, CASF president Michael Kuntz, noted that the association had also launched the Ken Lemke Education Fund with a renewed focus on education within the industry, and also held a highly successful Conference in the fall. The association had also welcomed Paola Battiston, chair of the School of Biological Sciences and Applied Chemistry at Seneca College, to the board of directors.

"We continue to make great strides in Western Canada thanks to our board member and CASF Western Liaison Rob Newman," Kuntz noted, "and also in the East thanks to our immediate past president Richard Thibodeau."

A number of regulatory matters were key issues for CASF during 2017. Cap and Trade took effect in Ontario, so that facilities are now faced with the terms and conditions of the auction processes and must ensure they purchase emission allowances for their facilities through the first compliance period.

In January of 2018, this program harmonized with Quebec and California, thereby changing the program structure. Ontario's Ministry of the Environment and Climate Change (MOECC) has sent out invites for PARs and AARs to attend training sessions in January. The post-2020 framework is still not developed, and CASF is monitoring this regulatory instrument for pending amendments.

ECCC published a consultation document in 2017 proposing changes to the Federal Chromium Regulation. CASF responded with a Member Letter requesting face-to-face meetings in 2018 to talk through the fundamental changes being proposed, due to concerns expressed by its member base.

CASF is currently working with the membership and MOECC on potentially expanding the list of contaminants currently under the Metal Finisher Industry Standard. In 2018 CASF will be following up with the members and the MOECC on this issue and what the next steps forward will be.

In April, CASF will host and sponsor the Bright Design Challenge (BDC) at the College for Creative Studies (CCS) in Detroit, MI. Kuntz described the BDC as "a lively, spirited design competition that connects young designers with major OEM design studios. The winners of the contest receive scholarships on behalf of the Association as the competition challenges students to balance style and function with electroplated and other surface finishes.

"I personally helped create the program in the 1990s and it has continued each year since then. It's a great way to promote surface finishing and our industry to young students who often go on to become lead stylists and designers for the world's most recognized automotive and motorcycle companies."

This year CASF, NASF and CCS have partnered with Harley-Davidson to design the next generation of motorcycles.

The CASF Golf Tournament will be hosted this year by Whistle Bear Golf Club in Cambridge, ON, on Tuesday. September 11. This event always sells out, and Kuntz advised signing up early.

RadTech Program Available Online

The technical conference program for RadTech 2018 is now available online. The event will be the16th biennial conference and exhibition dedicated to UV+EB technology, and it takes place May 7-9, 2018, at the Hyatt Regency

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There will be over 100 presentations covering the latest innovations in UV LEDs, 3D printing materials, printing and packaging, coatings, formulations, and more. The event also offers academic educational opportunities in 'undergrad' and 'graduate' level polymer chemistry and a course on design of experiments. There will also be more than 80 exhibitors demonstrating the application of these technologies. Registration is open now, and phase one of the technical conference program is available online at www.radtech2018.com.

IGP Pulvertechnik Buys Performance Powders

Swiss powder coating system manufacturer IGP Pulvertechnik AG has acquired Performance Powders, a Kentucky-based powder coating manufacturer.

"This acquisition was an important next step in our continued growth as a global powder coatings manufacturer," stated Marc Zuellig, CEO of IGP.

The company has hired Dean Edwards to head up the new North American operations. With over 20 years' experience in the US market, Dean, Zuellig says, will help to integrate the Swiss technology and product offerings into the US manufacturing operations.

"There has been a tremendous response from the North American market to the IGP product portfolio in the last few years, and we're excited to continue that growth here with the addition of the facility in Louisville, Kentucky" said Edwards. "We will continue to supply the Performance Powders customers from here, and be able to offer a new level of service and support to the growing US IGP customer base."

Chemetall Takes Airbus Supplier Award

The Surface Treatment global business unit of BASF's Coatings division, operating under the Chemetall brand, has been awarded the highest supplier award in the Airbus Supply Chain & Quality Improvement Program called SQIP. For the fourth consecutive year, Chemetall achieved the Accredited Supplier status. The award acknowledges sustained quality and delivery performance, strong continuous improvement and customer-oriented approach. Chemetall supplies Airbus with high-quality Naftoseal and Ardrox products which meet the strict requirements of the international aerospace industry.

"We are extremely proud to once again receive this prestigious award, which values the dedication and commitment of the Chemetall team in line with Airbus targets and expectations in 2017," says Hendrik Becker, Chemetall's global aerospace manager. "Winning the award for the fourth consecutive year is a great honor for our long-lasting and successful business relationship with Airbus."

In 2017, Chemetall strengthened its supply chain. "We implemented several projects to further improve the performance of our European aerospace supply chain and strongly supports the ramp-up of the Airbus A320 and A350 programs," says Ronald Hendriks, quality manager and SQIP coordinator.

The aim of the Airbus Supply Chain & Quality Improvement Program, known as SQIP, is to advance the major strategic Airbus suppliers towards the goal of industrial excellence with regard to product quality and delivery reliability. In view of increasing production rates, this goal is of particular importance. Every year, the performance of each participating supplier is reviewed and either confirmed or – in case of non-conformity with the requested quality standards – downgraded or even rejected.

"We are delighted about this supplier award from Airbus. It acknowledges the continuous efforts of the Chemetall team and our commitment to deliver high quality service and products. Operating as a brand of BASF's Coatings division, we look forward to supporting the Airbus growth strategy even more now and in the future," says Dr. Martin Jung, senior vice-president, surface treatment. "The combination of expertise and innovation power will accelerate innovation and drive even more success for our customer, Airbus."

IHEA and CCAI Join Forces for Conference

The International Heating Equipment Association (IHEA) and Chemical Coaters Association International (CCAI) will co-host the International Thermprocess Summit (ITPS) and International Finishing and Coating Summit (IFCS) July 30-August 1, 2018, at the Intercontinental Hotel in the Buckhead area of Atlanta, GA. This is the first-time IFCS will be held in conjunction with the established ITPS, providing expanded opportunities for participants due to the synergies between the two industries. The executive level summits are co-sponsored by Products Finishing, Industrial Heating, and Heat Treat Today.

The agenda will include joint general sessions covering advanced manufacturing technologies, international dynamics impacting business, and strategic business insights. Breakout sessions will address topics specific to industrial finishing and thermprocessing. A tabletop exhibition in the general session ballroom will supplement the program.

A series of networking activities is also planned, including a welcome reception and a Taste of the South dinner. Sponsorships and tabletops are available by visiting the Training & Events section of www.ihea.org.

DDD Completes Gemini Dispersions Integration

DCC has fully merged its dispersions business subsidiary, trading as Gemini Dispersions Ltd, into the parent organization. This includes all activities of the business, including changes to its name, contact information, sales, customer service, and website.

The name of Gemini Dispersions Ltd. is now Dominion Colour Corp., and all references to Gemini from correspondence, technical literature, safety data sheets, etc., have been discontinued. The 'Gemsperse' tradename has been retained as well as the individual product codes, so customers are able to order their products as before.

All contact telephone numbers at the Waterfoot site remain, but all email addresses have been changed from the domain name @gemini-dispersions.com to the new domain name, @dominioncolour.eu. Sales and customer service will become the responsibility of DCC's global sales and customer service network.

The Gemini website will be redirected to the DCC website, which now illustrates the ranges of dispersions available, the product index, and the corresponding product selection guides. Customers can visit the dispersions portion of the DCC website to view the newly re-branded dispersions materials.

"We are very excited about the merger of the two businesses," said Dr. Bruce Howie, global product marketing manager, "and look forward to serving people with the full range of Dominion Colour's solutions portfolio."

Additionally, DCC achieved registration of its Dispersions and Preparations site in Mississauga to the ISO 9001:2008 Quality Management System standard, as of January 22. The scope of the

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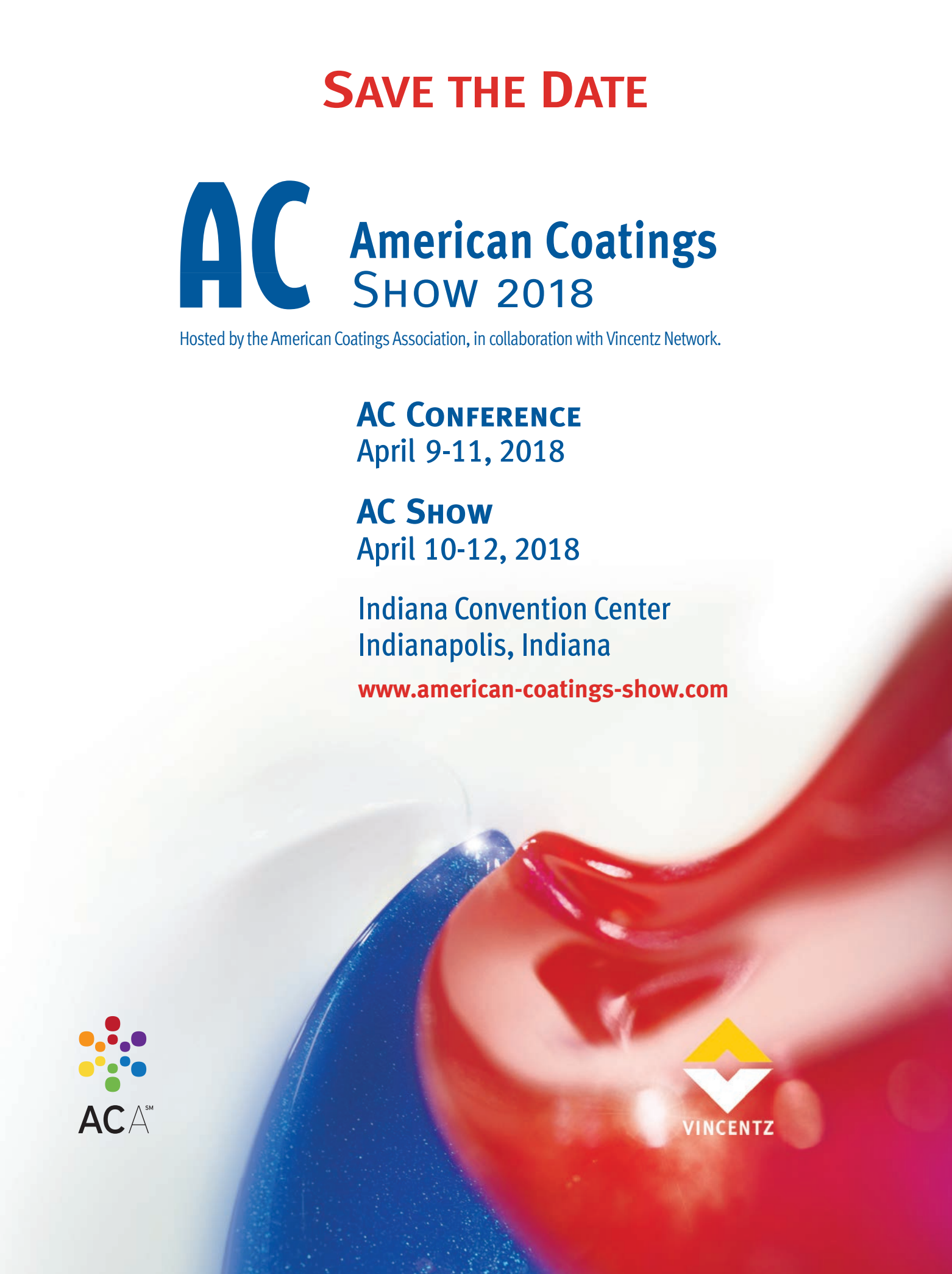

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site's registration includes the design and manufacture of specialty industrial coatings, dispersions and digital printing ink.

Sherwin-Williams Names Award Winners

Sherwin-Williams, through its Industrial Wood Coatings and General Industrial Coatings divisions, announced three winning business partners during the ninth annual Equipment and Supplies Vendor Awards Ceremony at the Hilton Orlando, in Orlando, FL, on January 31. The Equipment and Supplies program serves all of the finishing needs of original equipment manufacturers, tier suppliers and finishing job shops by offering a selection of more than 10,000 brand-name supplies and equipment items to address the entire coating process, from sanding and pre-treatment to finished product, and on-site support to improve paint finishing operations.

Mirka Abrasives earned Vendor of the Year as well as the new Excellence in Sales Award, chosen via live voting by Sherwin-Williams Industrial Wood Coatings and General Industrial Coatings sales representatives and facility managers. The company's support of the Sherwin-Williams sales teams throughout 2017 resulted in an increase in new customer accounts and substantial sales gains. In addition, Mirka Abrasives provided consistent and effective promotional and administrative support. Mirka USA was also a Sherwin-Williams Equipment and Supplies Vendor Awards winner in 2016, earning the Field Sales Support Award.

The Sales Excellence Award went to SAMES-KREMLIN, which offers complete finishing solutions – from pumps to complete application systems – that help to improve manufacturing efficiency and deliver bottom line results. SAMES-KREMLIN's award is the result of impressive rep support provided to the Sherwin-Williams sales staff and facilities, garnering the largest gross dollar sales increase of any Equipment and Supplies partner in the past year.

Roo Glue won the New Market Growth Excellence Award. Roo Glue's mission is to make the highest quality adhesives with the perfect bonding strength for any application. Partnering with Sherwin-Williams Industrial Wood Coatings field staff to provide outstanding technical support to customers, Roo Glue has grown sales throughout the country. Over the past year, no other supplier has seen as large an increase in the number of Sherwin-Williams blending facilities through which its products are sold.

"We developed our Equipment and Supplies program to provide high-quality products and technical expertise to our customers to ensure their finishing process is completed safely and efficiently," Dan Drellishak, Sherwin-Williams marketing director, Equipment and Supplies. "It is only with the support and teamwork of our dedicated suppliers that we can offer this unparalleled level of support to help our customers succeed."

Axalta Signs Multi-Year Deal with NASCAR

Axalta is now the Official Paint Partner of NASCAR, after entering into a multi-year agreement with the stock car racing venture. "Our affiliation with NASCAR runs deep," Axalta chairman and CEO Charles Shaver said. "We were the Official Finish for nearly 20 years before taking some time to strategically develop our program. With this new agreement, we can grow our reach and leverage partnerships throughout the sport for business development opportunities with like-minded companies who need or use coatings. Motorsports represents all the things we see in ourselves; team work, high performance, a drive to be better, and winning."

As part of the partnership, Axalta joins the NASCAR Fuel for Business Council, bringing together a group of more than 50 official NASCAR partners to buy and sell products and services

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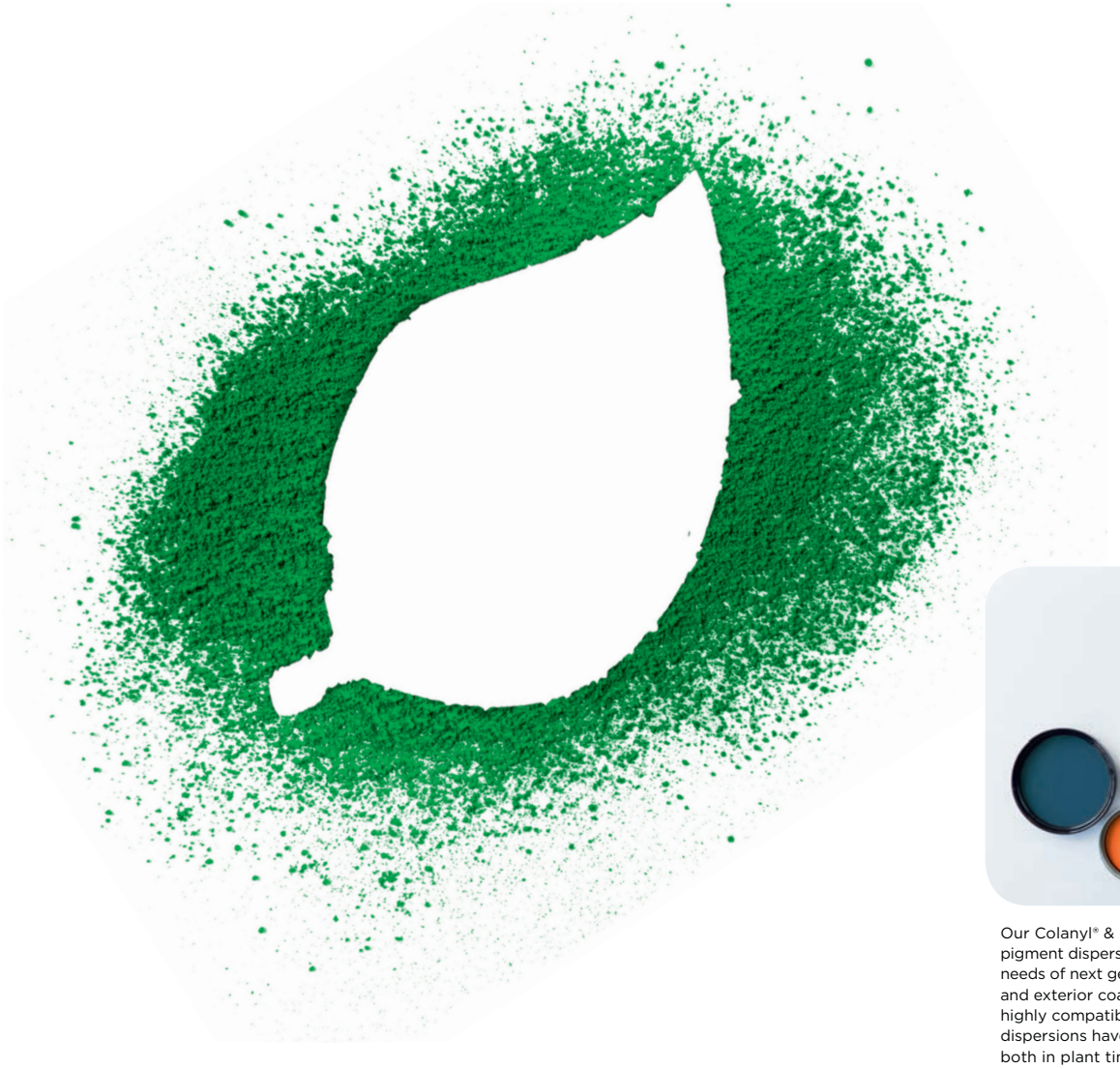

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"Axalta is a category leader and we're pleased to welcome them back to our diverse portfolio of Official Partners," said Daryl Wolfe, chief sales and partnership officer, NASCAR and ISC. "This new agreement is largely in place due to the strong return on investment Axalta receives in the sport. This partnership will further complement that integrated approach and drive business for years to come."

Axalta has a long connection to NASCAR, dating back to 1992 when it sponsored a 21-year-old rookie from California, Jeff Gordon. In 2016, Axalta became the fifth Founding Partner at Daytona International Speedway's (DIS) new motorsports stadium, receiving 32,000 sq ft of branding and engagement opportunities in the Center Injector. Additionally, the brand serves as a primary sponsor with Hendrick Motorsports, a partnership that has been in place for more than a quarter century. Axalta's relationship with the sanctioning body dates to 1996, when it became an Official Partner, a partnership that spanned 17 years.

DowDuPont Announces New Brand-Names

DowDuPont has unveiled the corporate brand names of the three post-merger divisions that it plans to create. The two chemicals giants merged in 2017.

The intended Specialty Products company, also based in Wilmington, DL, the company said, will "reflect the strength of its technology-driven specialty businesses with highly-differentiated products and solutions that transform industries and everyday life." It will be based in Midland, MI. "The Dow name and the Dow diamond have an extremely strong foundation from which we will grow and serve our customers," said Jim Fitterling, chief operation officer, Material Science Division. "The iconic red diamond logo will serve as a point of continuity for all of our stakeholders as we build the most innovative, customer-centric, inclusive and sustainable materials science company in the world. We will continue Dow's long history of innovation and be centered on Dow's core values of respect for people, integrity, and protecting our planet."

With nearly $44-billion in 2017 pro forma revenue and $9.1-billion in 2017 pro forma operating EBITDA, the Materials Science Division will leverage its integration and innovation strengths to focus on three high-growth market verticals: packaging, infrastructure and consumer care.
The agricultural division will be called Corteva Agriscience, while the materials science company and specialty products divisions will be known as Dow and DuPont, respectively. Materials Science is anticipated to separate by the end of the first quarter of 2019. Agriculture and Specialty Products are expected to separate by June 1, 2019.

"Our selection of these company names is a major milestone in the process of creating three, strong independent companies, and each name reflects the unique strengths and value proposition of the company it will represent," DowDuPont CEO Ed Breen said. "As we move forward, a critical part of our work will be to build and strengthen the global corporate brands that express the commitment we are making to our customers, employees, investors, and all of our stakeholders, to grow value through innovation."

Added executive chairman Andrew Liveris, "The Dow and DuPont teams have made incredible progress in six short months and today's announcement is another demonstration of the unprecedented value creation potential of this historic merge and spin transaction. "We are squarely focused on unlocking enhanced cost and growth synergies, delivering on our growth

investments and innovation pipeline, and separating into three industry-leading companies on the accelerated timelines we recently announced."

Corteva Agriscience, based on a combination of words meaning 'heart' and 'nature' – will be based in Wilmington, DL.

"In Corteva Agriscience," said James C. Collins, Jr., chief operating officer, Agriculture Division, "we bring together three businesses with deep connections and dedication to generations of farmers. Our new name reflects our commitment to enhancing their productivity as well as the health and well-being of the consumers they serve.

"Our name reflects our purpose: enriching the lives of those who produce and those who consume, ensuring progress for generations to come. With the most balanced portfolio of products in the industry, nearly a century of agronomic expertise, and an unparalleled innovation engine, we are creating a new agriculture company that will work together with the entire food ecosystem to produce a secure supply of healthy food sustainably and efficiently."

With more than $14-billion in 2017 pro forma revenue and $2.6-billion in 2017 pro forma operating EBITDA, the Agriculture Division has a comprehensive and balanced seed and crop protection portfolio.

Paint Recycler Promotes Patented Process

Paint is not one of the easier materials to recycle. Of necessity, it is always a blend of multiple ingredients, and separating them can be difficult and energy-consuming, which makes it potentially expensive.

A company called Regent Paints, based in Glendale, NY, has a patented process it believes improves on existing technologies for recycling both water-based and, potentially, oil-based paints. President Huzaifa Matawala says his family has long been active in paint production in Dubai and in Mumbai, India, and the recycling process was a natural outcome of efforts made to re-use off-spec product

"We have been doing this now for the past 10 years," he says. "We can recycle paints into paint primers, and gloss paints and solid latex paints can be converted into bricks, roofing and flooring compounds, mastics, putty, and similar things."

Regent Paint's processes re-combine waste or mismatched paints into some of its own products, including its Bitumen Primer and Bitumen Emulsion, which are two of its top brands. It can also supply recycled ingredients to other paint manufacturers.

"For water-based paints the process involves just color-wise sorting, bulking, filtering, blending and packing. For solvent-based paints, we have extra processes of initial sorting on the basis of type of paint or solvent, then on the basis of resin and solvent, compatibility with other matte and gloss paints, and a density and ingredient check. After the above steps, we ascertain the product mixing in batches of our patented primers and coatings."

The paint pigments, he states, work as fillers and colorants in batches of matching shades. The final option, Bitumen coatings, are always black. Regent Paint can formulate quantities of black pigment in dosages to convert most items to a uniform dark color.

"We have very minimal or none of unrecy-

clable items," Matawala adds. "As we use the heating processes with solvents and bitumen to liquidity the most gelled or thickest of items. Water-based paints have a tendency to become solid, and cannot be liquefied after. However, the solvent-based product can always be converted back to usable form."

The company is actively looking to work with paint manufacturers in Canada as well as the US. It is working with a franchise model of collection to expand its reach.

Huber Increases FR Output

The Fire Retardant Additives (FRA) business unit, part of the Huber Engineered Materials (HEM) division of J.M. Huber Corp., is increasing production capacity for Martinal LEO fine precipitated alumina trihydrate at its Martinswerk Plant in Bergheim, Germany.

"We are pleased to announce this phase two capacity expansion at our Martinswerk operation to support the growing demand of our customers in Europe, India and Asia for our halogen-free fire retardants," says Martin Schulting, managing director of Huber's FRA business unit in EMEA. "This substantial investment will increase our production capacity for the high quality Martinal LEO grades by an additional 20 percent and represents the single largest investment made over the last 40 years at Martinswerk.

"In addition to this investment, we are committed to reducing our environmental footprint and have initiated ongoing sustainability discussions with various governmental entities that we believe will result in the delivery of several sustainability improvements in line with our company objectives."

The new capacity will be phased in several steps with the first incremental volumes scheduled to become available in the second half of 2019, before the expansion project is completed in early 2020.

"This investment underlines the commitment we have to our customers to support their growth and our clear strategy to grow our halogen-free fire retardant business globally," added Jerry Bertram, vice-president and general manager of Huber's FRA Business. "This second capacity expansion project at Martinswerk comes only two years after Huber's acquisition. In addition, we are currently expanding fine precipitated alumina trihydrate capacity at our facility in Bauxite, Arkansas, which will come online in the third quarter of this year."

The Martinal LEO fine precipitated alumina trihydrate grades aim to offer superior processing properties and serve as the company's global product platform for its customers. Huber's FRA business unit has four manufacturing sites in North America and two in Europe.

Costs Boost Moly Orange Prices

Dominion Colour Corp. (DCC) has initiated a price increase or surcharge for all Bismuth Vanadate (Pigment Yellow 184), Chrome Yellow (Pigment Yellow 34) and Molybdate Orange (Pigment Red 104) pigments that are utilized in the coatings and plastics industries worldwide. The company says this is necessary as a result of the elevated and increasing costs of the metal-based raw materials used during the manufacture of these products. Company sales representatives

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Commodity prices have escalated in recent months due to a global shortage in supply. Further, prices are expected to continue to increase during 2018.

DCC is a manufacturer and supplier of pigments for customers in the coatings, plastics, printing ink and paper industries worldwide.

PEOPLE:

CPCA Names New Staff

The Canadian Paint and Coatings Association made two staff appointments in January. Rob Taylor (pictured) is now vice-president, public affairs, and Melanie Di Tullio is manager, graphic design and digital communications.

Taylor brought with him 20-plus years of relevant experience in association management and senior roles in the public, private and political arenas. In his career, he has specialized in strategic communications, advocacy and stakeholder relations.

Di Tullio is a certified as a designer under RGD (Registered Graphic Designers of Ontario).


Rob Taylor


Melanie Di Tullio

She brings more than a decade of experience in design, social and digital marketing strategy and visual communication.

Gelest Promotes Staff

Doug Wulffleff has joined Gelest as vice-president of Mergers & Acquisitions. He is responsible for identifying business opportunities and developing and executing strategies for growth through acquisitions in the specialty chemicals industry and adjacent markets.

Wulffleff brings to Gelest decades of M&A experience and most recently served as vice-president of Strategy and Corporate Development at VWR International. He has also held transaction related leadership roles at BDO International, Arthur Andersen, Coopers & Lybrand and Bankers Trust Company.


Doug Wulffleff

Additionally, Dr. Jonathan Goff has been promoted to vice-president of Research & Development at Gelest, Inc., and Dr. Youlin Pan has been named senior research fellow, adding to his current title of senior R&D manager.

Jonathan Goff

Youlin Pan

Goff will broaden his role as a strategic partner in facilitating customer relationships, research initiatives and operational efficiencies. He will continue to manage the Polymer Development and Technical Services groups, and to help lead the Silanes & Metal-Organics and Research Engineering groups. He is an eight-year veteran of Gelest.

In addition to continuing to manage his research and development group, Pan will broaden his role in developing and expanding the capabilities of Gelest R&D and overall operations. He has been with Gelest for over 21 years.

Gelest, Inc., headquartered in Morrisville, PA, is a manufacturer and supplier of commercial and research quantities of organosilicon compounds, metal-organic compounds and silicones.

IGM Resins Promotes de Wind to Business Director

IGM Resins has promoted Frans de Wind to business director, EMEA and added him to IGM's executive management team, reporting to CEO Edward Frindt. Previously de Wind served as commercial manager EMEA.

His goals are to continue to build value in the European market through IGM's comprehensive and innovative product lines and dedicated services approach; and to further optimize and develop systems, processes and procedures to enable the company's European team to more efficiently serve customers. His responsibilities include direct management of the European Sales and Technical Service teams as well as Supply Chain and Compliance in the EMEA region.

De Wind joined IGM Resins in February 2005 from the Holland Office Group, where he was account manager for the Dutch market. His


Frans de Wind

service in several sales and sales management positions contributed to IGM's growth in Europe.

"Frans has shown significant development, growth and consistency in delivering results for more than a decade, and I welcome him to our executive management team," Edward Frindt said. "I'm confident that he will continue to drive value and further growth for our company and our customers while improving our systems and processes."

IGM specializes in the development, manufacture and supply of products and technical services to the global UV ink, coatings and adhesives industry. IGM develops, produces and distributes a full range of radiation curable materials including acrylate oligomers and monomers, photoinitiators, and additives from manufacturing facilities in the EU, USA, and Asia, supported by technical labs in the EU, USA, Asia, and South America to help create next generation energy curable coatings, inks and adhesives.

AkzoNobel Looks to next Chairman

AkzoNobel has nominated Nils Smedegaard Andersen to its Supervisory Board, with the intention to elect him as Chairman, assuming his appointment is approved at the April 26 annual general meeting. Andersen is a non-executive director at BP and Unilever, where he serves on both companies' audit committees. Previously, he also served as Group Chief Executive of A.P. Møller – Maersk from 2007 until 2016. Earlier in his career, he was president and chief executive officer of Carlsberg and Carlsberg Breweries.

"We are very pleased to nominate Nils Andersen," said Byron Grote, deputy chairman of AkzoNobel. "He has a wealth of relevant experience gained during an extensive international career in the consumer goods, energy and shipping industries. Nils will bring this broad business insight to the Supervisory Board as AkzoNobel becomes a focused, high-performing paints and coatings company."


Nils Smedegaard

If confirmed, Andersen will take the place of Antony Burgmans, the current Supervisory Board chairman, who is in his final year on the board. Burgmans played a major role in last year's

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RADTECH UV+EB 2018

TECHNOLOGY EXPO & CONFERENCE

May 7-9, 2018 | Hyatt Regency, O'Hare | Chicago, Illinois

What's happening at RadTech 2018?

More than 100 presentations and nearly 80 exhibitors

UV LEDs

25+ Presentations on the latest LED developments, panel discussions and more!

3D Printing

Sessions include new materials, formulating, innovations and UV LEDs.

Short Courses

Includes graduate- and undergraduate-level courses, design of experiments and click chemistry.

University Academic Presentations

Sponsored by the Photopolymerization Conference

Researchers from six universities and the Air Force Research Lab will present on critical results in self-assembly, novel polymerizations, controlling structure, photo-responsive networks, and light-activated dark cure.

Start-ups

RadLaunch, a new technology accelerator, will recognize it's first class, early-stage start-ups and small businesses for new tech advancements.

Student Art Awards

Awards will be presented for creative, original posters that tout the benefits of UV+EB.

Emerging Tech Awards

Past winners include: Carbon 3D, Ford Motor Co., Pepsico, Cleveland Steel Container, Gecko Biomaterials, Cambrios Advanced Materials, and Gillette-Procter & Gamble.

New Exhibit Theater

Located on the show floor, these exciting sessions include:

- 3D Printing
- Future of UV LED Chemistry
- Future of UV-C LED
- UV LED Myth Busters
- Trends in UV Inkjet/ Digital Printing
- Food Processing & Disinfection
- Future of Automotive Manufacturing & Customer Use

For more information or to register for the conference, visit www.radtech2018.com.

Calendar of Industry Events

April 10-12, 2018: American Coatings Show, Indianapolis, IN. www.american-coatings-show.com

April 24-26, 2018: ECOAT 18 Conference. Innisbrook Golf & Spa Resort,Tampa Bay, FL. www.electrocoat.org

May 7-9, 2018: RADTECH 2018, UV+EB Technology and Expo, Hyatt Regency O'Hare Hotel, Rosemont, IL. www.radtech.org

May 23-24, 2018: Canadian Paint and Coatings Association Annual Conference and AGM, Marriott Eaton Centre Hotel, Toronto. www.canpaint.com

June 4-6, 2018: SUR/FIN 2018, Cleveland, OH. www.nasfsurfin.com

June 12-14, 2018: Fabtech Canada 2018, Toronto Congress Centre, Toronto. wwwfabtechcanada.com

July 30 - August 1, 2018: Joint IHEA and CCAI International Thermprocess Summit, Intercontinental Hotel, Buckhead, Atlanta, GA. www.ihea.org

September 11, 2018: CASF annual golf tournament, Whistle Bear Golf Club, Cambridge, ON. www.casf.ca/events/casf-golf-tournament

September 13-14, 2018: CanWeld 2018 Expo and Conference, Place Bonaventure, Montreal. www.canweldexpo.com

October 10-12, 2018: Pacific Northwest Society of Coatings Technology, Coatings-Fest 2018, The Inn at Laurel Point, Victoria, BC. https://pnwsct.org

October 24-25, 2018: Canada Woodworking East, Espace St-Hyacinthe, St-Hyacinthe, QC. www.canadawoodworkingeast.ca

November 6-8, 2018: Fabtech 2018. Georgia World Congress Center, Atlanta, GA. www.fabtechexpo.com

A Sample of Issues Facing the Coatings Industry

Defending the Canadian Industry from Global Regulatory Creep

Chemicals management is impacted by regulatory actions undertaken both domestically and internationally. Decisions taken in another country or region on a given substance can be quickly replicated here in Canada outside of the Chemicals Management Plan (CMP) process and without the balanced analysis of scientific rigeur, risk management, and economic impact. CPCA works closely with allied organizations within Canada and around the globe such as the International Paint and Printing Ink Council (IPPIC) and the American Coatings Association (ACA) to identify developing issues, inform industry and intervene with regulators to deliver evidence-based advocacy initiatives.

Below are a few brief examples of international chemicals management initiatives that are being pursued in Canada by NGOs, activists and academics as reported in CPCA's member-only regulatory news alerts:

Volatile Organic Compound (VOC) Update

California to Adopt Stricter Volatile Organic Compound (VOC) Limits in Architectural and Industrial Maintenance (AIM) Coatings: California's South Coast Air Quality Management District (SCAQMD) intends to proceed with the implementation of new VOC limits in all AIM categories and the removal of the small container exemption by 2019. All new VOC limits would be in the order of 50 or 100 grams per litre except for a few higher VOC limits for industrial maintenance, fire-resistant, metallic pigmented coatings, and color-indicating safety coatings. The California Air Resources Board (CARB) may also look at statewide adoption of the SCAQMD limits.

The American Coatings Association has identified problematic categories where the limits are overly restrictive limits such as recycled coatings, aluminum roof coatings, or industrial maintenance. ACA is intervening, arguing that the removal of these key VOC-exempt compounds compromises paint manufacturers' ability to meet more stringent VOC AIM limits. CPCA is monitoring this very closely as the federal government has had a document called the Federal Agenda for VOC 2020 and at some point they will revisit the need to look at ways and means to reduce VOCs from certain coatings categories beyond the existing limits, and a greater focus will be on the industrial segment. It is critical that industry is aware of this and understands the need to engage early to ensure any further action of lowering VOC emissions in coatings products is realistic and evidenced-based.

Removal of Key VOC Exempt Compounds in California: Despite receiving exemptions from the Environmental Protection Agency (EPA), several California Air Districts are requiring a long list of VOC compounds to go through an additional rulemaking process in order for the exemptions to be adopted. Four districts (South Coast, Bay Area, San Diego, and Sacramento AQMDs) have not exempted several of the EPA compounds. Based on recent regulatory activities in those districts, the adoption of many of the exemptions is unlikely, with additional restrictions expected in the future.

TBAc: Later in 2018 SCAQMD will no longer consider tert-butyl acetate (TBAc) as VOC-exempt for industrial maintenance and certain auto refinish coatings. The current VOC-exemptions for TBAc will be formally removed from Rule 1113 (AIM Coatings) and Rule 1151 (auto refinish coatings).

PCBTF: PCBTF is exempt in all US states and in all California air districts. However, based on a recent National Toxicity Program study, SCAQMD will likely petition the State of California to review the health effects of PCBTF, which may lead to further restrictions. The removal of PCBTF is likely to happen in the mid-term, following its final designation as carcinogenic by the NTP within the next year or so (2019 or 2020). Districts will then request that OEHHA complete a review of PCBTF within 2 years. Given the solid new carcinogenicity evidence prevailing against PCBTF other state agencies across the US may also

conduct their own review. PCTBF is extensively used in the coatings industry and its removal from VOC-exemption lists is very problematic. CPC is monitoring a new ACA working group that will discuss commissioning a review of the NTP report, future hazard communication implications and the development of advocacy tools.

Dimethyl Carbonate, AMP and Methylene Chloride: The first two compounds remain exempt — AMP will be soon — in all states except for the four California air districts. SCAQMD will evaluate the complete phase out of methylene chloride (for example in Rule 1136 Wood Coatings).

Here again CPCA has been proactive and arguing for reliance on federal regulations already in place and based on sound science. The exemptions for the compounds as noted and 13 others that have been exempted for use in Canada remain so. CPCA continues to make the case that these exempt compounds are critical in helping lower the VOC concentration in a wide range of products. Without them it will be difficult to get further reductions while retaining similar levels of performance.

Metro Vancouver New By-Law No. 1086: Based on Southern California regulatory initiatives Metro Vancouver is moving forward with municipal air quality bylaws outlined in a discussion paper (New Bylaw No. 1086). CPCA has been engaged with local air quality planners and made a submission in mid-January providing additional information on the presence/absence in paint formulations of all designated "toxics" in the discussion paper (including TBAc) and delivered a scenario of VOC emission reductions to be expected from three more restrictive VOC limits in automotive refinish paints.

Air quality planners intend to meet with the Metro Vancouver Board in early 2018 and adopt the new bylaw later this year, pending any additional modification requests generated by the consultation. The focus of CPCA's submission pointed to key factors such as: the limited benefits in terms of air quality that can be achieved if the proposed regulation were adopted; the fact that body shops employ strict procedures in coatings application with the use of spray booths and proper PPE; the negative impact it could have on the 350 body shops in the Lower Mainland; and that it exceeds the established federal regulations that went to great lengths in setting existing VOC limits for these products. It would be a highly unusual and troublesome move if they proceeded to exceed federal regulations thereby creating an unlevel playing field, which is never good for business and ultimately costly for consumers.

Recent VOC Regulatory Development in the US to Watch Closely: The recent VOC regulatory developments

in California may reach well beyond Vancouver's new bylaw 1086. There is a possibility that these developments may affect the final publication of other VOC regulations in Canada, such as the VOC Concentration Limits for Certain Products Regulations that is expected in Canada Gazette Part I in the spring or summer of 2018. At a Paint and Coatings Working Group (PCWG) meeting last year, Environment Climate Change Canada (ECCC) officials confirmed that they were considering further restrictions on limits in the Architectural VOC regulations. The actual US context may force ECCC to revisit the Architectural VOC regulations towards OTC II more quickly and to consider additional changes to the list of VOC-exempt compounds under CEPA, 1999.

Parliamentary Review of the Canadian Environmental Protection Act (CEPA) 1999

In 2017 the House of Commons Standing Committee on Environment and Sustainable Development (ENVI) conducted a review of CEPA 1999 including 87 and presented a report to the government with recommendations for amendments based heavily on ENGO and academic perspectives calling for the adoption of the European hazard-based approach to chemical assessment. The Government of Canada is considering regulatory, policy and program changes that respond to some of the Committee's recommendations, and has committed to a fulsome response by June of 2018.

While CPCA was expecting to participate in a broad stakeholder consultation this winter on the recommendations, officials from Environment and Climate Change Canada (ECCC) and Health Canada (HC) will instead only be discussing a short list of ten issues with NGOs (i.e. vulnerable populations, reverse onus for substances of high concerns, air and water quality issues, mandatory uses of alternatives, hazard labelling, etc.). CPCA, working through the Industry Coordinating Group (ICG), and with discussions directly with key officials, will ensure industry's concerns with some of the recommendations are fully discussed.

The Protection of Confidential Business Information

In response to the Parliamentary Committee's recommendations on the CEPA Review, the Government of Canada is determined to make broader chemical information accessible to the public. Industry has been pushing for the government to consult and consider information from notifiers as to how to disclose Confidential Business Information (CBI) and still protect the industry's ability to innovate. A template letter has been developed and circulated among ICG members to support this initiative.

Antimicrobial Exposure Assessment Task Force (AEATF) of American Chemistry Council (ACC) Biocides Panel and CPCA Simultaneously Submit Further Scientific Evidence on Exposure and Usage of OIT

The ACC AEATF recently completed its Category B submission on Paint Brush/Roller and Swipe Study results and submitted it to PMRA, meanwhile CPCA provided further evidence of OIT (2-n-octyl-4-isothiazolin-3-one) use in paint formulations on the Canadian paint market. Industry is confident that this additional information will trigger a new re-evaluation of OIT by PMRA before the current cancellation of uses of paint and coatings takes effect in 2019. PMRA already mentioned it would be on a tight schedule for developing and publishing a new proposed decision on OIT before May 2019, and requested the submission of the ACC study results early in 2018.

CPCA is working with its American counterparts to push for regulatory alignment between Canada and the United States for chemicals management. Given that half of all paint and coatings sold in Canada are imported from the United States, the integrated nature of the market, and the importance the paint and coatings manufacturing to the Canadian economy, greater regulatory and environmental policy alignment between Canada and the United Stated alignment will enhance the sustainability of this innovative sector. ■

Photoinitiators
Key to UV Curing

WITH THE GROWTH OF UV-CURED chemistries for coatings, photoinitiators are becoming increasingly significant ingredients. Substances that can react appropriately to different wavelengths of UV light, to produce differently timed or differently effective responses, are key to producing high-quality, durable finishes.

A key factor in the development of the field has been the expansion of LED technology in recent years. LED light-sources last longer than conventional types, and are generally more energy-efficient.

They do place certain demands on existing chemistries for triggering the photo-cure process. At the same time, they also offer opportunities for developing new capabilities.

IGM Resins is one company that is introducing a new photoinitiator for UV-cured materials in the first half of 2018. In 2016, IGM bought the photoinitiator line from BASF.

The new substance, says Jeroen Diepgrond, global business manager – photoinitiators, uses a new and innovative ketocoumarin chemistry platform.

" The benefits of this technology platform align with key industry drivers such as LED curing technology and low post-cure yellowing," he states. "The product has excellent surface cure properties under air expanding the scope of LED curing pigmented and non-pigmented industrial coatings.

"With the ongoing market penetration of LED technology, formulators are faced with limitations on surface cure for coatings requiring low post-cure yellowing. The new ketocoumarin-based photo-initiator will help overcome this limitation."

Diepgrond says IGM continues to see strong growth in the use of water-based UV coatings driven by wood finishes. The company's current development activities focus on surface and through-cure photo-initiators that combine the benefit of LED curing with excellent handling properties and enhanced formulation flexibility.

"Another growth area for UV coatings is the electronics industry," he days. "Growing demand in high-quality consumer electronics drives growth of UV coatings used for e.g. displays and plastic casings."

Further expansion of the portfolio of photoinitiators targeted to support LED market penetration into water-based UV coatings is another focus area IGM is addressing with new product development. Initial results of these developments were presented at the 2017 Radtech Conference in Europe and market introductions are expected later this year.

"The need to further reduce VOC emissions combined with the excellent gloss, mechanical and resistance properties of UV-cured coatings continue to be a strong driver for growth," Diepgrond adds. A good example, he notes, is China, where reduction of emissions in all areas of industry is a priority, including VOC emissions to improve air-quality.

Sun Chemical's SolarFlex LED inks are aimed at the four-color flexo printing market, though the company's technology has the potential to be extended into other areas. These use the company's M-Cure photoinitiator technology, which have been successfully developed to handle LED light in curing.

The process employs a photoinitiator composition comprising a combination of aminoalkyl phenone, thioxanthone and a multifunctional amino benzoate synergist. It is not dependent on LED light sources, though it has been developed specifically to accommodate them.

Spectra Group, another major supplier, identifies two main types of photoinitiators. The company points out that photoinitiators are chemical compounds that are used to generate reaction intermediates after the absorption of light. In the presence of specific small molecules of liquid monomers, these intermediates are responsible for the production of solids from liquids, via polymerization.

Type I photoinitiators produce reactive intermediates directly after light absorption. Type II photoinitiators require a second compound, a so-called co-initiator, to produce such intermediates.

Spectra Group pioneered the development of its H-Nu photoinitiator line in the 1990s. These substances are capable of curing resins of two general kinds acrylates and methacrylates, cured by free-radical processes; and epoxides, cured by cationic processes.

Spectra Group offers a patented line of Type II UV/

visible light photoinitiators, covering the panchromatic UV-A and visible spectrum: H-Nu 470, H-Nu, 535, and H-Nu, 635.

Consultancy IHS estimates around 80 percent of UV-cured materials are used in the wood coatings and graphic arts fields. This is different in the Asia-Pacific region, where demand is primarily driven by the high-performance electronics industry. This region uses an estimated 45 percent or more of the global consumption of UV coatings.

Europe, IHS says, sees higher usage in wood, paper and plastics coatings. To date, North America has had a heavier bias towards the overprint varnish segment.

The wood coatings field uses them for furniture, parquet flooring, decorative panels and door-skins. Key factors driving the industry identified by IHS as increasing environmental awareness include the demand for green products, a still-rising electronics market, and growth in demand of industrial wood coatings.

As might be expected, much of the current technology is being developed and manufactured in China, often by companies without a global profile as coatings suppliers. For example, Tronly, which was founded in 1997, produces and exports photoinitiators, UV-curable monomers and oligomers. It has three subsidiary companies, several advanced research and development centers, and chemical production plants.

It partners with other Chinese players in this market, such as Eternal Chemical, and supplies products to companies all over the world. It currently claims a 90 percent market share for cationic UV curing in Europe.

Its monomers, oligomers and photoinitiators are used in dry film for PCB and color filter for LCDs. They are also employed for specialized chemicals for semiconductors, inks, and coatings, as well as the growing 3D printing industry.

The photoinitiator market in general is moving to a more stable state as UV-curable coatings become more widely accepted, and more companies become comfortable with the process. However, it still has the potential to produce surprises out of the laboratory, and there are certain thresholds in curing, such as in coatings for wood, where a few limitations have to be overcome.

In short, the technology is proven, but it is still capable of doing things that disrupt its own established markets. ■

Equipping Your Own Test Facility

FOR MANY PEOPLE IN THE COATINGS INDUSTRIES, their suppliers provide laboratory services that satisfy most of their needs. Such labs can verify samples and identify formulation problems, and provide at least a partial sense of security that a smaller plant does not have to operate with crossed fingers.

Most companies today also have some instruments of the type described in this issue's feature on Thickness Measurement. Portable instruments have become more affordable and much easier to use in recent years, as well as offering a range of probes for different kinds of applications.

But having a laboratory onsite provides the surest kind of QC verification. There is the capital investment involved, which is no small sum, and there is also the need to have a trained technician – or two – to run it. But with that sort of capability on hand, any company can provide its customers and itself with much more assurance of good finishes and consistent coatings values.

There is also the fact that while a portable device for in-plant use is an excellent tool for checking output on the fly, long-term analysis is also important to ensure that there is no drift in specifications. Most measuring devices available today easily interface with statistical analysis software, or actually have it onboard, and laboratory technicians may understand better than production staff what measurements could be indicating about ongoing low-level problems.

"The training and education required often depends on how deeply involved the personnel is in the design of the finishing or coating process," notes Samantha Rosenfeld, marketing coordinator with Krüss USA. "When it comes to quality testing with standardized methods, our instruments can provide results that are user-friendly with just the click of a button. Our software and instruments do all of the 'heavy lifting' for carrying out the measuring procedure, evaluating raw data and utilizing the appropriate scientific models."

That said, she adds, defining quality standards with respect to the desired surface properties of the materials and coatings requires a deep understanding of the testing methods and an in-depth evaluation of results.

"Therefore, we like to emphasize the technical consultancy sessions we provide, in addition to the seminars we offer worldwide. This supports our customers in optimizing their products and pretreatment measures."

A highly precise and accurate method is preferred and sought after, she notes, especially for adhesion, coatings, cleaning, surface treating, wetting and printing applications. Because reliability and repeatability are imperative, manual test methods that involve the user's assessment are no longer making the cut. Krüss incorporates proven scientific methods such as contact angle measurement in standardized procedures of fully automated instruments.

"The challenge," she says, "lies in making scientific lab methods quick and mobile in order to use them for quality control while keeping their informative value. Our customers don't want to choose between speed and quality, they want to increase both.

"In the area of contact angle measurement, we squared that circle with our Mobile Surface Analyzer – MSA and its intuitive software, Advance , which handles even complex measuring tasks and represents the results on a clear and easy-to-use interface. With a large variety of fitting methods for the analysis of drop shapes and all of the important models for calculating surface free energy (SFE), Advance matches high scientific standards.

This features automatic background video recording for subsequent evaluation or quick access, and reanalysis of drop shape images. Such features, she says, make Advance a highly sophisticated tool for all tasks in contact angle measurement.

New methods of measurement take a time to penetrate the industry, and users need to develop confidence in them before they are accepted. For example, Rosenfeld says, for many years dyne pens were the way most companies measured surface free energy In recent years, the analysis of surface free energy has evolved from dyne ink measurements to contact angle methods.

"We think there were two main reasons why test inks have been preferred over contact angle measurement," she says. "Firstly, they used to give results more quickly and directly on-site. Secondly, though many customers were not really convinced of test inks, they used them because they were simply not familiar with the contact angle technique.

"All this has changed since the last few years. More and more customers contacted us because they realized that their dyne ink results could not explain quality issues they had in their coating process. This lies in the nature of the dyne ink method, which is based on a very simple scientific model that is just not valid in many cases. We could help those customers solve their problem, sometimes with measurement series carried out in a few hours."

The MSA system was the means the company could offer to achieve this.

The ongoing design shift represented by digital technology and electronically based miniaturization generally does mean that what once would have occupied significant real estate on the manufacturing floor is now a simple benchtop unit. For example, in the field of spectrophotometry, Konica-Minolta's CM-3600A system occupies roughly the same desk space as a laptop computer.

This unit handles not just color, the company says, but also relative gloss and UV characteristics of small to large-

Konica-Minolta's compact CM-3600A unit.

sized paint and powder samples. It has a company-specific optical system, and can use SpectraMagic NX software to record measurements and provide a comprehensive color analysis. It can also deploy Colibri software to formulate color recipes for various applications and share real-time measurement data.

Masks for the unit's three measurement areas (SAV: Ø4 mm, MAV: Ø8 mm, and LAV: Ø25.4 mm) are included as standard accessories, so users can select the one that suits in-house measurement requirements.

The system is designed to manage opaque, transparent, translucent, and fluorescent samples. It is also set up, the manufacturer states, to communicate color seamlessly internally within a plant, and throughout the supply chain.

Elcometer offers its model 1720 washability and abrasion tester for various applications. These machines, the company says, have been designed for testing the washability, brushability and resistance of a wide range of materials including paint, lacquers, inks, coatings, leather, wood, plastics, printed material, fabrics etc.

Made from anodized aluminum to make it durable and robust, all its stations can be tested wet or dry. It offers rapid tool change, and can test up to four samples simultaneously.

The user-adjustable stroke length is from 10 to 300mm (0.4 to 11.8 in.) Speed cycles can be adjusted from 10 to 65 cycles per minute, or set to the ISO standard of 37 cycles per minute.

Elcometer's 1720 model testing system.

Just how to equip an in-plant laboratory is a decision that is not only individual to any given company, but also evolves over time. It is also apparent that as equipment technology improves and becomes more versatile and needs progressively less human intervention, a coating operation today can expect to be running a physically small but technically powerful laboratory facility.

The key thing, of course, lies in selecting a system that truly addresses the company's actual needs, as well as setting it up to deal with future market requirements. Digital technology offers many powerful tools, but an operation that knows its own capabilities and goals is the one that is best positioned to make full use of it. ■

Antimicrobial Coatings

Preserving Critical Assets and Keeping Ecosystems Safe

By Gary LeRoux

ANTIMICROBIAL COATINGS enhance hygiene standards and public health, while keeping important ecosystems safe and reduce overall GHG emissions. They reduce the risk of infected surfaces acting as a source for transmission for infectious bacteria to food and humans. Some of the major types of bacteria observed in paint and coatings include Escherichia Coli (E.a), Pseudomonas aeruginosa (P.a.), Listeria and Bacillus subtilis among others. These coatings also provide economic and environmental advantages by reducing the frequency of painting, labour and chemical costs. Biocides such as silver, copper and titanium(IV) oxide are added to paint formulations to enhance the product by protecting them from microbial attack thereby providing added protection against fungal and algae growth. They also prevent the stain and deterioration of paint caused by bacteria or larger microorganisms.

The antimicrobial coatings market has grown tremendously over the past decade with new and improved products leading the market. Antimicrobial coatings are witnessing increase in demand from various industries that include electronics, pharmaceuticals, construction, food and packaging and various others. These coatings are most commonly used in healthcare for sterilization of all healthcare equipment. These end users utilize antimicrobial coatings for a number of applications and to varying degrees. The medical and HVAC industries are the largest markets for antimicrobial coatings driven by safety needs, particularly in North America.

It is important that any assessment of antimicrobial coatings for the purpose of regulation or otherwise consider the added value and benefits it brings to a wide range of products for a number of important uses.

Antifouling Coatings

Antifouling coatings used in maritime trade have proven to be an environmental success. Biofouling is the gradual accumulation of organisms such as algae, bacteria, barnacles and protozoa on underwater equipment, pipes and surfaces, corroding and impairing structures and systems. It is a significant problem for maritime trade as these challenges contribute to increased maintenance and replacement costs as well as decreased speed of ocean-going vessels in transit, which in turn adds to fuel consumption costs. Over the past two decades the problem has exploded as an environmental issue with the transference of invasive species from one continent to another on the hulls of ships. Cases in point are the zebra mussels and ocean lampreys in the Great Lakes, both of which negatively impact the aquatic environment to a great degree and significantly increase costs of control measures. Protecting these marine structures and environments has been a major preoccupation of both industry and government.

Water treatment and purification or tidal and sea energy became a first line of defence to combat biofouling with increased use of electrolytic systems, chemical dosing, ultrasonic systems and electro-chlorination. The paint and coatings industry continues to innovate with new antifouling coating solutions to reduce in-transit shipping costs and to preserve certain species and ecosystems. Informed governments around the world along with the shipping industry are relying on the paint and coatings industry to develop better and more sustainable antifouling solutions to preserve expensive and valuable assets, while keeping ecosystems safe.

More than 250,000 commercial ships conduct commerce in large freight containers, and cruise ships we see docked in our ports and harbours daily. Recent European data estimate that one container ship can cause as much pollution as 50,000 automobiles each year and release up to 5,000 tonnes of sulphur oxide into the air. Fuel represents 50 percent of a ship's total operating costs. Antifouling coatings reduce drag or friction when a ship is moving. Without antifouling coatings fuel consumption, maintenance costs and carbon dioxide emissions could rise by 40 per cent or more.

The International Maritime Organization (IMO) suggests that a single vessel with proper antifouling coatings would see minimum savings of 6 per cent over a five-year period and "could reap savings of 9,000 tonnes of fuel, reducing emissions by 31,000 tonnes and saving around US$3.6-million per ship." It's estimated that without such coatings the world's fleet would use in excess of 70-million tonnes of fuel annually, producing more than 210-million tonnes of greenhouse gas emissions, and nearly 6-million tonnes of sulphur dioxide from acid rain.

The commercialization of antifouling coatings began in the late 19th century. Over the years, industry has been working hard to enhance their performance, especially since the late 1970s. Ensuring a better product became particularly important because antifouling paints in recent decades primarily acted as a biocidal reservoir, which gradually becomes depleted according to various leaching rates after application. Their effectiveness and life cycle

depended on the types and level of biocides as well as the types of resins.

Very few biocides have been practical for use in antifouling formulations since extremely precise properties are required with regard to toxicity and solubility in seawater. As a result, formulators have worked hard to develop antifouling compound analogues that display significant anti-adhesion properties without the related toxicity. Examples of these are TFA-Z, Diuron, Tolylfluanid, new classes of antimicrobial agents, imidazole-triazole derivatives, or nano-TiO2-based coatings.

The Canada Shipping Act and related regulations for the prevention of pollution from ships and dangerous chemicals apply to all ships in Canadian waters and to all Canadian ships abroad. Another regulation for Canadian vessels contains specific provisions for noxious liquids and dangerous chemicals, sewage, garbage, air and antifouling systems. They incorporate the provisions of MARPOL and the Antifouling Systems Convention. Canada has acceded to both conventions.

In 2009, Environment and Climate Change Canada and Health Canada proposed a risk management approach for non-pesticidal organotin compounds recommending the addition of tributyltins (TBTs) and tetrabutyltins to the List of Toxic Substances. In 2012, the government prohibited the manufacture, use, sale, and offer for sale or import of TBTs into Canada and of products containing them with few exemptions. Compared to earlier copper-containing coatings, TBT is more toxic and lasts longer.

Health Canada regulates the sale and use of products such as organotin paints in the country. The federal Pest Management Regulatory Agency (PMRA) maintains a list of registered antifouling paints that may be imported, sold or used in Canada. The PMRA must be notified of any minor changes in antifouling formulations.

The coatings industry has since improved antifouling performance and sustainability, primarily by reducing or eliminating the use of toxics in their formulations. The latest environmentally friendly antifouling coatings are considered more costly—roughly a fourfold increase—than conventional formulations, but the return on investment is considerably higher. It is truly what sustainability is all about: taking action that is both good for the economy and good for the environment. Further, more recent antifouling research has targeted the development and testing of promising non-toxic biomaterials, which are based on the behaviours of biological systems. Their biocompatibility gives them the potential to efficiently resolve environmental issues safely and sustainably.

General Antimicrobial Protection in Waterborne Decorative Paint

The coatings industry around the world is united in support for the continued safe use of an essential raw material

for waterborne decorative paint formulations. Known as paint preservatives, these antimicrobial additives are necessary for controlling the growth of unwanted microorganisms in waterborne paints. These products have achieved great consumer acceptance over the last 60 years, owing to their ease of application and clean-up, and overall product performance.

At the same time, as the public has come to rely on preservatives in paint and a wide variety of other products, regulatory agencies around the world have established effective control strategies that ensure safe use and continue to re-evaluate such measures considering any new information. Because of the widespread public acceptance of waterborne architectural paints, and the industry's commitment to safe use of the antimicrobial preservatives needed for their formulation, it is critical that regulatory agencies around the world understand the essential nature of these products as part of their continued effort to evaluate and respond to any new, or emerging health, safety and environmental information. As such, the following should be noted:

- Antimicrobial preservatives used in waterborne paint formulations are approved (for use) by chemicals management agencies around the world.
- In approving their use, regulatory agencies require rigorous scientific documentation, including expanded testing and related risk assessments, to ensure control of microbial contamination can be accomplished without harming human health or the environment. This is especially true for waterborne decorative paints containing antimicrobial preservatives, which have been safety used for over 60 years.
- In paint formulations, antimicrobial contamination control is accomplished at the lowest possible concentrations, using materials that have established parameters for safe use.
- Antimicrobial preservatives prevent product spoilage and ensure quality and safety throughout the shelf life, and during consumer use, and are essential for the paint industry to address supply and demand.
- Consumer use typically results in the product being vulnerable to contamination. Should this occur, antimicrobial preservatives provide additional protection, to maintain the integrity of the product during subsequent storage.

In the same way, safe and effective antimicrobial preservatives in waterborne decorative paints, while essential for formulation, transport, use and storage, also allow for significant industry contribution to sustainability. It should be noted that:

- Since the early 1950s the continuing acceptance of waterborne decorative paints has largely led to the decline in solventborne paints (i.e. those that use high concentrations of organic solvents or Volatile Organic Compounds (i.e. VOCs). The substantial reductions in VOC emissions from decorative paints have been recognized around the globe as part of continued industry innovation aimed at supporting sustainable development.
- In addition to VOC emissions reductions, use of antimicrobial preservatives help extend the shelf-life of waterborne decorative paints allowing consumers to store and use the entire contents purchased without spoilage. Prevention of microbial spoilage is economically beneficial, and prevents premature disposal of both consumer products and raw materials used during production. This reduces the environmental impact of product disposal, packaging in landfills, and energy consumption required to re-manufacture and transport replacement products.
- Building on the sustainability benefits of VOC reductions and prevention of waste, the paint industry around the globe has increasingly advanced feasible and effective programs for post-consumer paint recovery programs. By collecting leftover paint and finding economically feasible ways to re-use or re-process it, the paint industry is driving towards an acknowledged sustainable "closed loop" or "circular economy".

CPCA is an active member of the International Paint and Printing Ink Council (IPPIC), which supports initiatives such as UN Lead Paint Alliance, which organizes the Global Marine Coatings Forum in support of IMO initiatives, and the international mica initiative. IPPIC also supports international workshops on biofouling management for sustainable shipping, bringing together representatives of marine industries, coatings manufacturers and suppliers, governments and research organizations. These events promote and develop effective and practical management strategies to ensure that shipping and other industries can continue to support trade, security and economic development with minimal environmental impact. CPCA helps raise overall awareness of important advances in coatings technology and highlights the latest trends and developments of its members with respect to antimicrobial coatings. This, in turn, further informs governmental and non-governmental organizations in their noble quest to preserve and protect the environment without negatively impacting the important benefits derived from antimicrobials. ■

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

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merger talks with Pittsburgh-based PPG; at one point, a hedge fund that was backing the deal sought to remove him as chair.

HERO Products Group Names Senior Vice-President

The HERO Products Group (HERO), a division of I.C.T.C. Holdings Corp., has appointed Glen Knowles as senior vice-president, sales and marketing, Americas. He brings with him over 20 years experience in sales & marketing inclusive of 15 years in the paint and coatings industry.

His experience includes Consumer Group Canada and Wood Care Canada and most recently, he served as vice-president, sales & marketing, for Sherwin-Williams' Diversified Brands Division in Canada. Earlier, he was product manager for the power tool company Makita.

Steve Balmer, president & COO of HERO Products Group said, "I'm pleased to announce Glen in HERO's most senior role in sales and marketing. Glen's experience, from retailers to key accounts will aid him in bringing forward the needs of the paint industry's key paint producers and the point of sale equipment component, that will help HERO continue to expand distribution of our paint equipment and integrate with our global service requirements.

"Glen has a proven record of facilitating long term business relationships with both customers and industry partners. His strong winning attitude and personality are assets that will complement and enhance HERO's ability to meet the needs of our customers as we continue to provide quality, innovative color technology and support to the industry."

PCI Names Board of Directors

The Powder Coating Institute (PCI) has named its latest board of directors and list of executive officers. They are: president: Chris Merritt, Gema USA; vice-president: John Sudges, Midwest Finishing Systems Inc.; secretary/treasurer: Suresh Patel, Chemetall US Inc.; past president: Ron Cudzilo, George Koch Sons, LLC.

PCI executive director Trena Benson remarked, "We welcome our newest board member for 2018, Chris Beninati, Elcometer, Inc. Chris brings generational diversity to our board and we are thrilled to have him help us in speaking for the younger sector of the powder industry. We are appreciative of our entire board, the face of PCI, for their devotedness not only to PCI, but to the entire industry."

In addition to the officers, serving on the board of directors for 2018 are: Chris Beninati, sales manager, Elcometer, Inc.; John Cole, president, Parker Ionics; Craig Dietz, product manager, Axalta Coating Systems; Sue Ivancic, account executive, Nordson Corp.; Steve Kiefer, powder coatings business director, Powder Coatings N.A., AkzoNobel Powder Coatings; Mark Mortensen, president, All-Color Powder Coating, Inc.; and PCI legal counsel, David Goch, Partner, Webster, Chamberlain & Bean.

PCI's board, from left to right: Ron Cudzilo, Mark Mortensen, John Cole, John Sudges, Craig Dietz, Sue Ivancic, Steve Kiefer, Suresh Patel, Chris Beninati, Chris Merritt, Paul West and Trena Benson, PCI Executive Director.

Dispersion and Mixing Equipment

PAINT MIXING is one of those things that is over 90 percent science but still calls for a few percent of skill based on long experience. Sometimes there is no clear-cut reason why a certain additive blends in a certain way, or coagulates in the wrong way, and the person in charge of blending simply has to learn to allow the material, and not textbook technology, to dictate how to make the mix work.

The best mixing equipment, therefore, can allow for the quirks and tweaks of paint recipes. And it can do this while still maintaining consistently high performance so that outcomes are predictable, and downloaded output data is reliable.

One trend in market demands has come from companies needing small, specialized pieces of equipment. Netzsch emphasizes its high-speed mixing and dispersing units, horizontal media mills, bench-size, pilot plant and production-size mills, and particle analysis capabilities in its product line. The company, through its Grinding and Dispersing business unit, uses its Exton, PA, technical center for pilot product production and testing on a diverse range of wet and dry grinding mills.

Despite this emphasis on large-scale machines, it has noted an increase in requests for equipment for high-throughput, laboratory sized operations. As major companies have merged and come to dominate the volume sales market, production flexibility has become a significant need for the smaller paint producer looking to service niche markets.

The company's larger systems have their main impact in wet mixing. Many customers are interested in increasing throughput while operating their homogenizers in circulation mode.

Features of Netzsch's large homogenizer models include stepless RPM-control of the agitator and the homogenizer, which provide a highly efficient agitating and homogenizing system in all RPM ranges. These also offer patented scraping for clockwise and counterclockwise direction.

The company also offers a patented method for homogenizing smallest amounts of material in the vessel, as well as a proprietary method for moving and dispersing powders. The systems offer intensive homogenizing in the vessel as well in the recirculation.

A relatively recent introduction from Netzsch is its S-Jet milling system. This offers the advantages of dry-grinding with superheated steam. Through use of an air classifier integrated in the mill, the company says, particle sizes down into the submicron range are possible.

There are reportedly significant benefits to be gained by using superheated steam as a grinding medium instead of air. The jet energy, which is considerably higher than that of air (jet speeds of up to 1200 meters per second can be achieved), increases the discrete energy input and the kinetic impact energy of the product particles is reportedly increased fourfold.

Bühler Mahwah/USA, says the primary technical demand it is seeing relates to use of smaller grinding media, which offer more efficiency in reducing particles to the desired size. Customers are also looking for sophisticated control solution, and better premixing/pre-grinding equipment to better deal with occasional lower raw material quality.

A recent product introduction from Bühler is a grinding option that unites its MacroMedia pre-dispersing unit and the MicroMedia bead mill. The combination of the two, the company says, greatly changes the wet grinding process.

Thanks to the improved process control of the MacroMedia in the pre-grinding stage, fluctuating raw-material qualities can be balanced out, thereby achieving uniform properties for intermediate products. This allows for optimization of the fine grinding process with the MicroMedia bead mill.

Agitated bead mills with small grinding beads have long become the standard in demanding technical applications, the company says. But quality expectations for simpler dispersion tasks, such as producing printing inks or coatings, have also risen significantly in the past few years.

This is leading manufacturers of such inks, for example, to seek the efficiency benefits of small grinding beads. Besides the reduced energy consumption and increased productivity, the quality aspect is decisive for them: the finer pigment grinding requires less pigment and helps them increase their margin.

An optimal pre-dispersion Bühler offers is, it says, crucial for the advantages of the agitated bead mill with micro-grinding beads to unfold. In practice, there is usually only a mixing process before the actual wet grinding which is very dependent on the quality of the raw materials. If the mixing is not absolutely homogeneous, problems may occur in the grinding.

Uneven particle size distribution can lead to clogged mills or that larger grinding beads must be used. Another disadvantage is that sedimentation can occur throughout the whole plant system. This then results in frequent cleaning intervals and thus production interruptions.

The MacroMedia, which offers these capabilities, is a compact pre-dispersion unit that combines all essential components, such as pumps, material conveyance and

dispersion zone, into a single shaft that can be integrated into existing environments without a problem. Special emphasis has been placed on a high level of process safety and easy cleaning.

The machine has a dynamic, self-cleaning multiple gap separator. No particles can clog the separation gaps because of the shear forces between the rotating and static parts in the dispersion zone. The high flow capability enables high recirculation rates and a high number of turnovers.

Radia Products, at one time known as Red Devil Equipment Co., changed the timer of its Speed Demon I one-gallon mixer. This was done because it discovered that it could achieve full color incorporation in 90 seconds, compared to a previous timing of just over twice that.

Radia offers explosion-proof models for companies that use potentially volatile ingredients. It also offers space-saving bases that can stack mixing units.

CB Mills has long offered a range of grinding mills. Its Dyno-Mill production grinding mills, the company states, are best suited for ultrafine wet grinding operations.

The Dyno-Mill KD horizontal agitator bead mill series is a standard operating media grinding mill, with a horizontal chamber for dispersion and fine wet grinding. The models in this series are designed for difficult to grind products, and are able to de-agglomerate as well as reduce particle size.

The ECM-AP series, the company says, is considered to be its high-energy horizontal mill. Its proprietary media separation design allows operation with media as small as 0.1mm, while increasing efficiency by as much as 35 percent over previous designs.

And for small-scale operations, the ECO 5 is designed as an economical, five-liter horizontal mill. This can be used for laboratory work, or small batch production.

Determining the optimal mixing equipment for any plant can be a difficult decision, though one where today hard data is available from suppliers on what their equipment can accomplish. And the new generations of machinery, coming out of a highly competitive marketplace, at the very least offer much greater reliability and endurance than used to be the case.

If nothing else, that reduces a lot of the guesswork out of recipe preparation. Paint blending might never become a pure science, but it comes closer to this state today than it ever did before. ■

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Wood Shines with UV Curing

ULTRA-VIOLET CURING for wood finishes is a developing field. Where solvent-based paints and coatings is essentially an area of settled technology, and waterborne finishing is becoming a mature one, UV-cured finishes still show promise for gains in quality and cost-effectiveness.

Not every company will find UV finishing suits its requirements. Often, it is companies having larger throughputs that can best capitalize on it, though medium-sized finishers stand to gain from improvements in color selection that are now commercially proven.

"UV coatings are a bright spot of growth for wood finishes," says Joe Kujawski, business director of Sherwin-Williams Industrial Wood Coatings. "There are a lot of efficiencies with UV that are attracting a lot of attention right now.

"For example, it's a very low-cost coating system. It goes such a long way and it has an incredible spreading rate and coverage. You can wipe excess coating off the belt and recycle it through the system."

One factor pushing UV's growth, he points out, is offshore competition. Where kitchen cabinets from China and other Asian countries used to offer low value, high-quality units are now being imported to this continent, and that is creating pressure for companies here to compete more effectively.

The efficiency of UV systems, combined with the durability of the finishes they yield, is a significant selling point in the face of this. Add to that the scratch and abrasion-resistance UV offers, and its chemical resistance, and a domestic finisher can offer major selling-points.

"There are three 'flavors' of UV coating," Kujawski says. "The market for solvent-based types is stable to declining slightly. The second 'flavor,' 100-percent solids, uses rollers, not spray-guns, so it applies only to flat items.

"The third 'flavor' is waterborne coatings, and that's where we see the major growth. They can be sprayed, and we feel Sherwin-Williams' waterborne UV coatings are a cut above the competition in that they tend not to clog the

UV-curing on wooden kitchen cabinets offers a high-quality look.
(Photo: Sherwin-Williams).

tips of spray-guns, they don't bubble and foam, and they're much easier to reclaim than the earlier generation of materials."

On the 100 percent solids front, the company claims an edge in its floor finishes and their Taber abrasion resistance. This measure of durability refers to wear-through more than scratch resistance, which is important for something that will face repeated friction throughout its lifespan.

A significant advantage Sherwin-Williams has been able to offer recently is advances in matching custom colors. The company, Kujawski says, has extended its ability to match colors to achieve greater batch to batch consistency.

"Custom colors are all the rage right now," he says. "People want to match colors they have seen, and we can now offer that with waterborne coatings.

"In previous generations of UV colors, a color could change drastically when it went through the UV curing lamps. Now, with our new materials, it still matches the color it was before curing."

This, he adds, can be a boon to the small to mid-sized cabinet manufacturer. Large manufacturers work mostly with a standard color palette, while mid-sized companies often offer a much larger palette, and will do custom colors as well.

A promising shift in the past few years has come with the arrival of LED lamps. They last much longer than mercury or gallium lamps in the field, though still have limitations, such as needing to be very close to the surface of wood – usually, about a quarter-inch – to work properly. This means the finish line has to be very consistent, with no profile.

"It's picking up steam, but very slowly," Kujawski says. "It makes sense for large manufacturers of flatline furniture, and we see it picking up momentum in Europe. With the next generation of LED UV lamps, it will probably be used more extensively."

Several coatings suppliers have noticed a demand in the market for opaque coatings, and away from more traditional finishes.

"We've seen a lot of transition from stains to opaque coatings," says Carl Gaynor, market segment manager with Axalta. "We find the strongest market potential is in kitchen cabinets and furniture, although flooring is also a stable market for us."

Opaque, waterborne UV coatings he adds, offer enhanced application performance over other types of coatings, lower VOC levels and greater productivity. There are also the advantages of rapid cure and greater mar resistance than with other finishes.

"We see many opportunities to improve existing performance characteristics using UV-cured coatings," he says. "For example, there are industry-wide labor challenges that mean productivity is a very important issue.

"UV used to be used by only larger companies, but now it's smaller companies that are starting to use it. They're trying to automate as much as possible, and UV offers a way to help with that."

There are a number of suppliers in the UV marketplace today, he adds, and most of them can probably manage the formulas for UV-cured coatings without significant difficulty. The problem, he says, can lie not in having the chemistry, but in delivering it to the user.

"The hardest part is transitioning it into the customer experience," he says. "Axalta's advantage is that we have the right people to help customers get things working they way they should."

The wood finishing industry in Quebec is hoping a recent initiative at the University of Laval will provide some welcome impetus to developing new UV-cured coatings. The NSERC/Canlak Industrial Research Chair in Finishes for Interior Wood Products is headed by Véronic

UV-cured finishes can offer pleasing matte as well as gloss finishes.
(Photo: Sherwin-Williams)

Landry, an associate professor in the Wood and Forest Sciences Department of the university. Its aim is to increase the use of interior appearance wood products by developing finishing products or densification processes that improve the performance of these products, or give them new attributes.

Landry says her main interests are nanocomposites and stimuli-sensitive coatings, as well as wood impregnation systems with a low environmental impact.

The purpose of the new project is to spur development of interior wood products that meet professional construction requirements for mechanical performance, fire resistance, and appearance. To reach ambitious performance and appearance objectives, Landry explains, a holistic approach to wood treatment will be used.

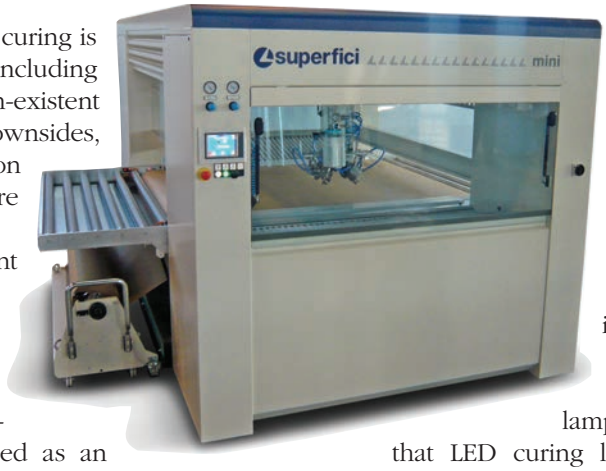
The research program will examine both finishes and densification and will touch on chemistry, wood science, and mechanical and industrial engineering. This, obviously, includes UV-cured coatings, which fall under the project's mandate to look for a low environmental impact, as well as that for developing better appearance in finished wood.

"This will help Canadian manufacturers position themselves strategically as leaders in the field of interior appearance wood products, for all types of materials," Landry notes. "Approaches developed in collaboration with the program's industrial partners will be used to diversify and broaden the use of interior wood products in appearance applications.

They will include the use of stimuli-sensitive materials (such as self-healing materials), materials with a low environmental impact (such as aqueous phase products featuring high chemical and mechanical performance) and high-speed polymerization processes for wood surface densification.

Partners in the program include Quebec-based finishes suppliers EMCO-Inortech and Canlak, as well as other companies involved in the wood finishing industry. ■

LED Leads in UV Curing



Superfici's UV Mini curing system.

REFINING THE METHODS of ultra-violet curing is an ongoing project. The advantages, including reduced energy usage and almost non-existent hazardous emissions, are clear; the downsides, which include limits on the configuration of parts and initial capital investment, are at least improving.

The process has received a significant boost from the advent of LED UV lamps, which drastically cut energy usage, and last several times longer than conventional types of light bulbs. But some of the technology is still under active development, and LED can still be described as an emerging method, not a mature one.

In another feature in this issue, we cover use of UV curing for wood, but the process is used in an increasing number of industries. The automotive industry uses it for scratch-resistant coatings, and digitally printed items are being protected by UV coats. Even in construction, fiberboard panels used for exteriors are acquiring UV finishes in some instances, though the longevity of exterior UV coatings is still sometimes sub-optimal.

Design of UV curing units is changing as the technology makes greater inroads. Venjakob, for example, stresses the modularity of its systems, which mean that customers can begin with a basic line, and upgrade as demand or available capital permit.

The company says that other customer requirements it is called to address include a reduction in ozone emissions from the curing; reduction in operating temperatures; and generally longer equipment lifetime.

Another equipment supplier, Superfici, notes that in some cases customers, especially in wood finishing, are asking for narrower finishing lines. A traditional line might be 1.35 meters wide, but some customers the company serves have specified a line 650 mm wide, to save on floor space. There is also an emerging requirement for smaller electrical cabinets, again to reduce the amount of floor space.

Superfici's Mini system addresses these requirements. It is used primarily for lacquering applications.

The goal for many users, the company says, is to have a couple of narrow lines that are geared to quick color changes, or changes in sanding effects. Kitchen cabinet manufacturers in particular are requesting such flexibility, partly because of the ongoing shift to water-based coatings.

Superfici maintains a lab in Concord, NC, and customers can send samples to this and have the lab run them. This, the company says, makes it possible to check for how to avoid potential problems and achieve optimal results.

Phoseon Technology is one of the systems suppliers putting strong emphasis on LED UV lamps. This company notes that LED curing light sources have been proven to support trouble-free press operation, compared to conventional mercury lamps. There is no warm up-time required and less down time due to the instant on/off of UV LED.

The technology therefore offers higher consistent yields and reduced waste compared to traditional UV curing. LED systems can process a variety of materials, including thin and heat-sensitive substrates, at maximum production speeds and with low-input power. UV curing can accomplish tasks that cannot be done with ARC lamps due, in part, to high temperatures, ozone damage and radiation risk.

Due to the low curing temperatures of LED, it is possible to coat materials such as pine and other resinous woods with significantly lower reject rates. For example, if the surface of a pine board exceeds 50 deg. C, the scrap rate increases significantly.

The longer wavelength output, such as the UV-A range seen from UV LEDs, can penetrate through thick or pigmented systems, producing through-cure of the material. This ensures better surface adhesion as well as the ability to cure pigmented wood coatings.

Phoseon states that it is exploring new solutions for networking/connectivity, as communications between devices becomes more sophisticated. It has also worked with several major ink manufacturers to produce and improve inks that will replace the need for ARC lamps, so they can be used in industries where ARC lamps were never a viable solution.

Many Phoseon products are designed to be scalable, which gives the end-user the flexibility to create custom length solutions, as well as offering optical uniformity, for consistent and reliable curing. And as noted above, there is an ongoing move to reduce the equipment footprint. The push is on to use the newest lamp technolo-

gies to reduce the number of lamps required by up to 50 percent in many applications.

The automotive industry has begun to use UV LED curing solutions for paint and coating touch-ups, and also window and sunroof seals, among other applications. In particular, the lightweight materials used in today's vehicles benefit from the low temperatures enabled by UV LED technology.

Heraeus Noblelight's entry into the LED sector is its Semray system, which is designed as a plug-and-play unit. This is simplified to have one UV LED segment, one backplane, one data cable and one power cable.

Semray units have a custom-designed chip-on-board for efficient, optimized curing, and are particularly suited to curing heat-sensitive materials because of their low heat generation. They also offer flexible working distances without, the company says, loss of UV light intensity, due to the use of special micro-lenses that produce beam focusing.

The design enables fast on/off switching, so that energy is consumed only when it is needed for curing. The ozone-free technology requires the installation of no exhaust systems.

Another supplier in the field is Hanovia. Its Reflector UV curing system assemblies feature lightweight extruded aluminum housing, and ARC lengths from four in. to 77 in.

Units are air-cooled from either end or the center, and are adaptable for use with dichroic optics (coated reflector/quartz plate). They can be used with ceramic or metal-end UV lamps, and are available with a focused or a flood reflector.

The company also produces a wide range of UV lamps.

Using UV systems for curing is relatively simple, once the production line is aligned and all conventional safety requirements are met. The low level of emissions is welcomed by both management and plant workers.

There are limitations still in terms of part configuration that have to considered, and UV cannot always replace every type of finish traditionally handled by conventionally curing finishes. But overall, its advantages in production and operating reliability make it look like a sure bet for future growth and development. ■

The Semray LED system from Heraeus Noblelight.

Manual Guns Stress Ergonomics

FOR EVERY INSTANCE where automated paint spray systems are needed, there are a dozen more where reliable manually operated guns are the tools to use. Whether the end-use is a short production run, a refinishing job or a part with a particularly complex geometry, the manual gun is not about to be phased out of the industry.

3M's Accuspray manual gun.

Key developments in gun design today include an emphasis on ergonomics. For example, leading suppliers are producing lighter guns with triggers that require less pressure to actuate.

S.T. Rajan, vice-president of sales for Canada with SAMES-KREMLIN, says that in addition to the lightness and ergonomics, a manual spray gun needs to be a good selection of nozzles, needles and aircaps to handle fluids of differing viscosities.

"Customers prefer having a smaller number of parts to be maintained," he says. "They want their guns easy to maintain and allowing for easy replacement of parts." In addition, a gun has to atomize well, and be well balanced.

He says his company looked at its manual electrostatic applicators and came out with two new versions. The first is the Nano low pressure gun. This can be connected to pressure pots, diaphragm pumps or piston pumps designed for low pressure.

"They are up to 80 percent transfer efficient and the gun is lighter as compared to most guns in the market," Rajan says. "It comes in two versions, one with flat fan spray and the other with a round spray with a super vortex attachment."

The second version is the Nano gun medium and high pressure. This has been designed for productivity and outstanding transfer efficiency of 93 percent.

"Both these guns have been developed to spray with both high current and high voltage," Rajan says. "This helps in optimizing paint charge and excellent substrate coverage. The control modules for both the guns are easy to maintain and easy to use. The displays can be seen from a 5-meter distance."

The company recently introduced its patented FPro P air spray applicator. This comes in three versions, HVLP, LVLP and a conventional type.

"It has transfer efficiency of 78 percent," Rajan explains, "which is unknown in air spray technology. This has been made possible because of the Vortex and the restrictors which have been introduced.

"It offers the most compact handle and the lightest trigger stress on the market. The applicator comes with a good selection of nozzles, needles and restrictors. It brings an amazing sensation when in hand, thanks to its shape, surface quality and balance. When used with our new range of light hoses, this applicator becomes the most flexible and lightest tool on the market."

SAMES-KREMLIN also has a new manual airless applicator, the model SFLO. This comes in two versions, the 275 and the 450.

"These guns have a high transfer efficiency of 81 percent," he says. "They are designed for high atomization quality and heavy duty industrial applications. We have a very large selection of tungsten carbide tips from flat to reversible to skill (double insert) available for every application. They are designed with a comfortable grip and fatigue-free trigger."

Additionally, the Nano gun for air spray and the company's Airmix units are light in weight and very high in

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SAMES-KREMLIN's manual Nanogun.

transfer efficiency saving coatings. The manual Airmix lite applicator and the automatic airless guns will be introduced to the market within the next two months.

The 3M Co. recently introduced its Accuspray ONE spray gun system, with the goal of eliminating spray gun maintenance kits and reducing cleaning time and solvent use. 'ONE,' the company says, is the key word, as the gun can be used for virtually all coating applications.

"Each part of a paint job – primer, sealer, base, clear coat – can demand a different application, and a different tool," says Scott Tucker, business development manager with 3M Canada. "For example, the same spray gun that provides broad coverage for primer rarely gives you enough precision for clear coating.

"With its five sizes of spray heads, the painter can use the Accuspray ONE spray gun for all coating applications – there's no need to switch spray guns.

"It allows painters to spray consistently at 90 degrees, no matter how the part is positioned. This makes material transfer more consistent, limits paint overspray and lowers paint consumption. Even more importantly, because the PPS spray cup is a closed system, painters can spray at any angle – even upside down."

The gun has a composite spray gun body that is mold-

The Binks AA series manual spray gun.

ed in one piece, making it lightweight and eliminating the complexity, wear and cleaning of small parts and pieces. It uses a series of replaceable, transparent atomizing heads which can be reused five to 10 times and then simply removed and replaced. It affords the performance of a brand-new spray gun, on demand and at a fraction of the price of a metal gun.

"Painters," Tucker notes, "are looking for manual spray guns that are easy to use and maintain, saves them time in the prepping and clean up processes and enables them to spray in hard-to-reach areas, at any angle, consistently and evenly."

Binks, a Carlisle Fluid Technologies' brand, has launched the all-new Binks Trophy AA, Air-Assisted Airless manual spray gun.

"The new Binks Trophy AA represents the next generation of air-assisted airless guns," says product manager Payton Cozart. The SATAjet range offers a variety of manual spray guns. For example, the model 4800 works with both waterborne and solvent-based paints and coating materials, and offers a universally adjustable spray pattern with fine atomization for a high work speed.

There is a short trigger pull, SATA says, and low trigger forces ensure fatigue-free working. Air and material swivel joints, using ball bearings, provide for optimum operation. There are ergonomically shaped control elements such as fan control and integrated air micrometer, and the nozzle-head and material passages are made of stainless steel.

The much smaller SATAjet 20B is a spray unit offering fine atomization and reduced weight compared to competing guns. Right and left-handed people, the company says can both use it without problems.

Special nozzle sets are available with adjustable pre-air, for achieving special painting effects. This model can be used either with a plastic gravity flow cup or a plug-in glass cup. There is an easily changed air connection hose with no tools, which facilitates using the best air hose connection for the task in hand.

Prona Tools Inc. specializes in air-powered tools. It recently launched a new spray gun, the air-assisted airless manual R-2200.

This, according to company president Jason Jiang, "sprays phenomenally on all surfaces with all materials. It comes with a large selection of nozzle sizes and its excellent transfer efficiency meets the highest requirements of today."

Another, established product from Prona is the SG-71. This is a specialty manual spray unit that can be used for appearance decoration. It will spray out various patterns such as floss, coarse dot, fine dot, as well as other patterns.

There is only so much a manual gun can do, and that in turn is affected by the skill of the operator. But manufacturers have spent much time on developing guns that can deliver the most accurate spray pattern possible.

As a result today's products in the field are better than they ever were before. ■

Through Thick and Thin

Easy thickness testing is a must for any finishing plant today.

RODUCT SPECIFICATIONS are something that always gets tighter. Nobody ever asks for less stringent product dimensions or quality, and that means finishing measurement is progressively more important.

Today's portable measuring devices take advantage of progressive miniaturization of components. Combined with constantly improving algorithms, their accuracy increases every year.

Additionally, ergonomics is getting more attention, as is wireless connectivity. Not every plant has or needs such connectivity, but it is penetrating the industry bit by bit.

DeFelsko recently introduced the PosiTector 6000 FNDS probe for duplex coating systems. This, the company says, simultaneously measures and displays the individual layer thicknesses of zinc and paint in a duplex coating system with a single reading.

"The PosiTector 6000 FNDS is ideal for measuring the three types of zinc used in duplex coating systems – hot-dip, electro and zinc spray metalizing (thermal spray zinc)," says Julia Lashure, of the marketing department of Gardco (Paul N. Gardner Co.) "When taken out of duplex mode, the instrument can be used as a conventional ferrous/non-ferrous gauge to measure the thickness of coatings on all metal substrates."

There are four ways to view and report PosiTector and PosiTest inspection data. From dedicated desktop software to web and mobile based platforms, the PosiSoft suite of solutions has been completely redesigned and re-engineered and is compatible with DeFelsko's full line of inspection instruments. These four ways are: Desktop, Smart Device Apps, web-based software and instrument-based reporting.

Recent improvements include the addition of Custom Fields to PosiSoft Desktop software," Lashure says. "A user can add labels, notes, checkboxes, probe information, measurement data and more to create fully customized reports. Alternatively, they can overlay custom fields on existing PDF inspection forms to automatically populate text and measurement data."

The company recently added a new coating thickness probe to its PosiTector 6000 series. This features a 0.48 x 0.2 in. (12 x 5mm) probe head with a 13.75 in. (350mm) reach. It is designed for measuring hard-to-reach areas and other challenging applications such as tight diameters, edges, and corners.

A PosiTector 6000 hand-held unit.

PosiTector 6000 Series gauges work on all metal substrates. They include a protective rubber holster, and the latest models include three powerful scan modes.

They also include storage of 250 readings per probe. The stored readings can be viewed or downloaded as required.

Elcometer offers its 456 gauges, which are ferrous probes that measure non-magnetic coatings on ferro-magnetic substrates. Elcometer 456 ferrous gauges accept any ferrous probe, while the non-ferrous gauges accept any non-ferrous probe.

Probes are fully interchangeable, and available in a number of designs and scale ranges to meet specific applications. Dual FNF probes measure both ferrous and non-ferrous applications with automatic substrate detection.

These gauges accept all ferrous, non-ferrous and dual FNF probes. They feature a maximum operating temperature of 150 deg. C, while the proprietary PINIP probes have a maximum operating temperature of 80 deg. C.

Each 456 gauge and separate probe is supplied with a Test Certificate. For separate gauges, the test measurements are generated using factory reference probes.

Fischer Technology's XAN 500 X-ray fluorescence instrument is a recent measurement unit that work as a hand-held, desktop or inline device. Equipped with a tablet computer, the XAN500 also utilizes established WinFTM software.

Coating thickness measurements with WinFTM is based on the fundamental parameter analysis. This makes it possible to measure without prior calibration – that is, standard-free.

Applications include precise coating thickness measurement in running production of zinc, zinc-nickel, silver, gold and other metals. The instrument can also measure bulky parts like pipes, housings or machine components, reportedly with good repeatability. Placed into its measurement box, the XAN500 becomes a fully functioning desktop unit, allowing precise and repeatable measurements on small parts like nuts and bolts.

Fischer's MPO and MPOR series instruments are designed with a robust construction, to function under rough environmental conditions. They offer simple operation, even in hard-to-reach measuring spots, with two independently pivoting and illuminated displays.

They measure according to standards, with special modes for use with IMO PSPC and SSPC-PA2. Depending on how they are configured, they can handle coatings on steel and iron (the Permascope instrument format); aluminum and other non-ferrous metals (the Isoscope format); or all of these (using the Dualscope format).

Fischer's handheld coating thickness measurement devices from the FMP10 to FMP40 range deliver precise results and the various measurement techniques available make them highly flexible. Models are available with magnetic inductive measurement (Deltascope), eddy current measurement (Isoscope) or both techniques combined (Dualscope). By attaching different probes to these instruments, users can create the right solution for virtually any measurement task.

TQC offers an ultrasonic thickness gauge designed to measure the thickness of both metallic and non-metallic materials, including aluminum, titanium, plastics, ceramics, glass and plastics. It can also be used to monitor all types of pipes and pressure vessels for loss of thickness due to corrosion or erosion.

The gauge, the company says, is

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Where Finishing Connects

ElektroPhysik hand-held thickness gauges.

easy to use and will give readings to an accuracy of one percent. The unit is not suitable for cast iron, however, due to its big crystalloid composition.

The gauge is available in two models, Basic and Pro. The Pro version allows storage of data and performs a sound velocity measurement when used with a known material thickness. This model is also supplied with an extra probe (5.0 MHz).

The Basic version has 10 preset sound velocities and does not offer the possibility to store data.

ElektroPhysik's SIDSP (for Sensor Integrated Digital Signal Processing) digital technology sensors calculate the complete thickness value at the actual point of measurement where the sensor touches the coating. Only the fully analyzed and processed digital coating thickness value is transmitted through the probe wires, not an analog signal.

An ElektroPhysik product that uses this technology, the MiniTest 700 Series, features an ergonomic design, probe sensors and automatic substrate recognition. The MiniTest model 740 converts from a built-in integral probe design to a probe-on-cable, simply by changing out the probe cartridge.

The MiniTest 720 model features an integral probe with built-in sensor, while the MiniTest 730 has an external probe with sensor on a cable; and the MiniTest 740 features inter-changeable sensors with memory to store up to 100,000 readings in up to 100 individual memory fields.

All models feature a comprehensive statistics package that includes batch statistics, user selectable high and low limit settings with visual and audible alarms and an IrDA 1.0 transmission data port. A 180-deg. rotatable display allows for easy viewing, regardless of the operator's position while taking readings.

Selecting the right device is always a matter of price versus performance. But with the increasing range of instruments available in today's market, the selection process is becoming progressively easier, and the results achieved in production increasingly useful. ■

Danglers Face Challenge of Higher Loads


Danglers with different insulating materials, from Newact.

EFFICIENT DANGLERS are one of the essentials of a good plating operation. As with any critical component in manufacturing, it pays to take care of them, and to carefully source new designs as plant requirements shift, or as innovations come into the market.

If one thing has improved consistently with the design of danglers over the years, it has been the shift towards improved insulating layers. Conventional vinyl sleeves, for example, can cause dragout, whereas a plastisol dip gives a much more secure covering. The initial outlay per dangler for a plastisol covering could be higher, but it preempts the risk of a chemical ingredient being carried from one tank to the next, or the possibility of chromate leakage into the parts happening at the unload station.

Barrel plating line staff need to check danglers each time the barrel is unloaded. In most production systems, there is usually enough time to replace a dangler without removing the plating barrel from the line. There is a selection of quick-change tools available from most suppliers, to make this process easier.

Most dangler suppliers will tell you that replacement of barrel danglers, or the contact tips, should be part of any ongoing maintenance program. A damaged or worn dangler can impede the plating process and add to production costs.

Dangler designs and construction change with the times, and the engineering they employ has shifted. There are also, of course, market forces forcing changes. Brad Hatcher, president of The Dangler Guys, observes, "It seems to me that the industry is growing because of high demand for plating faster. Companies are running bigger barrels with higher current and bigger loads.

"This is causing us to make larger danglers such as our 350MCM and 444MCM danglers. The loads in these barrels are upwards of 1,000 to 1,200 lb."

These two dangler designs were produced to handle higher amperage. Following the plating industry's ongoing recovery after the 2007/8 economic meltdown, new barrel lines were installed by many companies, with the higher capacities that lead to a more competitive operation. As a result, demand for customized danglers, Hatcher notes, has definitely taken off in recent years.

Most suppliers concur that the plating industry has opted for customized danglers that suit specific applications. Even job shops are now asking for such customized designs featuring non-standard coatings, lengths and cable sizes that can accommodate the range of work that may come in.

The Dangler Guys is a company that has existed for most of two decades, and working very closely with customers on dangler designs is a key part of the business today. One relatively recent innovation from the company is a dangler featuring a thicker vulcanized sleeve. This is

made of a combination of materials that make it more chemically resistant and flexible, as well as lasting longer.

All the company's dangler heads feature an exclusive triple-crimp design. This concept can be used with any sized parts or barrel loads.

Steady market demand is also reported by Newact Inc., although president Tom Vale notes that few new plating operations are coming into the market. The growth, he says, is coming in small, steady increases.

"It's hard to say there are specific trends we're called to address," he says. "We are typically solving problems with custom heads and sleeving."

One change the company did have to make was to shift away from chlorosulfonated polyethylene. DuPont made Hypalon chlorinated PE at a US plant until 2010, then closed it, and the product is no longer commercially available on this continent.

"We have recently developed a Kevlar-filled compound which allows the dangler to wear longer," Vale says. "This is also made from a CPE-based material," so it is similar in its technical capabilities.


Heavy-duty danglers from Metafin.

"This is a special item," he explains, "that reduces cuts and wear on the sleeve, at a small up-charge per dangler."

NewAct's danglers are manufactured to customer specifications in lengths up to 120 in., and in most standard cable sizes up to 0.75 in. in diameter. Additional customization options include crimped over, standard, double-crimped, or custom configured knobs.

There are other suppliers with specialty lines as well as distributors of standard products. Metafin Supply Co. offers heavy-duty danglers made from durable, insulated high-tensile strength cable, in standard 4/0, 2/0, 1/0, 6ga, 4ga and 2ga sizes. Knob sizes for these are available from two to five in.

The barrel anglers are custom-made to fit individual customers' barrels. Non-standard sizes, special designs or special materials are available as well.

Despite the fact that danglers are often seen as a generic category of products, the market remains competitive, and it always pays for a plating operation to hunt for options in buying danglers. The industry will continue to come up with creative options, and canny customers know that active cooperation with a committed industry supplier can usual solve the problems of technical efficiency as well as cost-efficiency. ■

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Rotary Atomizer

The Eisenmann VarioBell 2 is a high-speed rotary atomizer, for 1K and 2K applications. Users can switch from bells to guns on the same robot.

The system features a wet application rotary atomizer bell, which has a nylon casing. There is a mixer in it, so the unit can mix in the bell.

The company claims it is one of the smallest rotary atomizers for wet paint applications on the market. It is suitable for painting component exteriors and cavities.

There is a dual-channel design for very rapid color changes, and high paint transfer efficiency thanks to direct electrostatic charging. It offers minimal paint wastage when changing colors

It is suitable for water-based and solvent-based paints, the integrated mixer allowing the use of two-component paints. There is an integrated high-voltage cascade.

www.eisenmann.com

Holiday Detector

Gardco's new M/1S Holiday Detector is for porosity detection in thin film coatings on conductive substrates such as tanks, concrete, and similar items. It has an ergonomic design with a twist-lock ground cable.

It also features a strong fiberglass wand, a large sponge and a plastic sponge holder. This instrument conforms to NACE International RP0188 ASTM D5162-A, for low voltage holiday detection.

The M/1S Holiday Detector is strong and the lightweight wand material reduces fatigue and will not bend. The new sponge material used for it is thick and strong. The sponge holder is plastic and will not damage coatings.

There is easy battery access, and the unit uses common, easily found nine-volt batteries. It has a regulated, 67.5-v DC output.

The unit is a wet sponge-type holiday detector, and features a pushbutton calibration check.

It has two resistance settings: 80k Ω for tanks and pipe, and 90k Ω for coatings on concrete.

It is designed to be used on thin film coatings and is non-destructive. It has an impact resistant plastic case, stainless steel hardware, and a long-life ground cable.

www.gardco.com

PPG Develops Shed Paint

PPG has introduced PPG Aquacron 200 and 100 coatings, which are designed to meet the unique challenges facing shed and barn manufacturers.

PPG Aquacron 200 waterborne acrylic urethane enamels deliver a rustic aesthetic and, the company says, excellent substrate protection. They are available in both solid and semi-transparent colors that create stain-like finishes on a variety of primed substrates, including engineered, pre-primed boards such as LP Smartside and DuraTemp products.

PPG Aquacron 100 acrylic enamels provide ease of application with excellent sag resistance. Available in a palette of solid colors, they are designed for substrates that include LP Smartside, DuraTemp and other engineered, pre-primed boards, as well as T-111 wood siding.

Both Aquacron 200 and Aquacron 100 coatings are available in popular ready-mix colors, or they can be custom-tinted to more than 1,800 hues from The Voice of Color palette by PPG.

www.ppgtruefinish.com

Carbon Blacks

Orion Engineered Carbons is promoting two easily dispersible carbon blacks. These are Colour Black OE 430 W Powder and Special Black 40 Powder.

Colour Black OE 430 W Powder, formerly known as XPB 430 Powder, is a stir-in preparation for high-jet water-borne coatings. Special Black 40 Powder is a carbon black for medium- to high-jet industrial coatings and tinting applications.

www.orioncarbons.com

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