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CANADIAN FINISHING & COATINGS MANUFACTURING MAGAZINE

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Photo Courtesy of PPG

USING A ZINC RICH BASE COAT

TO ENHANCE THE PERFORMANCE OF ELECTROCOAT FINISHES

BY MATTHEW S. SCOTT

Electrocoat has been used for many years, on various substrates to improve the corrosion resistance of the finished parts. Typically the parts are made of steel or galvanized steel and finished with electrocoat.

Recently OEMs and manufacturers of parts have implemented strategies for weight reduction, base metal thickness reduction, and an increase in welded component parts. These must be accomplished while trying to control the cost of materials and manufacturing. These manufacturing changes have put a focus on insuring that the finish that is used on these parts will impart superior performance characteristics to meet the stringent requirements for the automotive and industrial markets. To improve the performance of electrocoat on this new breed of parts, zinc rich base coats have been used in conjunction with electrocoat. This duplex coating has proven to be a viable and cost effective solution for finishing these parts and meeting or exceeding the performance expectations.

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- Barrel Plating
- Air Pollution Control
- Anti Corrosion Additives
- Biocides, Algaecides and Preservatives
- Health and Safety Across Canada
- Masking

MUCH MORE!

CPCA CORNER

with Gary LeRoux



CPCA YEAR IN REVIEW

The year at the CPCA was a busy one beginning with the appointment of a new President in January. The year started out with preparations for the completion of a new three-year strategic plan to reaffirm the Association's value proposition. A membership survey of the Association was conducted using an independent, professional firm to compile and tabulate the results. The survey covered all aspects of the Association's work: products and services, management work, seminars/workshops, member involvement, events/annual conference, committees and more. The survey results were then used by the board to prepare for a strategic planning session culminating in a three-year strategic plan being approved by the Board with six key priorities.

NEW STRATEGIC PLAN

The priorities in the strategic plan cover a range of important issues that include:

working toward the harmonization of provincial stewardship programs; continued representation of the industry with respect to regulations at all three levels of government; actively growing the membership of the Association; improved communications with stakeholders and the public in general to create a greater awareness of the industry's significance and accomplishments; increasing the level of member participation and engagement; and improving the bench strength at all levels of the organization including board, staff and technical committees.

In conjunction with the strategic and operational plan a robust communications plan was approved. This plan is essential to convey to members and non-members the valuable programs and services offered by the Association on a daily basis and the outcomes that are essential to sustain this vitally important sector of the economy. A renewed website with revitalized programs and services was also

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In the News

Association News

Canadian Paint and Coatings Association Names Board of Directors at Annual Conference

The Canadian Paint and Coatings Association (CPCA) approved its Board of Directors for 2012-2013 at its Conference and Annual General Meeting in Vancouver.

Dale Constantinoff, President and CEO of General Paint and Chair of the Association says, "The Board continues to move forward with a strong and fully engaged Board of Directors on a new three year strategic plan for CPCA and I am very pleased to be working with them on important issues for the paint and coatings industry in Canada." CPCA Board of Directors for 2012-2013 are:

- Dale Constantinoff, General Paint (Chair);
- Tim Vogel, Cloverdale Paint (Treasurer and Chair of Finance & Audit Committee);
- Darrin Noble, Home Hardware (Nominations Committee Chair);
- Sharon Kelly, KelCoatings Limited;
- Ed Thompson, L.V. Lomas Ltd.;
- Mario Tremblay, DuPont Performance Coatings;
- Andy Doyle, American Coatings Association;
- Fred Vegheli, OPC Polymers Canada;
- Carl Minchew, Benjamin Moore & Co. Ltd.;
- Rick J. Duha, The Duha Group;
- Andre Buisson, Boomerang Paint;
- Mike

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Government Changes

Premier Dalton McGuinty shocked the Province of Ontario in October 2012 when he announced his resignation after almost 10 years as reigning premier. What might this mean for the paint and coatings industry in Ontario?

President of the Canadian Paint and Coatings Association (CPCA), Gary LeRoux responds: "Speaking to it from the paint industry perspective, there is not much nice to say for how the McGuinty Government treated the paint industry in Ontario related to post consumer paint recycling under his government's Extended Producer Responsibility (EPR) commitment. This was manifest in the Municipal Household and Hazardous Waste (MHSW) program under Stewardship Ontario as the program operator. That program oversees 9 categories of waste and the paint category is by far the largest representing approximately half of the program by volume and costs. Costs for the program is in excess of \$40 million annually. Even though the paint category of MHSW exceeded targets annually the government foreword with an

amendment to the regulation in February, which substantively altered the program, increasing industry's costs including paying a deficit of \$7.2 million, which the industry was not responsible for creating. The government was responsible. The regulation also reduced the amount of input and transparency with respect to the way the program is now run and this continues to cause angst for the paint industry in Ontario. So much so that the industry is now looking at ways of getting out of the program to establish its own program operations. Even if it does that it will still fully comply with the regulations related to EPR in Ontario, but hopefully have a much better governance process for program development than currently exists. It will still be difficult because Waste Diversion Ontario and the MOE will still be responsible for oversight to the Provinces EPR program in terms of implementation.

It is hoped that going forward the paint industry will be in a better position on post-consumer paint recycling and con-



tinue to meet or exceed targets as it has done in the past. In Ontario the industry gets little or no credit for exceeding recycling targets and the fact that it now leads the world in post-consumer paint recycling with programs in every Province of Canada. The political interference with the paint industry's stellar efforts on recycling such as the unfortunate Eco fee debacle of 2010 – despite the fact that tires and electronics had and continue to have a visible eco fee for its products. Further, the more recent regulatory amendment in February of 2012 sent a clear signal to the paint industry that it was not appreciated for its

commitment to sustainability. It is unclear why the McGuinty Government chose to target the paint industry in Ontario, especially given the successes it has had with recycling. It is time the government got back to appreciating industry in general and the contribution of the paint industry to the economic prosperity of the Province with the majority of Canadian paint manufacturing located in Ontario. It is time to recognize the fact that the manufacturers represent the 'P' in EPR.

Paint manufacturers are now global, multi-national companies and make investment decisions on friendly business environments and the kind of regulatory treatment by governments is a big factor when those decisions are being made. It is incomprehensible that a government would do such a thing to a sector when its financial predicament is so bleak. I am only speaking of one manufacturing sector and if similar situations exists in other sectors, is it any wonder Ontario fell into 'have-not' status under the McGuinty government."

Read the Year in Review CPCA Update this issue.
sandra.anderson@cfcma.ca

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In the News

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Klein, Dominion Color Corporation; Ron Nakamura, PPG Canada Inc.; Harry Dhanjal, BASF Canada Inc. and Claude Brosseau, AkzoNobel.

Paint and Coatings Industry Honours Four Deserving Individuals

The Canadian Paint and Coatings Industry (CPCA) recognized several key individuals for their exemplary service to the Association and the paint industry over many years. The Roy Kennedy Award is presented to an individual who has made an outstanding contribution to the work of the Association. Darrin Noble, Vice President of Home Hardware Beauti-Tone Paints has been an integral part of the transformation of CPCA into a successful, modern association and he continues to bring passion and energy to the Association's work as a valued board member. Constantinoff comments, "As Chair I have seen first-hand Darrin's commitment to the Association giving freely of his time to ensure that the wider paint industry is strong and sustainable for the long term." In addition to support of the Association, Darrin Noble is an active board member of several industry associations including the Canadian Chemical Specialty Products Association, Product Care Association, the Coatings Research Group and Guild CPO.

Susan Peterson and Yvon Savaria of AkzoNobel and Jim Edwards of Home Hardware Beauti-Tone Paints received the Industry Statesman Award at the Association's recent annual conference in Vancouver. In granting these awards, Dale Constantinoff, President and CEO of General Paint, and CPCA Chair said, "I'm pleased to present this award to three deserving individuals who have been nominated by their colleagues and I wish them well in their new endeavours upon retirement from the industry."

Yvon Savaria joined AkzoNobel, then known as Sico, as marketing manager in January 1996, and led the development of a contemporary marketing effort that helped establish tremendous brand recognition for the company's products. Jim Edwards was involved with the paint industry for over 50 years working for companies such as Home Hardware, Cloverdale Paint, Penfound Varnish and Sico, leading efforts on new and experimental products that found their way

to store shelves across the country. Susan Peterson dedicated a large part of her life to the paint and coatings industry beginning as a chemist with C.I.L., Bapco, ICI and later AkzoNobel. She has been involved in many industry-wide issues through her work with CPCA and other industry Associations.

All recipients received their awards at the annual Chair's Gala held during the Association's annual conference.



Yvon Savaria, retired AkzoNobel receives Statesmanship Award from CPCA Chairman Dale Constantinoff, General Paint.



Dale Constantinoff, CPCA Chairman, presents the Statesman Award to Jim Edwards, with Darrin Noble, Home Hardware, at the recent CPCA Conference in Vancouver.



Susan Peterson, retired from AkzoNobel, receives Statesmanship Award from Dale Constantinoff.



Dale Constantinoff presents Darrin Noble, Home Hardware, with the Roy Kennedy Award.

Canada's WMS Returns to the International Centre in 2013

The Woodworking Machinery & Supply Expo (WMS), Canada's national woodworking show, is returning by popular demand to the International Centre, October 24-26, 2013.

The International Centre had hosted WMS for most of its more than 40-year history. In 2011 WMS was held at the Direct Energy Centre in downtown Toronto.

"We are happy to announce that WMS is moving back to the International Centre," said Steve Reiss, vice president of Vance Communications ULC, organizer of the event. "Our goal has been to book the venue that will best meet the expecta-

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tions of attendees and exhibitors. While we were overall pleased with the results of WMS 2011 at the Direct Energy Centre, it became clear that a good number of exhibitors and attendees did not like commuting downtown or having to pay for parking."

WMS will feature Canada's largest exhibition of woodworking machinery, software, hardware, components and other products. More than 5,000 woodworking professionals, including those involved in the manufacture of furniture, cabinet and millwork are expected to attend the show.

In addition, the 2013 edition of WMS will include a conference program focusing on business and technical topics for wood products managers and owners, plus special demonstrations on the expo floor.

The International Centre is located a short drive from Pearson International Airport and includes thousands of free parking spaces. Hotels are plentiful and the allure of downtown Toronto is within a short commute after WMS show hours.

TOSCOT Christmas Lunch

Despite the fact it is now part of the CPCA, the Toronto Society of Coatings Technology will still be having its annual Christmas Luncheon on December 11, 2012. Location to be announced. Check in at www.cfc.ca for more information.

Ontario Painting Contractors Association (OPCA) Christmas Lunch

OPCA Christmas Luncheon will be held Wednesday, December 5, 2012, 12:00 PM – 2:00 PM at the Paramount Conference & Event Venue, Woodbridge, ON.

www.opcatrusted.ca or by phone at (416) 498-1897 or (800) 461-3630.

The Ontario Painting Contractors Association fosters collaboration to achieve success in advocacy, education, industry standards and labour relations.

By 2013, it will be an offence under the Workplace Safety and Insurance Act to hire a contractor or subcontractor to perform construction work without the contractor or sub-contractor having a valid WSIB clearance certificate. Employers could be liable for unpaid premiums and prosecuted. Individuals could be fined up to \$25,000 and/or imprisoned for up to six months. The maximum fine for a corporation is \$100,000.

Canadian Copper & Brass Development Association introduces the new Copper Alliance Branding Program in Canada

The Canadian Copper & Brass Development Association has introduced the International Copper Association's (ICA) new Copper Alliance branding program.

The new branding program gives a unified appearance and feel to all of the global network locations of the International Copper Association. The Canadian Copper & Brass Development Association (CCBDA) name remains the same. All of CCBDA's communications and publications will eventually feature the new logo phased in over time. One of the first elements to feature the new logo will be the CCBDA website www.coppercanada.ca.

The CCBDA website has been redesigned. It presents a modern graphics presentation of a number of the Association's services, including provision of information on copper's role in a wide

range of innovative sustainable and renewable energy applications. The website also provides updates on a number of important topics, such as the replacement of lead water services with copper tube and lead-free fittings. Green building applications include the annual announcement of the winners of the North American Copper in Architecture Awards which regularly feature winning projects in Canada.

With the emphasis today on the importance of recycling of materials, copper is 100 per cent recyclable. Over 80 per cent of the copper ever mined during the past 10,000 years is still in use in some form somewhere.

The Canadian Copper & Brass Development Association is a national trade organization founded over 50 years ago to represent the Canadian copper industry.

Company News Paint Instead of Sandblast?



A before and after look at a property downtown Toronto at 650 Bay Street.

TheBrickPainters.com have discovered a new solution for restoring the look of painted brick, with a faux finish, that is a fraction of the cost of the traditional methods of sandblasting or chemical paint stripping. The company's faux-finish process involves painting the brick with four to five different colors of paint on primer, applied to each individual brick, one brick at a time. It looks like the

brick has been stripped off, but it hasn't, and there is no chemical clean up. They charge approximately \$5 per square foot.

Peter Woodworth of TheBrickPainters.com explains that they are a "start-up" company and the process is one he originally developed to refurbish

his own brick home back to the original natural brick and mortar look. It looks like it was sandblasted and stripped, but there is no damage to the brick and no chemical clean up. The company now has it available to others with offices in both the US and Canada.

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Chemetall Opens \$25 Million Cutting-Edge Facility

Chemetall, an innovator in surface treatment and metal processing technologies, has opened a new cutting-edge facility in Blackman Township, Michigan, early October 2012. When completed, the \$25 million chemical manufacturing plant will cover



200,000 square feet to house administrative, manufacturing, warehousing operations, and a physical testing laboratory. Over 900 Chemetall products will be produced at the 40-acre Blackman site for applications in surface treatment, metal fabrication, cleaning and sanitizing.

"The labor force, as well as the strong support from Blackman Township and the State of Michigan, made Blackman Township the most logical choice for our new plant. We have selected the best area talent to support our growing operations," says Dr. Ron Felber, CEO of Chemetall NAFTA.

Automation advancements, including bulk material handling systems, mixing vessels, and packaging lines, have been incorporated into Chemetall's Blackman Township facility to increase productivity as well as improve product yield and quality for customers. As a measure of its dedication to environmental sustainability, Chemetall has installed a semi-automated waste treatment system to reduce process wastewater by 90 per cent. "High-tech additions to the new Blackman Township site ensure the efficiency of operations for the manufacture of the finest quality chemistries," says Dr. Felber. "Customers can be assured of Chemetall's commitment to their satisfaction through our innovations and service from all of our facilities. Our mission is to integrate our decades of experience in close cooperation with our customers, employees, and communities to produce customized solutions that enhance processes as well as the environment."

Chemetall has been developing, manufacturing and supplying state-of-the-art specialty chemical products since 1909.

BASF launches new Construction Centre in Canada

BASF's Construction Chemicals division has opened a new Construction Centre in Toronto, ON. A celebratory event was hosted at the site for more than 100 construction contractors, distributors, architects and engineers in the greater Toronto area.

"The new BASF Construction Centre will service the Greater Toronto Area and the Canadian marketplace and will continue to build on BASF's leadership position and commitment to providing



product and system solutions to solve even the most demanding jobsite challenges in the construction industry," says John Salvatore, Head of BASF Construction Chemicals Americas.

Located at 10 Constellation Court in Toronto, the BASF Construction Centre offers on-site customer service and support, manufacturing and warehousing capabilities, and is centrally located to ensure optimal service to BASF's construction partners in the industry. Additional benefits include increased service to the Canadian marketplace and enhanced distribution and logistics to deliver products on time.

As for the paint and coatings capabilities, the Construction Centre will provide custom color matching and tinting of Senergy brand Exterior Insulation and Finish System products as well as Thoro brand decorative and waterproofing coatings from the Construction Chemicals division. The site also houses other BASF divisions that produce paints and coatings such as Automotive, Industrial and Specialty coatings.

"Our Wall Systems business will offer a complete product line to meet the needs of the professional contractor in the Canadian construction market," says Bill Kasik, Head of BASF's Wall Systems business. "This offering includes all Exterior Insulation and Finish System (EIFS) components, custom color matching and tint capability, local delivery service and a hands-on classroom and training facility."

The BASF Construction Centre will feature a full line of products from the Construction Chemicals business, including:

- Cementitious flooring products
- Concrete repair products
- Deck membranes
- Grouts
- Joint sealants
- Performance flooring products
- Wall coatings
- Water repellents
- Waterproofing products
- EIFS products:
- Adhesives
- Air/water-resistive barrier products and coatings
- Insulation
- Base coats
- Reinforcing mesh
- Acrylic finishes and coatings
- Accessories and tools

"With the opening of the Construction Centre, we are reinforcing our commitment to serving the needs of construction professionals in the Canadian marketplace," says Brian Denys, Head of BASF's Construction Systems business.

The BASF Construction Centre is open for business from 8:00 a.m. to 4:30 p.m. EDT Monday through Friday.

The Construction Chemicals business also manufactures a full line of concrete admixtures at the Brampton, Ontario facility. In addition, BASF offers the Watson Bowman Acme brand of custom expansion control systems to the Canadian construction market.

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EXEL North America's Systems Group utilizes standard products by providing a turn-key solution that fits special needs and demands. They invest in Research & Development and design custom solutions and create new technology. They will review a customer's current finishing and dispense system and offer solutions to optimize them to be as efficient as possible.

Protech/Oxyplast Buys Innotek

The Protech/Oxyplast Group of Montreal, QC, has reached an agreement to purchase the powder coating business and manufacturing assets of Innotek Powder Coatings of Big Spring Texas. Innotek is a well-recognized name within the powder coatings industry specializing in high performance thermoplastic powder coatings.

David Ades, Managing Director of Protech says, "Innotek's leading thermoplastic technology is a great addition to our global business. It is complementary to our extensive thermoset powder coatings product range." Protech fully expects to benefit from the excellent business relationships and the unique thermoplastic technology that Innotek has developed over the years. Protech will integrate the Innotek's manufacturing operations into its own organization.

The Protech/Oxyplast Group is one of the world's largest manufacturers and marketers of powder coatings. Now in its thirty-sixth year of operation, the Protech/Oxyplast Group continues to grow its reputation as the leader in quality and innovative powder coatings. Protech Oxyplast powders are produced in more than twenty facilities worldwide.

Nanocoating Blocks 99.9% of UV Rays

Hy-Power Nano, based in Brampton, ON, has created a clear glass coating that blocks virtually all UV rays and a significant amount of infrared. Hy-Power Nano Inc., a subsidiary of Hy-Power Coatings Limited, says its new Clear Liquid Solar Blocker glass architectural coating is a "milestone" nanotechnology-enabled product. The company says the waterborne nanocoating does not impact visible properties of the coated glass, yet blocks 99.99 per cent of ultraviolet rays and up to 40 per cent of infrared rays. The company develops "next generation" nanocoating products that deliver solar-blocking and thermal-insulation benefits.

photo - new HQ - nouveau QG.jpg

Walter Surface Technologies Turns 60

When Walter J. Somers and a few colleagues opened the first office in the Montreal region in 1952, they took the first steps on a new and unfamiliar path.

Walter J. Somers laid the company foundation during the 1950s and '60s. Emphasizing "total performance". He concentrated on bringing the best tools to Canada, the ones offering the best productivity - first by importing them from Europe, then developing and manufacturing their own brand throughout the years.

Walter's new international headquarters and industrial center in Pointe-Claire, Quebec visually is built according to LEED standards, the complex is the ultimate expression of Walter's commitment to sustainable development. This center was designed for optimized energy efficiency and ideal working conditions that favor the health and well-being of employees along with ultra-efficient logistics and warehouse systems. The new building serves as the world center for management and research. This is where Walter's future will take shape - one innovation at a time.

Cytec Announces Agreement to Divest Coating Resins Business

Cytec Industries Inc. will divest its Coating Resins business to Advent International, a global private equity firm for \$1,032 million plus assume liabilities of \$118 million bringing the total value to \$1,150 million. The sale is expected to close in the first quarter 2013, following the satisfaction of regulatory requirements and other customary closing conditions.

"I am extremely pleased with the evolution of Cytec over the last 18 months and this transaction is another significant step in our portfolio transformation," says Shane Fleming, Chairman, President, and Chief Executive Officer of Cytec. "The sale enables us to focus on our industry-leading portfolio of growth platforms comprised of advanced materials and separation technologies to drive long-term growth and deliver greater returns to our shareholders."

"The transaction with Advent International creates an opportunity for the Coating Resins segment to fully leverage its breadth of environmentally-friendly resin technologies. I want to thank the employees in Coating Resins for their focus and perseverance during the divestiture process and for their good work that has led to improvement in the business performance," says Fleming. Included in the transaction are the Radiation-Cured Resins, Liquid Coating Resins, Powder Coating Resins and Amino Crosslinkers product lines. J.P. Morgan acted as Cytec's financial advisor.

Huber Expansion

Huber Engineered Materials, a division of J.M. Huber Corporation, announces it is increasing capacity at its precipitated silica plant in Etowah, Tennessee (U.S.). The expansion will add 14,000 metric tons annually at Etowah and is set for completion in the third quarter of 2013. Earlier this year, Huber announced a new production line at its precipitated silica plant in Jhagadia, India, which is set for completion in fourth quarter 2012 and doubles the capacity to 35,000 metric tons. Huber is a global leader in precipitated silica with seven manufacturing sites strategically located across North America, Europe and Asia.

Auto Colour Trends

PPG Industries released its annual automotive color popularity and trend data and white has again come out as number one, but the company forecasts that the overall use of color is on the rise.

According to PPG's annual survey of global color popularity, white ranked first (22%) and sil-

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MSCT 2012 Honorary Night

The Montreal Society of Coating Technology (MSCT) met for a short cruise on Monday June 11, 2012, to honour four special individuals to the industry.

"This is MSCT's way of showing recognition to the men and women who build the Quebec coating industry," says president Marc Gagnon.

The association recognized the exceptional work of four industry pioneers who have recently retired. The MSCT provided the following commentary about their achievements.

- Mr. Diran Attarmigiroglu, Scientific Director at SICO-AKZO: "The only difficult thing about Diran is being able to pronounce and spell his last name. Diran was always open to new ideas and brought paint formulation to new high. Still, the one thing to remember about this great man is his character; a hard worker with the highest ethic, a great

sense of humour and a vision of paint formulation close to no one."

- Mr. André Lamarre, technical sales representative at BASF Canada: "André started his career in 1969 at Caledonia Chemicals. Later he worked at ABA Chemicals, Reichhold, Hercules and Stochem. His last assignment was at BASF for more years than he would admit. André has always been a gentleman, and people enjoyed his company and good humor. He now starts a new career as a Chef with his grandson."
- Mr. Alexandre Vignini, technical support manager at BYK Additives: "Alex had a long and successful career in the coatings industry; he worked at Sico Industrial coatings, Tioxide and BYK Additives. He also was a great teaching resource for the MSCT. At BYK as Canadian technical support manager, he has helped everyone in Canada. His multi-talents and knowledge have made him one of the most respected in the industry."
- Mr. Jean Guy Bourbeau, technical sales representative at Chemroy: "Jean-Guy his one of the "Sicologue". This is an elite club for people that have worked at Sico architectural paint. They are also known as the 'Sico-Mafia'. You can find one of them in almost any paint-related company in Quebec. After Sico, he went to Protech and Denalt before becoming a sales rep for Debro, Chemcentral and Chemroy. Jean-Guy is a globe-trotter. Now that he is retired, you may come across him anywhere in the world. If you see him ask him about the Nordique!"

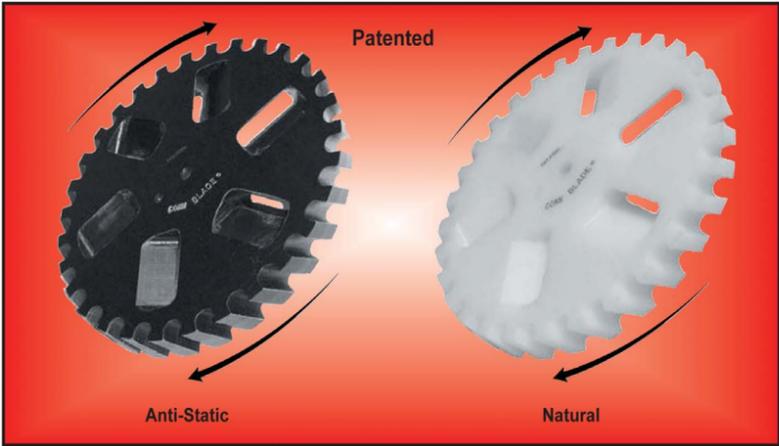
The Association held the event on Bateau Mouche (bateaumouche.ca) leaving from Quay Jacques-Cartier, Old Port of Montréal.

Each honoree was presented with a commemorative plaque.

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The MSCT heading out on the Bateau Mouche.



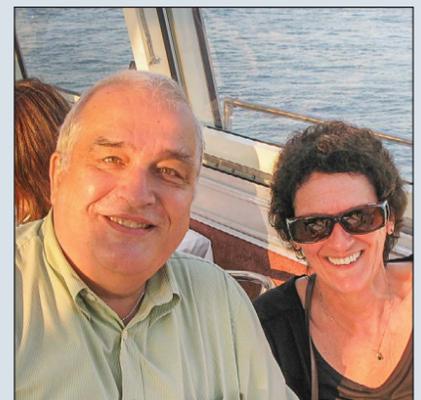
Jean Guy Bourbeau with Paul Proulx (Debro).



Luc Pepin (Sico AKZO) with Diran Attarmigiroglu.



Diran Attarmigiroglu receiving award from Marc Gagnon (Dempsey Corp.)



Jean-Guy Bourbeau and his wife Claudette.

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launched this year to better reflect the importance of the Association's work on behalf of members and the industry in general.

With respect to retention and recruitment of members, all members in 2011 renewed membership in 2012 and five new members joined the Association including: Valspar, Loop Paint, Sansin Corporation, Brenntag Canada and Hero Products Group. A part of the strategic plan to grow membership is to include those in the industry who rely on a healthy and vibrant painting and coatings sector in Canada. As such, CPCA created additional categories of membership that includes distributors in the supplier category and a new membership class for users or affiliated members.

TAKEOVER OF TOSCOT

During the year CPCA concluded discussions with the Toronto Society of Coatings Technology (TOSCOT) to assume the role TOSCOT has played over many years to provide education and training for those working in the paint and coatings sector. It was TOSCOT's view that the time had come to expand the reach of its work and the logical home was CPCA. To date TOSCOT was largely concentrated in the Greater Toronto Area, but now that the courses have been put online, it will provide an opportunity for others throughout Canada, and the world, to have current training on critical elements in the coatings sector. The training and certification program will now be under the wing of a newly created Education and Training Committee of CPCA. In keeping with the focus on education and training, CPCA began new initiatives to revitalize the widely recognized work under Coatings Care, a program that has been adopted by more than 600 companies globally. This effort clearly reveals the industry's ongoing commitment to ensuring that all in the coatings industry subscribe to high standards with respect to health, safety and the environment.

World Leader in Post-consumer Paint: Also this past year post-consumer paint recycling programs were rolled out in the Atlantic Provinces with the final one announced in September in P.E.I. This now means that there are viable post-consumer paint recycling programs in every Province of Canada. Given that the United States has only just begun to roll out programs in several States – and Europe has few such programs – Canada now leads the world in post-consumer paint recycling. This further reveals the industry's abiding commitment to sustainability at every level.

While there are stewardship programs in all ten Provinces, there remains growing concern with the regulatory framework for Municipal Hazardous or Special Waste (MHSW) in Ontario. The regulations were amended without industry consultation in February of 2012 precipitating

a new approach to reporting that virtually eliminates the option to have visible fees; included a requirement for the paint industry to pay a \$7.2 million deficit that accrued over several years under Stewardship Ontario; and continuing governance challenges with respect to program changes, updates and ongoing program costs and reporting requirements.

Responding to much concern expressed by the membership, the Board has decided to proceed with an application for an Industry Stewardship Plan (ISP), which is permitted under the Waste Diversion Act. If approved, this means that the paint and coatings sector will work with a new program operator, other than Stewardship Ontario. A new program operator will only be concerned with one product category and not nine as exists currently under Stewardship Ontario. The primary reason for moving in this direction is to have a more responsive govern-

ance regime that addresses the industry's concerns with respect to post-consumer paint recycling. The industry will continue to be in full compliance with the current regulatory framework that is in place in Ontario. Moreover, it fully expects to continue to meet established recycling targets as it has done every year since the program began in Ontario. However, extricating paint and coatings stewards from Stewardship Ontario and replacing it with a new program operator is an onerous and costly task. To date there have been no ISP's approved in Ontario for a single product category, but CPCA will continue working with like-minded stakeholders to ensure that the first ISP is established for the paint industry in Ontario.

CPCA'S FEDERAL REGULATORY WORLD

There were a number of initiatives taken by CPCA to ensure that members are ade-

quately represented in a highly regulated industry. First and foremost this is done via the two primary CPCA committees, Health, Safety and Environment and the Product Stewardship Committee. Under the HSE Committee the Paint and Coatings Working Group is comprised of CPCA staff and members, as well as key officials of Health Canada and Environment Canada. This group meets regularly to ensure that all regulatory issues impacting the coatings sector in Canada are fully addressed. Generally, the PCWG deals with issues well in advance of consultations with other industry associations and stakeholders with interest in the proposed regulations. This allows CPCA to have a first opportunity to have direct input well before the issues are fully developed. This past year there were a number of issues worked on by the PCWG related to Canada's Chemical Management Plan (CMP), which is currently assessing 2200 chem-



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icals now in commerce, including many in the coatings sector in Canada. The following provides a brief overview of some of those issues.

CHALLENGE OR CMP-1

PCWG Pre-consultation Meeting on MEKO CAS # 96-29-7, July 19, 2012: Once again CPCA engaged in a ‘pre-consultation’ session on MEKO with representatives of Environment Canada and Health Canada. The Government presented an overview of a proposed Code of Practice, which consists of voluntary labelling requirements targeting consumer interior alkyd paint products that will remain on the market after all Architectural VOC deadlines expire. A draft of the code was subsequently provided to CPCA and the Association was asked for formal comment in advance of it being provided for wider consultation. After reaching out to members for comments, CPCA made a formal submission and the views expressed in that document were discussed at a follow-up meeting with the federal government. If agreed to by CPCA and the federal government, this will be the first time that a Code of Practice has been put in place for a consumer product in Canada. It has been done in the past only for heavy industry such as in the pulp and paper industry.

Below is a summary of CPCA’s comments related to the proposed Code of Practice should it proceed:

Found this code and its labelling statements unnecessary (even challenging the risk assessment exposure scenarios derived from the use CONSEXPO and WPEM models and related conclusions);

Requested to add a ‘minimum’ or ‘safe concentration’ to the code of practice, in excess of which ‘additional’ labelling requirements about ventilation will apply (i.e. 0.3% or less);

Raised concerns about liabilities or difficulties for consumers to understand the new labelling statements as proposed and suggested to apply CCCR 2001 labelling statements for a chemical classified as toxic which apply to much higher levels of inhalation exposure for MEKO than the current ones suggested by EC/HC.

CPCA also asked to align as much as possible any compliance with such a code of practice with the GHS implementation timeline for consumer products, which will require re-labelling before 2020.

Requested to limit the use of such a code of practice based on labelling requirements with respect to other substances or family of substances on the CMP-2 or CMP-3 lists and not to consider it an add-on multi-risk instrument tool.

There will be further opportunity for industry to comment once the Code of Practice is published in the Canada Gazette Part I in December 2012 (and finally in Spring 2013) for wider input from other interested stakeholders.

Surface Coatings Materials Regulations: These regulations will be amended to impose a new limit on Batch 3 DEGME

for its use in consumer paint products (excluding stains) and to clarify the definition and scope of the regulations. CPCA will continue working with relevant officials at Health Canada and Environment Canada to ensure that reasonable approaches are taken with respect to the regulations and that industry is not subject to extensive administrative burden.

By mid-year, the PCWG pigment users is expected to have good news with respect to two Batch 2 pigments: Pigment Yellow 34 and Pigment Red 104, for which the final risk management control instrument of a SNAC (Significant New Activity) was published in Canada Gazette Part II and formally excluded paint applications from the applications that are subject to SNAC requirements. The publication confirms that no further action is to be expected in Canada for these two substances. CPCA issued a special bulletin on this for the benefit of members.

A draft Science Framework Document is still expected for a 60-day publication and CPCA will continue to provide input into these ongoing deliberations. At the end of 2012 or some time in the Winter 2013 the federal government will release the first draft set of screening assessments.

CMP-2, CMP-3 ISSUES

The Polymer Approach: Preliminary data collection for the 570 candidate substances for polymers was done through the DSL IU. CPCA submitted comments following a consultation with Environment Canada and Health Canada, which ended on May 18, 2012. The Polymer Approach is a very complex topic, which is sensitive for the paint industry and several other industrial sectors. The CPCA raised a number of issues, the main one being the move forward with a CAS# scheme that would end the current practice whereby one CAS # can represent many individual polymers (using the current 2% polymer rules and differing molecular weights). This could eventually lead to instant non-compliance for many users if modifications are not made. Another issue is the requirement for an eventual Schedule 9 submission for all DSL listed polymers. This reporting work will be onerous for industry and could lead to many difficulties. CPCA members noted that most polymers are exempt from most reporting requirements in the U.S. and questioned why Canada was not trying to align the activities on polymers more closely with those in the U.S. CPCA also questioned how the government would assess the risk

of hundreds of monomers all at the same time and recommended working closely with the producers of polymers in the Chemical industry. CPCA and its members continue to be involved on this issue and remains hopeful that the outcomes will not negatively impact the work of those working in the paint and coatings industry. The Government will identify candidates for a detailed polymer specific survey in the course of 2013-2014 and should proceed with data gathering using a polymer-specific survey beginning in 2014.

The DSL IU Exercise: CPCA’s Paint and Coatings Working Group members participated in the Stakeholder Workshop in Toronto on May 1, 2012 and discussed this issue extensively with CPCA staff. PCWG members asked whether this process would be recurrent and were told there was no concrete plans to update the DSL on a regular basis. CPCA submitted comments on May 15, 2012 highlighting CPCA’s concerns about the 10-month

timeline (despite the one-month extension) and general agreement with the exclusion of manufactured items. The Government will review the DSL IU data in 2013-2014.

Groupings Initiative: Update on 359 Aromatic Azo- and Benzidine-based Substances: CPCA participated in the Spring technical consultation on this substance via one of the industry members of the PCWG. All stakeholders were fairly satisfied with how pigments had been grouped by government under the Chemical Management Plan; however, the federal government is now reconsidering some groupings for pigments. A draft Science Framework Document is still expected for a 60-day publication and CPCA will continue to provide input into these ongoing deliberations. At the end of 2012 or some time in the Winter 2013 the federal government will release the first draft set of screening assessments.

Update on Other Groupings Initiatives: CMP continues with groupings under the CMP process and CPCA is intimately involved with the work on this initiative. Section 71 notices on MDI/MDAs and cobalt compounds have recently been published. CPCA worked hard to ensure that the follow-up questionnaires and

checklists for cobalt compounds were all completed by members in Summer 2012. CPCA has asked for the early engagement data provided by individual companies through the PCWG work to be simply referenced in the Section 71 notice and not completed again. CPCA members have confirmed that they use several of the MDI/MDAs and cobalt compounds. Further, early engagement or voluntary checklists on Fire Retardants and Selenium compounds were sent to members with September 2012 as a timeline. It should be noted that for the proposed flame retardant regulations the paint industry might be using 2 substances only but this still needs further confirmation.

NON-CHALLENGE SUBSTANCES UPDATE

CPCA expects to have more information on key substances for the paint and coatings industry that will be considered under the federal government’s Chemical Management Plan. Draft assessment for acetone, biphenyl, 1,1-dichloroethene were expected before the end of 2012. The CPCA PCWG will receive feedback from Environment Canada and Health Canada with respect to environmental monitoring they undertook this past summer on BDTP (Tinuvin UV-328).

VOC UPDATE

Aerosol Paint VOC Risk Management Instrument: ACA and CPCA submitted formal comments on the proposed aerosol regulations asking the federal government to wait for a formal regulatory tool or pollution prevention instrument. A socio-economic analysis was undertaken by Environment Canada in the Spring of 2012. A report was received in early September 2012. CPCA once again engaged directly with members and Environment Canada in considering the way forward. In commenting on the available options based on the March 2012 consultation, CPCA expressed the wishes of members to have a non-regulatory approach for aerosols in Canada that would align with criteria and objectives brought proposed by the new CARB regulations in the United States. This recommendation was favourably received by the federal government and more discussions will occur in the coming months. Whatever is used, the goal is to ensure a level playing field for all in the industry on both sides of the border. CPCA continues to work with ACA on ensuring that the regulations on both sides of the border are in alignment.

Automotive Refinish VOC Regulations: A project to assess the performance of risk control instruments used for the VOC Concentration Limits for Automotive Refinishing Products Regulations began in September 2012. CPCA was contacted by Environment Canada to determine the best way to proceed on this project. A private firm was engaged via an RFP process to complete the project to review industry’s compliance with the VOC regulations

Anyone involved - in any way - in the paint and coatings business can get first hand knowledge of important regulatory issues in a highly regulated sector of the economy.

and to determine if any issues remain. A formal survey for manufacturers and distributors was co-developed by Environment Canada and the contractor and CPCA comments were sought to improve the survey process. The report is due in November 2012 and CPCA remains close to this file.

Architectural VOC Regulations: CPCA provided several notices to members in the course of 2012 about the Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations. CPCA prepared and distributed specific memoranda to ensure manufacturers are in full compliance with the stop-selling deadlines for limits in 45 category that are coming into force on September 10, 2012 (including traffic marking products). This also applies to the stop manufacturing deadlines of 6 categories coming into force on September 9, 2012. Before proceeding with formal inspections, CPCA has learned that the Environment Canada enforcement personnel division usually gives several months grace to manufacturers to adjust and fully comply with new regulatory restrictions after they come into force. However, paint manufacturer members were urged to move quickly to clear off the shelves from old, non-compliant products.

Federal VOC Agenda to 2020: CPCA has learned from Environment Canada that a formal notice providing exact timelines for seven categories identified and discussed in 2010 will not be published any time soon. However, Environment Canada remains dedicated to moving forward to reduce VOC emissions from seven targeted sectors (aerosol paints, industrial and commercial adhesives and sealants, portable fuel containers, asphalt cut-backs, cars/vans/light trucks assembly coating/auto parts coatings, rubber products manufacturing and plastic part coatings and printing) and has initiated considerable work and preliminary economic and feasibility studies with respect to these sectors. Three sectors specifically relate to paint and CPCA already has meeting scheduled with Environment Canada to follow-up on the agenda and to ensure that if any new sector is added to the agenda, that industry will be pre-notified and consulted.

Cooperation on the Management of Chemicals with the US: Although the management of chemicals is not part of the current negotiations of the Regulatory Cooperation Council between Canada and

the United States, there is a continuing long-standing dialogue with the US EPA. A summary of the 83 substances listed under the United States' TSCA Work Plan of chemicals for risk assessment (2012-2014) was provided for review. Challenges remain with aligning activities under the US-TSCA. Senior Regulatory Cooperation Council members and stakeholders from both countries met in Ottawa on September 24, 2012. It appears as if future work on nanotechnology might evolve to a trilateral RCC process involving Canada, the USA and Mexico.

CPCA MEMBERSHIP: THE VALUE PROPOSITION

Anyone involved - in any way - in the paint and coatings business can get first hand knowledge of important regulatory issues in a highly regulated sector of the economy. This is important for several reasons, the first of which is to ensure that you are in full compliance. Secondly, CPCA members have an 'early warning' system that ensures members fully understand the direction of regulations while still under development; and well in advance of other stakeholders and well in advance of publication in the Canada Gazette. Thirdly, with this functioning 'early warning' system, those doing business in the coatings industry will have an opportunity to shape the course of regulatory development for regulations impacting their business. Finally, CPCA's approach ensures that companies deriving revenues in the paint and coatings sector can help minimize the impact of the regulations on their business operations and ultimately their bottom lines. That is something company shareholders will greatly appreciate and something that will sustain the industry over the long term.

CPCA CONTINUES ENGAGEMENT WITH NATIONAL AND INTERNATIONAL STAKEHOLDERS

As part of its commitment to reach out to other industry stakeholders, CPCA continues to be active with organizations such as the following: American Coatings Association, CMP National Stakeholder Advisory Council, Stewardship Ontario Advisory Committee, CEPA-Industry Coordinating Group on CMP, Product Care Association, Eco Peinture, International Paint and Printing Ink Council, Chemical and Allied Industries Group, Canadian Manufacturers Coalition and the Network for Business Sustainability.

Annual Conference Focused on Relevant Issues: This year's annual conference was entitled, United for a Sustainable Industry. As the title suggests the paint and coatings sector in Canada takes seriously the need to focus on issues that help sustain the industry both from an environmental and economic perspective. One cannot exist without the other in today's business world where companies need a 'social license' to operate no matter in which sector of the economy. The public demands that companies act responsibly and as a result governments, at every level, have responded with legislation and regulation to ensure that industry acts in the best interests of the consumer.

This year's annual conference sought to explore some of the issues related to how the industry is performing in all its various aspects including: general perspectives of the supplier, manufacturer and retailer; key environmental imperatives including stewardship; how all three levels of government view industry through the regulatory lens; international perspectives impacting the sector in Canada; the importance of industry best practices for HSE and advocacy; the need to have standards related to product use; and a look at the retail landscape in Canada. The plenary session covered all of those aspects with 15 different presenters conveying their unique views of the

world from their respective vantage points in the system. It was challenging to cover all these topics in one day, but the job was done.

100th Anniversary in 2013: Next year's annual conference will be a special one as CPCA celebrates its 100th anniversary at the Chateau Laurier in October (October 20 - 22, 2012). Next year's conference will begin on Sunday and conclude with the plenary session on Tuesday. All are asked to mark their calendar for what will prove to be a momentous occasion and a time of celebration for the industry. There will be a number of initiatives taken throughout the year to acknowledge the Association's efforts over the past 100 years culminating in a grand soiree in October.



Gary LeRoux, President, CPCA



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At the Cocktail hour before Dinner Saturday night, from left: Ian Stone, Paramount Painting; Mark Sumi, Paul Buzzin, LPC; Bryan McIntosh, Indu Kote Systems Inc.; Thomas Corrett, ECL Engineered Coatings Ltd.

Organizers are pleased with the attendance for the weekend of networking and seminars at the annual Ontario Painting Contractors Association Conference at Langdon Hall, Cambridge ON, October 12-14, 2012.

The conference kicked off Friday with a Reception, Dinner and hospitality gathering. Seminars were held both Saturday and Sunday morning on topics of interest. Saturday's speakers included Brian Gingras, FTI; Dave Stvartak, LMCI, Ian Cunningham, COCA, Jeff Koller, OCFIA and Robert Bronk, OIFSC. All provided updates of their activities within their organizations.

Other seminars included a paint and coating Economic Outlook by Rishi Sondhi, Ontario Construction Secretariat. Susan McEwen from the Office of the Employer Advisor spoke about return to work legislation and what employers should know. Gary Danner, FBC talked about Tax Issues for Small Business.

At the dinner on Saturday night, Ian Stone was introduced and presented the Elder Statesman award by Gilbert Satov, Magil Painting Limited. Stone is one of the founding members of the Ontario Painting Contractors Association, being its London Representative from 1978 to present. He joked, "If you want one of these awards all you have to do is participate and get old."

Seminars held Sunday morning dealt with "A Practical Guide for Implementing Effective Construction Project," by Ron Fernandez, Revay and Associates Limited; "Virtual Construction and the Paint Contractor" by Tom Strong, Ellis Don; "Streamline your Budgeting, Planning and Forecasting" with Chad Pearson, Plexxis and "Google Demystified—Tips for Contractors on Securing More Leads from Google" with David Ross, Search Engine People.

Organizers are pleased with the event. Attendance was about 60 and many brought their families for the weekend.

CPCA Thoughts for the OPCA

Gary LeRoux, president of the CPCA was scheduled to speak, but unable to attend the recent Ontario Painting Contractors Association Conference held in Cambridge, ON, October 2012. He had planned to talk about, "the things the CPCA is doing that ultimately filters down to the user."

"That is, the work we are doing on the Chemical Management Plan to ensure that the chemicals used to make products effective remain in place as much as possible," explains LeRoux. "Currently government is assessing 2200 products in commerce and a quarter of those are used in coatings in one form or another. In some cases we are working to protect the chemicals from being banned altogether under this Plan, which could happen, in others where we work with Health Canada and Environment Canada on a risk management approach that allows manufacturers to continue to produce coatings that work for the consumer, whether provided by a contractor or via DIY. Recent years have seen new regulations that require lower levels of VOCs in paint, which in some cases has reduced the efficacy



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Brian Gingras, FTI.



Andrew Sefton, OPCA.

of the product. The contractor is then put in a position of having a customer complain about the contractor's work, when in reality it has to do with the product that may not have the same level of efficacy because the active ingredient has been limited by regulation. This is not too bad via the current regulations as we have been successful in keeping the requirements reasonable." Leroux feels that in the future, the public will demand more stringent regulations. "CPCA must be vigilant in how much water is put in our wine, as the products will become of less utility," he says.

LeRoux in his talk to the paint contractors would have put this in the context of how regulators from both Health Canada and Environment Canada view the world when they show up for work every day. "Health Canada staff see their role as protecting the Canadians from getting sick from the products they use, so they hold chemicals in commerce that have some degree of toxicity, to a very high standard – the direct impact on the consumer from walking into a room that has just been painted and the potential exposure to any level of emissions from the paint. They use modelling to determine that kind of thing and come up with regulations to limit exposure such as opening windows, using fans, etc. That is what we are dealing with, and if successful, as we have been in a number of instances, the contractor is better off," says LeRoux.

He adds, "Environment Canada has a similar focus, but the standard is less onerous as they approach their job from the standpoint of protecting the ecological environment, the ground we walk on, the water we drink and the air we breathe. While it can still be onerous it is a lower standard in many ways because it is not about trace amounts of a chemical that may impact air emissions and the like."

LeRoux said he just wanted to give the OPCA a sense of the work of CPCA and how it impacts their work over the long run.



Dave Stvartak, LMCA.



Robert Bronk, OIFSC.



Susan McEwan, Office of the Employer Advisor.



Susan Fitzpatrick, OPCA; MJ Stone, Paramount Painting and Reba Satov, Magil Painting..



Ian Cunningham, COCA.



Gary Danner, FBC.



Dave Stvartak, LMCI, Diane Dreier, LMI and Anita Fantin, Paintology Inc.



Jeff Keller, OCFIA.



Ian Stone wins the Elder Statesman Award.

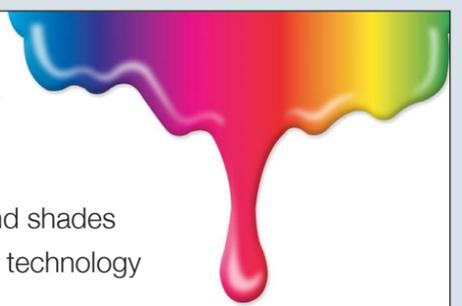
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Inhibiting Corrosion

Corrosion is the chemical disintegration of a substance into its component atoms due to its reaction with the environment – rust. The aim of anti-corrosion additives in the manufacturing of paint and coatings is to keep it safe, non toxic and organic if possible while at the same time having it do the job for which it is intended, prohibit corrosion due to humidity, moisture and salt. Corrosion of metallic structures causes huge economic impacts around the world. Various additives in paint and coatings have been devised and used that effectively minimize the impact of corrosion.

Protective anti-corrosion coatings consist of several layers, including a pretreated layer, a middle anti-corrosive inhibition primer and a polymer topcoat. Some of the most effective anti-corrosion coatings include epoxy aluminum, bituminous coatings and micaceous iron oxide paint.

ANTI CORROSION STUDIES

Corrosion inhibitors are substances that, when added to the environment in small amounts, effectively reducing the rate of corrosion of all exposed metals. Some of the most commonly used corrosion inhibitors include sodium nitrite, chromates, amines, phosphates, ascorbic acid, hexamine and cinnamaldehyde.

In a recent issue of Progress in Organic Coatings a study was done on “Anticorrosion properties of smart coating based on polyaniline nanoparticles/epoxy-ester system”

In the study, the anticorrosive effect of dodecylbenzenesulfonicacid-doped

polyaniline nanoparticles as a conductive polymer was investigated using electrochemical impedance spectroscopy (EIS) and X-ray photoelectron spectroscopy (XPS) techniques. Initially, the n-PANI (DBSA) was successfully synthesized via inverse microemulsion polymerization leading to the spherical nanoparticles with an average diameter less than 30nm. Two coating systems including 1wt per cent n-PANI(DBSA) blended epoxy ester (n-PANI(DBSA)/EPE) and neat epoxy ester (EPE) were coated on the carbon steel substrate. The anticorrosion performance of the prepared coatings was studied using EIS measurement in 3.5 per cent NaCl solution during 77 days. The experimental data was modeled using Zview software according to the appropriate equivalent circuit model. The results clearly showed the better corrosion protection of the n-PANI(DBSA)/EPE coating compared to the EPE coating. This behavior was attributed to the ability of n-PANI(DBSA) in releasing dopant anion when the corrosion process is initiated on the metal substrate emphasizing the smart protection of n-PANI(DBSA)/EPE coating. Accordingly, the released dopant anions along with the iron cations provide a secondary barrier layer, which passivates the substrate.

In the same December 2012 issue of Progress in Organic Coatings, the effect of silica/PVC composite coatings on steel-substrate corrosion protection was examined.

It focused on the preparation of thin polymer coatings synthesized from 30-nm and 600-nm silica particles dispersed in

polyvinyl chloride (PVC) and deposited on two different steel substrates: duplex DSS 2205 and austenitic AISI 316L steel. It was shown that a silica surface modification with silane IO7T7(OH)3 (trisilanol isooctyl polyhedral oligomeric silsesquioxane, POSS) significantly improves its dispersion properties when mixed with PVC. For comparison, the surface morphology and surface roughness of PVC coatings filled with both silanated and as-received (non-silanated) silica fillers were analyzed with scanning electron microscopy (SEM) and atomic force microscopy (AFM) when sprayed on the steel surface. The effect of the silica silanization is later on reflected in a decreased average surface roughness in the silanated, compared to non-silanated, silica/PVC-coatings. The wetting properties of the silanated and non-silanated silica/PVC-coatings on DSS 2205 and AISI 316L were investigated using contact-angle and surface-energy measurements, indicating an increased surface hydrophilicity in terms of a decreased static water contact angle and an increased total surface energy compared to the uncoated specimens. Finally, the beneficial corrosion resistance of the silica/PVC coatings was confirmed with potentiodynamic polarization spectroscopy in a 3.5 per cent NaCl solution.

Another study was also done on Corrosion resistance performance of cerium doped silica sol-gel coatings on 304L stainless steel.

The aim of this work is the synthesis and investigation of silane based organic-inorganic hybrid coatings, which can

be used to improve the corrosion performance of steel structures subjected to a marine environment. The silane based sol-gel coatings were prepared by dip coating 304L stainless steel in a solution of organically modified silica sol made through hydrolysis and condensation of 3-glycidoxypropyl-trimethoxysilane (GPTMS) as precursor and bisphenol A (BPA) as a cross-linking agent in an acid catalyzed condition. The influence of the addition of cerium and the use of bisphenol A as a cross-linking agent on the microscopic features and morphology as well as on the corrosion resistance of the coatings were examined using Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM), neutral salt spray tests, potentiodynamic polarization and electrochemical impedance techniques. Results show that cerium modified nano-hybrid coatings show a superior corrosion inhibition performance compared to silica hybrid coatings. Additionally, data showed that the bisphenol A as a cross-linking agent has a significant effect on the morphology and corrosion resistance of the cerium doped silica coating. Omitting the use of bisphenol A causes the creation of defects/cracks in the coating, thereby promoting diffusion of the aggressive electrolyte toward the substrate and decreasing the corrosion resistance of the coating.

ON THE MARKET

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ting, stability, weathering, corrosion resistance, foaming properties, fire resistance and texture.

The company says, additive selection is complicated by the relationship between the additive and each of the other components of the formulation. A. S. Paterson Company is able to pool the resources of its additive suppliers along with colour, polymer and wax suppliers to help find the right combination. In the area of anti-corrosion, they carry Cortec Organic corrosion inhibitors. Corrosion not only causes nearly 2,000 billion dollars worth of damage for the inhabitants of our planet each year, but also severely endangers their safety. Cortec Corporation recently submitted papers at Eurocorr 2012 held in Istanbul, Sept. 9-13, 2012 and The Association of Water Technologies (AWT) 2012 annual convention and exposition held Sept. 19-23, Palm Springs, CA. Cortec® was represented at the latter by Ming Shen, Cortec's Laboratory Research and Development Engineer. She presented the research paper entitled "Slow Release Corrosion Inhibiting Block" written by Boris Miksic, et al. The presentation introduced Cortec's new product CorrBlock, a time-release, biodegradable corrosion inhibitor block for water treatment industries which is friendly to marine ecosystems. Corrosion Inhibitor Releasing Block (IRB) is formulated using renewable soybean-based wax and proven Vapor phase Corrosion Inhibitor (VCI) technology. The inhibitors in IRB provide corrosion protection to multi-metals, including carbon and galvanized steels, aluminum and yellow metals.

In Anti-corrosion additives, **Andicor Specialty Chemicals** represents WPC Technologies and their WAYNCOR Non-Toxic Corrosion Inhibitors:

- STAINBAN Tannin, Rosin, and Knot Stain Inhibitors
- CORROSTAIN Synergistic Corrosion and Stain Inhibitors
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- CORROSPERSE Strontium Chromate Dispersions
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BYK additives boost the performance of all anti-corrosion coatings by improving specific aspects of their functionality. These additives can be used in a range of applications, including primers, intermediate coats and topcoats. The spectrum of optimized solutions is well equipped to deal with the future and is suitable for a variety of resin systems like alkyds, acrylics and epoxies, polyurethanes, silicones, siloxanes and fluoropolymers. Solvent-borne, solvent-free or water-based, and for every area of application.

Manufacturers of anti-corrosion additives are continually updating their products to meet every paint and coating manufacturing need.

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ver was second (20%), followed by black (19%), gray (12%), red (9%), natural (8%), blue (7%), green (2%) and other colors (1%).

During the annual Automotive Color Trend Show held at PPG's offices September 2012, the coatings company presented its ideas for future vehicle colors to leading global automobile manufacturers. Titled "Perspective," the 2012 show presents PPG's unique viewpoint and angle on color direction, using insight from all the company's businesses that color items such as laptop computers, homes, buildings, airplanes, ships and heavy equipment.

PPG presented 64 new exterior shades to automotive designers for consideration in designs of the 2015-2016 model years. These included colors such as: Al Fresco, a silver metallic with fresh green tint; Victoria Grey, a classic grey with an iridescent highlight of gold metal; Opulence, a refined red pearl with intense jewel tone; Glacier, an icy graphite grey with a slight violet blue tone; Sunshine, a bright high-sparkle intense yellow; and Elixir, a metallic mixture of silver and magenta.

Global Sealant Industry Growth

According to a just completed study by the consulting firm Kusumgar, Nerfi & Gowney, the global consumption of sealants was 3.6 billion pounds in 2011 worth \$8.45 billion. Growth is placed at a 5 per cent annual rate through 2016 with the Asia-Pacific region advancing 8 per cent per year and North America and Europe each growing at a 2 per cent annual rate.

North America took 24 per cent of the 2011 sealant dollars. Construction is the largest end use for sealants representing 63 per cent of the volume and dollars in 2011. The other large end use is automotive which was an outlet for 23-24 per cent of the pounds and dollars and includes vehicle manufacturers and the aftermarket. Insulating glass, fire stop, aerospace, and industrial are smaller end uses which are treated separately in the study.

Silicones are the largest sealant type in volume with 30 per cent of the pounds and are second in value with a 32 per cent share. Polyurethanes, including one-component air infiltration foams, were the leader in dollars with 35 per cent of the total and captured 28 per cent of the pounds. Other larger sealant types include emulsions, silyl modified polymers, butyl, and plastisol.

Pricing Updates

Arkema Coating Resins Announces Price Increase for Latex Products in North America

Effective October 25, 2012 or as contracts allow, Arkema Coating Resins will increase pricing on all latex products sold in North America. ENCOR and SNAP acrylic, styrene-acrylic and styrene-butadiene latexes, NEOCAR Acrylic latexes and Celacor opaque polymer will increase by \$0.04 to \$0.05 per wet pound. ENCOR vinyl-acrylic, vinyl acetate-ethylene and NEOCAR Latexes will increase by \$0.02 to \$0.03 per wet pound.

This action is necessary due to escalation in the cost of raw materials and transportation for latex products.

Customers should contact their Arkema Coating Resins account representative for additional details.

Cytec Announces Price Increases on its Powder Coating Resins Product Range in the Americas

Cytec Industries Inc. (NYSE:CYT), and its affiliated companies, increased prices for its entire range of Powder Coating Resins sold in the Americas. The price of all products in the range will be increased by \$0.05/lb to \$0.07/lb. The adjustment will be effective for all shipments as of October 15, 2012 or as contract terms permit and is in addition to any previously announced price adjustment. Cytec is committed to servicing and delivering value to its customers, however a price increase is necessary to compensate for the increase in raw material costs.

Huber Announces Global Price Increase For Precipitated Silicas and Silicates

Huber Engineered Materials, a division of J.M. Huber Corporation, announces a global price increase for its precipitated silicas and silicates. The increase is effective beginning Oct. 30, 2012, or as current contracts allow. The price adjustment of up to seven percent is dependent on geographic region, and the increase has become necessary due to increasing costs in raw materials, energy, freight, labor and manufacturing.

Huber is a world leader in silica production and a trusted and reliable supplier with a global manufacturing footprint of multiple production sites in North America, Europe and Asia producing a variety of silicas and silicates used in consumer, food, industrial, paper and pharmaceutical applications.

People

ICA Wood Coatings Expanding

Jose Luis has come to Canada from Portugal to take on the role of Technical Industrial Sales Representative for Canada. In Europe, he has been working with ICA as a distributor and hands on technician for many years and he has been in the wood coatings industry since 1993. Jose Luis has worked with many major European manufacturers presenting new products and solutions and is very familiar with water



Jose Luis

based (single & 2K), polyester, UV, 2k polyurethane and the various stain systems. Jose Luis is looking forward to meeting those clients who are seeking to distinguish themselves by using the most innovative and cutting-edge wood coatings. We take this opportunity to welcome Jose Luis and we hope that he enjoys the cold.

New at Pneu-Mech Systems Mfg.

Pneu-Mech Systems Mfg. announces the appointment of Jerry Trostle to Sales Manager.

Trostle comes to Pneu-Mech Systems Mfg. with over 30 years' experience in the finishing industry. Trostle comes to Pneu-Mech Systems Mfg. from Wagner Systems where he served as General Manager for the last 8 years. As Sales Manager he will be responsible for managing the

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ADVANCING IN-CAN PRESERVATION AGAINST Microbial Spoilage

BY THOMAS KÖHLER, ANDERS CARLSEN AND GERHARD TIEDTKE

Today, the need to be sustainable and the increasing public awareness about potentially dangerous chemicals, Biocidal Product Directive – Biocidal Product Regulations (BPD è BPR) are the main influencers when it comes to preservative selection for formulations. Due to increasingly strict regulations, including BPD and Ecolabel certifications, many traditional active ingredients used as in-can preservatives have migrated towards more environmentally acceptable options (Volatile Organic Compound [VOC] regulations, residual monomer restrictions, natural ingredients); resulting in commercial products with higher susceptibility towards microbial spoilage. The most frequently used active ingredients from an increasingly limited selection of viable options are restricted in efficacy spectrum, speed of kill and/or chemical stability. Even though it is increasingly difficult to achieve robust preservation given developing consumer preferences, Dow Microbial Control developed and notified Methyl-BIT (MBIT), a new active substance, which is an excellent building block for powerful in-can preservation.

Comparing properties and numbers of

originally identified active ingredients (706) to those actually notified actives for in-can-preservation (50) and extrapolating what may be left in 2015 (an estimate of 25-30) shows a clear trend – the active ingredients surviving are typically more suitable for long-term preservation and have limited efficacy spectra, low speed of kill and/or chemical stability.

The slow speed of kill and the selective control of organisms can lead to the adaptation of certain organisms or population shifts. Paints, for instance, never used to have issues with yeast or fungi contamination until slow speed of kill reagents like MIT/BIT combinations were employed over long periods of time. While analysing existing “old” actives, Dow Microbial Control has rediscovered an unusual reaction pathway of Dithio-2,2'-bis-benzmethylamide (DTBMA), a well-known biocide which has been on the market for over 30 years. It was widely used in both wet state preservation applications (in-can paint) and dry-film preservation alike due to its broad spectrum of effectiveness against moulds, yeasts and bacteria.

It has long been known that DTBMA hydrolyses in alkaline media to N-methyl-benzisothiazolinone, but we could demonstrate that this conversion is quan-

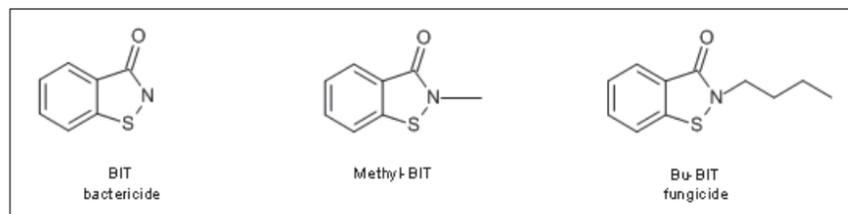


Figure 1. Structural similarities between isothiazolone based bactericides and fungicides. On the right are the longer chained Bu-BIT which is known as fungicides with a modest efficacy against bacteria. On the left side, the typical short chained isothiazolone bactericide BIT. Methyl-BIT is structurally very similar to both the bactericide BIT and the fungicide Bu-BIT, which could explain why it works better versus fungi than BIT and better versus bacteria than Bu-BIT.

titative in solvency moderating matrices.

Table 1 shows conversion rates for DTBMA to MBIT in different acrylic systems. In this experiment only DTBMA (~200ppm) was added and within 2 hours about 10-15 per cent of DTBMA is converted to MBIT.

The rapid conversion of DTBMA to MBIT together with the much higher water solubility of MBIT than DTBMA demonstrates that MBIT is the actual biocidal active component in DTBMA. Recently, MBIT has come to be recognised as the biocidal active component in DTBMA and a microbicide on its own.

The isothiazolones are based on the same core, the tendency being that the more traditional bactericides have shorter chains and the fungicides have longer chains. Biological tests in the DMC Labs could show that MBIT is a better fungicide than BIT and a better bactericide than Butyl-BIT (Bu-BIT).

BIT can be de-protonized (pK_b ~8.5) and the de-protonized form has much lower efficacy as a bactericide. MBIT does not de-protonize due to the N-methylated heterocycle. Non-deprotonized BIT is also relatively lipophilic with a low solubility in water (< 0.1 per cent) whereas MBIT is more hydrophilic with a higher solubility in water (~2 per cent). In essence, MBIT is a more potent biocide at alkaline pH and has higher availability in the aqueous phase than BIT which is essential for contact with microorganisms. Dow Microbial Control have tested and published MIC and synergism studies of MBIT (DTBMA) combinations.

Next, we take a deeper look at the comparison between MBIT/MIT and BIT formulations in an application scenario. Many waterborne systems including paints are susceptible to microbiological contamination and spoilage, require the use

of an in-can preservative to provide protection during manufacture, and to guarantee the desired shelf life. Biocidal active ingredients (ai's) possess a range of both physicochemical and biological properties, which will affect their applicability in certain types of formulations and/or manufacturing processes. The selection of an appropriate in-can preservative is an important factor in the development of a paint formulation and failure to prevent spoilage due to microbiological growth can result in the development of foul odours, discolouration, loss of structure and the generation of gasses that might distort/damage the final packaging.

The susceptibility of a coating formulation to microbiological spoilage and the potential efficacy of an in-can preservation system are usually determined using a microbiological challenge test. The International Biodeterioration Research Group (IBRG) has been developing a test protocol for testing the in-can preservation of paints and varnishes. The following study compares a synergistic MBIT/MIT formulation to traditional in-can formulations in an acrylic paint system (six cycle/week challenge test for not aged and same conditions after heat aging of paint for 4 weeks at 40°C).

The results in Table 2 show how well the combination of 50 ppm MIT and 38 ppm MBIT is preserving a material in wet state – in this case an acrylic exterior paint with pH >8. The combination of MBIT/MIT is the only formulation that withstands six inoculations against a mixed bacteria/yeast/fungi inoculum at the lowest concentration. It can be concluded that MBIT formulations work very well in synergistic combination with other actives – in this case MIT.

This study showed that MBIT is a proven, effective bactericide and fungicide

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TABLE 1: Conversion rates for DTBMA to MBIT in different systems. Concentrations in ppm.

	2 hrs DTBMA	MBIT	1 day DTBMA	MBIT	3/4 days DTBMA	MBIT	14 days DTBMA	MBIT
MBIT								
Masonry Paint based on acrylic binder pH 8.00 styrene-acrylic emulsion	166	32	102	88	66	124	2	179
pH 8.05	169	29	101	92	0	184	0	181
Styrene-acrylic paint pH 8.89	155	28	75	97	9	154	0	159

TABLE 2

	Conc.	Inoc 1 +1 wk			Inoc 2 +1 wk			Inoc 3 +1 wk			Inoc 4 +1 wk			Inoc 5 +1 wk			Inoc 6 +1 wk			corresponding ai. concentration [ppm ai.]					
		%	B	Y	F	B	Y	F	B	Y	F	B	Y	F	B	Y	F	B	Y	F	BIT	MIT	M-BIT	CMIT	
Bioban 551 S	0.1	1K																				50	38		
M-BIT-MIT	0.15																					75	56		
	0.2																					100	75		
	0.4																					200	150		
aged 4 wks, 40°C	0.2																					100	75		
BIT/CMIT-MIT	0.075																					38	31		2
	0.1																					50	41		3
	0.15																					75	62		5
	0.3																					150	123		10
aged 4 wks, 40°C	0.15																					75	62		5
BIT:MIT 2:1 form.	0.1																					50	25		
	0.25																					125	63		
	0.4																					200	100		
	0.6																					300	150		
aged 4 wks, 40°C	0.4																					200	100		
BIT:MIT 1:1 form.	0.1																					50	50		
	0.15																					75	75		
	0.2																					100	100		
	0.3																					150	150		
aged 4 wks, 40°C	0.2																					100	100		

Challenge test of an acrylic exterior paint, pH >8 using a mixed inoculum of bacteria (B), fungi (F), and yeast (Y). The ratings are given in a graphical evaluation, (1K) abbreviated for one colony per plate.

for wet state preservation applications. Dow Microbial Control demonstrates a well-balanced synergistic combination of MBIT (DTBMA) and MIT that is effective against several common spoilage organisms outperforming common BIT blends. Due to better water solubility, MBIT is more bio-available in the aqueous phase than BIT, which is critical for contact with microorganisms. At alkaline pH the impossible salt formation of MBIT leads to a more potent biocide than BIT. Due to its solubility in water, MBIT formulations are available as stable, VOC-free liquids rather than the viscous, and sometimes more difficult to handle, aqueous dispersions of DTBMA.

Thomas Köhler, Anders Carlsen, and Gerhard Tiedtke are with Dow Microbial Control, Buchs Sg, Switzerland.

Together... making waves in the pond

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In the News

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sales efforts of the company in North America.

Pneu-Mech Systems Mfg. also announces the appointment of Bill Brawley to System Sales.

Brawley comes to Pneu-Mech Systems Mfg. from AccuSport International Inc. in Winston Salem, N.C. There he was responsible for growing AccuSport from an early stage start up company to a multi-million dollar company in 7 years. Bill will be responsible for System Sales with a focus on growing sales into new and emerging markets. His small company attitude with big company results will be a great asset to Pneu-Mech.

Pneu-Mech Systems Mfg. of Statesville, NC, a member of the Brawtus Group, provides paint finishing system engineering, design, manufacturing, installation and project management to the industrial market.

www.pneu-mech.com

Obituary: Steve Guntner

Steve Guntner, Sales Manager for Myers Engineering Inc., passed away Friday, September 28, after a battle with cancer.

Guntner started in the mixing industry with Scott Tubine Mixers in the early 1980s. Guntner worked for TK Mixers and Hockmeyer before moving to Myers Engineering Inc. in February 2005 as the Sales Manager.

Guntner is survived by his wife Susan, two sons, and a brother and sister.

In The News

Manufacturing CEOs Retain Optimism About Business in 2013

FABTECH 2012 to feature manufacturing CEO panel with predictions for coming year

"Same as it ever was" is not only a lyric by The Talking Heads, it also describes the outlook for the fabricating and manufacturing sector in 2013. A group of CEOs – who will be featured at a roundtable at the FABTECH exposition – remain optimistic that the growth experienced by many manufacturers since 2010 will continue for a third year in a row. The roundtable is part of the special events planned for FABTECH 2012, November 12 – 14 in Las Vegas.

The CEOs include Jerry Ward, Vice President of Metcam, Inc.; Rick Taylor, president and CEO of Jay Industries; Gregg Simpson, president of Ohio Laser; Shivie Dhillon, president of SunDial Powder Coatings and Patrick Thompson, president of Trans-Matic Manufacturing. The roundtable featuring these industry leaders, entitled State of the Industry: Manufacturers' Executive Outlook, will take place the first day of the show at 12:30 p.m. Dr. Chris Kuehl, economic analyst for the Fabricators & Manufacturers Association, International, will moderate the panel. The session is free and open to all attendees.

Each CEO participating in the roundtable represents a business that specializes in a different technology and serves a different customer base. This will ensure a variety of opinions during the roundtable discussion that mirrors the breadth of opinions found among the 25,000 attendees at FABTECH. The CEOs will discuss and debate several factors that impact business for manufacturers: energy costs, raw materials, regulations, areas of growth and decline, exports, uncertainty, skilled-labor issues and capital investments.

In pre-show interviews, some CEOs agreed that materials supply will continue to be unpredictable, making it challenging to plan. For others, energy costs are a greater concern. However, despite this uncertainty, the CEOs all agreed that their companies expect to continue the growth that they have experienced in the last two years. Some of the CEOs predicted strong growth of 20 per cent or more, while others are expecting slow, but steady growth in the coming year or two.

FABTECH is expected to attract more than 25,000 manufacturers to the Las Vegas Convention Center to view 1,100 exhibits, including live equipment demonstrations covering more than 400,000 net square feet of floor space. Simultaneously, the education program features technical, operational, economic, and managerial sessions where participants will discover solutions to advance their career and their businesses.

FABTECH is co-sponsored by five industry-leading associations: the American Welding Society (AWS), the Fabricators & Manufacturers Association, International (FMA), the Society of Manufacturing Engineers (SME), the Precision Metalforming Association (PMA), and the Chemical Coaters Association International (CCAI). www.fabtechexpo.com.

Argex Launches Feasibility Study for TiO2 Plant
Argex Titanium Inc. has hired Canadian engineering services firm GENIVAR Inc. to conduct a feasibility study on the economic viability of a titanium dioxide (TiO₂) first-module production facility. Citing the potential of the company's CTL process, both GENIVAR and Argex have agreed to mutual terms of exclusivity for engineering services related to the development and construction of TiO₂ processing plant projects using this patented process. Argex has also appointed Aecom, a global provider of professional and industrial services, to conduct an environmental study for Argex and to accompany it in obtaining the required environmental permits.

Argex Launches Feasibility Study for TiO2 Plant

The studies follow positive results from a TiO₂ grade sensitivity study conducted earlier this year.

Argex currently operates a pilot plant in Mississauga, Ontario, where its CTL process runs continuously.

Argex currently operates a pilot plant in Mississauga, Ontario, where its CTL process runs continuously.

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HVLP Air Cap

The innovative HVLP-Plus nozzle/air cap system (blue air cap) ensures high material savings and an excellent fine surface finish. Measurements by the Fraunhofer Institute for Manufacturing, Engineering and Automation using the EN-Norm 13966-1, produced a transfer efficiency of up to 88%. This is much higher than the 65% required for HVLP applications

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Coating Makers Study Green Crackdown

U.S. trade regulators are cracking down on green claims, with potentially significant implications for the paint and coating industry.

The American Coatings Association (ACA) is taking a careful look at the Federal Trade Commission's newly revised Green Guides, which toughen and expand the legally enforceable guidelines for environmental marketing claims.

This is the first revision for the guides since 1998, and they feature significant changes and additions that are not subject to public comment.

The changes include a general ban on broad, unsupported claims that a product is "environmentally friendly" or "eco-friendly" and a sharp new look at environmental certification schemes.

Health and Safety Across Canada

BY DAVE SAUCIER

Today's article covers some of the differences between Provincial Occupational Health and Safety (OHS) legislation. I will also update you on recent concerns industry has expressed regarding the Chemicals Management Plan Phase 2 (CMP2) and wrap up with a year in review summary.

First, we'll start with provincial OHS legislation. There are 10 Provincial and 3 Territorial and each has its own safety legislation. For all private sector employers, they are covered by the Province in which they work, or are based. Employees working for the Government of Canada are covered by federal legislation.

Each province's OHS legislation outlines the rights and responsibilities of employers, supervisors, and employees. The Workplace Hazardous Materials Information System (WHMIS) provides special rules for paint company employees who handle hazardous substances. As reported in the August article, WHMIS is going to soon be replaced by the Globally Harmonized System (GHS) as the "special" legislation covering hazardous substances used in the workplace.

Each Province and Territory will create an Act, commonly called the Occupational Health and Safety Act, or something very similar. These Acts typically apply to most workplaces, except farming and home based businesses. The Act enables the particular Province or Territory to develop and enforce regulations. These regulations are typically managed and enforced by the ministry responsible for labour. Quite provincial workplace safety program management is often aligned with workers compensation boards. In some cases, the worker compensation board administers and enforces OHS regulations.

All jurisdictions require the formation of health and safety committees, employee and supervisor training, employee injury reporting, etc. Employee chemical exposure limits is an area where some provinces will differ from others. Most provinces establish employee occupation exposure limits are based on the American Conference of Governmental Industrial Hygienists (ACGIH) published list of Threshold Limit Values (TLV) which are comprised of 3 categories:

- 8 hour time weighted,
- short term exposure, and
- a ceiling

Alberta publishes its list of occupational exposure limits as Schedule I Table 2 of their OHS Safety Code. Saskatchewan OHS Regulation Table 21 provides exposure limits as Workplace Contamination Limits (CL). Ontario Regulations 833 and 490/09) and Regulation cover Occupational Exposure Limits (OEL) that have been established for chemical substances.

In Québec, they also acknowledge the ACGIH TLV's but have added an additional category or permissible exposure limits for "unusual work schedules". It was very difficult trying to find established exposure limits for chemical substances in the Territories and Atlantic Provinces.

You should check with your provincial labour ministry to find out what exposure limits are in place so that you can adequately protect your workers.

On the CMP2 front, the CPCA, Canadian Association of Chemical Distributors (CACD), and the Industry Coordinating Group (ICG) have expressed some concern about keeping CMP2 on track. There are a number of risks to CMP2, none of which alone are critical but which in combination would be significant.

Recall that due to election-related delays last year, CMP timelines have been compressed. As a result, there is a high peak of activity coming in the next few months including the DSL Inventory Update and several Surveys. Complying with all of these demands at the same time will be a challenge for the paint industry and its supply chains, yet it is necessary otherwise we will face further timeline compression and even greater inefficiencies.

We have made some recommendations and are ready to roll up our sleeves to help the government keep CMP2 on track. Something that you can do is to promote CMP2 to your supply chain, especially towards your suppliers from the United States where they grapple with how to move forward with a review of the Toxic Substances Control Act (TSCA) inventory.

Some other points that need to be considered are that some US news media outlets are estimating that if the US takes a REACH style approach the cost to industry will be \$1MM per chemical. Not good news for the US or Canadian paint and coatings industry.



We've had a busy year with CMP2 rolling out; the GHS beginning its transition phase in the United States and moving toward a Canada Gazette I publication early in 2013. More Environment and Health Canada surveys are being planned using grouping initiatives that were successfully started by the CPCA some years ago.

We can also expect changes to the toxicological profiles of some raw materials used in the coatings industry as REACH reporting beings. The State of California has changed some classifications for some solvents used to produce industrial

coatings. What will next year bring? Transport security regulations for dangerous goods will be front and center as the regulatory framework is being discussed with stakeholders. Nano materials are part of the secure border Regulatory Cooperation Council target list for harmonization. We are all waiting to see how that will work.

Dave Saucier is Vice President, HDTS Chemicals Inc. www.hdtschemicals.com

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continued from front cover

The goal of this work is to develop a liquid zinc rich primer that will impart true sacrificial performance in the film thickness range of 6 to 15 microns. The primer must be a single component and stable during repeated bulk and dip applications. Further, the primer must be a suitable base for electrodeposition topcoat with excellent adhesion. The coating system should provide at least 1000 hours of neutral salt spray performance with no appearance of red rust.

The first step in the proposed process is the substrate preparation followed by a pretreatment. This step is critical as inadequate surface preparation can lead to premature coating failures. The surface preparation includes caustic cleaning to remove heavy soils and oils followed by the application of a conventional tricationic (Zn, Mn, Ni) phosphate pretreatment.

The role of the tricationic (or zinc phosphate) pretreatment is to protect the exposed steel to slow corrosion. It also mitigates the zinc corrosion rate by decreasing conductivity to slow the corrosion electrochemical process. Contrary to traditional thinking, the zinc phosphate crystal layer is permeable enough to allow conductivity between the zinc layer and the iron base metal. This allows for sac-

rificial activity, and provides better protection than sand blasted substrate.

ZINC RICH PRIMER

Zinc rich coatings have been used for many years as sacrificial primers. They contain high levels of zinc dust (>80 per cent weight) dispersed in binder. We have found that conventional zinc rich technology does not provide adequate sacrificial corrosion performance in thin films. Organic binders are unsuitable due to their tendency to insulate the zinc particles. Inorganic silicate binders are too unstable to ambient moisture to be practical in this application. Conventional zinc dust or powders are also problematic due to low surface area contact.

Therefore, in this work, two key ingredients have been developed to overcome these limitations; a novel inorganic binder with improved stability, and a new engineered zinc flake designed for electrocoat compatibility.

BINDER CHEMISTRY AND EFFECTS ON PERFORMANCE

New inorganic binder technology has been developed for thin film zinc rich coating applications. Conventional organic binder approaches have proven to be ineffective in thin film zinc rich application due to their tendency to encapsulate the zinc particles and hence electrically insulate the particles from each other and from the iron substrate. This makes sacrificial activity very difficult to achieve with films in the range of 5 to 8 microns. Thin films would be required where threaded parts have tolerance restrictions, and especially where subsequent coatings will be applied over the zinc coating. Conventional inorganic binders based in silicate sol gel technology are also problematic in that they tend to post cure (causing topcoat blistering) and are generally very brittle. It can be difficult and costly to modify the rheology and film properties of such binders to achieve desired film properties.

The new proprietary zinc-rich binder technology replaces conventional silicate chemistry with analogous organo-titanate technology. Like silicates, the titanates cure by hydrolysis and pyrolysis of the organo titanate to form titanol species, which subsequently condense to form a titania matrix. Titanates, however are more reactive than the silicate analogues and are capable of reacting with organics as well as self-condensation. This offers the opportunity to easily form organo-titanate hybrid binders with greater flexibility and rheology control. Organotitanates are of the general formula $Ti(OR)_4$. Where the -OR group can be a wide variety of organic moieties. The organic group can be chosen to provide the proper balance of cure rate, hydrolytic stability, and hydrophobicity. Additionally, hybrids can be formed by including silicates, silanes, and polyfunctional organics, which are reactive with the titanate. Titanate oligomers formed by partial hydrolysis of titanate monomer can also be used.

Inorganic binders tested in this work included titanate-silane hybrids, with, and without modification with an organic diol. It was found that the addition of organic diol will decrease the film shrinkage and brittleness.

When a zinc rich flake primer is formulated with these inorganic-organic binders, there is a significant effect of organic on corrosion performance. Inclusion of the organic, and the resultant shrinkage decrease, allows the binder to encapsulate the zinc flakes to a greater extent. As was seen with the organic binders, this partially insulates the flakes. If the organic content is not too high, the corrosion rate of exposed zinc is slowed, while still maintaining some sacrificial activity.

ENGINEERED ZINC FLAKE

There are currently several commercial sources offering zinc flakes. These are traditionally produced by flattening zinc dust, typically in a ball mill. This process is done by

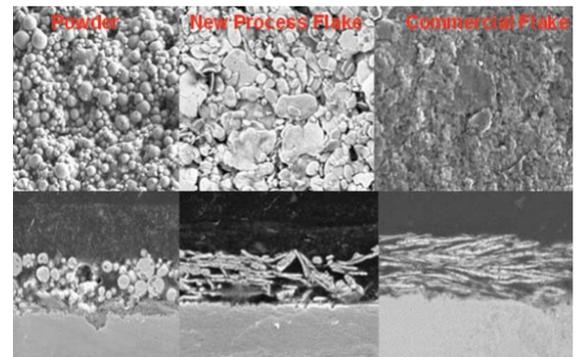
both dry and wet milling processes. The main drawback of these conventional materials is that they must use lubricants such as stearic acid or fluorocarbons, which can cause performance problems in the current topcoated system. The current work investigates flakes made by a novel, proprietary process in which conventional lubricants are minimized. This process also produces a unique particle size and shape distribution, which is compatible with the topcoat and gives improved performance.

ZINC PARTICLE MORPHOLOGY AND EFFECTS ON PERFORMANCE

It has been found that sacrificial corrosion performance in thin film zinc rich coatings is greatly enhanced by the use of flakey zinc particles versus spherical zinc dust particles. This is presumably due to the fact that the flake particles are capable of overlapping to give high surface area contact between zinc particles and the substrate. It is very difficult to achieve this type of electrical continuity with a spherical zinc dust film since the area of contact between spheres is very small.

Evidence suggests that zinc rich coatings made from commercially available zinc flake, especially in combination with the novel titanate binder, will exhibit high film conductivity and sacrificial activity. The primary drawback of flakes produced by conventional processes is that the resultant films are very smooth and non-porous, resulting in poor adhesion to subsequent coatings. The surface produced in this manner can also be especially poor substrates for application of electrodeposition coatings. Another factor contributing to poor coatability is the fact that conventional flake processes include lubricants, such as stearic acid, oleic acid, or fluoro-polymers, which can have an adverse effect on the adhesion of subsequent layers. Commercial zinc flake is also very costly in comparison to zinc dust.

While zinc flake has demonstrated significant performance improvements over spherical zinc powders it is also cost prohibitive in most commercial applications. To address this issue there is a novel process in which the binder ingredients are blended with zinc dust then the slurry is milled in specialized equipment under controlled conditions to form flattened flake-like zinc particles. This process allows control of the flake shape and size distribution. The resulting film is more porous but retains excellent electrical conductivity and sacrificial activity. This porosity, and the low levels of conventional lubricant, provides an excellent substrate for subsequent coating adhesion.



SEM Photos of zinc powder and zinc flakes. Top view and cross-section

ELECTRODEPOSITION TOPCOAT

The electrodeposition topcoat can be applied by conventional means, however coating parameters differ from those used for application over a pretreatment layer (Table 1). Note that the zinc rich layer is a more conductive ("hot") substrate and high current draw should be avoided to prevent pinhole formation. Actual coating parameters will vary depending upon the configuration and type of parts to be coated. Best results will be obtained by use of programmable voltage and amperage ramp controls. Table 1 lists typical electrocoat parameters.

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TABLE 1: Ecoat Parameters

	Epoxy Ecoat over Zinc Phosphate pickle, clean, phosphate, etc	Epoxy Ecoat Over Zinc Rich Primer Surfactant Rinse Only (no cleaning or phosphate)
Bath Temperature	85-90°F	85-90°F
Voltage	200-220 Volts	120-150 Volts (slow ramp)
Time	1.5-2.0 minutes	1.5-2.0 minutes
Film Thickness	0.8-1.2 mils	0.5-1.0 mils

TABLE 2: Ecoat Parameters

	Zinc Phosphate Epoxy Electrocoat	Zinc Rich Primer + Epoxy Electrocoat
Film Thickness (μ)	20-30	7-17 + 10-20
Cure Temp/Time (°F / Minutes)	375/20	400/20 + 375/20
Salt Spray hours to red rust (ASTM B117)	200-250	1000-3000
Cyclic Corrosion (cycles to red rust) (SAE J2334)	10-20	>100
Crosshatch Adhesion % retention (ASTM D3359)	100	95-100
Coefficient of Friction	0.13	0.13

CORROSION MECHANISM CONSIDERATIONS

There is a significant difference in corrosion behavior with a sacrificial coating over steel with no topcoat versus one with a topcoat. When no topcoat is present, the entire bulk of the sacrificial metal, typically zinc, is exposed to the electrolyte environment and is therefore available (in an electrochemical sense) for cathodic, sacrificial activity. In this case the area of sacrificial metal is much larger than the area of exposed iron. An example of this situation would be hot dip galvanized zinc applied to fence components.

In the case where a topcoat is applied over the sacrificial coating, the mechanism of protection against iron corrosion is quite different. At a point where the coating system is damaged there is a small spot of iron substrate exposed. At this point, there is only a small amount of the sacrificial zinc layer exposed to the electrolyte environment. Therefore there is a small surface area of sacrificial metal relative to the area of exposed iron. When this occurs, the sacrificial metal oxidizes rapidly. It must quickly form insoluble oxidation products, which seal the damage area, form a permanent barrier and prevent corrosion of the iron. The nature of the sacrificial metal layer is also important in localized corrosion events. If the sacrificial layer corrodes too rapidly, it will be exhausted before the damage can be “healed”. More importantly, if the oxidation products of the sacrificial metal are too amorphous, they will not form an insoluble, nonporous barrier. They will be washed away and red rusting will occur. This is often the case where hot dip galvanized substrate is over-coated. A well formulated zinc flake primer will produce oxidation products which are more crystalline and rapidly form a less porous barrier for “healing”.



Zinc Rich Primer plus Epoxy Ecoat on welded underbody assembly.

TYPICAL PROPERTIES

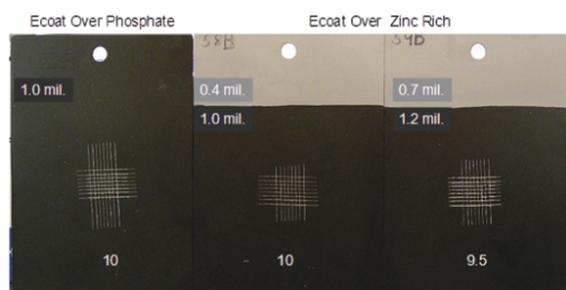
Table 2 lists the typical physical and performance properties of a multilayer coating system including zinc phosphate conversion, zinc rich flake primer, and cationic epoxy electrocoat. The cationic ecoat used for these examples includes modifiers designed to meet OEM torque/tension requirements of threaded fasteners.

ADHESION

1 mm crosshatch followed by tape pull according to ASTM D3359. 10 is 100 per cent retention of film; 9.5 is approximately 95 per cent retention. (Figure 10)

Electrocoat has been used in many commercial applications from a corrosion resistant primer to a highly durable topcoat. The use of electrocoat has also been recognized as a good finish across many market and industrial segments. The use of zinc rich as a base coat with an electrocoat top coat is also being recognized as a new finish that can solve some of the long term issues of corrosion that many of the industrial segments are observing as the life cycle of their products have been extended.

In automotive the life of the vehicle is being extended while also trying to reduce the vehicle weight by using thinner gage steel by all of the OEMs. With these new requirements the underbody parts and fasteners are subjected to longer original owner scrutiny. This has started a movement within the automotive engineering groups to evaluate finishes that will resist base metal corrosion longer than the traditional electrocoat performance. Zinc rich as a base coat in conjunction with electrocoat has proven to be a viable finish for the automotive applications to provide a finish that reduces base metal corrosion while providing a longer service life.



Crosshatch / Tape adhesion

The construction market for parts and fasteners is another commercial opportunity for zinc rich and electrocoat. The construction industry has been using electrocoat for a finish on small parts and fasteners for many years. In recent

years the industry has been using plated substrates in conjunction with electrocoat to achieve the more stringent requirements for their customers. The construction market has evaluated zinc rich as a base coat with an electrocoat

top coat for some applications. This segment can utilize this zinc rich coating instead of galvanized or plated substrates that use electrocoat as a top coat.

There has been a push to utilize zinc rich products for the solar and wind energy markets. These parts can be large support structures to small parts to fasteners. Both the solar and wind energy OEMs want a coating that will prevent premature base metal corrosion in situations where the structure life may need to be 30 years. Zinc rich has proven to be a good base when used with a top coat such as electrocoat to provide that base metal corrosion prevention. The finish is in testing for both the solar and wind energy markets to prove the viability of this approach for finishing parts.

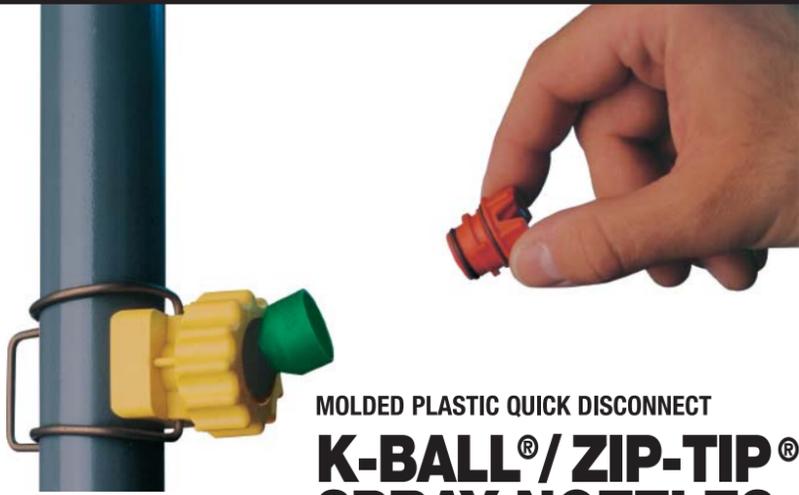
Zinc rich and electrocoat has also been evaluated in other applications for the military, as a galvanized steel replace-

ment and as a replacement for plating when hydrogen embrittlement is a concern. The base coat can be applied by drip drain, spray or dip spin and used with a variety of top coats. Zinc rich as a base coat is applied as a thin film with multiple application techniques, which makes it a good choice for many commercial industrial applications for use in conjunction with electrocoat.

The versatility of zinc rich in application makes it a good choice for use with electrocoat to increase the penetration of electrocoat into many new markets and to rejuvenate the use of electrocoat into traditional markets that have been serviced by the electrocoat finish in the past.

Matthew Scott has 30 years experience at PPG Industries in the formulation, synthesis, and evaluation of polymers and coatings.

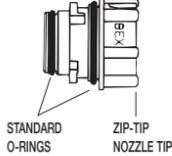
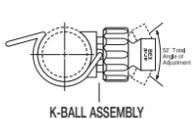
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December 5, 2012: OCPA Christmas Lunch, 12pm-2pm, Paramount Conference & Event Venue, Woodbridge, ON., susan.fitzpatrick@opcatrusted.ca

December 11, 2012: TOSCOT Christmas Lunch, location TBA, www.toscot.org

February 26-27, 2013: Radtech uv.eb WEST 2013 Redondo Beach, CA, www.radtech.org

June 10-12, 2013: SURFIN | Stephens Convention Center | Rosemont, IL www.nasfsurfin.com

October 8-10, 2013: Coating 2013 America's Center, St. Louis, MO, www.coating-show.com

October 20-22, 2013: CPCA Conference 100th Anniversary, Chateau Laurier, Ottawa, www.cdnpaint.org

October 24-26, 2013: WMS Woodworking Machinery & Supply Expo (WMS) International Centre, Toronto, ON, www.WoodworkingExpo.ca

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Masks Are Not Only For HALLOWEEN

BY JOE PASQUARELLI

Most people do not have an appreciation for the importance of masking in all manner of industrial applications. Masking has been used in one form or another since the beginning of civilisation. The earliest cave paintings near Cantabria, Spain were painted about 30,000 years ago. The artists used rolled up reeds or hollowed out bones to spray the pigment onto the cave walls. The artist used whatever was available to control the edges of each colour in order to create a recognizable image. Paintings in Argentina dated 12,000 years ago are the oldest found where hands are used to block the pigment and leave behind an outline of the artist's hand. The first known instance of using a mask to produce a negative image.

Moving forward 10,000 years we find that most Egyptian painting is done by using some form of brush with charcoal outlines or carved recesses to separate colours and shapes. The artists of the time were trained to work to a very rigid set of rules that restricted creativity and innovation. Very few new ideas were being implemented during this time of stability. However Egyptians are credited with the invention of resist dyeing to create coloured patterns on linen. They covered the whole cloth with a layer of wax then scratched off the wax from areas to be coloured. They then dyed the cloth and finally removed the remaining wax to reveal the pattern. This method was very time consuming and expensive. The technique was refined by developing methods to create a master then pressing it onto another cloth that would absorb the wax and create the desired pattern on many sheets before the wax on the master was used up. This resist dyeing technique and its variations were used throughout the world until 900AD when better fabric dyeing methods were developed.

The development of screenprinting in China around 1000 came from a desire to be able to reproduce identical colour images and was aided by the availability of strong, thin silk fabric. Screenprinting begins with a taught screen of silk fabric mounted on a wooden frame. An emulsion is used to block the image where the colour is not wanted. The frame is placed over the canvas and ink is squeezed over the top of the screen and appears only where the screen is not covered by the emulsion. By registering multiple screens

on the canvas, one for each colour of ink, a repeatable full colour image can be created for a relatively low cost. Although the colours are well defined the images are cold and graphic with no shading. Silkscreening has proven to be a very popular type of reproduction method and is carried out to this day using the same basic concept.

Stencils have been used for thousands of years but became more and more sophisticated as better papers and cutting tools were invented. The Japanese took stencilling to its highest form in a technique called Katazome used for dyeing silk during the 17th century. Today stencils cut from paper wood or steel provide a fast and cheap method to produce simple signs with easy to read text.

In the late 1800's spray painting systems were invented with the airbrush being generally regarded as the first practical form of spray painting. In the hands of a talented artist an air brush can spray and blend colours very accurately however it is difficult to create sharp edges with an airbrush or spray gun. To solve this problem artists used friskets to separate colours and define edges. A frisket differs from a stencil as it covers the whole canvas and sections are cut-out of it to define each colour. Then the remaining paper on the canvas can be stripped off and the cut-outs can be reapplied and a background colour can be applied. This leaves a graphically sharp image with no shading or blending between colours. However once the cut-outs are removed the artist can do any blending or shading that is required.

Although the first electrodeposition was performed in Italy in 1805 electroplating did not really take hold until the wide availability of electric generators in the latter part of the century. With the mass production of plated parts now possible methods of masking for electroplating became necessary. These maskants had to resist high temperatures, submersion in both acidic and caustic solutions while being easy to apply and remove. Wax was one of the first maskants because it was readily available and inexpensive even if it is somewhat messy to use. It worked well as long as plating bath temperatures stayed below 150F. Once plating is completed the wax is heated to remove it from the part. The removal process can be time consuming because the wax does not come off cleanly. The wax can be

reused so long as it is kept uncontaminated. For mass produced parts guards could be built to prevent plating on unwanted areas. Guards take advantage of the fact that plating thickness will be reduced where line of sight to the anode can be blocked or greatly reduced. A skilled plater can design the guard to either not allow plating or to control the thickness of plating to offset high current density areas.

By 1925 spray painting was becoming very popular for use on automobiles and appliances because of its ability to coat large areas quickly using minimal amounts of paint when compared to brush painting. However painter's jobs were very frustrating because the adhesive tape commonly used for holding the butcher paper in place would often peel off the paint underneath when it was

removed. This caused needless rework and quality issues. It was a 3M employee who witnessed this happening in an auto body shop who came up with the concept of making a tape specifically for masking. The idea was both simple and revolutionary. Adhesives were developed that gave crisp clean lines yet peel off easily without removing the paint underneath. 3M eventually developed many lines of masking tape with different strengths of adhesive then colour coded them for easy identification. Along the way painters discovered that any residue left behind by the tape could be removed by WD-40



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Photo Credit: Alliance Express

while preserving the paint underneath. It was just a few years after the invention of masking tape that the X-Acto knife was introduced (after its failure for use as a scalpel) to allow for accurate trimming of stencils, tapes and all manner of maskants. The original design was so good that there is little difference to the one being produced today. It is hard to imagine doing masking without the use of an X-Acto knife for trimming.

Today tapes are made from a variety of materials to serve many different industries. Polyester is used for etching, plating and powder coating. Polyimide is com-

monly used in the electronics soldering applications. Glass cloth is used for grit blasting. Metal foils and vinyl tapes are used in plating. Laminated multi material tapes are used on thermal sprayed parts. Painters have tapes available with paper or polyethylene sheet attached to one side for masking large areas. However there are no hard and fast rules as operators in the coating industry tend to be very creative in finding solutions to new problems on the fly.

As tape materials were being developed so were new adhesives. They come in three general categories based on

strength and temperature resistance. Rubber based adhesives provide excellent adhesion but poor temperature resistance. Acrylic based adhesives provide the widest range of temperature resistance from below freezing to 300F. Silicone adhesives provide the highest temperature resistance of up to 500F where low temperatures are not a concern. A conductive component can be added to any of these adhesives in order to make the tape conduct electricity.

During the 1950s molded vinyl, EPDM and silicone plugs and caps became readily available and affordable for use as

masking. Silicone is mouldable, soft, pliable and temperature resistant. These are all good features to have in a maskant. Today they are available in thousands of different styles and sizes for almost any application you can think of. They come with pull off handles, flanges, tapers and vents. If you can't find what you want they can be custom molded to your design. Plugs and caps are reusable, fast and easy to use with little skill required thus making them the maskant of first choice whenever possible.

With the advent of the digital age we now have the ability to make adhesive masks from the CAD data for a perfect fit even on intricate free form profiles. Stencils can be cut to locate areas that require masks in the middle of a featureless panel. Dots of various sizes are available and you can get them with lift off tabs to speed removal. There are many new types of liquid maskants available that offer good adhesion on intricate shapes and undercuts that are easy to remove while being less messy than using wax. Photolithography can now be done using electron beams with a stencil made of SiN that is only 100 nanometers thick. Using this technology linewidths can be cut that are only 10 nanometers or .00001 mm wide!

As you can see masking has been with us for a very long time. Many techniques have ancient origins but now offer a more refined and precise capability. Masking will remain an important part of industry for the foreseeable future.

Joe Pasquarelli is General Manager of Aluminum Surface Technologies, Burlington, ON.

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Testing the Finish

Finishers want to know what is available in testing equipment to measure different types of surfaces as well as the latest technology.

DeFelsko Corporation, a leading North American manufacturer of coating thickness gages and inspection instruments, offers a variety of instruments designed specifically to meet the coating industry's requirements.

Their PosiTector 6000 coating thickness gage is now smarter, faster and more powerful. Both Standard and Advanced models feature built-in memory, onscreen statistics, USB mass storage, and new Fast mode. Advanced models also include hi contrast reversible colour LCD, Scan mode to store continuous readings, onscreen help, real time graphing, and more.

The PosiTector DPM Dew Point Meter measures and records climatic conditions including: relative humidity, air temperature, surface temperature, dew point temperature and the difference between surface and dew point temperatures. It is available with either a Built-in or Magnetic Separate probe, and 2 models to choose from – Standard and Advanced. All models include memory, Auto Log, statistics, USB port and Smart Trend indicators to help you identify rising, falling or stable readings. Download and transfer options include USB, Bluetooth and PosiTector.net cloud-based memory storage. No software is required.

The PosiTector SPG Surface Profile Gage measures and records peak to valley surface profile height in accordance with ASTM D4417-B and others. Available with either Standard or Advanced features, the PosiTector SPG has a fast

measurement rate of over 50 readings per minute – ideal for quickly and accurately measuring surface profile over large surface areas.

The PosiTector body universally accepts all PosiTector SPG, 6000 and DPM probes easily converting from a surface profile gage to a coating thickness gage or dew point meter.

DeFelsko also offers quality inspection instruments including the PosiTest Adhesion Tester and PosiTector Ultrasonic Thickness Gage.

The most recent of the company's PosiTector series of coating thickness and inspection instruments have WiFi technology. WiFi wireless technology is included with all PosiTector Advanced models with serial numbers greater than 730,000. WiFi technology wirelessly synchronizes with PosiTector.net, downloads software updates, and connects to mobile devices to expand gage functionality. PosiTector.net is a free web-based application offering secure storage of PosiTector readings. Manipulate uploaded data using an internet browser from any location in the world, job site or head office, generate reports with graphs, annotations and images. Share measurement data with authorized users via a secure login from any computer or web-enabled device. Export data to popular formats such as XML, CSV and CQATK for further analysis.

Stone Tucker Instruments was incorporated in 2003 to meet the Canadian coatings industry's need for cutting-edge inspection and testing technology.

As DeFelsko's primary Canadian distributor, all standard product lines, and a wide variety of other items are in stock at



PosiTector 6000 coating thickness gage.

all times. They carry DeFelsko's full range of products, including the PosiTector SPG Surface Profile Gauge, as well as the newly redesigned PosiTector 6000, and Dew Point Meter.

Stone Tucker Instruments is also a Canadian distributor of the TQC line of field and laboratory instruments, including the Curve -X2 USB Oven Temperature Profiler.

The company says the TQC Curve - X2 and cross hatch adhesion kit, combined

with the DeFelsko Powder Checker and PosiTector 6000, will provide powder coating facilities with all the information required to prove the quality of their powder coating application.

Stone Tucker also distributes Dakota, Testex, Chlor-Rid, Western Instruments, Salt Smart Salt Meter, PCWI, Montipower, Rhopoint, and G.A.L. Gage.

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that are portable and simple to use. Fischer Technology, a member of the HELMUT FISCHER Group, is a U.S. manufacturer of coating thickness, material testing, and material analysis instrumentation. They cover sales, production, technical support, and service for the United States, Canada and Mexico.

Demanding measurement applications require highly-qualified technical support. Fischer helps its customers to meet these challenges through its applications laboratory. They can help solve measurement dilemmas and determine which of their instruments will be the right fit for the application.

Fischer offers a complete range of hand held coating thickness gauges ideally suited for measurements of paint, powder coating, plating and anodize. The FISCHER DataCenter software, for quick and easy data transfer to your PC and personalized inspection reports, is included with Fischer's handheld instruments. All Fischer units and foils come certified at no additional charge.

The FMP Series product line includes the DUALSCOPE, DELTASCOPE, and ISOSCOPE coating thickness gauges. The gauges measure over ferrous, non-ferrous, or both substrates with automatic substrate recognition. They can measure thin, thick, soft, and duplex coatings and

can adapt to any measuring application using the large selection of interchangeable F-probes which yield extreme accuracy and a wide measurement range. Probes are available for hard to measure areas such as inside, curvature, and surface roughness. Bluetooth wireless technology is available. Fischer also offers the pocket sized MP0 and MPOR Series, which

has two large displays and integrated wear resistant hard metal tip probe. These instruments give fast, precise, repeatable readings and are very easy to use.

Other products offered by Fischer include the:

- PHASCOPE PMP10 for measurements according to the phase-sensitive Eddy current method. Ideally suited for measuring the non-ferrous metal coatings on steel fasteners and other small plated parts.
- PHASCOPE DUPLEX measures individual thickness values of multi-layer coatings used in the automotive and appliance industries.
- FISCHERSCOPE MMS, a desktop universal measurement system, is designed for coating thickness and materials testing according to the magnetic, magnetic induction, Eddy current, beta backscatter and electrical resistance measuring methods.

Fischer has a broad assortment of calibration standards. All Fischer calibration foils and standards are serialized and certified.

When it comes to Material Testing Instruments, Fischer offers:

- FERITSCOPE for material testing of the quality of weld seams in steel construction
- ANOTEST for quick and simple on-site measurements for anodic coatings on aluminum
- SIGMASCOPE for the measurement of

the electrical conductivity of metals such as aluminum or copper

- FISCHERSCOPE AND PICODENTOR for measurement systems to determine the Martens Hardness in the micro and nano ranges

Fischer's X-Ray fluorescence instruments utilize an energy dispersive X-ray fluorescence analysis (ED-XRFA) method. The measurement and control software allows for the simultaneous thickness measurement and analysis of even complex coating systems, with or without calibration standards. The broad assortment of instruments can determine single or multiple coatings on the smallest structures or large components, trace analysis required by RoHs, or testing of jewelry and gold.

ElektroPhysik is a leading manufacturer of portable, non-destructive coating thickness testing gauges. They are the North American exclusive agent for Sheen Instruments offering viscosity testing devices, film application equipment, color and gloss, adhesion and physical test devices.

ElektroPhysik is perhaps best known for the MikroTest coating thickness gauges utilizing the magnetic attraction principle. This gauge has been called the 'banana gauge' because of its shape and is strictly for non-magnetic coatings applied over steel. The MikroTest is perhaps agreeably the most widely utilized coating thickness testing gauge in the world.

Other brands include the MiniTest, eXacto, GalvanoTest and PoroTest which are electronic platforms for measuring coatings over both ferrous and non-ferrous substrates.

The company offers "sensor" technology and continually strives at advancing products in this area such as Sensor Integrated Digital Signal Processing (SIDSP)



The MiniTest from ElektroPhysik.

digital sensor technology.

SIDSP is an ElektroPhysik exclusive, which took years of research and development. The entire coating thickness measurement is processed in the sensor at the point of measurement. SIDSP is unlike previous conventional techniques where an analog signal is generated by the sensor and then sent to a host gauge to processing. The vulnerability with that technique has always been that the analog signal is susceptible to environmental influences such as strong electro-magnetic fields and other signal disturbances that could affect the analog signal and therefore the reading.

SIDSP is available in the MiniTest 70, 700 and 7000 Series.

Manufacturers of testing equipment for industrial finishing have a solution for every finisher's need.

Editor's Note: Companies mentioned in this article can be reached at:
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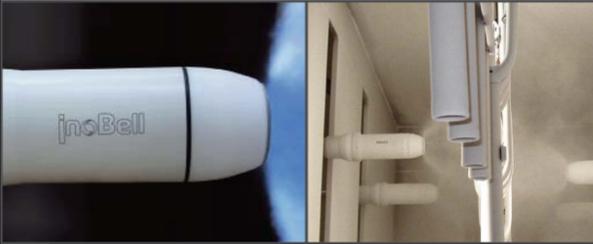
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Air Pollution Oxidizers

It is the law. Air pollution control equipment must be installed in the ventilation structure of chrome plating and anodizing tanks to amass and confine chromium emissions. Government has been coming down hard on the plating and anodizing industry to protect the environment, the ozone and the air people breath from Volatile Organic Compounds (VOCs), Hazardous Air Pollutants (HAPs) and odours.

The industry demand is for technologically advanced, yet user-friendly air pollution control products.

DIFFERENT TYPES

The Regenerative Thermal Oxidizer (RTO) destroys Hazardous Air Pollutants (HAPs), Volatile Organic Compounds (VOCs) and odorous emissions. Usually using high temperature thermal oxidation, with a mix of temperature, time, turbulence and oxygen to turn pollutants into carbon dioxide and water vapour.

RTO is the most widely used pollution control technology because it can repurpose the thermal energy generated during operation to reduce operating costs and energy consumption of the system. VOC and HAP laden process gas is either pushed or pulled into the inlet manifold of the oxidizer by a fan. Flow control or poppet valves then direct this gas into energy recovery chambers where it is preheated. The process gas and contaminants are progressively heated in the ceramic media beds as they move toward the combustion

chamber. Once oxidized there, the hot purified air releases thermal energy as it passes through the media bed in the outlet flow direction. The outlet bed is heated and the gas is cooled so that the outlet gas temperature is only slightly higher than the process inlet temperature. Poppet valves alternate the airflow direction into the media beds to maximize energy recovery within the oxidizer. The high energy recovery within these oxidizers reduces the auxiliary fuel requirement and saves operating cost.

The Regenerative Catalytic Oxidizer (RCO) destroys HAPs, VOCs and odorous emissions through the process of thermal and catalytic oxidation, converting the pollutants to carbon dioxide and water vapor while reusing the thermal energy generated to reduce operating costs. The RCO is different from a standard regenerative thermal system because it uses a catalyst, allowing destruction of harmful compounds to occur at lower temperatures. VOC and HAP laden process gas enters the oxidizer through an inlet manifold to flow control, poppet valves that direct this gas into energy recovery chambers where it is preheated. The process gas and contaminants are progressively heated in the ceramic media beds as they move toward the combustion chamber. Catalyst placed near the combustion chamber helps oxidize the VOCs and HAPs in an exothermic reaction. Since catalytic oxidation occurs at lower temperatures, a layer of catalyst is used in conjunction

with the ceramic packing in an RTO or as a replacement of a portion of the ceramics. As a result, fuel consumption required to preheat incoming emissions could be lowered by 50 to 95 per cent, further reducing the carbon emissions and operating costs of the already efficient thermal oxidizer. Hot, purified air releases thermal energy as it passes through the media bed in the outlet flow direction. The outlet bed is heated and the gas is cooled so that the outlet gas temperature is only slightly higher than the process inlet temperature. Poppet valves alternate the airflow direction into the media beds to maximize energy recovery within the oxidizer.

Thermal Recuperative Oxidizers destroy HAPs, VOCs and odours using the proper mix of temperature, residence time, turbulence and oxygen. The Thermal Oxidizer is based on volume of airflow, organic vapour concentrations and desired destruction efficiency. During operation, HAP and VOC laden air is drawn into the system fan and discharged into the inlet where it is preheated in the tube side (typically) of a shell-and-tube style heat exchanger. Contaminated air then passes by the burner where it is raised to the thermal oxidation temperature (1,200-1,800°F / 650-1,000°C) for the specified residence time (0.5 - 2.0 seconds) and an exothermic reaction takes place. The pollutants are converted to carbon dioxide, water vapor and heat within the reactor chamber.

The hot, purified air then passes again through the shell side (typically) of the heat exchanger where the energy released by the reaction is used to preheat the incoming air. The heat exchanger minimizes the system's fuel consumption with the system being self-sustaining at moderate Lower Explosive Limits (LELs). Finally, the contaminant-free air is exhausted into the atmosphere. Applications carrying silicones may have the configuration reversed, allowing the hot silicone laden air to pass through the tube side of the heat exchanger after the burner for maintenance and cleaning.

Catalytic Recuperative Oxidizers destroy emissions at significantly lower temperatures than thermal oxidation through the use of a catalyst, converting pollutants to carbon dioxide, water vapor and heat. VOC and HAP laden process gas is either pushed or pulled into a metal heat exchanger inside the oxidizer via a system fan. The contaminated airstream is progressively heated while traveling through the heat exchanger towards the

combustion chamber. At the burner, the process gas is raised to the catalyst operating temperature. As the heated gas passes through the catalyst, an exothermic (heat releasing) reaction takes place. The pollutants are converted to carbon dioxide, water vapour and heat. Once oxidized across the catalyst, the hot, purified air passes through the opposite side of the heat exchanger and releases thermal energy to preheat the incoming air. The heat exchanger reduces the auxiliary fuel requirement, thus saving operating cost, allowing self-sustaining operation with no auxiliary fuel usage at Lower Explosive Limits (LEL) levels of 8-12 per cent. Finally, the cooler, purified air is exhausted to the atmosphere through the system stack.

Direct Fired Thermal Oxidizers (DFTO) destroys HAPs and VOCs that are discharged from industrial or chemical process exhausts by the process of combustion. VOCs and HAPs are oxidized to carbon dioxide and water vapor with the proper combination of temperature, residence time and turbulence within the combustion chamber. The DFTO is an ideal technology for process streams heavily laden with pollutants and intermittent batch processes where the oxidizer can come on-line relatively quickly. Sometimes referred to as an Afterburner, Enclosed Flare or Vapour Combustor the direct fired thermal oxidizer uses a specially designed burner to raise the temperature of a pollutant laden air stream to a predetermined combustion temperature. In operation, the contaminated process exhaust is ducted into a burner chamber. Heat applied by the burner oxidizes the VOCs and HAPs creating harmless products of combustion (water and carbon dioxide). The clean, heated exhaust gas can then be discharged to the atmosphere or sent through an optional heat recovery system.

It can destroy 99 per cent of the hydrocarbon. The heated air is kept in the combustion chamber for a specified amount of time. At the inlet to the combustion chamber, turbulence is generated to mix the pollutants and oxygen molecules. Proper mixing of the combustion air and process streams destroys VOCs and HAPs and is safe to operate.

This is just a sampling of the air pollution control equipment in the marketplace. Talk to an air pollution control equipment provider to determine the system best suited to your operation.

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BARREL PLATING

The Barrel, the Speed, the Media, the Tanks

By FRED MUELLER

The manufacturing revolution created by Henry Ford needed large quantities of small mass produced parts metal finished. It was not economical to rack plate these small parts so finishers turned to barrel/cylinder plating. The first barrels were made from wood. These early aids to mass finishing were far from ideal, the wood absorbed the plating chemistries which then contaminated other finishing chemistry. Add to this the exposure of the barrels too changes in

“What gets bigger, the more you take away from it? A hole. The holes in a barrel control the solution turnover/exchange. So the trick is to run the part in a barrel with as large a hole as possible without the parts falling out or getting struck in the holes.”

temperature all of which caused rapid deterioration of the barrels.

Modern barrel plating started about 1950 with the invention of a wide range of different plastics. Barrels constructed from polypropylene materials did not suffer from the same problems facing wooden barrels. Quality took a major step forward because solution contamination was greatly reduced and a greater percentage of parts were being uniformly coated/electroplated. Mass production also introduced the SPECIFICATION to industry and the barrel made it easier for the finisher to meet his customer's requirements.

The barrel and the tank together form a geometric system. Both the barrel and

tank should be optimized for the other. Barrels come in many sizes from something that fits in your hand to barrels too large to fit into the bed of a pickup truck.

THE BARREL

The horizontal barrel and the oblique barrel are the two most common styles. Horizontal round barrels made from mild steel, stainless steel, monel or other specialty steel are used for phosphating, pickling/descaling, black oxidizing, polishing/burnishing and more. Horizontal hexagonal plating barrels can be made from many different materials but are usually made from polypropylene for the plastics chemical resistance. The hexagonal shape helps to force solution into the barrel. Both horizontal and oblique barrels come in many sizes and shapes. Each barrel fills a special need and can look very different from the common everyday barrel. For example, larger horizontal barrels are very capable of running heavy and/or bulky loads to a customer's requirements/specifications.

The oblique barrel operates a little like a cement mixer in that it sits at an angle and does not need a lid to keep the parts/load in the barrel. Oblique barrels can be easily tilted to look at the load and/or quickly empty its contents all without stopping. It can plate almost anything the horizontal barrel can and has advantages (very part dependent) over the horizontal barrel. The barrel rotation speed cannot get too fast or the parts can “stick” without moving to the outside walls of the barrel. Oblique barrels can be used for both dry or wet tumbling.

Construction of barrels must include consideration of the interior surfaces to encourage sufficient tumbling of the parts/load to ensure good mixing. Ideally the parts on the outside of the load spend as much time inside as the inside parts spend outside. The interior surfaces must have ridges or dimples to prevent parts from sticking to the barrel surface. The surface tension forces with water can cause the parts (especially flat parts) to stick together and to the interior surfaces of the barrel.

THE HOLES/PERFORATIONS

What gets bigger, the more you take away from it? A hole. The holes in a barrel control the solution turnover/exchange. So the trick is to run the part in a barrel with as large a hole as possible without the parts falling out or getting struck in the holes. Slower solution turnover in barrels

with smaller holes limits the current density (lower current densities = longer plating times) and longer plating times costs you money. Generally speaking, parts that weigh about 2 kg are the upper limit for parts in a barrel. The polypropylene is soft compared to steel and over time willpeen over/close the holes, which further slows solution turnover etc., etc... You can drill the holes open again but this takes time. If the barrel holes have been peened over and a light load is in the barrel it can float off of the V-blocks that guide the barrel to the middle of the pickup point/location and cause a major problem/crash on automated lines.

The more holes the better except that the barrel panels get weaker. Today's loose rule is that the number/area of holes should not exceed 30% of the surface area of the panel. Very light loads like small electronic pins can be plated in a mesh screen panel barrel that's more open than

30 per cent. Larger holes have another benefit they drain better. Chemistry is expensive let's try to keep it in the tank.

Herringbone (larger on the outside of the barrel and at an angle to the hole on the inside of the barrel & generally not round) holes help to “pump” solution into the barrel to increase the current density and lower the plating time.

Automated plating lines can have spare barrels in a wide range of commercial size holes/perforations and can place the “right” barrel into the loading station quickly to optimize the hole with the load.

BARREL SPEED

Quicker barrel rotation works with the hole size and tumbling load to allow higher current densities which lowers plating times. Higher speeds have a tendency to give a more polished look to the parts in the barrel. But, you cannot go too fast because the parts will more aggressively slide over each other creating more dam-

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PLATING AND ANODIZING: BARREL PLATING

age than slower speeds. This is especially true for parts with sharp edges and/or corners. So, how fast are we talking – 4 to 6 RPM is typical factory settings, but higher speeds could work depending on the application.

BARREL MEDIA

Steel balls can be used for polishing in barrels. Horizontal barrels can be used to tumble polish many small metal items (buckles, rings, etc.) at lower costs than other methods. Most shops use about twice as many steel balls by volume for each load of parts. Crevices and tight places can be reached by the smallest

balls available and it is not unusual to mixed different sizes to get the desired results. Special soaps are used so as to not damage the load or the steel balls.

TANK SYSTEMS

Tanks must be large enough to hold the anode area needed to get good plating results over time and deep enough so that the volume of solution can buffer the chemical changes that occur during plating. The industry tries maintaining a one to one ratio of anode area to work/load area. This is very difficult because the area in the barrel can be huge. Several anodes have been developed to help with this

problem. Curved anodes are cast in most of the metal that are commonly plated. They are curled toward the bottom of the barrel in such a way as to be equidistant from the outside edge of the barrel. This gets more current to the load but spreads the current over a greater area, which lowers the current density at each individual hole. The overall effect is to improve the deposit making it more uniform and smoother. Titanium anode baskets come in an upside down “Y” shape and an “L” shape and offer advantages over metal anodes in that they don’t lose area over time. This is very helpful if you need all the anode area you can get to control the

reactions at the anode.

I have just touched on a few of the facets of modern barrel finishing. Barrels can economically produce parts of very high quality. Barrels today are designed to handle parts that 10 years ago would have been impossible to barrel finish. Having a tough finishing problem today would be a great day to give your supplier a call to see what they may do for you.

Fred Mueller is Corp. Quality and Safety Manager at General Magnaplate Corp. and past president of the American Electroplaters and Surface Finishers Association, Inc. (AESF).

New Products & Technology

DuPont Announces Polyester RAL Product Line Now Formulated With Globally Accepted Resin System

DuPont Powder Coatings announces the transition of the DuPont Alesta RAL product line from the standard triglycidyl isocyanurate (TGIC) to hydroxyalkylamide (HAA), TGIC-free chemistry. DuPont Powder has over 20 years of experience in formulating HAAs and believes the trend in North America will reflect the transition from TGIC to HAA polyesters already occurring in other regions around the world.

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www.gardco.com

New PCM and VFMZ offer Consistency, Quality and Efficiency for Coil Coaters

Saint Clair Systems has released their new PCM (Profile Correction Module) and VFM (Vertex Flow Module) for the Coil Coating industry. These modules eliminate edge-to-edge temperature variations and resulting film build inconsistencies normally associated with coating systems operating in the 2-roll mode. In addition, significant paint savings can be realized by lowering the fill volume. The patent-pending PCM and VFM provide improved finish quality in gloss and metallic alignment as well as eliminate the “ropiness” effect, giving paint a truly “sprayed” appearance.

www.saintclairsystems.com

Precision Laser Cutting after Powder Coating Assures Clean Edges



Custom laser cutting and drilling services performed on parts that are powder coated first to produce clean openings and eliminate masking are being introduced by Advanced Laser Technologies of Stoneham, Massachusetts.

Laser Cutting & Drilling Services from Advanced Laser Technologies can be performed on parts that have been powder coated already with thermal barrier coatings (TBCs) to eliminate masking time and reduce assembly and handling costs. Featuring precise patterns, laser cutting after powder coating can produce holes down to 0.015” dia. and assure clean edges with no overspray.

Ideally suited for parts made from 6061 Aluminum and similar materials which have been powder coated first, Laser Cutting & Drilling Services from Advanced Laser Technologies are performed using a Nd:YAG laser system and can handle parts up to 30” dia. Applications include instrument housings, detectors, filters, and air and fluid control components.

www.advancedlasertechnologies.net

EYE Lighting Applied Optics Division Introduces Super Xenon Test Chamber

EYE Lighting International of North America, Inc., a leading provider of lamps, luminaires and related lighting products for the Applied Optics industry, has announced the introduction of its

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new Super Xenon Solar/Weather durability test chamber (XER-W75) designed for maximum flexibility to provide a single test system that complies with global automotive, textile, plastic, paint, and other material test standards.

Developed to meet evolving technology demands, the XER-W75 system yields results with exceptional correlation to true outdoor exposure conditions. Its high output EYE/Iwasaki proprietary Xenon lamp and filter assembly provides outstanding spectral compliance with natural sunlight, and "shower" and "day/night" cycles assure natural exposure effects. The XER-W75 programmable touch screen setup manages all weathering parameters and cycle functions to ensure repeatable test results and test efficiency in the development of new products.

The XER-W75 system complies with common ASTM, ISO, JIS, and JASO global standards for testing paints, plastics, and textiles. Additional options allow the system to comply with specific ISO/JASO automotive tests for accelerated weathering and exposure to artificial radiation.

Data collection and analysis is obtainable through the XER-W75 built-in datalogger. A removable memory card allows simple transfer of data to MS-Excel and other common analysis programs.

www.eyesolarlux.com

New Pro Xp Electrostatic Spray Gun from Graco



Graco Inc, announced the debut of their new electrostatic spray gun, Pro Xp. The newly designed spray gun is now smaller and lighter than previous models and has a built in power supply. The company also added several models to the product line to accommodate a greater number of applications.

The Pro Xp has new aircaps that use less air with the potential to lower energy costs. These one-piece aircaps are indexed for accurate positioning and were designed to improve spray performance and cleanliness.

To better analyze performance, the Pro Xp comes in a "smart" version. This model has a digital display that shows key indicators of electrostatic performance. Other Pro Xp gun models include a kV Booster Gun, a 40 kV gun with the transfer efficiency of a 60 kv gun. A round spray gun for parts that require a slow velocity, bell-shaped spray pattern. And a high

conductivity gun which is ideal for spraying lower resistivity material.

Built in the USA with durable components, the new Pro Xp electrostatic spray guns also feature a three-year warranty.

www.graco.com

Teflon Powder Coatings Add Chemical and Corrosion Resistance



A full line of Teflon powder coatings that are electro-statically applied to pumps, mixers, tanks, valves, and other components is available from Applied Plastics Co., Inc. of Norwood, MA.

Applied Plastics' Teflon Coatings include standard formulations such as Teflon PTFE, FEP, PFA, Tefzel ETFE, Teflon S, Halar, ECTFE, Kynar, and Xylan, plus custom formulations to meet specific application requirements. These coatings are ideally suited for pumps, mixers, tanks, valves, and related components subjected to chemicals, corrosion, and rough weather.

Tailored to customer requirements, Applied Plastics' Teflon Coatings can be electro-statically powder coated from 0.0002" to 0.020" thick on parts weighing up to 2,000 lbs., depending upon the coating and substrate. The surfaces on new parts or those being refurbished are all properly prepared.

Applied Plastics' Teflon Coatings are priced according to formulation, part complexity, and quantity; applied in single to production quantities.

www.appliedplastics.com

Hi Temp-Resistant Paint

Sherwin-Williams has introduced the next

generation of corrosion under insulation (CUI) coatings to the oil and gas industry, Heat-Flex Hi-Temp 1200, an immersion-grade single-component inert multipolymeric matrix coating.

Heat-Flex Hi-Temp 1200 combines ease of application, ambient cure, surface tolerance and UV resistance in one formulation for application under calcium silicate and mineral wool insulation systems, and is recommended for use in wet/dry cyclic service at operating surface temperatures of cryogenic to 1,200 degrees F, with application temperatures from ambient to 500 degrees F.

www.sherwinwilliams.com

ELANTAS: Nanotechnology Based Wire Enamels

ELANTAS, the division Electrical Insulation of ALTANA AG, is introducing a newly developed wire enamel into the electrical insulation market. The new product Deatherm E 641 GL combines the positive effects of nanotechnology with the established and well-known properties of highly temperature resistant wire enamels. Intensive endurance tests have proven that this new wire enamel shows significantly improved the resistance against partial discharge and voltage spikes.

The application of nanotechnology to the electrical insulation industry represents a very attractive way to upgrade and increase properties of conventional insulating coatings. ELANTAS Electrical Insulation has been particularly active in the investigation of such novel technology applied to wire enamels over the last decade. Among possible ways to combine nanotechnology with wire enamels manufacturing technology, ELANTAS strategically decided to leave the conventional application of resulting nano-modified products untouched in order to protect customer investments in their enamelling machines.

Deatherm E 641 GL is a nano-modified wire enamel based on polyester-imide (PEI). Developed by ELANTAS, this product is a clear example of the successful application of the 21st

century most innovative technology to electrical insulation.

Thanks to its intrinsic nature, such novel nano-modified enamel is characterized by exceptional performance in high voltage environments and by excellent electrical, thermal and mechanical properties. The organic resin was developed to be highly heat resistant and to maintain its flexible structure even after high temperature treatments, while the inorganic material has high affinity for the resin and its excellent dispersion in the binder which provides the necessary homogeneity before (liquid enamel) and after application (cured coating).

By incorporating nano-sized inorganic matter, the hardness and brittleness that micron sized equivalent materials bring to resulting coating is significantly reduced. A well-designed organic resin, in which thermal resistance is combined with excellent mechanical properties, along with crucial cross-linkers and incorporated nanofillers, guarantees the homogeneous distribution of the later ones in the final, cured coating.

www.elantas.com

OMNOVA Introduces an Innovative Water-based Technology for Wet-Look Concrete Sealers

OMNOVA Solutions unveiled Hydro PLIOLITE WL modified acrylate copolymer for wet-look concrete sealers. Based on OMNOVA's proprietary EBS (Emulsified Binding System) technology, this water-based acrylic binder can be formulated into a wet-look concrete sealer with a superior appearance and performance versus traditional latex-based sealers. Coatings formulated with Hydro PLIOLITE WL provide better adhesion and penetration to concrete surfaces and deliver a true "wet look" similar in appearance to solvent-based sealers. The new resin has excellent blush resistance and is non-yellowing.

Hydro PLIOLITE WL is available in bulk shipments or 1,000 liter/ 264 - gallon totes.

www.omnova.com/hydropliolitewl

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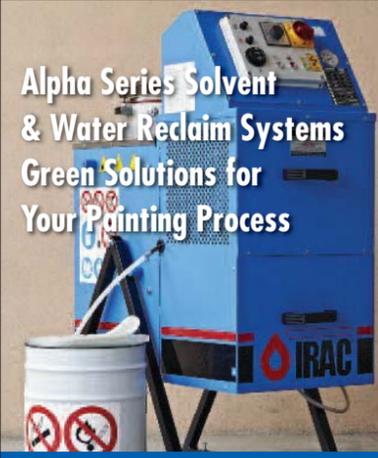


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