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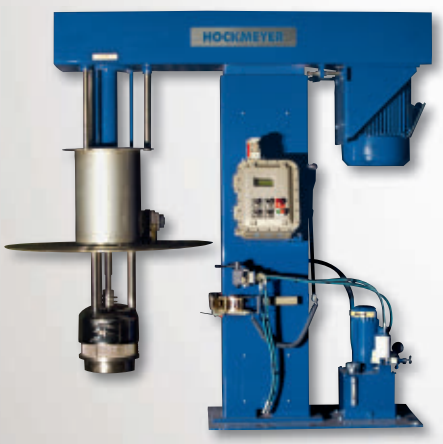

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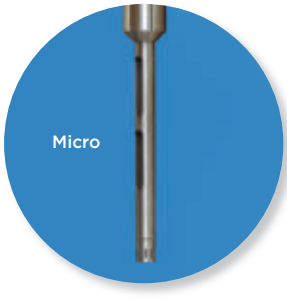

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Advanced Aerospace Coatings in Europe

This month's feature article is on the aerospace coatings market. Coatings manufacturers I interviewed reported positive market conditions and growth is predicted for the coming year.

According to a report from Future Market Insights, the Europe advanced aerospace coatings market was valued at $390 million in 2018. Analysts report that increasing demand for efficient and lightweight advanced aerospace coatings is expected to be a major factor driving the demand for advanced aerospace coatings in the Europe market during the forecast period.

Europe's increasing air passenger traffic has led to an increase in the demand for commercial aircraft. This, in turn, has led to an increase in the production of commercial aircraft. The growth of the advanced aerospace coatings market is directly dependent on the total aircraft production and the fleet size.

The Europe advanced aerospace coatings market is consolidated with the top two market players – Akzo Nobel and PPG – accounting for double-digit market shares as of 2017. The top ten players in the Europe advanced aerospace coatings market are projected to collectively account for between a 50-60 percent market share.

FMI reports that in the recent past, the advanced aerospace coatings market has witnessed significant improvements from a competition perspective. Acquisitions, collaborations and expansion of production capacity are some of the key strategies being adopted by market players to expand and sustain in the Europe advanced aerospace coatings market.

Highlights Include:

• Praxair, Inc. and GE Aviation opened a new facility in the U.S. for their PG Technologies business that specializes in advanced coatings and enables jet engines to withstand high stress and temperatures.

• PG Technologies Ltd. announced that it intends to add a new additional coating capacity in Singapore to meet the ever-increasing demand from the aviation industry.

• AkzoNobel opened a specialty coatings facility in Dongguan, China, primarily for the production of advanced aerospace coatings for South and North Asia aviation markets. ***CW***

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PPG Reports 1Q 2019 Financial Results

PPG reported first-quarter 2019 net sales of approximately $3.6 billion, down about four percent versus the prior year.

Performance Coatings segment first quarter net sales were $2.1 billion, down $52 million, or about two percent, versus the prior year. Segment volumes were lower by about two percent, including the prior year national retail do-it-yourself (DIY) customer-assortment changes, which reduced segment sales by more than two percent, or about $60 million year-over-year. Unfavorable foreign currency translation lowered net sales by about $85 million, or nearly four percent.

Aerospace coatings net sales volumes grew over 10 percent for the fourth consecutive quarter, supported by growth across all major technology platforms and outpacing strong industry demand. Organic sales results for automotive refinish coatings were modestly lower as soft industry demand in Europe was partially offset by solid growth in emerging regions. Aggregate sales volumes in the protective and marine coatings business increased by about 10 percent, with positive contributions from both segments. Year-over-year organic sales in architectural coatings – Americas and Asia-Pacific declined a high-single-digit percentage, with differences by channel and region. In the U.S. and Canada, company-owned architectural coatings same-store sales grew by a low-single-digit percentage. Aggregate year-over-year volumes in the DIY national retail and independent dealer channels declined significantly driven by the customer-assortment changes. Latin American architectural coatings organic sales volumes were modestly lower due to a shift in quarterly timing of the Easter holiday promotion versus the prior year. Architectural coatings – EMEA organic sales increased by a mid-single-digit percentage for the second consecutive quarter, with solid contributions from both selling price increases and sales volume growth.

Industrial Coatings segment first quarter net sales were about $1.5 billion, down $105 million, or six percent, versus the prior-year period. Higher selling prices of more than two percent partially offset lower sales volumes of about five percent. Acquisition-related sales were approximately $15 million, driven by the acquisition of Whitford, which was finalized in March. Unfavorable foreign currency translation lowered sales by about $80 million, or about five percent, versus the prior year.

Automotive OEM coatings sales volumes decreased by a high-single-digit percentage year-over-year, consistent with lower global automotive industry production rates, including a pronounced decrease in China demand. Selling prices for this business were higher in each major region and were comparable to the company average. For the industrial coatings business, sales volumes decreased versus the prior year, mainly due to lower industrial production demand in most regions. Packaging coatings sales volumes decreased by a low-single-digit percentage year-over-year in comparison to above-market growth in the prior year quarter stemming from technology-based customer conversions.

Segment income for the first quarter was $218 million, down $21 million, or about nine percent, year-over-year, including unfavorable foreign currency translation impacts of about $10 million. Segment income was impacted by continued raw material and logistics cost inflation and lower sales volumes related to lower global industrial activity, partially offset by improving selling prices and strong cost management.

Businesses within both reporting segments are continuing to aggressively manage costs and execute previously announced restructuring initiatives. Restructuring actions delivered about $20 million of cost savings in the first quarter, consistent with company targets. Also, combined first-quarter corporate and legacy expenses were about $50 million and are expected to be $45 to $50 million in the second quarter.

The company continues to work on the previously communicated strategic review of its business portfolio and remains committed to finalizing the review by the end of the second quarter 2019. ***CW***

Index to Companies

This index gives the starting page for a department or feature with a significant reference to a manufacturer of paint, coatings, adhesives and sealants Subsidiaries are indexed under their own names.

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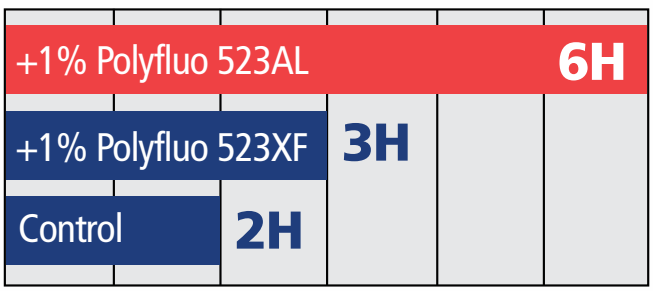

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AkzoNobel Investing in High Point, NC Site Upgrade

A multi-million-dollar investment by AkzoNobel is set to transform its wood coatings facility in High Point, North Carolina, into a best-in-class manufacturing site.

The transformation will involve reorganizing manufacturing operations at the site and will include the addition of automatic dosing unit technology to produce paint more efficiently. A new raw materials warehouse, research lab and technical application center are also being built. Construction is due to begin in April 2019, with rolling projects expected to be completed by 2020.

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

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

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

"This investment in High Point will enable us to ensure the satisfaction of all our customers and partners, including our direct OEM building product customers and our Chemcraft distribution partners," said Simon Parker, managing director of AkzoNobel's Industrial Coatings business. "We'll be able to provide current and future customers with even more flexibility through the delivery of small batch sizes; higher accuracy in stains and solid colors; more water-based products and rapid response to requests."

This latest investment follows last year's opening of a newly-constructed mega-warehouse in La Porte, Texas, which serves as a central regional hub for the company's Marine and Protective Coatings business. It also comes just weeks after the inauguration of a state-of-the-art R&D innovation campus at AkzoNobel's Felling site in the U.K.

Axalta Brazil Receives Toyota Global Contribution Award

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

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

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

PPG Foundation Invests $50,000+ in Atlanta-area Science, Educational Initiatives

PPG announced that the PPG Foundation invested more than $50,000 to support educational initiatives in the Atlanta area. The grants highlight PPG's commitment to the communities where the company has a presence and the foundation's priority of increasing science, technology, engineering and math (STEM) educational opportunities for youth. The donations were made on behalf of PPG's architectural coatings business in 2018.

The grant recipients and funding purposes were:

- Big Brothers Big Sisters of Metro Atlanta (BBBSMA) – $12,500 to support science, technology, engineering, arts and math (STEAM) Truck enrichment activities for children and youth in a one-on-one mentoring program, which includes activities focused on science, technology and engineering;
- Greater Hall Chamber of Commerce – $10,000 to support the Workforce Development program, which educates students on local opportunities in manufacturing while encouraging them to master technical skills to pursue a career in the field;
- Harvest Rain Academy – $9,300 to support the Pretty Brainy curriculum program, which empowers underserved students through hands-on learning experiences and offers resources for school-aged girls to explore activities leading to careers in STEAM fields;
- SoulSpa – $9,000 for an event where more than 600 elementary school children will participate in STREAM activities and interactive exhibits;
- YWCA of Greater Atlanta – $10,000 for the Teen Girls in Technology (TGI Tech) program, which inspires middle and high school girls to participate in initiatives focused on hands-on STEAM activities.

"PPG is proud to support local students in their educational experiences in the communities where we live, work and play," said Marsha Mosley, PPG

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distribution manager, Fairburn, Georgia. "We are excited to partner with organizations that provide students with real-world skills and foster their interest in pursuing a career in STEM fields."

Beckers Launches New Website

Beckers introduced its new website.

This platform has been designed to become a comprehensive Digital Hub and the pivotal point of Beckers' representation online.

With its improved navigation and more efficiently organized content, Beckers' website now provides an enhanced experience to visitors, whatever their access point is – from a desktop or any mobile device. Amongst other features, the new Applications section guides visitors through the various end uses of Beckers' coatings and help them find the information they are looking for in no time. Presenting case studies, technical tips and product information, the Knowledge section will be enhanced as Beckers' new projects grow.

"We are excited to reveal our new Digital Hub to the public," CEO Dr. Boris Gorella said. "We have designed this platform so that it becomes a window on Beckers' world for anyone interested in our activities, and the best stage to showcase our products, knowledge and solutions for sustainable innovation. We hope you like it and are waiting for your feedback."

Axalta, National University of Singapore Partner

Axalta Coating Systems signed a partnership agreement with the National University of Singapore's Formula Society of Automotive Engineers (FSAE), supporting its student racing team.

As an FSAE partner, Axalta will offer its waterborne refinish coatings, training and counseling, and car body spraying service to the NUS Eco Team, which consists of 16 selected undergraduate students. The students will participate in various SAE competitions for undergraduate students around the globe.

"By sharing and relaying the value of innovation, technologies, and sustainability to the next generation, Axalta becomes part of students' educational journey," said Sobers Sethi, president of Emerging Markets, Axalta Coating Systems. "This partnership enables both the University and Axalta to invest in the future of automotive engineers and provides a formal platform for regular engagements with students to foster their career development."

"By participating in Formula SAE, our students learn the importance of teamwork and have the opportunity to put their theoretical knowledge into practice," added Professor Seah Kar Heng, NUS Formula SAE advisor. "By coaching students' talent and passion in building their racing cars, Axalta helps steer students towards developing an interest in

Results of Paint Contractor/U.S. Architectural Coatings Industry Research Report

Which Compared Business Trends in 1Q19 vs. 1Q18

Each quarter, Northcoast Research surveys a large sample of paint contractors to get a sense for current business trends while United Mineral & Chemical Corp. (UMC) provides insight into coatings raw material trends. Note that of the three primary architectural paint channels (paint stores, home centers, and independent distributors), the contractor survey results are largely a proxy for the paint store channel. For inquiries regarding the results of the survey please contact Kevin Hocevar at 216-468-6924 or kevin.hocevar@northcoastresearch.com. For inquiries regarding raw materials please contact Dave Kotowski at 216-577-1982 or dkotowski@umccorp.com.

Contractor Sales — Growth Continues But at a More Moderate Pace in 1Q19

The cumulative responses to the question of how contacts' sales thus far in 1Q19 compared to the same time period last year show that growth has continued, however at a more modest pace. 54% of contractors experienced a higher level of sales YoY, 15% described their sales as "Flat," and the remaining 30% experienced a YoY sales decline in the period. These metrics produce a net increase (percent of contacts who experienced higher sales in the period minus the percent of contacts who experienced lower) of 24%. Sales grew an average of 3.4% in 1Q19, which is towards the low end of quarterly growth rates seen in the last few years. Adverse weather was cited as a common reason for the sales shortfall.

Price of Paint from Suppliers — Pricing At Highest Level Since Inception of the Survey

To get a gauge for the pricing environment surrounding the paint contractors, we asked a few questions related to said topic. When describing paint purchase prices YoY, 87% of respondents noted pricing as being higher compared to the prior year while 2% contacts cited prices as being lower. The remaining 11% described pricing as flat from the prior year. On average, contacts indicate pricing is up 4.2% YoY in 1Q19 which is slightly ahead of our 4Q18 survey which showed average prices up 4%. Given coatings companies have been trying to recover margins lost to raw material inflation we are not surprised to see pricing actions having success and expect manufacturers to continue to try to recoup margins lost to raws.

Raw Materials Pricing and Supply Update

As we begin 2019 there are many questions surrounding a potential trade agreement with China. The second phase 15% tariff that would have affected many paint raw materials has been put on hold due to positive discussions between Washington and Beijing. Indications are that a new agreement is close at hand. If an agreement is reached, what will it look like? Will it protect international companies IP? Is an agreement going to eliminate the original 10% tariff that has impacted paint raw materials? Would Washington sign a deal that eliminates tariff's and duties all together? How will an agreement be designed to improve the huge US trade deficit with China? Of course, there are many more questions surrounding a potential agreement. These questions will remain until a deal is completed or the trade war continues. Until the fog is lifted, we must be adaptive and flexible in how we manage our businesses.

It is a little surprising how Tio2 pricing continues to be strong. In early 2018, many people predicted falling prices by Q2 2019.

This does not seem likely given the recent $0.04 to $0.07/lbs price increase announcements. Some might say this is a defensive move by the major Chloride Tio2 producers in an effort to stem the tide on any price erosion. However, there is a strong indication that the price will have moved higher in China by $100/mt by the end of March. There were two separate $50/mt price increase announcements in Q1 led by the largest producer in China, Lomon Billions. Orders by major users in the US continue to be strong enough to balance supply/demand and the inventory on hand at the producers.

The good news comes to Paint companies on the price of resins. As of this writing, no one should see any price increases on polymers. Frankly, pricing on the two major acrylic monomer building blocks for latex resins have fallen significantly. The price for Butyl Acrylate and 2-Ethylhexyl Acrylate has fallen over $0.05lbs during the last 3 months. You should have seen some moderate price reduction as a result. Methyl Methacrylate has finally come out of its shortage doldrums. Prices have not retreated on MMA yet, but expectations are that prices could fall during Q2.

WTI Crude oil prices have moved higher off their recent lows. However, prices remain lower than in the same period last year by a few dollars per barrel. Today's price of around $58/bl is significantly lower than the high in 2018 of $75/bl. Forecasts are calling for stable pricing for the next 6 months.

3-Month Outlook — Contractor Outlooks Show Typical Seasonality and Improve Sequentially in 1Q19 as We Head Into Spring

At 74%, most contractors believe that business trends are improving/will improve over the coming months. Additionally, 26% described their outlook as "Neutral" (business trends will stay about the same) and 0% responded in the negative territory. In asking this question, we attempt to gauge actual expectations for the coming months based on how business has been trending as of late and based on leading indicators such as contractor backlogs, bidding activity, and any other relevant factors. To that end, a net 74% of contacts are feeling good about the upcoming months, coming in well ahead of our 4Q18 value in which a net 50% had a positive outlook, which is typical seasonality as outlooks improve as we head into the spring months. On a year over year basis, our reading was slightly better than the net 71% of respondents indicating a positive outlook in 1Q18. Our contacts described increased levels of backlogs and bidding activity as drivers behind their positive outlook for the coming months. In terms of what's driving the increased bidding activity/

backlogs, many contacts cited larger projects and renewed consumer/business confidence which is having a positive impact on spending. Further, respondents are indicating higher profit margins, larger projects and push forward of demand after a wet winter. Limiting the upside however is a lack of competent painters which has been a headwind for some time. Also our leading indicators are generally upbeat and reflect normal seasonality as outlooks improve in 1Q as we head into the stronger spring selling season. Additionally worth pointing out is that all metrics we track (outlook, bidding activity, and hiring plans) are showing stronger readings year-over-year in 1Q19 compared to 1Q18 so outlooks are fairly upbeat.

Northcoast Research 1Q19 Paint Contractor Survey Data by region:

Exhibit 1: 1Q19 Regional Average Sales Growth (%)

Source: Northcoast Market Research (NMR)

Exhibit 2: 1Q19 Regional Snapshot

	YoY Net Sales Increase (Decrease)	Average Sales Increase YoY	YoY Paint Purchase Price	Net Positive (Negative) 3-Month Outlook
Northeast	60.0%	4.0%	3.9%	100.0%
West	18.2%	3.4%	4.4%	59.1%
South	22.2%	3.9%	3.6%	88.9%
Midwest	20.0%	3.0%	3.8%	80.0%

Source: Northcoast Market Research (NMR)

Call for Papers for the International Coatings Congress (ABRAFATI 2019)

The call for papers for the 16th International Coatings Congress is open.

Researchers and scholars interested in sharing the latest research and findings can already submit their papers for review by the event's Scientific Committee, which is part of ABRAFATI 2019.

This edition of the Congress is expected to feature a broad-ranging program, filled with innovative contents, to improve and build on what happened in previous years. Presentations are expected to include cutting-edge studies and the latest developments in coatings properties, raw materials, production processes, waste reuse and product life cycles, as well as many other topics involving opportunities to offer answers to requirements from both consumers and the various markets served by the industry.

To have their papers included in the schedule of lectures and the Poster Session, researchers are to submit abstracts in Portuguese, English or Spanish to the Congress Scientific Committee for review, together with their professional information.

automotive and chemical engineering."

Axalta's professional spraying team will coat the racing cars with its environmentally responsible coating products. The students will learn from Axalta's educational sessions, including knowledge on advanced coating technologies and the advantages of using sustainable coating on a race car.

Axalta will also share industrial insights through campus talks to ignite students' interest in the coatings industry.

Teknos Completes Drywood Norge AS Acquisition

Teknos completed the acquisition of the business of Drywood Norge AS, a company operating in architectural coatings business in the Norwegian market.

Dutch Drywood paint products have been in the Norwegian market for over 40 years. The products, especially Drywood house and roof paints, have qualities suitable for the Norwegian climate.

"I'm extremely pleased for the successful completion of the acquisition. We look forward to providing extended product assortment and direct deliveries to our customers in Norway," said Paula Salastie, CEO, Teknos Group Oy.

PPG Completes COLORFULCOMMUNITIES Project at St. Jude's Ranch for Children Texas

PPG recently completed a COLORFUL COMMUNITIES project in the greater San Antonio area that helped revitalize the Bulverde campus of St. Jude's Ranch for Children (SJRC) Texas.

The project brought together more than 700 PPG PAINTS™ stores and dealer channel employees from the U.S. and Canada, who spent a half day during their national sales conference to make a difference in the lives of local foster children and teen mothers.

PPG provided nearly 200 gallons of PPG Paints products to assist with the project. The PPG Foundation also granted $5,000 to SJRC Texas to support community improvements and sustainability efforts of the Bulverde campus.

The Colorful Communities program provides PPG volunteers and paint products along with financial contributions to bring color and vitality to communities where the company operates around the world, such as in the greater San Antonio area, where PPG operates nine PPG Paints stores and sells PPG products through 10 local independent retailers.

For nearly 30 years, SJRC Texas has cared for children and teen mothers who have been affected by trauma, abuse and neglect and were removed from their homes by the Department of Family and Protective Services. The organization offers emergency placement, therapeutic residential care, community foster care, services to survivors of sex trafficking, pregnant and parenting teen services, and adoption services. Each day, it cares for nearly 100 children from the greater San Antonio and surrounding areas.

"We are so grateful for the service and generosity of PPG and its employee volunteers," said Kyana Beres, development manager, SJRC Texas. "They have truly transformed our houses into homes. Not only did they revive our campuses, but they also provided the children and youth we serve every day with an environment where they can heal and thrive. PPG's impact has colored our world."

During the Colorful Communities project, the volunteers painted the facility's living quarters in a PPG Paints color palette of Delicate White, Bark, Garlic Clove, Lazy Afternoon and Whiskers to provide a peaceful and comforting environment for current residents living at the Bulverde campus. The volunteers also painted two large murals on the facility's water tanks that feature inspirational quotes to foster an uplifting atmosphere.

"At PPG, we know that a fresh coat of paint can make a powerful difference," said Donna Broome, PPG VP, architectural coatings, trade, U.S. and Canada. "It can breathe new life and purpose into space, create memories and evoke feelings of calm and comfort, which is the type of environment we wanted to create for those who call the Bulverde campus their temporary home. PPG is proud to give back to the communities where we live and work through the beautification and revitalization of important community resources around the world."

AkzoNobel Picks 21 Startups for Paint the Future Event

A shortlist of 21 startups from around the world are one step closer to accelerating their innovative solutions for the paints and coatings industry after being invited to take part in AkzoNobel's Paint the Future event.

Being held in Amsterdam from May 14-16, the event – hosted by AkzoNobel and challenge partner KPMG – will give participants the chance to collaborate with industry experts and further their solutions. The ultimate goal is to partner with AkzoNobel on sustainable business opportunities.

"We were ecstatic to receive a total of 160 submissions and build an incredible innovation ecosystem," said Klaas Kruithof, AkzoNobel's chief technology officer and chairman of the Paint the Future jury. "It's the kind of collaboration that's going to take us beyond what we previously thought possible. Now

we're looking forward to exploring the selected 21 opportunities in more detail at what will be an exciting accelerator event when we get together in Amsterdam."

Responding to five real-world challenges, the selected 21 participants entered the following innovative solutions that could potentially change the game in paints and coatings:

Circular solutions

- Alucha Recycling Technologies (Netherlands) - turning waste into bio-oils and minerals;
- CaffeInk (Netherlands) - producing sustainable dark pigments from coffee grounds;
- Cyanetics (UK) - capture and bio-based conversion of CO2 from steelworks;
- PILI (France)- renewable and long-lasting colors from biomass

Enhanced functionality

- Cypris (US) - chemical technology to deliver the phenomenon of structural color
- Darkside Scientific Inc. (US) - illuminates any surface with a light-emitting coating
- Interface Polymers (UK) - tuning surface functionality with di-block polymers
- NANOAIR SOLUTIONS S.L. (Spain) - air-purifying coatings that clean themselves
- SAS Nanotechnologies LLC (US) - self-healing microcapsules as an anti-corrosive pigment
- Synmatter (US) - smart technology for corrosion protection and anti-fouling

Life science infusion

- Chromasol (US) - light-activated anti-microbial coating
- Hoekmine B.V. (Netherlands) - eco-friendly colors from biological materials
- Ocean Science (HK) Limited (China) - coating with a highly effective natural anti-fouling agent
- SGMA (UK) - non-toxic, durable anti-microbial protection for surfaces

Predictable performance

- AOMS Technologies (Canada) - optical fiber sensing system for corrosion in hidden areas
- Octo (Netherlands) - digital solutions for inspections using sensors, drones and AI

Smart application

- Action Paint (UK) - easily removable paint that prevents damage to the surface
- Apellix (US) - an autonomous drone that cleans and coats surfaces
- Archipelago Technology (UK) - precise drum application using thousands of nozzles
- Qlayers (Netherlands) - automated printing head to coat large surfaces in any weather
- Transforma Robotics (Singapore) - a mobile robot that scans, plans and paints interiors

All the participants will join the May event in person for an intensive, interactive experience including workshops, masterclasses and collaborative sessions – culminating in a case for collaboration presented to the event jury.

Axalta Announces 2018 Supplier of the Year Winners

Axalta announced its 2018 Supplier of the Year award winners: BYK Additives, Chang Chun Plastics, Eastman Chemical Company, Element Fleet Management, GEO Specialty Chemicals, Rhenus Group, Rianlon Corporation, and Wanhua Chemical Group.

"Our success as a global leader in the coatings industry starts with our suppliers and the leading service and materials they provide that enable us to deliver high-quality products to our customers every day," Axalta CEO Robert W. Bryant said. "With help from these outstanding suppliers, Axalta continues to deliver results."

Introduced in 2016, Axalta's Supplier of the Year award recognizes suppliers around the world that have gone above and beyond expectations to ensure that Axalta provides exceptional products and services to its customers every day. Suppliers must meet specific Quality, Service, Technology, and Value criteria,

as well as demonstrate their alignment with Axalta's stringent Sustainability expectations. Additionally, suppliers must exhibit a strong commitment to continuous improvement and excellent performance delivery. Recipients of the award are selected by Axalta's global procurement team in collaboration with our business, operations and technology teams from North America, Latin America, Asia-Pacific, Europe, the Middle East, and Africa.

"Through our supplier awards program, we recognize partners who understand us, know our priorities, and help Axalta continue to drive long-term performance and leadership in our industries," Bryant said.

Benjamin Moore, The Alpha Workshops Create Wallpaper Capsule Collection

Benjamin Moore along with The Alpha Workshops, a nonprofit organization providing decorative arts education and employment to adults and youth with disabilities and other vulnerabilities, announced the launch of their bespoke wallpaper capsule collection.

After decades of close collaboration, the Benjamin Moore color specialists have partnered with The Alpha Workshops wallpaper artisans to create this special edition of 15 hand-painted wallpapers featuring Benjamin Moore premium paints including CENTURY, Aura and Studio Finishes.

"The Alpha Workshops has always used Benjamin Moore as our preferred paint since we first introduced our signature wallpaper offerings in 2001," said Ken Wampler, founder and executive director of The Alpha Workshops. "This ultra-premium collection enhances our longstanding partnership and exudes the highest level of quality while coating walls in an artful, new way."

The Benjamin Moore and The Alpha Workshops Capsule Collection contains five patterns realized in three lustrous colorways. In Kimono, paints take the form of a radiant graphic floral, imprinted atop a rich, matte background. In Newport, they form delicate grids, stamped on the paper in layers to create a geometric masterpiece. In Topography, they're slathered onto a stamp and applied in thick, glossy layers for a marbleized effect. While in Spencer and Horizon, they're brushed on in featherlight strokes to textured paper that has been folded like origami. For most of the patterns, it takes a full day to create a single roll.

"The Collection speaks to the basic color groups of primaries and neutrals, but all with a layer of glamour," said Ellen O'Neill, Benjamin Moore director of Strategic Design Intelligence. "Benjamin Moore premium products coupled with the care and precision by Alpha's team, create captivating prints in a palette that can be easily mixed and matched." ***CW***

Sherwin-Williams Launches Dura-Plate 6000 Reinforced Epoxy Lining

Sherwin-Williams Protective & Marine Coatings launched Dura-Plate 6000, a new 100 percent solids, high-build, high-strength, reinforced epoxy lining for concrete and steel in severe wastewater service environments. The durable lining material offers asset owners and applicators a variety of time and cost efficiencies

due to its fast return-to-service times and the option for single-leg application. In addition, it provides long-term life expectancy due to its extremely low permeability and excellent chemical resistance.

Dura-Plate 6000 reinforced epoxy lining provides high film build characteristics and a variety of other properties to deliver easier, more cost-effective installations compared to other fiber or microfiber filled products. Reinforced with glass flakes, the material can be applied more than 125 mils thick in a single spray, potentially reducing the need for additional coats. The product's ability to be sprayed using a single leg application eliminates the expenses of renting a generator and using a plural pump operator. Providing additional cost savings potential, Dura-Plate 6000 has a long pot life, helping applicators reduce waste material, as well as a 21-day extended recoat window, which helps applicators reduce missed recoats. In addition, the lining does not require a glaze coat like other reinforced products.

"Dura-Plate 6000 answers our customers' needs for a 100 percent solids reinforced epoxy lining system that eliminates the application challenges associated with other fiber or microfiber filled products, which tend to sag at higher film builds and require additional steps," said Kevin Morris, global market director – Infrastructure for Sherwin-Williams Protective & Marine Coatings.

The reinforced epoxy lining material is rated for immersion service in a variety of severe environments, including headworks and primary treatment plants for wastewater operations, as well as manholes, wet wells and pump stations for sewer collection. It can be applied over properly prepared steel and concrete surfaces in these and other environments to deliver long-term service.

Rust-Oleum Rolls Out New Garage, Interior Floor Prime

Rust-Oleum Garage & Interior Floor Primer is a ready-to-use, premium primer made for previously coated or sealed garage and interior concrete floors.

The new water-based, low-odor primer allows homeowners to apply new floor coatings over previously coated or sealed concrete without fear of adhesion issues – just clean, prime and coat. There is no sanding or grinding required.

"It's a hassle-free option for changing the appearance of floors without extensive labor," said Jeff Svihra, brand manager at

Rust-Oleum. "We think that homeowners will be excited about the flooring projects they can now easily complete."

This new-and-improved primer can be top coated after six hours with any one or two part floor coating including Epoxyshield and RockSolid Floor Coatings Kits. One gallon covers up to 400 square feet.

Hempel Introduces New Topcoat Solution

Hempel is rolling out a highly flexible two-coat water repellent coating – Hempatop Repel 800. This new topcoat offers enhanced corrosion protection by actively repelling water from the coated surface. By enabling the use of fewer coating layers, this solution for offshore assets and installations can be applied faster and lasts longer than conventional coatings solutions.

Hempatop Repel 800 is used in combination with Hempel's patented Avantguard technology activated zinc primer – Avantguard 770. The first volumetric water repellent topcoat on the market, Hempatop

Repel 800 (used with Avantguard as the first coat) delivers improved flexibility and crack resistance, increased adhesion retention and minimizes corrosion.

This two-coat system requires one coat less than standard protective coatings solutions for offshore installations and lasts significantly longer.

"We have found that traditional three-coat systems used for offshore structures regularly show signs of early coating failure," said Oriol Osso, head of Energy, Group Product Management, Hempel. "Our new Hempatop Repel 800, used in combination with our innovative activated zinc primer Avantguard 770, simplifies the process and addresses all these challenges."

Hempatop Repel 800 is now available worldwide through local Hempel technical representatives. ***CW***

The Supply Chain – Your Brexit North Star

by Ray Rex, CRC-US
Contributing Editor

Brexit is coming! While the timing for its implementation is still uncertain, Brexit will impact many coating manufacturers importing product into both the EU and the UK. Recently, the EU granted a "flexible" Brexit extension until October 31st of this year. This extension, if it stands, will allow companies impacted by the withdrawal of the UK from the EU to better prepare for what appears to be the inevitable. In order to review the possible impacts of Brexit on companies importing chemicals into the EU and the UK, some key acronyms need to be set in place.

TABLE 1: Term and Definitions.

REACH: Registration, Evaluation, Authorization, and Restriction of Chemicals within the EU (2006)
ECHA: European Chemical Agency- Agency in Helsinki, Finland with which importers must register chemicals
HSE: Health and Safety Executive is the UK agency that will be involved in registering chemicals imported into the UK
OR: Only Representative - Companies that do not have a physical presence in the EU are permitted to appoint an OR who must be located in the EU
EU 27: European Union as it would be following the exit of the United Kingdom
Brexit: Creates (when it occurs) what will essentially be a separate but similar set of agencies and processes for importing chemicals into the UK as currently exist for the EU

Background

Businesses importing chemicals into the EU are aware of the requirements and costs associated with the European Union's REACH regulatory compliance. Importing one metric ton or more into the EU of any chemical substance requires the importer to register the substance with the European Chemicals Agency (ECHA), located in Helsinki, Finland. This requirement also applies to substances imported as part of a mixture and sometimes even as part of an article.

Companies that do not have a physical presence in an EU country, are able to appoint an Only Representative (OR) as permitted by Article 8 of the REACH regulations. The OR must be located in the EU to conduct annual reporting of chemical imports and to be in a position to notify customers and distributors of the registration status for their products.

"Brexit Day"

So how might Brexit impact your business? The current understanding is that the UK will introduce its own REACH-like legislation on "Brexit day." In fact, a draft text, which is in principle a copy of the EU REACH text, is already floating through the internet.

The EU has granted a "flexible" Brexit extension to October 31 of this year - although an earlier Brexit date is still possible in 2019. Some have referred to this extension as the Halloween Brexit. Companies impacted by Brexit and the government authorities within the UK, however, can possibly take advantage of this extension to better prepare for what appears to be an inevitable exit.

Your Supply Chain Determines the Path Forward

How should your company address this situation? It all comes down to assessing your current supply chain into the EU countries. ***If you are importing into the soon to be EU 27 and also into the UK, it will be like having REACH times two.*** You will need an OR located in an EU 27 country and an OR located in the UK, and you will need to register your chemicals with ECHA in the EU 27 and HSE in the UK, respectively. Bottom line business impact – more time and effort and more cost to continue to import chemicals into the old EU – now the EU 27 and the UK.

Brexit just is - so build a bridge and get over it. ***What you should do next starts with a definition of and a focus on your supply chain for each of your products?*** If you do not plan on importing into the UK to serve your customers, then keep your EU registrations and OR in the EU 27 and continue with business as usual. That was an easy one, but likely not representative of most companies.

Let's look at a more typical supply chain for a U.S. manufacturer of additives used in the paint and coatings market. There are a large number of potential and existing customers throughout the EU, with significantly different channels-to-market. The REACH regulation does not permit the U.S. manufacturer (a non-EU entity) to register substances in the EU on his own. A U.S. manufacturer must appoint an OR to

"Every situation is different, and you must remember to examine your supply chain first. Determine your path to compliance within the new EU 27 and separately within the UK."

TABLE 2: Scenario 1. The OR is located in the UK.

The U.S. manufacturer's OR is only able to cover direct imports into the UK post-Brexit
Any supply chain with active EU 27 clients or those which move chemical products through the EU 27 prior to entering into the UK will necessarily require an EU 27 based OR
The UK based OR has a legal entity in the EU 27 who can take over the obligation, if not, a dedicated EU 27 OR needs to be contracted
In any case, the US manufacturers existing REACH registration will need to shift to the new EU 27 OR. It should be kept in mind that, regardless of the actual situation, registrations may need to be duplicated to stay compliant under both the EU 27 and the UK REACH scheme

TABLE 3: Scenario 2. The OR is located in the EU.

Further action is only necessary, if a supply chain either enters the EU 27 through the UK or enters the UK at some later point
If the supply chain enters the EU 27 through the UK then changing the supply chain to enter the EU 27 directly, where possible, can save a lot of REACH related costs and work
When changing the existing supply chain is not possible or practical a UK based OR will be required to cover those chemicals being imported into the UK unless this obligation is assigned or pushed onto the UK importer(s)
In this cas, duplication of the existing registration will likely be required to stay compliant under both REACH schemes

take care of the necessary REACH registration activities because the registrant must be an EU entity.

The "Only Representative" (or OR) is a Service Provide

The OR is a service provider that allows U.S. manufacturers to maintain control of their registrations. It provides the non-EU company with the freedom to control their destiny - to sell to anybody in the EU without being dependent on a specific importer. The registration by an OR can cover as many importers as the non-EU company wants to deal with and only the OR needs to know who is covered by the registration.

The next steps for the U.S. manufacturer to maintain the current supply chain, post-Brexit, is dependent on the location of the manufacturer's current OR. The two scenarios regarding the OR location are: (1.) The OR is located in the UK; (2.) The OR is located in the EU 27.

What can you do?

Every situation is different, and you must remember to examine your supply chain first. Determine your path to compliance within the new EU 27 and separately within the UK. Remember that the actions you will take for chemical regulatory compliance are business decisions. You must assess the economic benefits and strategic implications regarding the marketplace and your products when making compliance decisions.

A Brexit check list:

1) Define your chemical supply chain from the source through manufacturing to the customers
2) Assess your EU business goals
3) Determine the required compliance activities to meet your business goals
4) Seek expert advice for compliance activities
5) Plan and execute

Good luck and remember to follow your North Star – the supply chain. *CW*

Chemical Regulatory Compliance Company (d/b/a CRC-US @ www.crc-us.com) is a sister company of CSB GmbH, a 28-year old company started by Heinz Dobbertin and now managed by Lars Dobbertin. CSB GmbH is focused specifically on serving all phases of the global chemical industry with regulatory and compliance services. CSB GmbH has full coverage and expertise for all REACH related activities and OR services located in the UK and the EU 27. Ray Rex, president of the CRC-US, has over 30-years of experience in the specialty chemicals market including the paint and coatings market as the former Commercial Director of HALOX. (ray.rex@crc-us.com)

CRC-US is a business partner of the CHEMARK Consulting Group, Inc.

European Coatings Show Focuses on Raw Materials

Raw material suppliers are having to react to a broad range of demands among European consumers and inudstrial customers who want healthier surroundings and a safer environment.

by Sean Milmo
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Europe's coatings producers are currently focusing on expanding their use of renewables and biological raw materials. But the objective is not just about the need to help tackle climate change.

Coatings manufacturers and their suppliers are also responding to other influences like the improvement of people's wellbeing by reducing pollution to improve air quality in urban streets and inside buildings. Also, they want to cut down on the use of solvents and substances of high concern because they are dangerous both to the environment and human health.

They are having to react to a broad range of demands among European consumers and industrial customers who want healthier surroundings and a safer environment whose resources will be protected through the recycling and reuse of products and materials in circular economies.

European Coatings Show Focuses on Raw Materials

These influences were among the most evident at the European Coatings Show (ECS) in Nuremberg, Germany, in March, comprising a three-day exhibition and a two-day conference mainly concentrating on new technological developments in the industry. The emphasis on sustainability had been strengthening at the bi-annual event in recent years but it was most prominent at this year's ECS.

At the same time, however, there were continuing concerns about the higher costs of switching to greener and cleaner materials, some of which may have lower performance levels.

Also, another challenge is the additional expense linked to the R&D needed to develop new materials.

Regulations Place More Challenges on Raw Material Suppliers

Meanwhile, regulations in Europe have been becoming more stringent as coatings producers and their materials suppliers are required to provide increasing amounts of data on the safety of the chemicals in their formulations.

However, there seemed to be at the ECS few exhibitors or conference speakers who favored a strategy based entirely on the traditional fossil-based chemicals or formulations. There were few either who were pursuing a policy in which a prominent role was not given to sustainability.

"For too long, there has been a general feeling that you either do well in business or do good for the environment—that you have to choose between performing well financially and contributing to a better world," explained Helen Hets, president of DSM Resins & Functional Materials. "We strongly believe that doing good and well go hand-in-hand."

DSM is trying to strengthen its position as a leading environmentally friendly producer of coatings resins by setting itself targets like having by 2030 a minimum 30 percent of raw materials being biobased or recycled.

By then it aims also to have reduced its greenhouse gas (GHG) emissions to 30 percent compared to 2016 levels and to have ensured that at least 75 percent of its purchased electricity will be from renewables.

Now companies like DSM, with a well-established reputation in the coatings sector for their pursuit of sustainability goals, are facing much stronger competition in maintaining their prominent eco images. Many other suppliers of coatings materials are now trying to do the same.

Perstorp, the Swedish company whose main business is in resins and coatings materials supplies, was promoting itself at the show as a leader in "pro-environment" solutions.

This was through an expanded portfolio of independently-certified renewable or part-renewable products and drop-in materials which will help its customers reduce their carbon footprints.

"We have the disadvantage of being well down the value chain where it's the brand owners and those closest to consumers who have the biggest interest in sustainability," said Elisa Swanson-Perbaeck, Perstorp's global marketing manager.

Meanwhile, the specialist bio-material suppliers are concentrating on broadening the performance and functions on their materials as well as improving their logistics so that they meet a greater variety of coatings producers' needs.

Belgian-based Scaldis-Ruien supplies, for example, low viscosity linseed oils as a starting material for alkyd resins and varnishes production and high viscosity versions to be used as a sole binder in paints and primers.

The company is well located to take advantage of what has now become the main supply chain for linseed in Europe stretching from producers in Russia and Kazakhstan to the Belgian port of Ghent.

However, coatings are not the only European sector in which there has been a big switch to biomaterials.

This is resulting in more frequent imbalances between supply and demand, which causes scarcity and fluctuations in prices, often influenced by trends in the Chinese market.

In addition to the coatings and inks sectors, pine tree chemicals are now a source of materials for a range of products like perfumes and cosmetics, vitamins, household cleaners, food additives and adhesives.

"Producers from these other sectors move in and out of the pine chemicals market," explained Gert-Jan van Ruler, business development manager at DRT, a French resins producer. "Currently we are having to compete for supplies more and more with vitamins producers who have been turning to natural materials because of problems with synthetic supplies."

The sustainability drive which was so conspicuous at the ECS was not just confined to biomaterials and renewables.

A major priority for many participants was showing ways of reducing volatile organic compounds (VOCs) through the use of formulations and chemicals based on fossil, bio or renewable materials.

A prominent means of decreasing VOC levels was through water-borne coatings. A poll of the conference audience by the publishers of the ECS daily newspaper, Hanover-based Vincentz Network, two-thirds selected water-borne coatings as being the most important future technologies.

The polyurethane market was a sector in which water-borne innovations were displayed as a means of not only being greener than solvent-borne systems but also at least equal in performance – with or without bio or renewable materials.

Covestro showed a water-based PUR system with a drying time which had been reduced from six to two hours. "That is similar to the drying times of solvent-borne systems," said a company official.

Hexion introduced at the ECS a range of resins based on vinyl silane monomers which are isocyanate-free yet have the same high, fast-curing performance of polyurethane two-component (2K) coatings.

Another theme of the show was the use of fewer components in formulations to achieve more, particularly with additives.

Michael Steiner of Hemmelrath Nanotechnologies gave details at the ECS conference of a spacer technology which uses a low-viscous dispersion of electrosterically stabilized nano barium sulfate to physically prevent pigment particles from sedimentation and agglomeration.

The technology can significantly reduce the application of conventional stabilization additives so that overall raw material and production costs can be cut by 50 percent.

Simplification of formulations, together with the conserving of resources through recycling and reuse of materials in circular economies, could be major trends at future European Coatings Shows. ***CW***

ENCOR® 601 LATEX CONTROL SURFACTANT LEACHING

Masonry coatings based on new ENCOR® 601 acrylic latex display excellent resistance to surfactant leaching, even in deep tint base formulations.

This new binder offers a combination of performance properties and formulating flexibility that makes it a good choice for interior or exterior masonry coatings.

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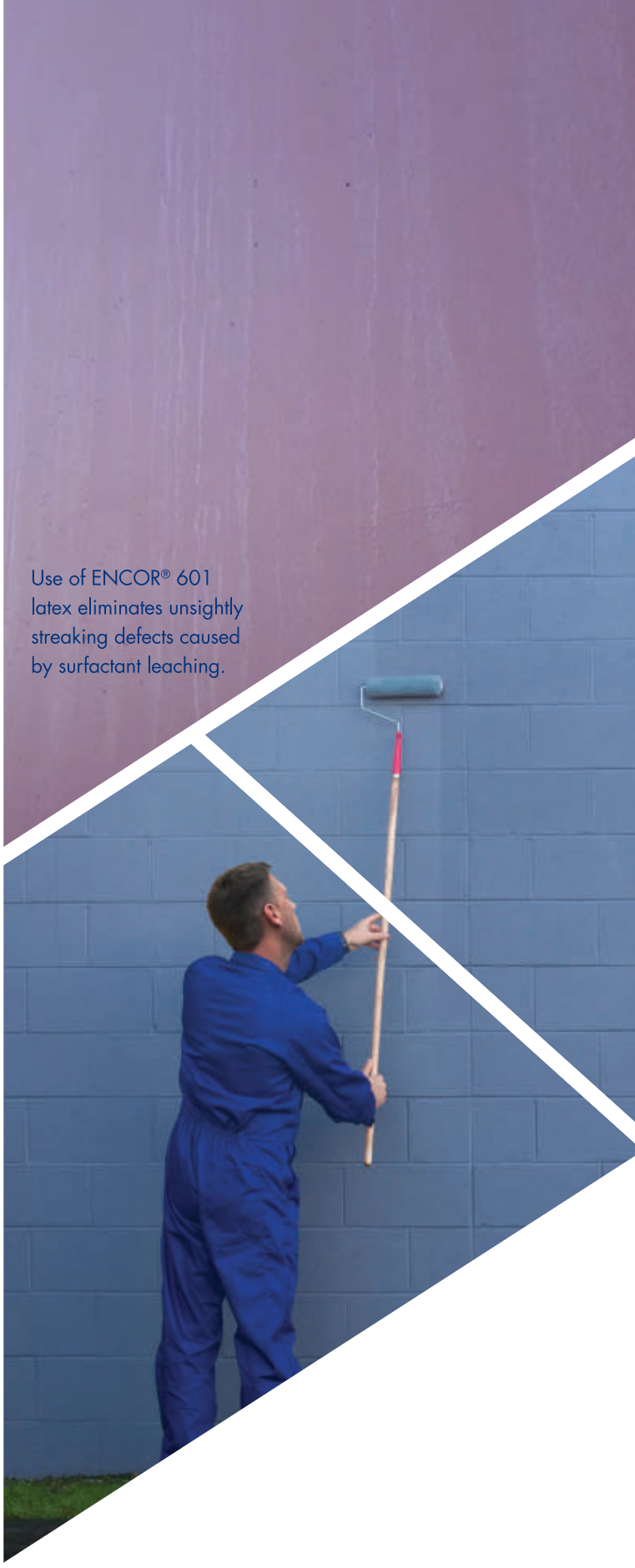

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Guatemala's Grupo Solid Manufacturing and Transocean Coatings Form Partnership

The partnership will strengthen Transocean's regional presence with nearly a dozen country offices, complementing its broader presence in South America.

by Charles W. Thurston
Latin America Correspondent
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The largest paint producer in Guatemala, Grupo Solid, has formed a strategic partnership with the Netherlands' Transocean Coatings to pursue a spot in the high-performance paint and coatings market in the Central America and Caribbean regions. Solid will utilize its Superbia factory in Escuintla to manufacture the coatings.

The partnership will strengthen Transocean's regional presence with nearly a dozen country offices, complementing its broader presence in South America, including offices in Argentina, Chile and Paraguay. Transocean Coatings is active in the manufacture and supply of antifoulings, anticorrosives and other coatings for ships, offshore installations, industrial facilities and pleasure crafts, the company said.

The commercialization of the Transocean products will be carried out through Solid's sales representative Sytec, throughout the region, as well as by Modelo in Nicaragua and Paleta in Guatemala, the company said. The region is said to consume about 40 million gallons of paint a year, worth more than $150 million, according to the Trade Intelligence Unit at CentralAmericaData.

"Solid Group thanks Transocean for the trust placed in it to be a strategic ally in Central America and the Caribbean," said Ariel Koll, president of Grupo Solid in a statement.

The Superbia plant now has a production capacity of 26 million gallons per year, which doubled capacity in 2011, thanks to a $10 million loan from the International Finance Corp. for the $18 million plant. The plant is equipped to manufacture industrial and automotive paints, resins and aerosols. The facility also

includes research and development laboratories, a pulp plant for gypsum board, storage tanks and silos.

In January, the Superbia plant gained ISO 9001:2015 certification for the guarantee of quality products. Solid has a broad brand portfolio of paint and coatings including the Paleta, Corona, Modelo and Sytec brands.

Solid addresses the Business to Business (B2B) segment through its Sytec Business Unit, supplying architectural and industrial clients' needs. Turnkey projects are managed through Solid's Tekno Business Unit, with certified painters and Quality Control Systems for customer paint programs.

"We have quality certification, formulations, products and technology to produce Transocean products and offer ad hoc solutions for our customers with a global guarantee, but with local logistics times and competitive costs," Juan Diego Toriello, the director of Sytec Regional, said in a statement.

Regional Paint & Coatings Trade Rising

In the first half of 2018, trade in paints and lacquers between countries in the Central America region totaled $59 million, of which 76 percent was sold by companies in Costa Rica and El Salvador, according to the Trade Intelligence Unit at CentralAmericaData.

Part of the lift is attributable to the strong growth of the maritime industry in the region. Container throughput in ports of Latin America and the Caribbean increased by 7.7 percent in 2018 in comparison with the previous year, according to data released in April by the United Nation's Economic Commission for Latin America & the Caribbean, ECLAC. This analysis is based on the performance of a sampling of 31 countries and 118 ports and port areas in the region.

"The Caribbean showed 12 percent growth in total maritime trade throughput, while Central America (without Mexico) had more subtle growth of seven percent only on the West Coast since the East Coast essentially maintained the same activity levels as in 2017," ECLAC said. "Panama, meanwhile, experienced growth on its Caribbean coast of 11 percent with regard to the country's total throughput, while its Pacific coast registered a decline of -16 percent," the organization said.

The port of Colón (MIT, Evergreen, Panama Port), which notched just over 4,324,000 TEU last year, experienced the largest movement of freight in the Americas, ECLAC said.

According to the report, called "port ranking" in prior years, "the data largely maintained the heterogeneity seen in throughput behavior in previous periods, both in reference to ports and countries. Of the total sample, 66 ports and port areas saw their figures improve versus 2017. The total volume of activity in 2018 exceeded 53.2 million 20-foot equivalent container units, or TEU, which represents 7.1 percent of global throughput, marking a slight increase in the rate versus the previous year, when it amounted to 6.6 percent of global throughput, according to ECLAC.

Macro Factors Strengthen in Central America & Caribbean

The timing of the strategic partnership bodes well for increased sales thanks to stronger macro indicators. Fitch Ratings Macro Research in April said, "Central America and the Caribbean will experience a steady expansion, supported by remittance inflows and tourism from developed markets," in the report.

"Growth in Central America will continue to benefit from positive spillover from U.S. economic strength, with the exception of Nicaragua. Economic activity will likely be the strongest in Guatemala, Honduras and Panama," Fitch analysts said.

"We expect Guatemala and Honduras to grow by 3.2 percent and 3.9 percent (this year), respectively. Activity will be driven by and remittances inflow from the U.S., with the latter supporting household incomes. Panama will continue to rank among the best performing economies in the broader Americas region, with a rebounding construction industry propelling growth to 5.5 percent," Fitch said.

In the Caribbean, Fitch said, "We expect growth to show modest improvement, averaging 3.9 percent in 2019. We forecast growth to return to Anguilla, Barbados, and Dominica after all three experienced contractions in 2018 due to hurricanes in Anguilla and Dominica and a debt crisis in Barbados."

The IMF also reported in April that Guatemala has been preparing documentation to be ready to come to the international bond markets for the first time in several years. "It is something we are considering and we are ready to do it and will finish analyzing whether the market will give us some space," Victor Martinez Ruiz, the country's finance minister said at a recent IMF meeting. Any deal will probably have a minimum size of $500 million – but could go up to $1 billion – and will be part of a financing strategy that includes local currency and multilateral debt, the agency reported.

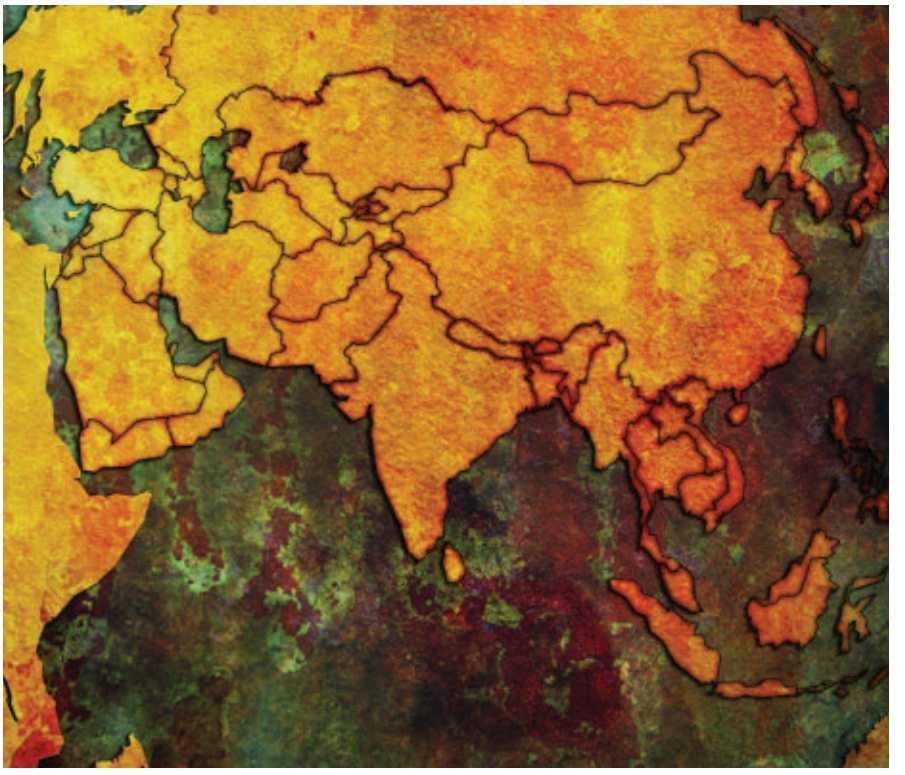
South America Partnership in Chile

In South America, Eecol Electric, a part of Wesco recently selected Transocean Coatings for high-performance coatings solutions to protect the electric modules it produces, which are exposed to the desert climate in Chile in the mining sector, among other ecosystems. Transocean products in Chile are manufactured and marketed by Pinturas Delfin.

Transocean is a global association of independent paint manufacturers that develops, manufactures and markets high-performance paint such as epoxies, vinyl, antifoulants, anticorrosives and polyurethanes for the industrial segment. The company produces additional coatings for boats, yachts, marine installations, among other markets. ***CW***

A Snapshot of AkzoNobel Vietnam

by Yogender Singh
India, Asia-Pacific Correspondent



Dutch multinational paint and coatings producer, AkzoNobel has been operating in Vietnam since 1992, when the company began selling architectural paints in the country. Later on, the company invested in four state-of-the-art production facilities in the country. In 2015, AkzoNobel invested in a performance coating facility and doubled the output of its existing powder coating production facility.

Coatings World: *What differentiates Akzo Nobel Vietnam from other paint producers in the country?*

Pamela Phua: With our rich history dating back to 1792 in the Netherlands, AkzoNobel and AkzoNobel Vietnam deliver quality and green innovation meeting customers' needs with our passion for paints. Worldwide, we are recognized by architects, designers and contractors as a reference in the industry with our color expertise and thought leadership in sustainability.

We are active in Vietnam providing one-stop solutions to the construction industry with our Decorative Paints and Performance Coatings which includes Wood Coatings, Coil Coatings & Packaging Coatings; Powder Coatings, Marine & Protective Coatings, and Specialty Coatings. Dulux is our popular household brand as a premium choice in decorative painting.

In addition to that, we have a wide range of sustainable products which effectively support Vietnam in facing current challenges of sustainable development and urbanization. In the country, we are widely known as the first manufacturer of powder coatings. Powder Coatings, in general, is one of the fastest growing coatings sectors, as the technology is increasingly seen as the preferred solution in a world which is strongly focused on environmental issues.

CW: *How many production plants Akzo Nobel operate in Vietnam. What is the scale and scope of all the production facilities? What is your approximate market share in architectural and industrial segments in the country?*

Phua: We have four manufacturing sites in Ho Chi Minh City, Dong Nai, Binh Duong and Bac Ninh to serve both retailers and project customers.

Our powder coatings plant is located in Nhon Trach (Dong Nai) with 151 employees and Specialty Coatings plant is in Que Vo (Bac Ninh) with 64 employees.

The plant in Ben Cat (Binh Duong) supports the Decorative Paints business, with an investment to expand the capacity up to 100 million liters per year. It is our largest plant in the country with 336 employees. In Bien Hoa (Dong Nai), 320 employees are manufacturing Wood Coatings; Coil Coatings, Packaging coatings & Adhesive Coatings.

Architecture and decorative wood coatings will remain the primary consumers of paints and varnishes, especially as Vietnam's major cities continue massive building booms thanks to years of rapid economic growth. We are now one of the major players in architectural and industrial segments in the country with Decorative Paints Vietnam as the No 1 in terms of market share based on value.

CW: *Do you cater to export markets from Vietnam. If yes, which are the important export markets for your company?*

Phua: Our four coatings manufacturing facilities in Vietnam are supplying coatings to customers throughout Southeast Asia.

Southeast Asia is a market which is experiencing robust economic growth, with a large population and high levels of construction. This is one of our key markets

and where we keep standing at the leading position in consecutive years.

In the past decade, AkzoNobel hugely invested in this region especially in Vietnam with new technologies and services.

***CW:** Despite, the steady growth in Vietnamese paint industry, per capita consumption of paints and coatings is abysmally low in the country. Do you see the situation changing in the medium and long term?*

Phua: Currently, we are witnessing massive building booms in major cities thanks to years of rapid economic growth. There will be a requirement of large quantities of paints following the enormous high-end housing developments altering the skylines of the country's urban areas and the apartments housed in these buildings. In view of that, we see potential growth in the consumption of paints and coatings in Vietnam.

***CW:** Which segment of Paints & coating industry is most significant for Akzo Nobel in Vietnam?*

Phua: In Vietnam, architectural and general industrial coatings are the biggest segments, which accounts for the largest portion of our business. In all of the segments in this market, we are the leader.

With the recovery of the Vietnam economy and growing affluence of its population over the next 5 years, we believe that the Premium segment will be the fastest growing in terms of market sales value. Mass segment's market value will also be significant as well as this is the biggest volume segment in the market.

***CW:** What according to you are the three biggest challenges facing Vietnamese paints and coating industry?*

Phua: Firstly, the business environment is becoming more and more competitive with more players to join the game. This requires us to make multiplied efforts to maintain our leading position.

Secondly, there are regular upward and downward swings in raw material costs, which affects the whole supply chain so we are always on the lookout for alternative materials that are both sustainable and economical.

Thirdly, Vietnam is experiencing an emerging trend of urbanization and construction that means it takes us a certain period of time before Vietnamese are familiar with our technologies rather than traditional methods.

However, we see those challenges as opportunities that we will fully tap into to make ourselves different from our competitors.

Pamela Phua, general director, architectual division

***CW:** Vietnamese consumers are considered among the most price-sensitive consumers, globally. To what extent, a price hike necessitated by rising crude oil and TiO2 prices be a roadblock in the growth of Vietnamese paint industry in the current and coming years?*

Phua: This is the common market trend, which somehow causes an unavoidable fluctuation in product prices. As consumers become more discerning and environmentally conscious, eco-premium products are on the rise as consumers seek out products that have more environmental benefits than their mainstream equivalents. With today's growth of technology and innovation, we see an abundance of opportunities to thrive in this sector and this will be our priority in the long run.

We will continue to take proactive steps with new innovative and environmentally responsible paint solutions as we believe this is right for our business both ethically and commercially.

***CW:** Green or environmentally friendly paints have almost become a norm in developed countries. What is your take on this sub-segment in Vietnamese paint industry? Approximately what proportion of your total sales do these products constitute in the domestic market?*

Phua: Producing green or environmentally friendly paints is not a part of our production but a focus. Staying one step ahead in the development of environmentally friendly coatings is one of our leading priorities. We manufacture to the highest environmental standards in order to minimize harmful emissions and waste, both in the factory and at customers' plants.

At AkzoNobel Vietnam, we are not only aware of sustainable business operations, but it is also a practice ingrained in our DNA. As the leader in the decorative paints industry, we are always committed to preserving the environment in whatever we do. Almost all of the products we are offering Vietnam market are with the least impact as possible and we are also step-by-step introducing sustainable products including eco-performer and eco-premium category to Vietnamese.

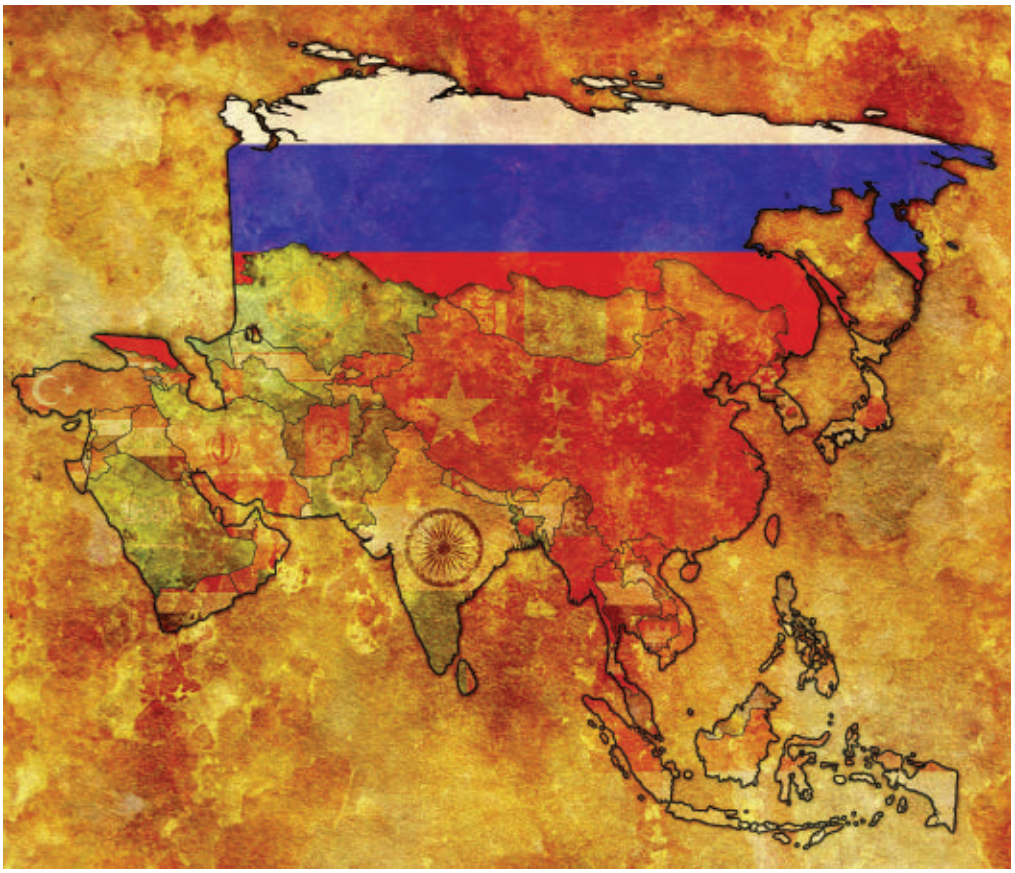
AkzoNobel is offering Vietnamese world-class local services, consistent and reliable quality (30 years warranty on products), and solutions for customers across the country through Interpon and Resiscoat brands.

***CW:** What has been the most challenging assignment in your professional career? How did you deal with that situation?*

Phua: My initial role in R&D is a natural fit for me since my degree is in chemistry. I was the director of R&D in the SESAME (South East South Asia Middle East) region for 12 years and director of the Global Exterior Wall Paints Expertise & Research Group for the last seven years. Last year, I started my new business role as the general director of AkzoNobel Vietnam. Thus, this business role is pretty new to me. However, we have achieved beyond expectations, thanks to the steadfast leadership as well as commitment, dedication and hard work of my teams. Passion, resilience and commitment to teams are the values I hold very close to my heart and I believe these are what drive me and help me and my teams to succeed. **CW**

Coatings Safety in the Spotlight in Russia Again

Environmetnal and public organizations in Russia have raised concerns over the safety of coatings on the domestic market.



by Vladislav Vorotnikov
Russia Correspondent

Several environmental and public organizations in Russia have raised concerns over the safety of coatings on the domestic market, following a scandal occurring when a property management company had been found using enamel with extremely high lead content in residential buildings.

In order to perform major capital works in a residential building, a local property management company in the city of Orsk in Orenburg Oblast, Russia picked up a coating with the lead content of 13,000 ppm, Russian public organization Council of Mothers said in a statement on its website. There are numerous scientific researches showing that such high lead content could negatively affect humans, causing numerous cardiovascular issues, problems with the gastrointestinal tract and in some cases even infertility, Council of Mothers warned.

"Lead is attributed to the most hazardous substances. According to the WHO's website, there are safe levels of lead content," Tatiana Butskaya, chairman of the Council of Mothers said.

Some local residents started protesting against the use of the potentially dangerous coatings, but the property management company refused to change the enamel to an environmentally-friendly one, international ecological organization Bellona reported.

In the end, the coating was replaced, but only because the local residents managed to prove that it was not matching to the federal fire resistant standards and for this reason could not be used on the escape routs, Bellona added.

This case is a "fortunate exception" from the common rule, as in most cases Russian citizens can do nothing with cheap coatings

with high lead content that is being used everywhere, including in schools and kindergartens, according to the Council of Mothers.

"This means that children, while they are in the educational facilities are breathing the lead in, and this is an extremely discouraging fact. According to the expert community and the Council of Mothers, Russia needs to introduce stricter requirements in regard to the safety of coatings," Tatiana Butskaya said.

Basically, the relatively safe level of lead content in coatings in the world is considered at 90 ppm. In Russia, there is a federal law 'On Safety of Coatings' that allows production and further use of coatings with the lead content up to 5,000 pmm, according to Bellona. Nevertheless, there is evidence that even this extremely high rate in Russia in many cases is being exceeded.

In 2016, a group of ecological organizations in Eastern Europe, Caucasus and Central Asia conducted large-scale research on the lead content in coatings in Armenia, Georgia, Moldova, Ukraine, Russia, Kazakhstan, Kyrgyzstan and Tajikistan. It turned out that 49 percent of collected samples of various coatings available on the local markets had a lead content above 600 ppm, with 13 percent having a lead content above 5,000 ppm and six percent, above 10,000 ppm.

The Council of Mothers said it was especially concerning that no company was putting information about the lead content on the label, simply because the laws didn't force manufacturers to do that. In most cases, it is unknown how much lead some coatings may contain, as such sort of researches are very rare in the country and many manufacturers in Russia prefer to not disclose that information.

Phasing out lead

It is believed that the negative effect that lead may cause in a human body requires no further evidence. In a 2015 research, Institute for Health Metrics and Evaluation estimated that the chronic exposure of lead caused 494,500 deaths and 9.3 million disability-adjusted life years due to long-term effects on health in the world, primarily in the low and middle-income countries.

In addition, it was also estimated that lead exposure accounted for 12.4 percent of the global burden of idiopathic developmental intellectual disability, which means intellectual disability not due to known causes such as genetic factors, 2.5 percent of the global burden of ischemic heart disease and 2.4 percent of the global burden of stroke.

There is a lack of information on what coatings have high lead content.

Olga Ponisova, executive director of the Russian ecological organization Eco-Soglasiye commented that the maximum allowable lead content in coatings differs from one country to another. Ponisova said that in the countries of the Eurasia Economy Union, including Russia, the maximum allowable level was set at 5,000 ppm, which was considered safe, although this was significantly higher as compared to the levels set in other countries.

Over the past few years, the concerns over the widespread use of lead in coatings has been continually been raised not only in Russia but also in Belarus and Ukraine. In particular, Eugene Lobanov, director of Belarus Center of Ecological Solutions called local coating manufacturers to enhance control over lead content in raw materials. Lobanov also advised those companies that manufactured coatings without lead content to put the information about that on the label and asked retailers to actively promote those products among the customers.

"For manufacturers that decided to replace pigments containing lead to lead-free ones the additional costs would only slightly increase the final price of their products. The production costs increase by five percent to 10 percent. In this regard, the most important thing is the public perception that could make coatings with high lead content non-demanded, and hence non-competitive," said Oleander Brichko, director of the Ukraine Association of Coatings Manufacturers.

Ukraine may become the first country in the post-Soviet space setting the maximum allowable content of lead at 90 ppm. The relevant draft decree has been prepared by the Ukraine Association of Coatings Manufacturers and is currently

Centrlak said it is prohibited to use coatings with any lead content indoor.

Coatings with high lead content is commonly used in residential buildings in Russia.

under consideration of the government agencies. It is not known how the new standards would impact the industry, but some forecasts say that by adopting that draft regulation, Ukraine could expand its opportunities in the area of coatings export to the European Union.

Old habits die hard

So far, there are no signs that any new regulations regarding the lead content in coatings could be adopted in Russia. The Ministry of Industry and Trade has not provided any comments on this issue by press time.

Gennady Averyanov, director of Russia's Coatings Producers Association Centrlak, said that all coatings on the domestic market are subjected to state control, while the Russian Health Ministry set the quality requirements for coatings, including in terms of lead content, in accordance to the common global standards.

"In particular, it is prohibited to use coatings with any lead content indoors," Averyanov stressed. "Russian Federal Agency on Technical Regulating and Metrology and Centrlak do not receive any major proposal or suggestions in regard to changing approaches to the establishment of safety requirements for coatings," Averyanov added.

Basically, it is believed that local coatings manufacturers would not refuse from using lead voluntarily. Speaking in an interview some time ago, Elena Boguslavskaya, chairman of the environment-protection department of the Belarus coatings manufacturer Lakokraska, stressed that if manufacturers could refuse from using lead-containing pigments, they would have down that by that time. Boguslavskaya added that without these pigments the production costs of coatings would significantly grow.

Over the past several years, various public organizations have been warning that it was actually the state procurement system in Russia that allowed the local coating manufacturers to produce cheap products with the high lead content. The problem is that the price in Russia is the main criteria of choosing the winner of competitive bidding procedures, and for this reason, cheapest coatings with high lead content are being used in schools, hospitals and in many other places.

It is believed it is primarilly Russian companies that produce coatings with lead content.

"Today, the Russian law [On State Procurement Programs] provides that, when making purchases, government organizations should be guided by how cheap the product is," said Andrey Kutepov, member of the Federation Council, the upper chamber of the Russian Parliament.

"There are numerous cases in which it is simply necessary to introduce additional criteria for the selection of suppliers of goods, works and services because the absence of such criteria affects the life and health of an unlimited number of citizens," Kutepov added.

At the moment, the Federation Council is considering amendments that would introduce some additional criteria to the state procurement programs for the children camps in Russia. If approved, the amendments would give the managing companies some freedom of maneuver, when choosing coatings.

"In future, it is necessary to revise the law on public procurement programs as a whole, so that in any sphere it would be possible to attract a supplier that would be able to provide products and service of proper quality and in time, rather than just at the lowest cost," Kutepov said.

There is a certain category of citizens that purchase the cheapest coatings, not worrying about any lead content and possible harm to health, commented a source in the Russian coating industry who wished to not be named. In the past few years, the demand for these types of coatings was at the same level or even was slightly up, because the purchasing power of the Russian citizens continues falling for several years in a row, and price matters often more than anything else, he added.

The presence of lead in Russian coatings is a fact that is well-known to everyone, including lawmakers for many years, so it is hard to imagine there would be any fast developments in this area now, the source said. **CW**

The Aerospace Coatings Market

Photo courtesy of Sherwin-Williams

The aerospace coatings market has continued to record growth. North America and Asia are leading the way, as manufacturers focus on developing lighter, more durable coatings.

Kerry Pianoforte, *Editor*

According to aerospace coatings manufacturers interviewed for this article, the market is healthy and will contiunue to grow in 2019 and beyond

"The areospace coatings market has been growing steadily," said John Griffin, AkzoNobel's Aerospace buisness director. "Airbus and Boeing both had record deliveries in 2018 contributing to the growth of the commererical fleet, and high-performance coatings continue to support these production increases. Aviation growth in Asia-Pacific continued in 2018, with more orders and market developments coming from the region."

"It is not a secret that the airline industry is growing very rapidly. According to many sources, it is expected that number of in service A/Cs doubles in the next 10 years," said Andreas Ossenkopf, director – Head of Aviation at Mankiewicz. "Therefore, the whole airline industry is experiencing a continuous growth and hence the demand for coatings is expanding along with it.

"Although already in use for more than 10 years, materials like composites are still relatively new when used in structural components. Production processes have evolved since the very first use but yet parts coming out of the autoclave do present a not optimum surface. Fillers are then needed to improve the surface quality before the painting process starts. To meet this demand, we offer a wide portfolio of solutions to match every need and defect."

According to Ossenkopf, airlines are also taking competition to a next level. "As the paint technology progresses, new solutions are available which allow airlines to create unique appearances. This is increasing in importance as it enable airlines to differentiate from other carriers. The thing that catches the eye first and foremost when seeing an aircraft is its exterior paint. Accordingly, there is a trend for special liveries and the use of micas and vibrant colors.

"The fact that paint can be used today where previously it was necessary to use decals also has a positive effect on the aerospace coatings market. The BaseCoat/ClearCoat system, originally developed by Mankiewicz in 2006, allows the use of paint to produce vivid colored liveries with the finest details. Its outstanding durability compared to decals, the excellent drying times of the BaseCoat and the paint's special fading and blending properties make this coating a perfect match for the exacting demands of the aviation industry."

According to Daniel Bencun, PPG global director, aerospace coatings 2018 was in line with previous years. "There was an increased backlog, and OEMs had more deliveries. The aftermarket boomed, taking the aerospace coatings industry

to levels beyond expectations. All of our major segments, including military, commercial and general aviation, expanded. Regionally, PPG saw significant growth in North America and Asia. The Europe, Middle East and Africa (EMEA) region recorded lower growth, but it was still in line with our plans. In 2019, we expect industry performance to continue to have reasonable growth. We anticipate increased throughput at our customers and strong demand in the aftermarket will continue to pull coatings demand. Strong military programs in North America also should benefit industry performance."

Reducing weight and improving efficiencies are major concerns when coating airplanes

Building lighter aircraft is generally beneficial for the industry and the aircraft operator. Reducing weight can result in more fuel savings and therefore increased financial and sustainability performance and longer aircraft ranges for airlines.

"PPG always strives to be at the forefront on developing innovative, new solutions for lighter aircraft, whether in coatings or other product lines that we offer, such as transparencies and sealants," noted Bencun. "We collaborate hand in hand with our customers to envision, design and launch products that satisfy their latest needs."

Photo courtesy of AkzoNobel

In the last couple of years, PPG has commercialized several products that are delivering weight savings to its customers. PPG DESOTHANE HD basecoat-clearcoat allows customers with liveries that have medium to high complexity to reduce the weight of coatings on their aircraft by up to 20 percent. PPG AEROCRON electrocoat (e-coat) primer, which is used to coat structural parts by electrodeposition instead of a traditional spray process, brings uniform film on the part. This can result in up to 75 percent weight savings on highly complex parts. In addition, it offers high transfer efficiency and is an environmentally sustainable technology.

"Reducing weight is always welcome by aircraft manufacturers and operators, especially during the design and certification phases, and we contribute to these benefits; perhaps dozens or a few hundred pounds overall, but our main focus is to develop products that perform functionally," said Griffin. "For example, our new Aerobase and Aerodur basecoat/clearcoat systems were developed to improve durability and reduce application time, and then we found ways to optimize our color formulation for optimum brightness and opacity, which can lead to fewer layers and lower film build and weight. In addition, we provide and continue to develop coating systems for composites, thermoplastics, and lighter substrates to support manufacturers with minimizing total aircraft weight."

"Weight is indeed of high concern to the airline," said Ossenkopf. "Every kg on the aircraft makes a big difference in the operational costs. When talking about paint, two main aspects have to be considered: the paint itself and the application process or sequence. On the first, Mankiewicz works continuously in adjusting the pigment concentration in products to achieve the best results by optimizing the weight of the dry film layer. The use of special research techniques allows Mankiewicz´s researchers to play with the tolerances defined by the different specifications in an effort of satisfying these but still same some grams on each iteration. On the other hand, Mankiewicz continuously works with Airlines and MROs on defining best practices. Only working closely with the user of our products, the smoothest and most efficient results can be achieved, resulting in potential reduction of paint consumption and ultimately reduction of weight."

Products like Sherwin-Williams' Basecoat/Clearcoat SKYscapes topcoats provide better coverage, which means less paint used. "Plus, through excellent opacity with our toner systems, full color hide with lower film build can be achieved," said Julie Voisin, global product manager, Sherwin-Williams Aerospace Coatings. "However, we find the best way to control weight, is to help shops focus on the fundamentals. Ensuring the coatings products are being applied properly and optimally can contribute a lot of weight benefit. Even training for the most experienced painter can provide benefits.

"As our technical service professionals are working in the field throughout the globe, they really help customers focus on efficient processes," she continued. "Coming up with repeatable systems that help ensure efficiency with every paint job is one of the top things that control the weight of the coating on the plane."

In addition to reduction of weight, customers have a number of requirements of their aerospace coating. These include regulatory compliance, ease of application and durability.

"Reducing the total cost of ownership and complying with the ever-changing regulatory environment are two key trends that guide our developments," said Griffin."Total cost of ownership includes the durability of coatings, ease of application, process time, and lastly, the cost per liter/surface area. Durability is by far the biggest contributor to total cost of ownership. Delaying the need to repaint aircraft or components saves significant costs in terms of material and application. Additionally, if aircraft do not need to be grounded for repainting, they can continue to generate revenue or be mission-ready. We definitely see a continued shift to basecoat/

clearcoat in the industry. These technologies were developed to improve durability and reduce application time. We have since found further ways to optimize our color formulation for optimum brightness and opacity, leading to fewer layers and lower film builds, potentially reducing weight.

Enhanced durability is one of many reasons why many airlines are switching to our basecoat/clearcoat systems, including Aerobase and Aerodur 3001/3002."

According to Ossenkopf, ramping up is definitely a hot topic: to produce ever more aircraft it is necessary to produce ever increasing quantities of interior components – without having any extra time or production capacity available. "That is why the pressure on manufacturers is enormous and along with this the demand for faster, efficient solutions. Mankiewicz offers approved paint solutions that help producers speed up their processes, increase their capacities and improve the quality of surfaces, ensuring they are uniform. The automation of solutions with water or solvent based Topcoats and Fillers range from automated mixing to fully automated robot application.

"Furthermore, there is an apparent contradiction between the desire for individual solutions and a trend towards eye-catching design effects on the one side, and extremely cost-conscious budget airlines on the other side. Mankiewicz offers products to satisfy both these demands. For airlines that attach great importance to design and individual appearance, there

Photo couretesy of AkzoNobel

is a great variety of colors, gloss levels and textures available – even special colors to match the airline's own design can be developed on demand. For low-cost carriers, Mankiewicz offers special products that save both time and materials, and that make extremely efficient painting processes possible.

"Another request we presently encounter quite often is for

training – either at our factory or on site with a customer. In our training courses operators can learn directly from us the optimal way to apply our paints and this ensures they are able to work as efficiently as possible. Not only does the training lead to savings in time and materials during the coating process, but also that as uniform as possible a finish is achieved with the paint, especially important when several producers are involved in the project. This kind of after-sales service distinguishes Mankiewicz as a family-run business and it is definitely something our customers increasingly appreciate. A further trend is for added functions in paints – not only with outstanding performance in terms of an efficient and effective delivery of gloss and color stability, they must also have useful additional features."

PPG's Bencun noted that their OEM customers are facing historical backlogs, and airlines are seeing the world traffic increasing. This results in specific needs for coatings solutions that allow customers to paint faster and increase their throughput. Reduced drying times can allow customers to speed their production process and minimize aircraft ground time.

"Both PPG Desothane HD basecoat-clearcoat and PPG Aerocron e-coat primer provide potential opportunities to increase productivity in addition to reducing weight," said Bencun. "Our customers are also looking for coatings with higher durability. They want their assets to be performing better in terms of color and gloss retention compared to previous technologies. PPG Desothane HD basecoat-clearcoat can increase this performance, resulting in brighter and more colorful aircraft that support an airline's brand and image. In addition to weight savings, productivity and durability, our customers are looking for more environmentally preferred solutions. Regulations, such as Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), are completely embedded in all our development efforts."

According to Voisin durability is a major priority for aerospace coatings customers. "Customers want the product to maintain its color and gloss throughout the lifetime of the coating," she noted. "The appearance of the coating can have a direct impression to customers and their feeling of safety so maintaining its appearance is important. Also, since the structures of most aircraft are still aluminum, corrosion control or prevention, is also an extremely important characteristic of aviation coatings."

Photo courtesy of Mankiewicz/copyright Brussels Airlines

New Proudcts

AkzoNobel has launched a new chromate-free exterior primer, Aerodur HS 2121, developed with and qualified at Airbus. For airlines, Aerodur HS 2121 promotes superior sustainability of the brand image and improves selective stripping of the decorative layer, enhancing rivet adhesion and reducing maintenance downtime. It was developed to meet all Airbus exterior system specifications, including the selective strippable systems. The product received its qualification from Airbus in March 2019.

"In addition, we are in the late stages of qualifying our Aerodur 2111 chrome-free primer to Boeing specification BMS 10-72. Production trials have been successful (dozens of applications), and the updated Qualified Products List should be released by late Q2 2019," Griffin said. "This product is similar to our AMS 3095 approved Aerodur 2118 that is currently used by several major airlines and being mandated for use by several military platforms."

This year Mankiewicz is presenting a new generation of Fillers that was specially developed for use on 3D-printed components. As shapes are getting more complex within aircraft components, the use of 3D printing process is increasing. While previously the technique was mostly used for producing spare parts, increasingly manufacturers are working with 3D-printed components from the outset. As with any new technology it brings new challenges to overcome. The 3D printing technique typically produces furrows, which particularly poses a problem for their subsequent coating – in order for the paint to achieve a shiny and smooth surface it is necessary to first compensate for the furrows with fillers. However, it is not as easy as it sounds. As the furrows made by a 3D printer are deeper than the unevenness normally found on aircraft components, a larger amount of filler material is needed. When applied in thicker layers many fillers no longer pass the heat release rate test and so are unsuitable for the aviation industry. Our new fillers pass the heat release rate test even in cases of deep furrows – and consequently a thicker layer of the product – without any problem. The filler is specially adapted to the demands of the aviation industry – and enables unhindered exploitation of 3D-printed components!

Mankiewicz has also developed and qualified a primer that is highly flexible and able to withstand the massive vibrations under which a flexible nacelle composite remains stable and intact: ALEXIT FlexPrimer 493-23. Not only does the primer prevent the paint from cracking, it also fulfils all properties of a normal exterior primer and is chromate-free. When used as a substitute for regular primer, there is no need for a further layer and thus no additional weight is added. This way the engine nacelle stays looking good, there is no loss of availability caused by unplanned maintenance and in general less repairs are necessary.

PPG has launched several technologies in recent years, and now is working on enlarging its qualified systems portfolio. "In pretreatment, for example, we have qualified PPG RECC 3007 sprayable chrome-free pretreatment to U.S. Military

Specification MIL-C-81706, Type II, Class 3, Form IV, Method A," said Bencun. "The pretreatment is formulated without chrome as an intentionally added ingredient. Our chrome-free primer technologies, including PPG Aerocron e-coat primer, are being approved by a growing number of OEMs and tier-one subcontractors. PPG CA7088 chrome-free integral fuel tank coating has been qualified to SAE International's Aerospace Material Specification AMS-C-27725, Type 3, Grade 2. The coating can help protect the interior of an aircraft's fuel tank against corrosion from fuel contaminants, such as water, salt water, aircraft fuels, hydraulic fluids, engine oils and dilute acid solutions, as well as diethylene glycol monomethyl ether (DiEGME)."

PPG Desothane HD basecoat-clearcoat has three new AMS3095A qualifications, and one major player in the industry has approved the same version with solar heat management. Airlines often avoid using dark colors in their liveries because they can absorb solar energy that heats the interior while the plane is on the ground. With this innovative technology, the coating reduces external aircraft skin temperatures, helping keep interior cabin temperatures cooler by 5 to 7 degrees Fahrenheit, so airlines are able to use dark colors in their liveries.

Bencun said another OEM has approved a thermally accelerated version of our new wing coatings technology, which improves our OEM customer throughput.

"We are also working very closely with customers on how to apply products,"added Bencun. "PPG's Aerospace Coatings Academy has had great success, with more than 70 companies participating in the program to date. We have worked with more than 300 painters, engineers and other customer representatives through this multiday program, which includes classroom and hands-on applications. We plan to conduct 10 sessions in all respective regions in 2019 for our customers globally."

From an exterior coating standpoint, Sherwin-Williams Aerospace Acry Glo Urethane has now been formulated with its Metallic HLG Acrylic Urethane topcoat finish for a metallic finish suitable for quick drying stripes on small aircraft and helicopters, and as an overall finish for GA equipment. Acry Glo is a multi-component topcoat that has been a versatile, proven performance system in the aviation industry for more than 30 years. It is a high-quality, rugged aerospace coating that offers outstanding durability, gloss retention and chip resistance that keeps equipment pristine and protected in harsh environments.

On the interior front, Sherwin-Williams Aerospace has just introduced Jet Suede, a two-component urethane topcoat designed to enhance the feel of aircraft interiors. Jet Suede delivers an upscale, textured feel to any surface to which it is applied. Perfect for application on rigid and flexible plastics and substrates, this interior topcoat provides a durable finish that will look great for years to come. Jet Suede is offered in low gloss, solid colors, including an array of OEM colors. ***CW***

Courtesy Dunn-Edwards

COLOR TRENDS: How to Identify Them, How Long it Takes and Where They're Headed

Over the past few months, several major paint and coatings companies announced either their 2019 Color of the Year or their list of color trends and forecasts.

Anthony Locicero, *Associate Editor*

But how do the color stylists identify these colors or trends?

"Each year the Benjamin Moore Color & Design team goes out to the world in search of future color trends," said Hannah Yeo, Benjamin Moore color & design expert. "From design across all industries to cultural influences, the team looks at macro trends to understand how we live with color and which colors will be most impactful in the coming year. Through thousands of photos and months of discussion, the team selects colors that have a strong presence. These colors are then considered through the lens of paint to assure that the colors are relevant for years to come."

"For a color to catch on and truly become a trend, it has to resonate with other décor and design trends, and it also has to reflect the current state and mood of society globally," added Dee Schlotter, senior color marketing manager, PPG paint brand. "PPG recognizes that we influence trends as much as trends influence us, and our thoughtful approach to color forecasting represents and connects to consumer feelings and preferences."

PPG's paint colors are sold in more than 70 countries, so "developing color trends is a global, cross-cultural effort," Schlotter noted.

"Collaboration between PPG's more than 20 color experts generates a fact-based approach to color trends and consumer preferences, resulting in a unified voice on color direction," she continued. "The company's color stylists around the world specialize in industries that include consumer electronics, architectural, automotive and aerospace. PPG experts study consumer mindsets, building material trends, wellness preferences and more to select a curated color forecast that resonates and is reflective of current consumer attitudes and spans cultures, regions and markets.

For AkzoNobel, colors being their journey at the company's design teams – who have been responsible for trend analysis, color & material research, color design and art direction for more than 25 years – according to Heleen van Gent, AkzoNobel's head of Global Aesthetic Center.

"Each year, leading design professionals from all over the

world are invited to come together to capture the mood of the moment, which is then translated into the annual color palettes," van Gent said. "Trend research is a vital part of identifying the Color of the Year and the four trend palettes that bring it to life, and it plays a big role in helping AkzoNobel to meet the needs of its customers around the world. While trends are of major significance for the decorative paints market, the insight that is gathered is also highly relevant to the company's coatings portfolio. For example, the Specialty Coatings business translates the annual trend research for customers in the consumer electronics and automotive markets. Meanwhile, color stylists at Wood Coatings use the information to offer on-trend color selections for product developers and designers in major markets such as furniture, cabinetry, flooring and building products."

PPG Night Watch/Courtesy PPG

"I extensively research a range of subjects including science and technology trends, demographic shifts and trends, health and wellness trends, luxury trends, cultural shifts and lifestyle trends, food trends, marketing and brand trends and fashion," added Sarah McLean, stylist and color expert for Dunn-Edwards.

How long does the process take?

"The whole process takes about a year to complete, but the team is constantly on the lookout for new color ideas," Yeo said.

"The PPG Global Color Team converges at the beginning of each year to determine which color best represents current consumer mindsets," Schlotter said.

"It's a continual process but I dedicate a year for each trends launch," McLean added.

Trend inspirations

In choosing a trend for this year, "We were struck by the stone facades of historical buildings in Europe with their subtle details and a presence of strength conveyed through time-worn materials and softness expressed through color," Yeo said. "There was something strong, yet simple about these materials that influenced our color thinking, paired with an array of other design influences noted in our travels.

"In the architectural paint market, PPG's global forecast not only resonates with the current consumer mindsets, but it also coordinates with trending materials such as textiles, wood, tile, cabinets, window frames and more," said Schlotter. "The colors are brought to life through four color stories in 2019: With It, With Class, With Out and With Spirit."

"We [also] observed a shift where quietude and a retreat from noise and chaos seemed to pervade the mood," Benjamin Moore's color & design expert continued. "There's a need to pause and enjoy not only moments of quiet and tranquility, but also the small details that we may otherwise overlook when we are immersed in the hustle and bustle of the day. Our research signaled a balance between strength and softness, presented in a subtle yet powerful manner. While gray has been popular in the recent years, we focused on the undertone and nuanced quality of this color and its ability to reinvent gray to continue its relevance in the home for years to come."

"For us, it's all about translating the trends into the colors and finishes of everything that surrounds us – homes, furniture, consumer electronics, cars and buildings," van Gent said. "People want their objects and spaces to connect from a color point of view, creating certain moods. Our beautiful, practical and harmonious palettes help make color choice for consumers and customers easy.

"Our latest trend research shows that people around the world are experiencing a renewed sense of energy, optimism and purpose," she added. "We want to reach out, engage with others and make things better. Last year, many of us were left unsettled by global events, so we closed our doors to retreat and regroup. Now we feel ready to open our windows and let the light in."

2020 and beyond

What will the next year – or decade, for that matter – bring in terms of trends?

The start of a new decade brings "a fresh start, time to recharge and renew goals and dreams for the new decade," McLean said.

"A sense of identity is changing triggered by recent rebellions and generational changes brought on by Millennials and Gen Z with new understandings of personal identity, inclusivity and cultural ties," she continued. "Science and tech advancements [will] enter a new level" and while a "lack of food and water plus climate change [will] create new problems," it will allow for the "possibilities for unique, new solutions."

"We're seeing colors shift to be a bit brighter from where we've been over the past few years, but the hues are still generally very muted," Schlotter said. "Blush colors with undertones of pink will continue to be an influence in 2020, as well as rich, earthy colors such as saffron and turmeric. We also see various shades of blue – from cobalt to deep, inky blues – making a big impact across various industries for the upcoming year."

AkzoNobel will reveal its 2020 Color of the Year in September.

"We monitor consumer and customer lifestyles 24/7 at our Global Aesthetic Center near Amsterdam, and we are now finishing our 2020 trend work, so, the story continues," van Gent said. "We know color and design can help give people the sense of protection, openness and exploration that they're looking for. Our palettes inspire designers, but also help consumers make confident, on-trend color choices in creating just the right environment and mood, at just the right time."

As for Benjamin-Moore, "We're deep in our research for what's next," Yeo said. "Stay tuned…" ***CW***

Biocides DIRECTORY

Here is a look at the latest offerings from select biocide suppliers. For more information on the products listed, please contact the company directly.

DuPont Microbial Control

Wilmington, DE, USA
833-388-7668
www.microbialcontrol.dupont.com

Product: BIOBAN BZ Antimicrobial
Attributes: BIOBAN BZ Antimicrobial is a MIT-free in-can preservative, offering broad-spectrum protection against bacteria and fungi due to ZPT and BIT actives. Highly stable across pH and temperatures, this antimicrobial is ideal for a variety of coatings and building materials formulations.

Product: SEA-NINE 211N Marine Antifouling Agent
Attributes: SEA-NINE 211N Marine Antifouling Agent for use in marine paint formulations offers broad-spectrum protection against a wide array of fouling organisms without harming marine environments. The active ingredient, DCOIT, rapidly biodegrades in the environment with minimal potential for bio-accumulation.

LANXESS Corporation

Pittsburgh, PA USA
412-809-1000
Fax: 412-809-1082
mpp-infor@lanxess.com
mpp.us.lanxess.com

Product: Preventol MP 260
Attributes: New to US market. 30% Glycolic solution of IPBC that can be used in both water-based and solvent-based coatings. Broad spectrum fungicide.

Product: Preventol BM 5
Attributes: New to US market. Aqueous solution of 2.5% BIT and 2.5 MIT. Broad spectrum bactericide that is effective at lower dosages than BIT alone.

Lonza

Basel, Switzerland

Product: Proxel HBC Preservative
Attributes: Introduced to the European market, it is dual-active, broad-spectrum wet-state preservative for water-based paints, adhesives, and construction chemicals. This preservative offers protection at target dose levels while avoiding hazardous warning labels.

Product: Proxel LSR Preservative
Attributes: Introduced to the European market, it is a dual-active, broad-spectrum wet-state preservative for industrial, water-based products preventing spoilage caused by microorganisms. This preservative is MIT-free and high a performing antimicrobial while offering compliance in an ever-changing regulatory environment.

SANITIZED Preservation AG

Burgdorf, Switzerland
+41(0) 34 427 16 60
Fax: +41(0) 34 427 16 39
info@sanitized.com
www.sanitized.com/preservation

Product: Sanitized BZ
Attributes: Sanitized BZ is a dual action in-can preservative formulation for durable protection of paints, polymer emulsions, adhesives and construction chemicals. Use of Sanitized BZ at recommended dose levels will not incur additional H&P statements for the final product.

Product: Sanitized ZDI
Attributes: Sanitized ZDI is a new generation dry film preservative for water-based facade paints. This formulation is designed to provide long term, broad spectrum protection against fungi and algae with reduced leaching of the active ingredients.

Troy Corporation

Florham Park, NJ USA
973-443-4200
info@troycorp.com
www.troycorp.com

Product: Polyphase 763CR
Attributes: Troy introduces Polyphase 763CR, an innovative IPBC-based preservative featuring controlled release technology. Polyphase 763CR is a broad-spectrum water-based product that is effective against a wide variety of *fungal and algal organis*ms. The preservative is also highly resistant to leaching.

Product: Polyphase 663
Attributes: Polyphase 663 is an advanced, broad-spectrum fungicide and algaecide for a wide variety of aqueous systems. With proven, long-lasting protection, Polyphase 663 is a cost-effective dry-film preservative that has set the standard for performance and value in the industry. The preservative is zero VOC and free of APE. **CW**

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abrafati.2019@abrafati.com.br
www.abrafati.com.br

ORGANIZATION:

ABRAFATI
Brazilian Coatings Manufacturers Association

Lab & Testing Equipment DIRECTORY

Here is a look at the latest offerings from select lab and testing equipment suppliers.

ACT Test Panels LLC

Hillsdale, MI, USA
517-439-1485
Fax: 517-439-1652
www.acttestpanels.com
brad.kimpell@acttestpanels.com

ACT Scribe Table

Attributes: Inconsistent scribe depth is one of the leading causes of variation in salt spray and corrosion testing results. With the ACT Scribe Table, you can significantly improve scribe consistency across sets of test panels reducing variation in your test results.

AMETEK Brookfield

Middleboro, MA, USA
508-946-6200
Fax: 508-946-6262
www.brookfieldengineering.com
MA-MID.sales@ametek.com

R/S SST Touch Screen Rheometer

Attributes: A soft solids tester that measures yield behavior in gels, pastes and liquid/semi-solid materials with suspended particles. The R/S-SST features the ability to operate in both controlled stress and controlled rate modes. Vane spindles are used to provide both viscosity and shear stress measurements.

DV2T Viscometer with Gel Timer

Attributes: The GEl Timer DV2T Viscometer features a unique magnetic compression- fit coupling to easily attach/detach the glass rod to/from the instrument. When gel time is reached, the display shows both gel time and equivalent viscosity value. The integrated temperature probe provides peak exotherm data in °C or °F if needed.

The Armor Group

Mason, OH, USA
513-923-5904
Fax: 513-923-5905
www.processall.com
sales@processall.com

Mixing equipment and vacuum dryers

Attributes: Processall's line of horizontal plow mixing equipment is the industry leader in processing and mixing particles. Our drying cycles are faster than the industry average because of careful considerations in heat transfer and higher U factor built into our designs.

Pressure reactors

Attributes: Each reactor is designed specifically for the process or application intended, creating a very efficient reaction while still producing a high volume pounds per hour output of product. Materials of construction include all 300 series stainless steels as well as high nickel alloys.

Charles Ross & Son Company

Hauppauge, NY, USA
631-234-0500
Fax: 631-234-0691
www.mixers.com
mail@mixers.com

Laboratory Paddle Blender

Attributes: ROSS introduces a new Laboratory Paddle Blender offering

advanced features for more convenient, automated powder blending and liquid spraying operation with recipe management. Shown is the 1-cu. ft. Paddle Blender (ROSS Model 42P-1SS) constructed entirely of US stainless steel type 304 with 150-grit interior finish and driven by a 1 HP TEFC motor. Complementing the blender's full vacuum capability, new features including a pneumatic powder charging port and liquid delivery spray system promote batch-to-batch consistency. Touchscreen PLC recipe controls are housed inside a NEMA 4X stainless steel enclosure allowing for indoor or outdoor use. For increased versatility, an interchangeable ribbon agitator can be supplied with any new Ross Paddle Blender. Both paddle and ribbon agitators are widely used in the preparation of dry solid-solid mixes, and can easily accommodate minor liquid additions.

Custom Milling & Consulting, Inc.

Fleetwood, PA, USA
610-926-0984
Fax: 610-926-0989
www.cmcmilling.com
sales@cmcmilling.com

Planetary Plus Mixer

Attributes: Each blade is designed with blades that are mounted to the shaft that are angled in different directions. As some of the blades are pushing material up from the bottom of the tank there are blades that are pushing materials toward the bottom. The high shear blade while simultaneously working with the finger blades shears particles and disperses them throughout the product.

EIT Instrument Markets

Leesburg, VA, USA
703-478-0700
www.eit.com
uv@eit.com

UV PowerMAP II

Attributes: The PowerMAP II is 60% smaller than the PowerMAP with 30x more memory. The instrument features a user adjustable sample rate of 128-2048 samples per second and now available in high and low power ranges.

LEDCure Four Band Instrument

Attributes: EIT will release a four band (365, 385, 395, 405 nm) LEDCure radiometer in mid 2019 to support users with multiple types of LEDs. Each band features our patented "Total Measured Optic Response".

Engineered Mills, Inc.

Grayslake, IL, USA
847-548-0044
Fax: 847-548-0099
sales@EMImills.com
www.EMImills.com

EMImils - Mini Mill – PLC

Attributes: EMI Mini Mills for testing dispersion samples by wet milling. Data collection available with PLC controls. Small volumes of pigments & additives milled by real process conditions. Color strength, gloss, transparency and stability can be studied.

Excelitas Technologies

Mississaugua, Ontario, Canada
905-821-2600
Fax: 905-821-2055
www.excelitas.com/omnicure
omnicure@excelitas.com

OmniCure AC8-HD Series

Attributes: OmniCure AC8-HD Series LED UV curing systems offer outstandingly high optical power in three standard cure widths, 6" (150mm), 9" (225mm), and 12" (300mm), which can be adjoined to achieve countless curing sizes without compromise in uniformity. Available in multiple wavelengths (385nm, 395nm, and 405nm) the AC8-HD offers greater flexibility and ease of integration.

Freeman Technology

Tewkesbury, UK
+44 (0) 1684 851551
Fax: +44 (0)1684 851552
www.freemantech.co.uk
info@freemantech.co.uk

FT4 Powder Rheometer

Attributes: FT4 Powder Rheometer, a universal powder tester, uses patented dynamic methodology, automated shear cells and bulk property tests, to quantify the flow properties of powders.

KRÜSS GmbH

Hamburg, Germany
+49 40 514401-0
Fax: +49 40 514401-98
www.kruss-scientifics.com
info@kruss.de

Mobile Surface Analyzer - MSA

Attributes: Measuring surface free energy in a second with only one click Our innovative Mobile Surface Analyzer – MSA measures surface free energy with two liquids, fully automatically and mobile

using our new "One-Click SFE" method. The MSA doses two parallel drops with one click, followed by the direct analysis of the contact angles and the derived results of the surface free energy. All steps are automated and happen within a second. The results enable well-founded statements about wettability by aqueous or organic liquids. The MSA supports you in your quality assurance in the pre-treatment and coating of solid materials in an ideal way.

Bubble Pressure Tensiometer - BPT Mobile

Attributes: Mobile quality control for cleaning and coating baths Industrial quality assurance is about reliability, speed, and ease of use. When it comes to regular checks of the cleaner or wetting agent content in a bath, our Bubble Pressure Tensiometer – BPT Mobile is prepared for these demands.

M.E. Taylor Engineering, Inc./Semicro Division

Rockville, MD, USA
301-975-9798
www.adhesiontesting.com
sales@semicro.org

Adhesion Testing Analyzer

Attributes: Our newly patented instrument greatly improves the accuracy of cross hatch adhesion testing standards such as ASTM D3359 and ISO 2409. By automatically calculating the area removed and classification rating, user error is eliminated. No more comparing to blurry charts.

Myers Mixers

Bell, CA, USA
877-652-4767
323-560-4723
Fax: 323-771-7789
www.myersmixers.com
sales@myersmixers.com

L850 Series - Lab-scale dual-shaft disperser

The Myers Mixers L850 Series laboratory-scale dual-shaft disperser is an ideal choice for rapid dispersion of lab and small-scale production batches. Two high-speed dispersion shafts can be co-rotating or counter-rotating, providing the shear or pumping your process requires.

LM850 Series - Lab-scale basket mill

Attributes: The Myers Mixers LM850 Series is a dual-shaft basket mill for fine dispersion and milling of particles. The cooling-jacketed basket chamber contains a pegged shaft and holds the milling media, while a second independently-driven shaft provides flow and residence time adjustment for the mill.

Paul N. Gardner

Pompano Beach, FL, USA
954-946-9454
Fax: 954-946-9309
www.gardco.com
gardner@gardco.com

Positest HHD

Attributes: Low voltage pinhole detector enabling you to inspect various coatings on conductive substrates for small defects such as holidays and pinholes. Ideal for use with a wide range or rolling spring electrodes. Custom sizes available upon request.

BYK Protective Coatings Field Kit

Attributes: Complete solution to evaluate the environmental conditions prior to painting with a film thickness gauge, BYK A200 termo-anemometer, BYK M200 moisture meter, BYK T200 IR Thermometer and carrying case.

Picosun Group

Espoo, Finland
+358 50 321 1955
Fax: +358 9 297 6116
www.picosun.com
info@picosun.com

PICOSUN P-1000 ALD Reactor
Attributes: The PICOSUN P-1000 Atomic Layer Deposition (ALD) reactor is designed for ultra-large scale batch coating of various 3D items such as mechanical machinery parts, glass or metal sheets, coins, watch parts and jewelry, lenses, optics, and medical devices and implants.

PICOSUN P-300B ALD reactor
Attributes: The PICOSUN P-300B Atomic Layer Deposition (ALD) reactor is designed for large-scale batch coating of various 3D items such as mechanical machinery parts, glass or metal sheets, coins, watch parts and jewelry, lenses, optics, and medical devices and implants.

RK Printcoat Instruments Ltd.

+44 (0) 1763 852187
www.rkprint.com
sales@rkprint.com

VCML Lab Pilot Coater
Attributes: Designed to print, coat and laminate all types of flexible webs on a reel-to-reel basis, with the ability to apply various coatings by various application methods, the VCML particularly useful for product development, QC and small scale production for low volume of specialised products.

Sensory Analytics (Specmetrix Systems)

Greensboro, NC, USA
336-315-6090
Fax: 336-315-6030
www.specmetrix.com
info@specmetrix.com

SpecMetrix DFT QA Coating Measurement System
Attributes: The SpecMetrix DFT QA Coating Measurement System delivers real-time, non-contact and non-destructive absolute coil coating thickness measurement data of primers and total top coat over any size samples. Designed to streamline coating QA processes, this highly accurate lab system improves coating process and quality control in virtually any QA lab or R&D center.

Union Process, Inc.

Akron, OH, USA
330-929-3333
Fax: 330-929-3934
www.unionprocess.com
unionprocess@unionprocess.com

S1 Attritor with Touch Screen Controls
Attributes: Original inventors of attritor technology; Manufactures a broad line of size reduction equipment including wet/dry/inert/cryo grinding attritors as well as the DMQX-series ultra-fine grinding horizontal bead mill. Services include lab & pilot plant R&D, tolling, process optimization, and particle characterization.

Sigma Equipment Corp.

White Plains, NY, USA
914-682-1820
Fax: 914-682-1820
www.sigmaus.com
sales@sigmaus.com

RM-2.5 Lab Roll Mill *CW*

To be featured in our Lab & Testing Equipment Directory, please email Editor Kerry Pianoforte at kpianoforte@rodmanmedia.com

Powder Coating Advances for Edge Corrosion Protection

Kathryn Shaffer, John Schneider, Holli Gonder, Cassandra Allen, Shawn Flegm, Lan Deng, Brian Woodworth, Susan Miller, *PPG, Strongsville, OH*

Introduction

Sharp edge coverage is a huge challenge for the coatings industry. The lack of coverage on sharp edges can compromise a coating's performance. One of the major failures is rust/corrosion resulting from these exposed edges. Several approaches exist as solutions, both from the manufacturing standpoint and from a coatings/technical perspective. A well-known strategy in manufacturing involves the rounding off of sharp edges on parts prior to coating application. However, this adds significant cost from the manufacturing side. From the coatings standpoint, two-coat systems are the standard for many customers, but this requires two separate oven bakes, adding complexity to the process. This under layer doesn't always apply at appropriate thicknesses that result in any true protection of those areas. Dry-on-dry approaches remove the double-bake complexity, but the performance hasn't been found to be a match to the two-bake process. Furthermore, the difficulty in applying dry-on-dry technology makes it a less attractive choice. It is evident that innovation opportunities exist in improving on high-edge coverage. Our team has developed a new, one-coat, direct-to-pretreated metal powder innovation which exceeds the corrosion protection performance of current technologies. This paper provides an overview of our approach toward the development of this new product.

The Challenge of Edge Protection

Why is protecting sharp edges on a metal part so difficult? The answer lies in the rheological changes that a paint (both liquid and powder) undergoes during the cure/bake process. Figure 1 shows the change that occurs to the paint on an edge post-cure. The shrinkage of the paint during cure on an already-exposed edge causes it to flow even further away from the sharp edges, resulting in bare metal at the edge. This is the entry point for corrosion failure. So the challenge for improving corrosion performance at the edges is getting the paint to those edges and keeping it there during the cure. We have taken on both of these challenges.

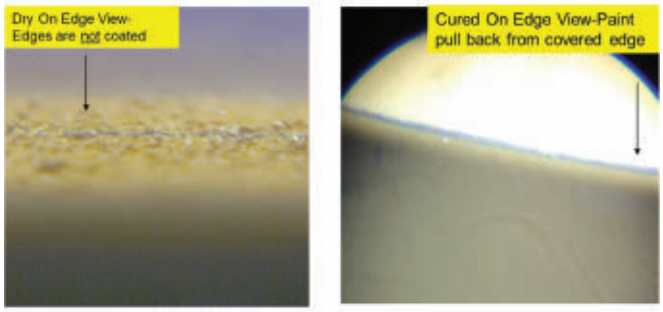


Figure 1. Maximizing powder coverage at the edges is a challenge for both liquid and powder thermoset systems. Pull-back of paint during the cure cycle further exposes these sharp edges.

Getting the Powder to the Edges

For powder paint, the application process is a bit more complex than for typical liquid spray products. When considering the electrostatics of a typical corona-gun powder application, we need to keep in mind the challenge that back ionization adds to the equation. Powder tends to be attracted at a faster rate to the edges during a typical powder spray, due to the extra charge buildup at the edges from the electric field. However, back-ionization of the powder occurs as a result of this quick, thick build, leading to both poor appearance and repulsion of powder from those edges. This same phenomenon of excessive charge build is the reason behind difficulties in spraying recessed areas of the part (otherwise known as the "Faraday Cage Effect"). We have incorporated

specific proprietary additives into our powder formulation to promote transfer efficiency and allow for powder to build at the edges without the concern for back ionization, if proper application parameters are followed. We have also demonstrated in the field and have witnessed first-hand the ease at which these electrostatic additives allow for the penetration of the paint into those hard to cover, Faraday areas.

Keeping the Powder at the Edge

For a paint to stay at the edge during cure, the viscosity of the formulation needs to be considered. Any attempt to restrict flow can come at a cost for appearance. We have found a specific set of flow restriction tools that work together to accomplish the task of flow restriction without imparting such a highly negative impact on appearance. Figure 2 provides a viscosity comparison of two of our powders; one is a standard-cure powder developed for heavy-duty equipment customers; the other powder is one modified to promote high edge coverage, again, a standard-cure powder.

By restricting the flow of our formulation, we enable the powder to stay on those sharp edges during the cure cycle. If coated thick enough, a primer underlayer would no longer be required for providing corrosion protection; our hope is that protection could be obtained in one direct-to-metal layer as long as consistently thick film builds were achieved along the sharp edges. The goal through the course of our work has been to obtain film builds at the edge that would allow for this level of protection.

Results

Our early lab work focused on optimizing our powder formulations using both the electrostatic and flow-restriction tools already mentioned. Using standard powder as a starting point, we used our additives toolbox to restrict flow until a balance was achieved providing the best level of both appearance and corrosion protection for these systems. Shown in Figure 3 is work completed experimentally in-house, illustrating excellent corrosion protection over iron phosphate pretreated, laser-cut panels for a high-edge modified formulation, direct-to-metal, at 500 hours salt spray, versus a standard control powder.

Figure 4 provides another example of an experimental powder applied direct-to-metal, this time undergoing 40 cycles

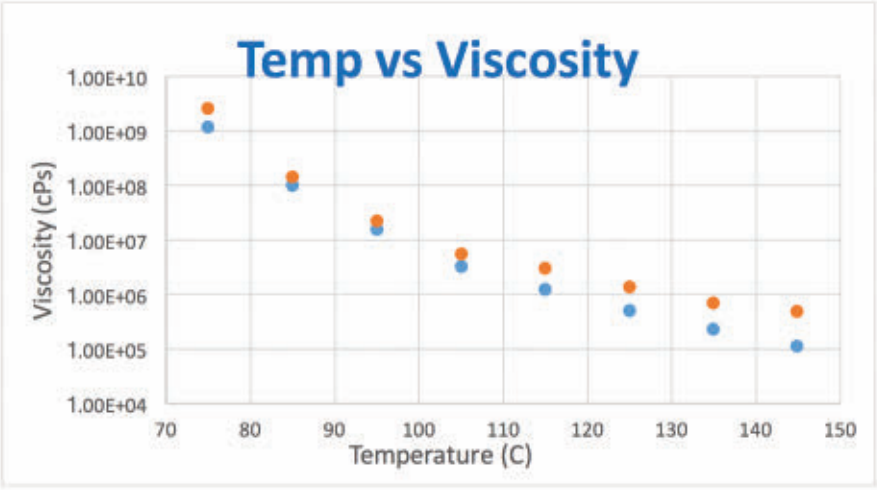


Figure 2: Increased viscosity of high-edge formulation (orange dots) improves the ability of the coating to remain on the edge during the cure cycle.

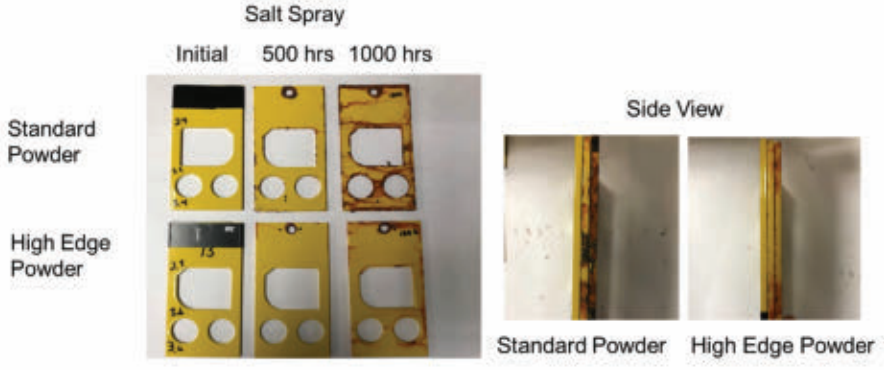


Figure 3: Salt spray results for a standard powder formulation and one modified for edge-protection. Significant performance improvement is evident in the high-edge formulation.

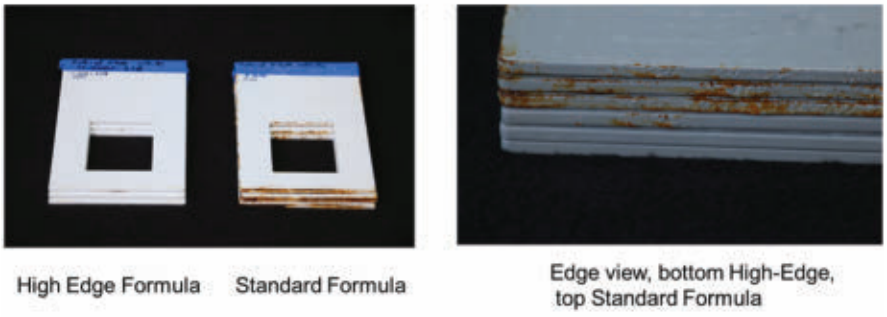


Figure 4: 40 Cycles CCT (SAEJ2334) of a high-edge powder formulation along with our standard powder control on laser-cut iron phosphate pretreated hot-rolled steel.

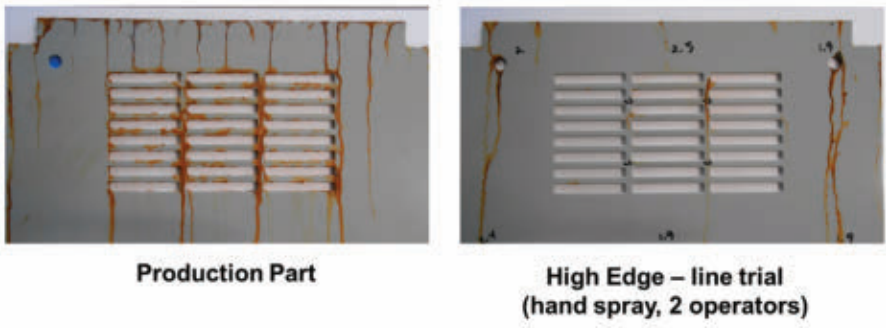


Figure 5: 1000 hour salt spray data on actual powder line-applied parts. Even on a large application line, the improvement in edge film build is greatly improved based on this long-range test data.

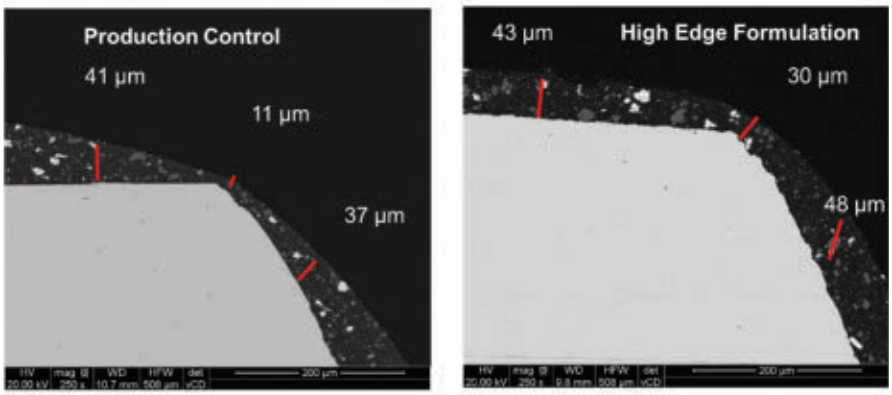


Figure 6: The SEM images shown here portray a 40% increase in sharp edge coverage for our high-edge formulation versus the standard powder production control part.

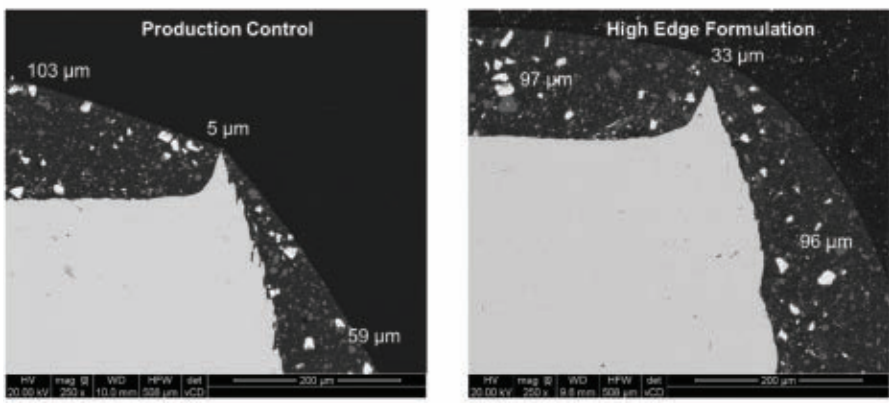


Figure 7: These SEM images demonstrate the high-edge formulation's ability to cover even highly ragged, burred edges.

of SAEJ23334 corrosion testing over hot-rolled, iron phosphate pretreated steel. It should be noted that laser cut steel, in particular, is a challenging substrate for corrosion protection, as the oxides that form on the sharp edges due to the laser cutting process can be problematic for pretreatment, thus providing a weak point for corrosion entry. We demonstrate in Figure 4 the ability of our high-edge formula to cover these laser cut edges to the extent that they survive 40 cycles of corrosion testing. Note the excessive corrosion at the edges of the standard powder control when applied direct-to-metal.

With the help of our commercial team, we took this technology out into the field and obtained excellent results from field trials. Figure 5 is a photo of 1000 hours salt spray results from two of our actual trial parts. For the High-Faraday areas, in particular, such as the sharp louver edges, the diminished corrosion level is evident on the high-edge powder coated part.

As evidenced in Figure 6, the mechanism behind our enhanced corrosion protection is the drastic increase in edge film build for our new high-edge powder versus a standard formulation. The SEM images of these parts show the stark contrast in thickness between these two formulations. With the level of edge coverage shown in Figure 5, film builds as high as 2.5 mils on the sharp edges can be obtained. This level of thickness removes the need for a primer under-layer, which has huge appeal for customers who want to save cost by decreasing the complexity of their line process. Production efficiency would be increased due to the need for only one coating line, and only one bake time would be required.

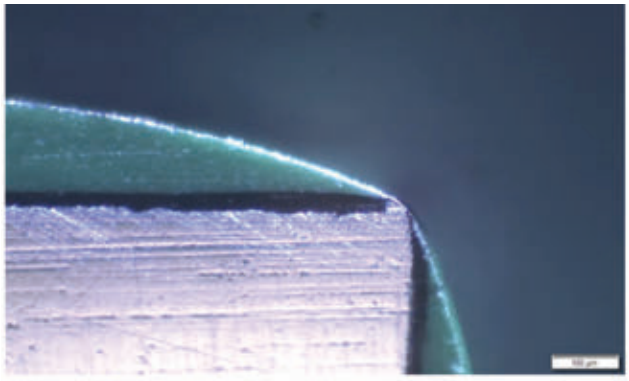
Figure 7 shows another example of excellent sharp edge coverage, this time on punched out parts with large, ragged burred edges. These images provide a great example of our product's ability to both get to those sharp edges and stay on the edges during cure, in contrast to a standard powder formula.

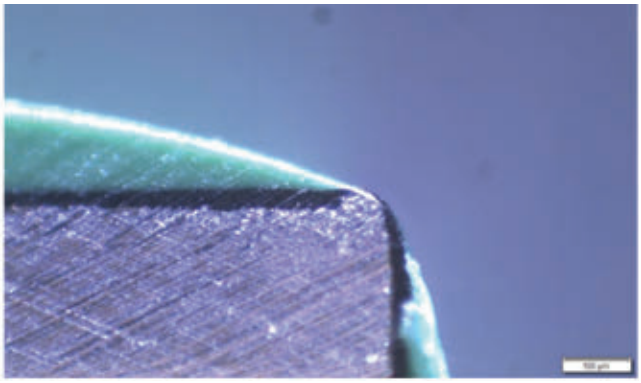
Shown in Figure 8 is an optical example comparing a high-edge formulation to a standard formula. For this trial, primer-coated parts were taken through the line and coated with our high-edge formulation along with a standard control powder. The optical images in Figure 8 show complete lack of coverage of the standard topcoat over primer, whereas our high-edge formula shows significant film build at the sharp edges.

Conclusion

We have demonstrated both in-house and in the field the ability to provide excellent one-layer corrosion protection to pretreated metal. This protection is the result of the increased dry film thickness our

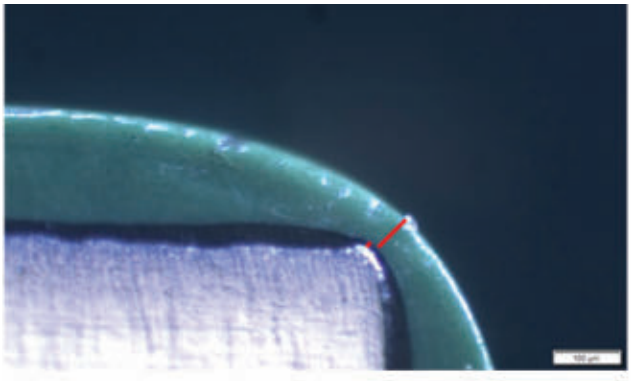
powders provide at the sharp edges. With our ability to control transfer efficiency through additives and application, as well as flow restriction through our "edge toolbox", we've brought a level of innovation to powder that surpasses current corrosion protection technology, without sacrificing heavily on appearance. This innovation has the potential for greatly simplifying corrosion protection in both the heavy-duty-equipment and general finish worlds. ***CW***

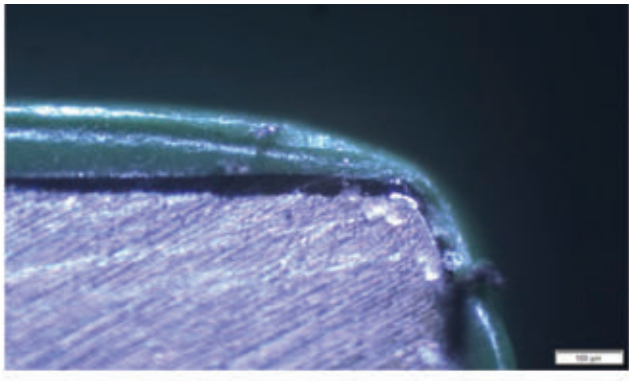




Control Powder I. Average* ± St. Deviation Film Build Measurements (mils)		
Coating Layer	**Optical DFT Measurement**	
Standard Powder (Control)	Not Observed	
Primer	0.16 ± 0.04	
Total Film Builds	**Edge**	**Flat Part**
	0.16	7.5

Control Powder II. Average* ± St. Deviation Film Build Measurements (mils)		
Coating Layer	**Optical DFT Measurement**	
Standard Powder (Control)	Not Observed	
Primer	0.15 ± 0.02	
Total Film Builds	**Edge**	**Flat Part**
	0.15	7.1





High Edge I. Average* ± St. Deviation Film Build Measurements (mils)		
Coating Layer	**Optical DFT Measurement**	
High Edge Powder	2.34 ± 0.08	
Primer	0.31 ± 0.09	
Total Film Builds	**Edge**	**Flat Part**
	2.65	5.8

High Edge II. Average* ± St. Deviation Film Build Measurements (mils)		
Coating Layer	**Optical DFT Measurement**	
High Edge Powder	1.32 ± 0.03	
Primer	0.58 ± 0.11	
Total Film Builds	**Edge**	**Flat Part**
	1.9	7.8

Figure 8. Shown is an example of line coated parts at a customer trial, this time over primer, another great example for our high-edge powder and its ability to overcome transfer efficiency and flow issues and build film.

PPG Appoints Devashish Saxena VP, Chief Digital Officer

PPG announced the appointment of Devashish Saxena as VP and chief digital officer.

In this new role, Saxena will lead the company's digital transformation, creating a sustainable digital organization to unlock customer value through enhancement, connectivity, automation, insights and innovation.

Saxena

Most recently, Saxena led digital strategy as VP, global digital business and e-commerce at Rexel, a France-based multi-channel distributor of electrical supplies. Prior to his time at Rexel, Saxena served as SVP global e-commerce strategy, at UK-based Premier Farnell, a multi-channel distribution group.

Pilot Chemical Company Names Richard Rehg VP of Commercial

Pilot Chemical Company named Richard Rehg VP of commercial.

A 30-year veteran of the chemical industry, Rehg will provide global leadership and direction for Pilot's primary business functions, sales and marketing and support the development and commercialization of new products and technologies.

Rehg

He will lead commercial operations from Pilot's headquarters in Cincinnati and oversee about 30 employees, including three newly named business managers.

"I am excited to join Pilot as it deepens its focus on customers and innovation," said Rehg. "The company has a strong track record, and I look forward to helping the Pilot team accelerate this transition."

Rehg joins Pilot after three decades at Sasol Performance Chemicals and its predecessor companies.

Gelest Appoints Jim Whitlock Chief Operations Officer

Gelest Inc. appointed Jim Whitlock to the newly created position of chief operations officer, effective immediately.

"Jim has more than 30 years of experience in the silicone business, including roles as SVP and corporate VP with Dow Corning in its Core Products Business and Global Manufacturing & Engineering Operations, and he is joining Gelest at a pivotal time," said Ken Gayer, CEO of Gelest.

Whitlock

Whitlock joins Gelest from Honeywell, where he served as VP of Integrated SupplyChain for its Performance Materials & Technology business group.

"I look forward to working with my new colleagues, driving operations excellence to position the company for profitable and sustainable growth, and positively contributing to the company's strategic priorities," Whitlock said.

ROYALSIL Hires Chief Operating Officer

ROYALSIL, Inc appointed Ronica Cleary chief operating officer. Her duties will be to oversee IT; manage customer service, logistics and purchasing; and major account oversight.

Most recently she worked as host, political reporter and White House Correspondent for the Fox affiliate station in Washington, DC. She has also worked as a media coach, public speaking professional and communications professor.

Maroon Group Names Terry Hill as CEO

Terry Hill will succeed Mark E. Reichard as Maroon Group LLC CEO effective May 1, 2019, the company announced.

Reichard will continue to serve as executive vice chairman of Maroon Group. Concurrent with Terry Hill's appointment, Mike McKenna will add the role of president to his existing responsibilities as COO of Maroon.

Under Reichard's leadership, Maroon Group became the third largest distributor of specialty chemicals and ingredients in the U.S.

"The last 37 years with Maroon Group have been an amazing ride," Reichard said. "I am humbled by the caliber of the team that I have been honored to work alongside, who focus every day on creating value for our customers and principal partners."

Reichard will continue to serve as president and CEO of Polyram USA.

Hill has served on Maroon's Board of Directors since March 2017.

He spent 30 years with Univar, where he served as EVP and chief commercial officer, president of Univar U.S., and also managed ChemPoint, Europe, Asia Pacific and Latin America during his tenure.

"It has been tremendous fun to participate in Maroon's expansion over the past several years, and I am enthusiastic about the opportunity to build on the exceptional momentum at Maroon," Hill said. "Mark has assembled a first-class team, who together have built a culture of excellence that contributes to our goal of Creating Customer Success. I am excited to work alongside Mark, Mike, and the entire Maroon Group organization in advancing that legacy and delivering value for our customers and principal partners." *CW*

BASF Increasing Capacity for Alkylethanolamines in Ludwigshafen

BASF will increase the production capacity of Alkylethanolamines (AEOA) by 20 percent at the BASF Verbund site in Ludwigshafen, Germany.

After the start-up in 2020, BASF's global annual nameplate capacity of AEOA will be more than 110,000 metric tons per year at its production facilities in Ludwigshafen, Germany; Geismar, Louisiana; and Nanjing, China.

"We have highly efficient manufacturing processes, and with this investment, we provide our customers greater flexibility and reliability of supply than before," said Dr. Frank Stein, SVP, BASF Intermediates Amines Europe.

The versatile Alkylethanolamines are mainly used as precursors for flocculants applied in water treatment and in the coatings industry where they act as binders between pigments and resins. Other applications include gas treatment, fabric softeners, lubricants in metalworking fluids and polyurethanes.

Photo courtesy of BASF

Arkema Begins Capacity Extension at Nansha Production Plant

Arkema successfully started up the 30 percent capacity extension of its photocure advanced liquid resin production plant in Nansha, China.

This new production line will help to meet the demand in Asia in the electronics, 3D printing, adhesives and inkjet printing market.

The new line will produce state-of-the-art UV, LED and EB liquid resins, which provide high efficiency and performance benefits to photocuring systems dedicated to high-end applications such as electronics where they are used in the production and design of printed circuits, as well as smartphone, tablet and television screens. The line will also manufacture Sartomer's portfolio of N3xtDimension resins for 3D-printed products.

With production sites and R&D facilities in Europe, Asia and the U.S., Sartomer, a world leader in specialty photocure resins, is positioned as a unique partner close to its customers with a strong local presence, high-quality technical support for tailor-made developments, as well as responsive local logistics services.

Environmentally friendly and complying with global standards on volatile organic compound (VOC) low emissions, these advanced solvent-free specialty liquid resins are part of Arkema's strategy to develop and offer sustainable solutions contributing to the Sustainable Development Goals (SDGs) of the United Nations.

Nouryon Launches More Sustainable Ingredient for Asphalt Market

Nouryon (formerly AkzoNobel Specialty Chemicals) expanded its offering for the asphalt market with Wetfix G400, a versatile non-amine adhesion promoter derived from renewable resources. Wetfix G400 meets customers' needs for a more sustainable alternative that maintains asphalt mixture performance and durability.

Adhesion promoters are added to asphalt mixes used in road construction and maintenance to protect from moisture damage and extend the life of asphalt pavement. However, conventional adhesion promoters are not compatible with polyphosphoric acid (PPA), which is growing in popularity as an economical way to modify asphalt binders to the desired performance level.

"With Wetfix G400, we've created a solution for our customers that is compatible with PPA modified binders and works with all types of aggregates," said Sundaram Logaraj, global technical marketing manager Asphalt at Nouryon. "Because it is derived mainly from castor oil which comes from renewable resources, it is more sustainable than conventional adhesion promoters. Also, it has exceptionally low odor, which improves the working condition for personnel involved in production and paving of asphalt mixes."

Olin Moving Offices to New Location in Houston

Olin Corporation said it will relocate its

Houston offices.

The global corporation will occupy 54,080 square feet of space in the Offices at Park Ten building located at 16290 Katy Freeway in Houston's Energy Corridor.

Olin expects to move into the new location in late April. The company found its former Houston office space could not accommodate its growth and continued investment in the community.

Olin's executive offices are based in Clayton, Missouri.

DIC Subsidiary in Thailand Achieves Silver Medal in EcoVadis Sustainability Assessment

DIC Corporation announced that Bangkok-based subsidiary Siam Chemical Industry Co., Ltd., which manufactures a wide range of polymer products, including coating resins, achieved a silver medal in the sustainability assessment conducted by EcoVadis.

EcoVadis uses its own platform to assess and rate the sustainability of suppliers across 190 industrial sectors in 150 countries. The company operates a collaborative platform that enables companies to monitor the corporate social responsibility (CSR) (sustainability) performance of their suppliers and provides objective ratings of suppliers' performances in four categories: environment, labor practices and human rights, ethics and sustainable procurement.

BYK Opens New Site in Shanghai

BYK is expanding its operations in Shanghai.

The Asia region accounts for one-third of sales.

"The new and ultra-modern facility is embedded in the Shanghai Chemical Industry Park (SCIP) where we enjoy, ideal framework conditions for our innovative, differentiated additive solutions," said Martin Babilas, CEO of ALTANA AG.

"Optimum technical laboratory support, product innovations, and fast, reliable supply chains play a crucial role in this strategy. Thanks to the facility being opened, we can offer our Chinese customers more direct services, as well as differentiated products that will provide an additional impetus to our business in the region," added Stephan Glander, BYK division president.

The new five-hectare site in Shanghai (around 54,000 sq.m.) is home to laboratories, a distribution center, and administration and was constructed in two years. BYK invested around €38 million.

Polynt Signs 5-year Contract with Orange Business Services for Global Wide Area Network

Polynt signed a five-year contract with Orange Business Services for a global wide area network (WAN). The network meets Polynt's requirement for a seamless, global end-to-end communications solution following its merger two years ago with U.S. chemical company Reichhold. It will also support the growth of Polynt's international operations and serve as a platform for future unified communications technologies.

The new infrastructure will help Polynt, based in Bergamo, Italy, drive innovation inside the organization and take full advantage of further digitalization. It will connect 44 sites in 15 countries across four continents, including North and Latin America, Europe and Asia. Other benefits include increased network performance with redundancy and high resiliency. By consolidating network design and maintenance with one single provider, Polynt will reduce complexity and strengthen application performance and agility.

Orange Business Services will also provide Enterprise Application Management with Riverbed, a fully-managed service that delivers application acceleration and WAN optimization. This will significantly improve the end-user experience of using enterprise applications by accelerating response times. It also will give Polynt more visibility on the network and applications and allow it to use data centers more effectively.

"By combining highly resilient and redundant global services and coverage with our capability to deliver consistent solutions globally with a local touch, we are excited to support Polynt's global growth in the years to come," said Fabrice de Windt, SVP, Europe, Orange Business Services.

"Developing a Global WAN with Orange Business Services will allow us to gain central control over our global IT infrastructure and to simplify contract management, making it easier to accelerate the integration of new acquisitions to support our global expansion. Being able

BYK's new Shanghai site/Courtesy BYK

to operate a consistent technology in every site is the first step towards aligning our corporate culture everywhere in the world," added Annamaria Codari, global IT director at Polynt.

Shell Joins W2C Rotterdam Project

A consortium comprising Air Liquide, Nouryon (formerly AkzoNobel Specialty Chemicals), Enerkem and the Port of Rotterdam announced that Shell will join as a partner in Europe's first advanced waste-to-chemicals facility in Rotterdam, the Netherlands.

Shell will become an equal equity partner in the proposed commercial-scale waste-to-chemicals project, which will be the first of its kind in Europe to make valuable chemicals and biofuels out of non-recyclable waste materials.

"The EU Renewable Energy Directive (RED II) coming into effect in 2021, as well as other environmental initiatives such as the Circular Economy Package, are creating an ideal environment for leading companies to drive sustainable growth through innovation," said Marco Waas, chairman of the waste-to-chemicals project in Rotterdam and director RD&I at Nouryon.

"Advanced biofuels, including those produced using bio-methanol, have the potential to decarbonize the transportation sector, in particular," said Andrew Murfin, GM, Advanced Biofuels, Shell.

The consortium aims to take the final investment decision later in 2019 as it pursues the development work and finalizes the selection of an engineering and procurement contractor.

The planned facility will convert up to 360,000 tons of waste into 220,000 tons (270 million liters) of bio-methanol – a chemical building block that is used to manufacture a broad range of everyday products, as well as being a renewable fuel. This represents the total annual waste of more than 700,000 households and represents CO2 emission savings estimated at about 300,000 tons when compared to the production of methanol from fossil fuels.

The project is supported by the Dutch Ministry of Economic Affairs & Climate Policy, which has agreed to develop mechanisms and regulation that will help bring this new technology to full scale to support the low-carbon transition of the Dutch economy. The waste-to-chemicals project is also supported by the City of Rotterdam, the Province of Zuid-Holland and InnovationQuarter, the regional development agency.

The facility will be built within the Botlek area of the Port of Rotterdam using Enerkem's proprietary technology and will convert non-recyclable mixed waste, including plastics, into syngas and then into clean methanol for use in the chemical industry and for the transportation sector. This is a departure from the reality of today, where methanol is generally produced from natural gas or coal.

The plant will have two production lines, or twice the input capacity of Enerkem's commercial plant in Edmonton, Canada. It will benefit from the modern infrastructure available within the Port of Rotterdam, as well as synergies with Air Liquide (large industries) for supplying the required oxygen and with Nouryon, for the hydrogen raw material. The current aim is that the facility's sustainable methanol output will be purchased by Nouryon and Shell.

The project can help the Netherlands realize its ambition to become virtually carbon-neutral by 2050.

Nouryon Completes Organic Peroxides Expansion in India

Nouryon (formerly AkzoNobel Specialty Chemicals) completed a €4 million expansion at Mahad, India which will increase organic peroxides production capacity at the site by 80 percent.

The increased capacity will support growing customer demand in India and the Middle East for organic peroxides, essential in the manufacture of polymer-based products such as athletic shoe soles, wind turbines and PVC pipes.

"This expansion allows us to better serve our customers and build upon our strong market presence, particularly in the PVC, acrylics and thermoset resin segments," said Amit Salagare, Mahad site manager. "It also reflects our commitment to the site and steadfast efforts to strengthen the local manufacturing sector."

"This project is the latest in a string of investments across the globe to better meet our customers' needs and grow with them," added Johan Landfors, managing director Polymer Chemistry at Nouryon. "In 2018, we invested more than €100 million to expand organic peroxides capacity and work on sustainable product and process innovations." The Mahad project also includes a new wastewater treatment facility that will improve the site's sustainability profile.

Nouryon is expanding its operations in the country. Earlier this year, it opened a new headquarters office and research center in Mumbai. Nouryon is also partnering with chemicals manufacturing company Atul, a part of Lalbhai Group, on a new monochloroacetic acid plant in Gujarat, to be completed later this year.

Industrial Physics Acquires C&W Specialist Equipment Ltd.

Industrial Physics, Inc. announced its purchase of C&W Specialist Equipment Ltd., which specializes in the development and manufacture of corrosion test chambers.

C&W will become a part of TQC Sheen B.V., a manufacturer of lab equipment to test and inspect surface and adhesion properties of paint and coatings.

Industrial Physics' portfolio of brands addresses critical test and measurement needs of customers in a broad range of industries with an emphasis on packaging and packaging-related applications including food and beverage, metal cans, flexible packaging, paper and plastics, paints and coatings, medical device and consumer electronics.

"With a large installed base of test chambers and strong brand recognition in the industry, we are very excited to add the C&W product line to the TQC Sheen product portfolio," said Antoon van Osch, managing director of TQC Sheen B.V. *CW*

ROSS Redesigns 1,000-gallon Pivoting Triple Shaft Mixer

The Ross VMC-1000 VersaMix is a 1,000-gallon Triple-Shaft Mixer available on a pivot-design single-post hydraulic lift. The new design allows the machine to be raised from a vessel, rotate 90˚ and lowered into another vessel.

This therefore allows for convenient discharge of finished product in the first vessel while a new batch is being made in the second.

By reducing overall processing time and minimizing downtime, the pivoting ROSS VersaMix saves time and money while simplifying the mixing, discharging and cleaning operations. The VersaMix is available across a full range of working capacities from 1 quart to 2,000 gallons.

Chromaflo Technologies Releases New Black Colorant

Chromaflo Technologies announced the release of a new black colorant, the latest addition to its thermoset product line.

The black is associated with Chromaflo's DL line of products and has a product code of DL-020017.

Created by Chromaflo's Thermoset technical team, the new black colorant targets the polyurethane market, which encompasses a host of different applications. The colorant is uniquely different in that it contains 40 percent high structure carbon black and its thixotropy allows the product to readily flow with no need for agitation.

Benefits of the DL-020017 new black include:

- Ability to achieve a jet black color at lower loadings;
- Lower loading provides a cost to use benefit, less impact of the colorant and properties of the final product and less inventory;
- A low viscosity, which allows for ease of handling including the ability to pump or meter.

"Our goal in the creation of this new colorant was to fill the need for a high color strength, low viscosity black in the polyurethane market," Technical Service Representative – Urethanes, Lisa Collette said. "Tested for color strength in an array of polyurethane systems, this new colorant has the 40 percent high structure carbon black and low, stable viscosity that users are looking for. Our goal here at Chromaflo is to create colorants that provide consumers with a fresh look and approach to their products and this new colorant does exactly that."

The colorant was initially released at the FOAM Expo in Novi, Michigan.

Arkema's New ENCOR 601 Binder Addresses Surfactant Leaching in Masonry Coatings

Arkema introduced ENCOR 601 acrylic latex for use in low VOC masonry coating applications. Properly formulated, this new resin provides outstanding surfactant leaching resistance, which helps reduce the likelihood of stain formation and other undesired effects in a finished coating.

"Traditional low VOC masonry coatings have always been prone to surfactant staining, especially in exterior building applications," said John Hiel, North American business manager for Coating Resins at Arkema. "In developing this product, we addressed the primary causes of staining resulting from surfactant leaching. This led us to focus on areas such as better temperature and environmental resistance, adhesion properties, formulation design and more."

The result, ENCOR 601 acrylic latex, is a 100 percent acrylic binder that offers a variety of benefits to the formulator, including:

- Surfactant leaching resistance;
- Excellent efflorescence and alkali resistance;
- Strong block resistance capability;
- Outstanding adhesion in wet and dry conditions;
- Low-VOC properties, making it ideal for formulations in the zero to 50 g/l VOC range

"ENCOR 601 binder enables the formulation of higher performance, lower VOC masonry coatings when compared to existing options," Hiel said. "This is something formulators and users of architectural coatings have been requesting for a long time."

Grieve Introduces 750°F Electric Class 100 Cleanroom Oven

No. 836 is a 750°F electrically-heated Class 100 cleanroom oven from Grieve, currently used to bake various coatings onto products at a customer's facility.

Workspace dimensions of this oven measure 36" wide x 36" deep x 39" high.

30 KW installed in Incoloy sheathed tubular heating elements provide the maximum temperature of 750°F, while a 1000 CFM, 1 ½-HP recirculating blower maintains horizontal airflow across the load.

No. 836 features a Type 304, 2B finish stainless steel interior with continuously backwelded seams, exterior finished with white epoxy paint #4, brushed finish stainless steel door face and control panel face. The oven has 6" insulated walls and an aluminized exterior.

Additional equipment on this Grieve oven includes a 30" x 24" x 6" thick stainless steel high-temperature HEPA recirculating air filter, digital programming temperature controller, manual reset excess temperature controller with separate contactors, recirculating blower airflow safety switch and a 10" diameter circular chart recorder. ***CW***

Eastern Coatings Show to be Held in Atlantic City May 13-15

May 2-3, 2019
Advanced Coatings 2019
Location: Houston, TX
Venue: Holiday Inn at Webster-Houston
Contact: advcoatings2015@gmail.com
Website: www.advcoatings.org

May 6-9, 2019
EPCEd: Core-Shell Latex Particles – Fundamental Aspects of Morphology Control
Location: Durham, NH
Phone: 603-742-3370
Email: Info@epced.com Website: www.epced.com

May 8-10, 2019
Spray Finishing Technology Workshop
Location: Toledo, OH
Venue: Owens Community College
Phone: 800-466-9367 ext. 7320
Email: sprayworkshop@netscape.net
Website: cdn.owens.edu

May 13-15, 2019
Eastern Coatings Show 2019
Location: Atlantic City, NJ
Venue: Harrah's Resort & Casino
Phone: 718-705-4561
Email: dlugo@gae-llc.com
Website: www.easterncoatingsshow.com

May 22-23, 2019
CPCA 106th Annual Conference & AGM in Vancouver
Location: Vancouver, British Columbia
Venue: The Sutton Place Hotel Company
613-231-3604
Website: canpaint.com

June 2-7, 2019
North Dakota State University Coatings Short Course
Location: Fargo, ND
Venue: Research 1, NDSU
Email: Stuart.Croll@ndsu.edu
Website: www.ndsu.edu

June 4-5, 2019
Cleveland Coatings Society's Sink or Swim
Location: Cleveland, OH
Venue: Cleveland Airport Marriott
216-731-5213
Email: Ron@ClevelandCoatingsSociety.org

June 4-7, 2019
Practical Wood Coatings Formulation and Application Course
Location: High Point, NC
Venue: Wood Coatings Research Group
336-802-1132
Email: r.obie@woodcoatingsresearch-group.com
Website: www.woodcoatingsresearch-group.com

June 16-20, 2019
CCAI, PCI 2019 Annual Meetings
Location: Hilton Head, SC
Venue: Sonesta Resort
Phone: 859-356-1030

June 26-28, 2019
Coatings Vietnam 2019
Location: Ho Chi Minh City, Vietnam
Venue: Saigon Exhibition and Convention Center
Email: info@veas.com.vn
Website: www.coatings-vietnam.com

Oct. 1-3, 2019
CEPE Annual Conference and General Assembly
Location: St. Julian's, Malta
Phone: +49 511 99 10 281
Website: www.european-coatings.com

Oct. 1-3, 2019
ABRAFATI 2019
Location: Sao Paulo, Brazil
Venue: São Paulo Expo Exhibition & Convention Center
55 11 4083 0504/ 0505
Email: abrafati.2019@abrafati.com.br
Website: http://www.abrafati2019.com.br/

Oct. 20-23, 2019
34th Biennial Western Coatings Show and Symposium
Location: Las Vegas, NV
Venue: Paris Hotel and Casino
714-974-4511
Email: westerncoatings@earthlink.net
Website: www.westerncoatingsshow.com

Nov. 5-8, 2019
SEMA Show
Location: Las Vegas, NV
Venue: Las Vegas Convention Center
Email: semashow@semashow.com
Website: www.semashow.com

Nov. 18-20, 2019
CHINACOAT 2019
Location: Guangzhou, China
Venue: Shanghai New International Expo Centre (SNIEC)
Email: info@sinostar-intl.com.hk
Website: www.chinacoat.net

Nov. 20-22, 2019
Greenbuild International Conference and Expo 2019
Location: Atlanta, GA
Venue: Georgia World Congress Center
Email: info@greenbuildexpo.com
Website: www.greenbuildexpo.com

2020

Feb. 16-21
2020 Waterborne Symposium
Location: New Orleans, LA
Venue: Sheraton New Orleans
601-266-4475
Fax: 601- 266-6265
Email: waterborne@usm.edu
Website: www.psrc.usm.edu/waterborne

March 31-April2
American Coatings Show
Location: Indianapolis, IN
Venue: Indiana Convention Center
Website: www.american-coatings-show.com

CW

Blades

Products & Services

Employment Opportunities

Seeking two sales professionals with 10-15 yrs chemical sales background.
One with personal care/cosmetic sales and the other industrial chemical sales experience.
Need to work independently from home and coordinate sales through our Sacramento, CA office and our Chinese and India sourcing offices. Able to attend national and regional shows and travel 50% regionally and nationally based on customer base.
Salary, expenses and bonus are offered based on successful candidates experience and ability.
Contact: Peterbotzenhart@eastarchem.com
I can meet canidates at the Eastern Coatings Atlantic City, NJ May14-16

Company Name	Page	Website
ABRAFATI	41	www.abrafati.com.br
ACT Test Panel Technologies	14	www.acttestpanels.com
Alberdingk Boley	17	www.alberdingkusa.com
Arkema Coating Resins	25	www.arkemacoatingresins.com
Azelis Americas	3	www.azelis.com/americas
BASF	11	www.basf.com
Chemark Consulting	15	www.chemarkconsulting.net
Conn and Co. L.L.C.	19	www.connblade.com
Excelitas Technologies Corp.	13	www.excelitas.com
Hockmeyer	Cover 2	www.hockmeyer.com
Keeneyes Industrial Corp.	16	www.keeneyes.com.tw
Lanxess	Cover 3	www.lanxess.us
Micro Powders Inc.	9	www.micropowders.com
Palmer Holland	7	www.palmerholland.com
Pan Technology	35	www.pantechnology.com
Paul N. Gardner Company, Incorporated	15	www.gardco.com
ROSS Mixers	5	www.rossmixers.com
Siltech Corporation	18	www.siltech.com
Troy Corporation	Cover 4	www.troycorp.com

PPG Completes Project for Lighthouse Children Welfare Home Association in Kuala Lumpur, Malaysia

PPG recently completed a COLORFUL COMMUNITIES project that helped revitalize the facilities of the Lighthouse Children Welfare Home Association in Bangsar, Kuala Lumpur, Malaysia. The project brought together around 50 PPG volunteers, who spent four days revitalizing this safe haven for more than 70 children from difficult family backgrounds.

PPG provided nearly 310 liters (82 gallons) of TAUBMANS paint products to assist with the project, contributing to the organization's goal of creating a pleasant, family-oriented environment for the children in its care. Some of the children, who range from 2 to 20 years old, are from family situations involving drug, alcohol, physical or sexual abuse. Others come from poverty-stricken or single-parent homes.

Lighthouse Children Welfare Home Association has a special focus on reuniting siblings who have been separated and helping them grow together within a large family environment to become balanced, educated adults. Attention is given to the children's individual needs and interests, and outside specialist care is provided when needed.

"We are happy and excited for the children, who helped choose the colors and got to see the painting process," said Jacinta Steven, founder and caretaker, Lighthouse Children Welfare Home Association. "It was a great experience, and it was very nice to see PPG's management team participating in this painting activity."

The Colorful Communities program provides PPG volunteers and products to bring color and vitality to communities where the company operates around the world, such as in Malaysia, where PPG has a manufacturing facility and administrative operation.

The PPG volunteers painted the home's interior and exterior walls in a PPG color palette of Daylight, Sky Green, Shy Rose, Mauve Ash, Chine Beige, Georges River, Powdered Gold and Sublime. These colors were chosen to create a welcoming, calming and soothing environment.

"PPG is committed to helping organizations like Lighthouse Children Welfare Home Association meet the needs of local communities," said Soma Swaminathan, PPG general manager, Southeast Asia and Industrial Coatings, Southeast Asia, Australia, New Zealand, India and Japan. "This Colorful Communities project revitalized an important community resource while bringing color and beauty into the lives of children who need them most." ***CW***

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