



CFCM

CANADIAN FINISHING & COATINGS MANUFACTURING MAGAZINE

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Chromium Plating

The past, the present and the future

BY PETER PAINE M.ENG., P.ENG.

This paper presents a summary of chromium electroplating from its earliest days and traces its development to the present. A look at the future of chromium plating is also presented from the perspective of non-chromium plating processes and how these processes compare with chromium plating. This month's article deals with the past and present.

Electroplating, at its simplest, is the application of a metallic coating to a substrate (which can be metallic or non-metallic) by the use of an electrolyte as a conducting medium (the plating solution) and a source of electrical power (direct current), which acts on a pair of electrodes (the anode and the cathode).

For chromium plating, the metallic coating on the substrate is elemental chromium, which is obtained from a hexavalent chromium solution (the elec-

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ALSO IN THIS ISSUE

- Corrosion Resistant Coatings
- Bio-Solvents
- Waterborne Resins
- UV Coating Formulation
- UV Curing
- Spray Booth Filters

AND MUCH MORE!

Automated Liquid Spray



It is not just for automotive and construction anymore, as many industrial finishers are moving into automation to achieve consistency in look and high volume when it comes to spray painting.

CFCM asked manufacturers of automatic liquid paint spray guns to comment on their latest and most popular products and how they answer customers' needs. The #2600 Automatic Spray Gun (Patent

Pending) from **Can-Am/TurboAir** HVLV Spray Guns features:

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- Single Fluid Port or Fluid Recirculation capability just prior to fluid nozzle
- Can safely feed thick or thin fluids up

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IN THE NEWS

CFCM Buyer's Guide Free Listing



It is time again for the Canadian Finishing and Coatings Manufacturing publication Buyers Guide. Listings are free and can be entirely done online for your convenience. Please go to <http://www.cfm.mercuryemail.com/> and add your first time listing. If you have received an email to update an existing listing, you must do so and approve it even if there are no changes. Don't forget to list your products. Product categories include Industrial Finishes, Industrial Finishing Equipment, Paint & Coating Raw Materials, Paint & Coating Manufacturing Equipment, Custom Coaters and Job Shops and Associations, Education and Government. Our Buyers Guide will be printed in standard 8-1/2 by 11 inch format in July. The online version is available year round. Please contact sandra.anderson@cfcm.ca if you are having problems, or have questions.

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Same Dad, Different House

So Canada had the Federal election May 2, 2011 and we now have a majority Progressive Conservative (PC) government with the New Democratic Party (NDP) as the Official Opposition. The Bloc Quebecois virtually disappeared in favour of the NDP and the Green Party got their first seat ever in the House. Oh yes, and the Liberals... oh well. So our Prime Minister has not changed, but now he will be able to perhaps really do something. We shall see. It would be nice if they could do something about lowering gas and oil prices. The paint and coating industry is one of many that would be grateful for this. I don't know what the NDP will accomplish in their new position, but they did make history with the most seats they have ever managed. According to Brian Mulroney who was interviewed on election night, French Canadians consider Layton "Bon Jacques", a good guy. Layton's father was well respected in politics and Jack smiled a lot and sported that cane, which he had to use as a result of recent hip surgery, like a conductor's baton all through his campaign. An editorial in a local newspaper described Harper as conducting his campaign as if he was that grumpy neighbour yelling at the kids to get off his lawn, but it worked for him. The PC campaign was dubbed the "IOU platform" for promises to be delivered once the federal books are balanced in 2014. They promise to cut government spending by \$4 billion and eliminate the deficit one year earlier than expected.

They plan to keep corporate tax cuts as they are, eliminate the \$2 per vote public subsidy for political parties and eventually introduce tax changes to allow income splitting for families to share income up to \$50,000 allowing them to reduce their overall tax bill. They also plan to shortly introduce anti-crime measures. They may manage to fulfill these promises.

On to other news, in our last issue (March/April) we ran a letter to the editor on this page from Arch Chemicals regarding an article in November/December 2010. The following is a response to that letter from the author:

In last month's Letter to the Editor, some alert readers suggested that some clarification was needed in the recently published article "Formaldehyde-free Wet State Preservation of Premium Paints and Coatings: Is it Possible." Upon further review, I see that unfortunately in reducing a lengthy manuscript to the required length, two separate concepts became juxtapositioned. Specifically, an opening

discussion about the useful properties of benzisothiazoline (BIT) ended up within a paragraph finishing a discussion about formaldehyde. The result, as pointed out, could be an inaccurate, seemingly damning, characterization of BIT. Such an interpretation was not only not intended, but would completely alter the central theme of the presentation. As a major international supplier of BIT and BIT-containing products, our intent was to make the case that BIT is going to be the preferred chemistry, perhaps the only chemistry, that can do the 'heavy lifting' in green coating preservation. If that point was muddled, then a major tenet of providing wet-state preservation to green coatings might have been lost to some readers. I have performed thousands of experiments with BIT and have installed multi-million dollar wet state preservative programs featuring BIT and BIT-based products. Having worked as an industrial microbiologist for thirty years, my first efforts always involve the simplest implementation possible and, if that is successful, great. But even in such cases, to fail to alert potential users of the pitfalls that can occur along the way to preserving a green coating is to do a disservice to those customers and to the industry. Furthermore, the customer must be alerted as to what supplemental paths are available in achieving his goals. This is a core expertise that should be offered to any customer. Green coatings are much more difficult to preserve than are polymer emulsions, cosmetics, titanium dioxide suspensions, etc. The successful preservation of these coatings is going to be a far more arduous than previously experienced in this industry and the preservative solutions provided will be far more varied than the industry is accustomed to seeing. My intent was to convey that the technology exists to meet these challenges as they arise. Other comments raised about the properties and performance characteristics of BIT are adequately addressed in the literature and I will leave that to the interested reader.

Gary Horacek, PhD, Director, Technical Microbiology Services – Americas, Troy Corporation, Florham Park, NJ.

Please send your letters to the editor, or news releases to sandra.anderson@cfc.ca.

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EDITOR

Sandra Anderson
519-442-4071
Fax 519-442-1359
sandra.anderson@cfc.ca

COPY EDITOR/PROOFREADER

E.J. Burns Anderson

PUBLISHER AND SALES

Pete Wilkinson
416-255-1808
Fax 416-519-1313
pete.wilkinson@cfc.ca

VICE-PRESIDENT, ACCOUNTING, CIRCULATION AND SALES

Brian Jones
905-405-1500
Fax: 416-519-1313
brian.jones@cfc.ca

GRAPHIC DESIGN

Allan S. Bates
416-485-9229
Green Apple Prepress
allan.s.bates@sympatico.ca

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WILKINSON MEDIA CANADA INC.

250 The East Mall Suite 1103
Toronto, Ontario,
Canada M9B 6L3
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Fax 416-519-1313

Regulation Concerns

By Dave Saucier

There are some regulatory initiatives underway that are worthy of mention to those in the coatings industry. The first involves Schedule 1 Toxic Substances used in generic products. The second concerns the Transport of Dangerous Goods Amendment 12 covering Part 4 Safety Marks that defines labelling and placarding requirements for dangerous goods shipments. The final initiative covers security.

Let's start with the "Regulations Respecting Products Containing Certain Substances Listing in Schedule 1 to the Canadian Environmental Protection Act, 1999" published in Canada Gazette, Part 1, on February 26, 2011. At first glance the draft regulation appeared to deal with Mercury and generic products containing Mercury. Within the text of the draft regulation was one sentence that changed the entire dynamic of the proposed regulation. The inclusion of the statement "The proposed Regulations are designed to allow for the future possibility of controlling products containing other substances listed in Schedule 1 to the Canadian Environmental Protection Act, 1999, by adding them to the schedule of the Regulations."

The proposed labelling and administrative requirements for Mercury and products containing Mercury appear reasonable. However, applying the same labelling and administrative requirements for any or all Schedule 1 substances is not appropriate. Each toxic substance has its own unique persistence, bio-cumulative and/or inherent toxicity profiles that require very specific and unique management programs tailored to address each health, safety or environmental concern.

Generic products containing Mercury must demonstrate "evidence that the product plays an important role in the protection of the environment or human health". No definitions for "important role" are available.

Finally, the Government appears to have circumvented all of the instruments readily available within CEPA 1999 to regulate Toxic Substances. One of the more successful tools is stakeholder consultation. The wording "to allow for the future possibility" completely eliminates the stakeholder consultation process, which is unacceptable. For sure there will be some form of regulation for Toxic Substances, let's get it right using a science-based approach that effectively addresses each specifically, using the entire suite of instruments available within CEPA 1999.

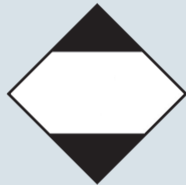
Amendment 12 of the Transport of Dangerous Goods

regarding Part 4 – Safety Marks, has been published. The amendment moves Canada closer to harmonization with the United States and the United Nations. Although some parts of the amendment deal with housekeeping issues, there are a number of new provisions that may affect the coatings industry (limited quantity provisions).

Section 4.10.1 introduces a new definition called Overpack which is "an enclosure used by a single consignor to consolidate two or more small means of containment for ease of handling but it is not a minimum required means of containment and it does not include a large means of containment..." Examples of overpacks are a pallet on which are placed or stacked two or more small means of containment that are secured by straps, shrink wrap, stretch wrap, nets or other similar means; or, a box, crate or bin in which two or more small means of containment are placed. If the labels on the small means of containment are not visible through the overpack the word OVERPACK and the primary and subsidiary class label for each dangerous good is required along with the shipping name, UN number and must have 2 labels on two opposing sides of the overpack.

TDG harmonizes with US 49CFR in January 2012 by introducing 2 new safety marks are added dealing with LIMITED QUANTITIES for ground and air shipments are introduced (air packages must meet the ICAO technical instructions to use the Y label):

For Ground



For Air



Changes are being made to the usage of the DANGER Placard for mixed loads of dangerous goods (e.g. flammable liquids shipped with corrosive liquids) that are non-ERAP-able (don't require an Emergency Response Activation Plan) and are not part of previously specified classes. Essentially the change creates a requirement to display a placard for each class of dangerous goods on the 4 sides of vehicles.

There are also new options for IBC (tote tanks) that permit shippers to label all 4 sides of the IBC or use 2 placards on opposing sides. Provisions for visibility and when to include

UN# in a placard are also addressed. Except for certain dangerous goods (Class 2.3, 4.3, 5.2, 6.1 PGI and 7) an exemption remains for shipments less than 500 kg. Finally for placards the Class 5.2 placard will be changed and will be:



Some current Safety marks will be updated and the previous Marine Pollutant label will be replaced by the following:



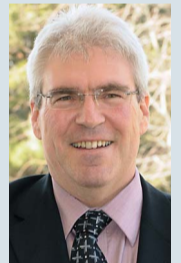
Employee training will have to be planned to introduce these changes if they are applicable to your business.

My last topic of the day is security. A recent Royal Canadian Mounted Police Critical Infrastructure Intelligence Report included an assessment that many of the industrial control systems used to manage key critical infrastructure were not designed with security in mind.

With regards to the coatings sector Transport Canada has created a new directorate called the Surface and Intermodal Security (SIMS) which is tasked with developing risk-based analysis to determine the need for new powers (i.e. regulations) to be aligned with US and world trading partners.

Security will now be the next frontier for the development of best business practices as no anticipated regulation will spell out how to comply with emerging security regulations. This will affect physical security of buildings, security considerations for transport and distribution, as well as human security and hiring practices. Standards or code elements, depending on whatever accreditation your company values will no doubt be developed to address this sensitive topic.

To find out more about the TDG 12 Amendment please contact Dave Saucier, Manager Regulatory and Government Affairs, The Canadian Association of Chemical Distributors (CACD) by email dave@cacd.ca or by telephone 905-844-9140.



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Association News

What does The NAI Coating Show offer?

The North American Industrial Coating Show is being held October 4-6, 2011 at the

Duke Energy Convention Center, Cincinnati, OH.

Organizers are expecting more than 1,800 attendees consisting of engineers, asset managers, coating contractors and applicators, quality control managers, and technical directors.

The Technical Program includes presentations by key representatives from the liquid and powder coating industry.

Having the show in Cincinnati opens an avenue for hundreds of new drive-ins, while still maintaining the Midwest core that typically attends The NAI Coating Show.

Coatings Career Zone will feature exhibiting companies recruiting new employees as well as job listings/projects in the industrial coating market.

Product Showcase will display exhibiting companies new and innovative products to all attendees.

Technical Help Zone is where any attendee can visit with a technical expert to determine solutions for their specific needs.

www.thenaicoatingshow.com

Company News

Graco to Acquire the Finishing Businesses of ITW

Graco Inc. has entered into a definitive agreement to purchase the operations of the finishing businesses of Illinois Tool Works Inc. (ITW) in a \$650 million cash transaction.

Graco plans to finance the transaction through a new committed \$450 million revolving credit facility (U.S. Bank National Association and JP Morgan as joint lead arrangers) and previously announced long-term debt of \$300 million. Operations are expected to be cash accretive immediately and will be included in Graco's Industrial segment for reporting purposes. Closing is expected in June 2011, at the earliest, pending regulatory reviews and other customary conditions.

The ITW businesses have 900 employees worldwide and manufacture and distribute equipment for industrial liquid finishing, powder coating and automotive refinishing. Forty per cent of their business is in the Americas. Significant operations are located in the United States, Switzerland, United Kingdom, Japan, Brazil and Mexico, with sales offices and distribution capabilities in several additional countries. Leading equipment technologies and brands, such as Gema powder finishing equipment, Binks industrial pumping solutions, DeVilbiss electrostatic guns and accessories, and BGK curing technology auto refinish guns and accessories and Ransburg.

"This acquisition is an excellent strategic fit with Graco's Industrial segment. It will advance all of our stated core growth strategies: new products and technology, geographic expansion, and new markets. We gain a leading position in industrial powder paint equipment — a growing global market where we have no offering today. In liquid finishing, the acquired product technologies are complementary to Graco's Industrial offering and also give us a leading position in automotive refinish where we have little presence. The acquired businesses generate two thirds of revenue outside North America, increasing our critical mass in important international and emerging markets. This transaction will bring several widely recognized premium brands to Graco, a strong distribution channel, an installed base and approximately 40 percent of revenue from parts and accessories. We believe this acquisition will create long term value for our shareholders," says Graco's Chief Executive Officer Pat McHale.

ITW is a Fortune 200 global diversified industrial manufacturer. Its key business platforms include welding, automotive OEM, industrial packaging, food equipment, construction, polymers and fluids, test and measurement electronics, decorative surfaces and automotive aftermarket products. ITW's revenues totaled \$15.9 billion in 2010.

Graco Inc. supplies technology and expertise for the management of fluids in both industrial and commercial applications. It designs, manufactures and markets systems and equipment to move, measure, control, dispense and spray fluid materials. A recognized leader in its specialties, Minneapolis-based Graco serves customers around the world in the manufacturing, processing, and construction and maintenance industries. www.graco.com.

Innovative Finishing Solutions Inc. — 2011 Business Excellence Award Winner

The Greater Dufferin Area Chambers of Commerce (Ontario, Canada) hosted their Annual Business Excellence Awards Gala Dinner to "Celebrate Business Excellence within Dufferin County". Nominees are selected by the community and the judging takes place by surrounding Ontario chambers. This year the Royal Bank of Canada presented Innovative Finishing Solutions Inc. with the 2011 Business Excellence Award for 25 employees and under.

Innovative Finishing Solutions Inc. was formed in 2002 and is a leading Paint Shop Solutions Company located in Orangeville Ontario. Innovative Finishing Solutions Inc. is an exclusive FANUC Robotics paint process integrator specializing in turn-key robotic systems & electrostatic finishing solutions representing EXEL (Kremlin, Sames,

Rexson & Johnstone spray equipment) as their exclusive systems integrator. Over two-thirds of the facility is dedicated to systems assembly, integration, service, and training & customer demonstrations. www.innovativefinishing.ca

Sherwin-Williams Renames Division and Highlights Global Capabilities

Sherwin-Williams Chemical Coatings is now Product Finishes

Sherwin-Williams announces that its Chemical Coatings Division has been renamed Product Finishes. Following the acquisitions of industrial wood finishing leaders Becker Acroma and Sayerlack in 2010, the newly expanded Sherwin-Williams Product Finishes Division now boasts a very strong presence in Europe, adding significant manufacturing and distribution capabilities. These acquisitions also added to the company's existing infrastructure in China and Asia, doubling its capabilities.

"The time was right to reflect our expanded footprint with a name that articulates the division's focus on providing finishes that meet customers' performance, compliance and aesthetic demands," says Drew McCandless, President of the

Product Finishes Division Sherwin-Williams Product Finishes Division.

"Welcoming Becker Acroma and Sayerlack into the Sherwin-Williams family is an enormous win for our global customers," says McCandless.

Sherwin-Williams, a global leader in technical support and solutions, color and design expertise, and customized design engineering, is now able to marry its world-renowned expertise with a newly expanded product portfolio with unique coating solutions for a variety of industrial finishing markets.

oem.sherwin.com.

DuPont Announces Global Plans to Expand Titanium Dioxide Capabilities

DuPont has announced a comprehensive titanium dioxide expansion plan that will add about 350,000 metric tonnes of global capacity and strengthen the company's capability to meet the increasing demand from its customers. The expansion includes new production facilities at the company's Altamira (Mexico) site as well as additional investments to improve the productivity at its other titanium dioxide sites around the world.

The new line at the Altamira site, at an invest-

ment of over \$500 million (USD), is scheduled for completion by year-end 2014 and will provide approximately 200,000 metric tonnes of new capacity per year. Facility upgrades under way at the company's five titanium dioxide manufacturing sites will continue over the next three years, yielding an additional 150,000 metric tonnes of capacity.

DuPont is recognized as the global leader in titanium dioxide, a white pigment widely used in the coatings, paper, plastics and laminates industries. The capacity expansion and continued focus on science-powered innovations will further enable DuPont to deliver high-quality titanium dioxide to meet rising consumer expectations for quality goods.

"This expansion and upgrades of our facilities allow us to rapidly adapt to changes in the marketplace and consistently meet the ever-changing demands of our customer base," said DuPont Titanium Technologies President BC Chong. "Adding capacity at our Altamira site in Mexico as well as improving our existing uptime and production rates at all sites is a vital part of our strategy to help our customers succeed. By increasing capacity, we will ensure a sustainable

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IN THE NEWS

supply for customers and partners to help secure their success in the marketplace.”

In addition to this expansion of existing manufacturing sites, DuPont will continue to identify capacity options including continued commitment to the current Dongying (China) greenfield plan and other opportunities around the world.

DuPont Titanium Technologies is the world's largest manufacturer of titanium dioxide, serving customers globally in the coatings, paper, plastics and laminates industries.

www.dupont.com

Dow Plans to Integrate and Grow North American Performance Businesses with Shale Gas Liquids

Dow Chemical Company has comprehensive plans to increase the company's ethylene and propylene production and to integrate its US operations into feedstock opportunities available from increasing supplies of US shale gas in the Marcellus and Eagle Ford shale regions.

Dow is currently finalizing plans to increase the Company's ethylene supply and increase its ethane cracking capabilities at existing U.S. Gulf Coast facilities.

Dow is also finalizing plans to increase the company's propylene supply by constructing a new, world-scale, on-purpose propylene production facility at Dow Texas Operations, for start-up in 2015. They are exploring an option to commercialize its own technology to produce propylene from propane, with the potential start-up of a new production unit in 2018.

Dow is pursuing additional feedstocks from the eagle ford and marcellus shale regions.

The company plans to supply the required ethane and propane for these projects through a variety of supply arrangements, including: a possible joint venture fractionator in Texas, supply from existing fractionators, supply from future new fractionators to be built within the industry, and potential supply deals from various shale gas opportunities such as the Eagle Ford and Marcellus shale regions. Dow has signed ethane and propane supply contracts based on the Eagle Ford shale gas and is pursuing several more agreements from this area.

In addition, Dow has signed a Memorandum of Understanding (MOU) with a wholly-owned subsidiary of Range Resources Corporation stating plans to enter into a long-term supply agreement for the delivery of ethane from the Marcellus Region in southwest Pennsylvania to Dow's existing operations in Louisiana.

www.dow.com

Sweet Partnership

The Dow Chemical Company and OPX Biotechnologies Inc., have announced a collaboration aimed at developing an industrial-scale process for the production of bio-based acrylic acid from sugar, such as corn and/or cane sugar, a renewable feedstock.

Acrylic acid is the building-block chemical for acrylic resins—a major raw material in many architectural and industrial maintenance coatings and adhesives.

In coatings, resins function as a film-forming “binder” that imparts key performance and appearance properties such as UV and moisture resistance, durability, gloss, color retention, and scrub resistance.

Dow, a major global producer of acrylic acid and esters, will provide expertise in industrial chemistry, process optimization and product development in the collaborative program. OPXBIO, a company that develops biotechnology processes to convert renewable raw materials into biochemicals and fuels, will contribute in strain development and bioprocessing utilizing its EDGE™ (Efficiency Directed Genome Engineering) technology.

OPXBIO says the technology platform enables it to engineer high-performing microbes and bioprocesses more effectively and efficiently compared to conventional genetic engineering methods.

OPXBIO, based in Boulder, Colo., manufactures renewable bio-based chemicals and fuels. The company says it developed and piloted the microbe and bioprocess that will produce its first renewable chemical product—BioAcrylic—at a lower cost than petro-acrylic, with a 75 per cent reduction in greenhouse-gas emissions.

Another product is diesel fuel bio-processed from carbon dioxide and hydrogen.

Dow said the program will seek to develop a “commercially robust” process using sugar to produce 3-hydroxypropionic acid (3HP), a building block for acrylic acid. The sugar can be derived either from corn syrup or cane. The 3HP is then converted to acrylic acid.

Acrylic acid, in turn, is a building block for a range of materials. Acrylic acid is converted to glacial acrylic acid or an acrylic ester such as butyl acrylate, a common ingredient in coatings raw materials.

www.opxbio.com

BASF Canada successfully completes Responsible Care

BASF Canada has successfully completed a 3rd party re-verification of its Responsible Care management systems. Having received initial verification in July 1995 and completed the re-verification site visits in December 2010, this is the fifth time BASF Canada has received positive results from the assessment.

Responsible Care is a Chemistry Industry Association of Canada (CIAC) initiative designed to promote dedication to technologies and business practices for sustainability. The re-verification is a system to ensure that the Responsible Care management processes, ethic and principles for sustainability are in place, that performance related to environmental protection, health, safety and security has improved and will continue to do so. The 3rd party team that verified BASF's performance was composed of peers and representatives from the community.

This year, the team concluded that BASF Canada has effective management systems in place to meet the Responsible Care codes and determined it is capable of identifying deficiencies through its management systems, processes, and performance indicators. The team also indicated that BASF demonstrates continuous improvement consistent with the expectations of the company's stakeholders, including neighbours, employees, peers and governments.

“We're proud of this re-verification,” says Laurent Tainturier, President of BASF Canada. “Like all of BASF, we take the corporate value of Sustainable Development very seriously. It's gratifying when the Responsible Care audit team certifies that we are taking the right steps towards environmental protection and social responsibility and identified some areas for us to improve.”

www.basf.ca

Building permits up 17 per cent in March

The value of Canadian building permits hit \$6.8 billion in March, the highest level since June 2007. The 17.2 per cent overall monthly gain was predominantly due to increases in the residential sector, where permits increased nearly 34 per cent to \$4 billion during the month. The non-residential sector edged down 0.4 per cent to \$2.8 billion in March. But that came after a 72 per cent gain in February.

Building permits are a gauge of construction activity to come.

The value of permits for multi-family dwellings more than doubled in March to \$1.9 billion, following two consecutive monthly decreases.

Nationally, municipalities approved 17,141 new dwellings in March, up 26.7 per cent from February. The increase came from multi-family dwellings, which rose 55.5 per cent to 10,469 units. The number of single-family dwellings declined 1.9 per cent to 6,672 units.

Regionally, Ontario led the gains, but the total value of permits increased in eight of Canada's ten provinces. Alberta recorded the largest drop in March as a result of a decline in the non-residential sector, after a significant increase in February.

Demand Grows for High-Performance Pigments

Worldwide high-performance pigment (HPP) consumption is currently estimated at 136,600 tonnes and expected to reach 175,200 tonnes by 2015, according to a new study by IntertechPira.

According to the study, rising oil and raw materials prices, coupled with the economic climate, are significant challenges for the high-performance pigments market. But in spite of this, long-term demand for HPPs will continue to grow, especially in some important markets, such as the printing inks and packaging segments.



IntertechPira predicts average global growth for HPPs in excess of four per cent for both volume and value over the next five years. Much of this growth is due to the increase in demand for cleaner, brighter colors with high resistance properties. However, with more competition in the market, and with the entrance of new players, pricing is under severe pressure, which is allowing for the use of HPPs in new applications.

The report, The Future of High Performance Pigments III – Market Forecasts to 2015, provides a detailed analysis of the current and future demand for high-performance pigments on a global scale over the next five years. Breaking down market forecasts by end-use sector, geographic region and pigment type, the study also addresses market drivers such as the dramatic increase from Chinese manufacturers, the effect of REACH legislation on the pigment industry, availability of raw materials and technology issues.

According to IntertechPira, Asia is the largest regional market by sales value, with total forecast

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sales in 2015 of \$1.64 billion, followed closely by Europe, with sales of \$1.58 billion. North America is the third-largest market, with sales expected to amount to just over \$1 billion in 2015. Asia will command 37.3 percent of the global market, Europe 36 percent and North America 23.2 percent.

By individual country, average annual growth rates for HPP sales volumes to 2015 range from 1.1 percent in the Iberian region to 8.3 percent in Russia. Emerging markets show more robust performances than established ones, with the possible exceptions of the Benelux region and Germany, where IntertechPira forecasts average annual growth to be 4.5 percent and 4.4 percent, respectively. The largest country market for HPPs is the United States, which accounts for around 20 percent of the global HPPs industry, both by value and volume.

China is the biggest pigment producer in the world with rapidly increasing output in recent years. IntertechPira predicts that pigment output there will reach 2.4 million tonnes in 2010. China is also the biggest pigment exporter. Exports of pigments reached 1.1 million tonnes in 2009. Yet China's pigment industry is driven mainly by its thriving downstream industries, such as coating, ink, plastic, rubber, papermaking and textiles. The country's coating industry, for instance, which consumes close to half of all home-made pigments, is experiencing output growth of 20 percent year on year.

According to IntertechPira, the largest end-use sector, by some margin, is coatings. Sales of coatings are forecast to reach 97,900 tonnes in 2015, or 55.8 percent of the total market. This is followed by the plastics segment, which is forecast to account for 39,100 tonnes of HPP sales in 2015, or 22.3 percent of the total.

The two smallest end-use markets, non-impact printing (NIP) and electronics, are each forecast to show pigment sales levels of less than 2,000 tonnes. IntertechPira expects sales into the NIP segment to stand at just over 1,000 tonnes in 2015 and those into the electronics industry at 1,500 tonnes, representing average annual growth for the six years 2009–2015 of just over 60 percent in each case. This makes them the fastest growing end-use sectors among the eight categories covered by this forecast.

www.pira-international.com.

New Recommendations Released for Occupational Exposure to Ultrafine TiO2

The National Institute for Occupational Safety and Health (NIOSH) Washington, DC, has released a new Current Intelligence Bulletin (CIB) that addresses exposure limits to ultrafine Titanium Dioxide (TiO2). Titanium Dioxide is produced and used in the workplace in varying particle-size fractions, including fine and ultrafine sizes.

The NIOSH CIB reviews the animal and human data relevant to assessing the carcinogenicity and other adverse health effects of TiO2.

NIOSH suggests exposure limits of 2.4 mg/m3 for fine TiO2 and 0.3 mg/m3 for ultrafine (including engineered nanoscale) TiO2, as time-weighted average (TWA) concentrations for up to 10 hours per day during a 40-hour work week. NIOSH has determined that ultrafine TiO2 is a potential occupational carcinogen, but that there is insufficient data to classify fine TiO2 as a potential occupational carcinogen. For the full report, visit

<http://www.cdc.gov/niosh/docs/2011-160/pdfs/2011-160.pdf>.

Pricing Updates

Arkema Emulsion Systems Announces Price Increase for Latex Products

Effective June 1, 2011 or as contracts allow, Arkema Emulsion Systems increased pricing on all latex products. UCAR acrylic, styrene-acrylic, styrene-butadiene and NEOCAR Acrylic latexes will increase by \$0.08 to \$0.10 per wet pound. UCAR vinyl-acrylic, EVOCAR vinyl acetate-ethylene and NEOCAR Latexes will increase by \$0.03 to \$0.035 per wet pound.

This action is necessary due to continued escalation in cost of feedstocks and key raw materials used in the production of latex polymers including propylene, acrylate esters and methyl methacrylate.

Customers should contact their Arkema Emulsion Systems account representative for additional details.

ISP To Increase Global Prices an Additional 10%

International Specialty Products Inc. (ISP) will increase global prices for polymers, vinyl monomers, emollients, emulsifiers, preservatives and encapsulates 10 per cent effective June 1, 2011, or as contracts allow.

This increase applies to products sold into the personal care, pharmaceutical, oral care, beverage, performance chemicals and agricultural markets. This price increase is in addition to the 10 per cent increase that was previously announced effective February 1, 2011. This additional price increase is necessary due to continued material and energy cost escalation.

ISP is also increasing prices globally for all Biocides containing 3-Iodo-Propynyl-Butylcarbamate (IPBC) by 10 per cent, effective June 1, 2011, or as contracts allow. Continued raw material cost escalation, especially for iodine, along with increasing regulatory, compliance, energy and transportation costs have necessitated this increase in addition to the up to 10 per cent increase previously announced effective March 15, 2011.

Sartomer Increases Prices on Monomers and Oligomers

Sartomer USA, LLC announced price increases of 4 to 12 per cent for all oligomers, as well as acrylate and methacrylate monomers sold in the Americas, effective June 15 or as existing contracts allow. The adjustment is driven by the continued escalation in raw materials costs caused by their tight supply and increases in their associated feedstocks.

www.sartomer.com

DSM to Globally Increase Prices for all Liquid Polyester Resins, Beads and Urethanes

Effective June 1, 2011 or as contracts allow, DSM Coating Resins will increase prices in all regions for all its liquid Polyester Resins, Solid Thermoplastic Acrylic Beads and Urethanes both solvent and waterborne with significant amounts, depending on the dynamics of the specific raw materials. The price increase affects the entire Coatings, Adhesives and Graphic Arts portfolio, including NeoCryl acrylic beads, NeoRez waterborne urethanes, NeoRez, Uraflex and Solucote solvent borne urethanes, Uradil waterborne polyesters and Uralac solvent borne polyesters.

The increases are necessitated by the fact that prices for critical raw materials continue to rise significantly. This is in large part down to supply-demand imbalances caused by structural capacity constraints, soaring demand in certain value chains and outages driven by force majeure, such as the recent tsunami in Japan.

"Current raw material price rises continue to outpace our own mitigation efforts, meaning that margins at these products are now at unsustainable levels. By acting now to address this, we hope to ensure that we can continue focusing on our customers by delivering innovations and supply capabilities for the technologies of the future," said Patrick Niels, Director, DSM Coating Resins.

BYK announces price increase

Effective May 15, 2011, BYK Additives & Instruments will increase prices for its product lines of wax, paint, plastics and industrial application

additives between 5 per cent and 9 per cent, or more for selected products. The price increase is to offset significant increases in raw material costs and operational costs such as energy, environmental, legal and regulatory compliance. This price adjustment is necessary to allow BYK and its affiliates to continue offering the high performance products and services that the customers expect.

Enthone Introduces Decorative and Hard Chrome PFOS-Free Processes Meet EPA Requirements

Enthone, Inc., a business of Cookson Electronics, has introduced a family of PFOS-free wetting agents/fume suppressants (WAFS) for decorative and hard chrome applications. Each process offers surface finishers environmentally sound, high performance solutions that address the pending U.S. Environmental Protection Agency (EPA) rules significantly impacting the use of Perfluorinated Octane Sulfonate (PFOS) fume suppressants for plating processes.

ENTHONER[®] PFOS-free solutions minimize air emissions, while reducing worker exposure to hexavalent chromium. Transitioning from PFOS-containing processes now, ensures an uninterrupted chemistry supply and service when the new EPA regulations take effect. Specifically, the processes include:

- ANKOR Wetting Agent FF: effectively prevents misting from decorative hexavalent chrome solutions based on formation of a foam blanket.
- ANKOR PF1: designed to reduce the surface tension of hexavalent chrome solutions with low foam generation. It is stable at elevated temperatures and can be used to reduce misting in operations such as hard chrome, decorative chrome and anodizing.
- UDIQUE Wetting Agent PF2: low foaming wetting agent that also reduces surface tensions designed for use in chromic acid etch solutions found in plating on plastics applications.

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IN THE NEWS

The final rule from EPA is expected to be approved later this year. Once enacted, the law will restrict the use of PFOS-based wetting agent/fume suppressants (WAFS) used in chromic acid anodizing, decorative chromium electroplating and hard chromium electroplating.

Brian DeWald, Director of Marketing and Commercial Development, Enthone Americas said, "By adopting a proactive approach to the PFOS issue years ago, Enthone is able deliver uninterrupted service and an uninterrupted chemistry supply to our customers now faced with needing to make the move to a more environmentally-friendly alternative."

www.enthone.com/PFOSfree

People

Saucier at CACD

Dave Saucier, former president of TOSCOT has left his position at Unipex and is now working part time for the Canadian Association of Chemical Distributors (CACD) as Manager, Regulatory and Government Affairs, and for himself as a consultant for New Substance Notifications.

Saucier can be reached at: HDTs Chemicals



Dave Saucier

Inc., 4426 Vallence Drive, Burlington, ON L7L 6J8
T 905-631-1962 F 905-631-5719,
www.HDTsChemicals.com

Byers Bush Hires New Outside Sales Representative

Byers Bush Powder Coating Inc. is pleased to announce the hiring of Len Yap as a new Outside Sales Representative.

Yap started his career over 30 years ago with Sherwin-Williams doing color matching, accounts receivable/payable and industrial technical sales. He

received training in powder coatings, wood finishes, automotive finishes and consumer products and within three years he was promoted to Store Manager.

After Sherwin Williams Canada, he joined International Paints as Factory Store Manager where he was responsible for bottom line results, which encompassed retail, dealer, protective coatings, and product finishes of which powder coatings was a part.



Len Yap

Over the last 15 years Yap has worked in the role of customer development manager at Chemcraft/Sico/Akzo Nobel responsible for identifying and commercializing OEM accounts within NAFTA. He acquired key accounts such as Volvo, Snap-On and Ingersoll-Rand, which expected exceptional customer service to remain customers.

His experience working with major OEM'S has provided him with an appreciation of the constant stress manufacturer's face to improve quality while at the same time reducing costs.

Albert von Hebel appointed member of the management team of BYK-Chemie GmbH

Albert von Hebel succeeds Gerd Büscher as Managing Director at BYK-Chemie GmbH, effective April 1. In his new role, he is responsible for the areas of finance, controlling, purchasing, IT, integrated management systems, and general administration.



Albert von Hebel

Albert von Hebel, 49, was born in Papenburg, Emsland in Lower Saxony. After studying business economics in Münster, he worked for roughly eight years at an auditing and tax advisory company in Düsseldorf. During this time, he successfully completed his tax consultant state examination. In the 20 years following, he was employed in a variety of roles in commercial departments of the companies within the ALTANA Group. In 1996 he moved to BYK-Chemie GmbH in Wesel. For the last four years, von Hebel has been Head of Finance & Controlling of ALTANA AG.

Gerd Büscher retired in May after 20 years service with the company.

Certified's Growth Focused on Increasing Service Level

Certified Coating Specialist Inc. (Certified) has recently appointed Mark William as Vice President Business Development. Certified is the industry leading coating contractor specializing in corrosion management, asset rehabilitation, lead abatement, and industrial and marine painting. Certified is a SSPC QP1 and QP2 certified contractor, and in 2009 was ranked as one of the fastest growing companies in Canada by PROFIT.

William grew up in the Canadian oil and gas industry with the last decade focused on anti-corrosion in the pipeline and pipe coating industry. As Canadian Manager for ShawCor's field coating division Canusa-CPS he was instrumental in achieving market growth objectives, new product development, and the commercial introduction of many new products and services. William has also used his experience and understanding of coating application to make positive contributions to the industry as a whole by spearheading the creation of the first Field Applied Pipeline Coating Application Training Course. NACE will be facilitating the first pilot of this course near Edmonton Alberta September 12-15, 2011.

William holds an MBA from the University of Calgary and a Bachelor of Administration degree from Athabasca University. He has also been a long-standing member of NACE International, the Canadian Heavy Oil Association, and Ducks Unlimited. Follow Mark William on LinkedIn.

Contact Mark William directly at: 403-620-7657 www.ccscoatings.ca

Bayer MaterialScience LLC's Steven Reinstadtler elected to board of Polyurea Development Association

Bayer MaterialScience LLC coatings expert Steven Reinstadtler has been elected to the Polyurea Development Association (PDA) board of directors. Reinstadtler, industrial marketing manager, Construction for the Coatings, Adhesives, and Specialties (CAS) division, Bayer MaterialScience LLC, will serve a two-year term on the PDA board, effective immediately. He has been a member of PDA since 2001.

The Polyurea Development Association was created in 2000 to serve as the trade association for the global polyurea industry. PDA works to define and market polyurea products, set standards for polyurea applications and provide training programs for developers and applicators of polyurea coatings. The organization also regularly hosts trade meetings, bringing the industry together to provide new product information, technical presentations, educational programming and networking opportunities.

Along with other board members, Reinstadtler will be responsible for developing and executing the overall strategy of the organization. The board will work to promote market awareness and understanding of polyurea technologies through the development of educational programs, product standards and by determining safety and use recommendations.

Reinstadtler will leverage his 22 years of experience with Bayer MaterialScience LLC in thick film traditional polyureas, high performance polyaspartics and other topcoats to help PDA expand in scope relative to adjacent high-performance coating technologies.

Calendar of Industry Events 2011

June 14-15: SUR/FIN 2011 in Rosemont IL. (Chicago) www.nasf.org

October 4-6: NAI The North American Industrial Coating Show, Duke Energy Convention Center, 525 Elm Street, Cincinnati, OH. www.thenaicoatingshow.com

October 4-6: AAC 2011 Anodizing Conference and Show, Tempe, Arizona. www.anodizing.org

October 27-29: WMS Woodworking Machine and Supply Expo, Direct Energy Centre, Toronto, Ontario. www.woodworkingexpo.ca

November 14-17: FINISHING TECHNOLOGIES Pavilion and Conference at FABTECH Chicago II. www.ccaiiweb.com

Calendar of Industry Events 2012

May, 8-10, 2012: American Coatings SHOW, Indianapolis, IN, USA. www.american-coatings-show.com

May, 7-9, 2012: American Coatings CONFERENCE, Indianapolis, IN, USA. www.american-coatings-show.com

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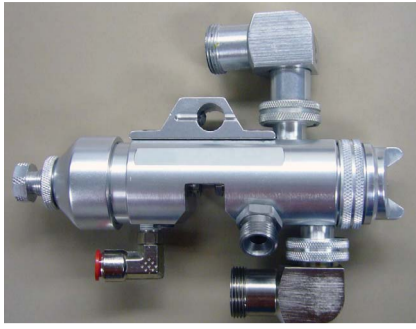
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INDUSTRIAL FINISHING: AUTOMATIC LIQUID PAINT SPRAY GUNS

continued from front cover



2600 Automatic Spray Gun (Patent Pending) from Can-Am/TurboAir

- to 1,700psi
- Extremely consistent film thickness for robotic fluid application from 1"-36"
- Seven Needle/Nozzle sizes
- Four Air Cap designs for product-specific purchases
- Outstanding metallic spray dispersion

Exel North America Inc. has Kremlin Rexson's new line of AVX Automatic Airmix guns that have been in the field performing very well with improved atomization and long life before repair. These guns are innovative and have been developed in cooperation with automatic machine builders to help assure their superior performance and ease of installation. These AVX Automatic Airmix guns are also proving themselves when stationary mounted or when mounted on EXEL's SAMES line of RFV reciprocators.



Exel North America Inc. line of AVX Automatic Airmix

The guns use Airmix technology, have a smaller and lighter design, side and rear entry base plates, less fan pattern turbulence, optimized design for water-based applications and superior atomization.

Features and benefits include: excellent finish quality, material savings, improved working conditions and spray area are results of the new VX114 aircap; compatible with water-based products: all wetted parts made of stainless steel with a range of specific tips, increased performance and fan width adjustment kit available as an option (sullied with VX14 aircap).

Graco's AirPro EFX is a complete line of air spray automatic guns with optimized performance at low flow rates. These compact and lightweight guns have aircaps and nozzles that are specifically designed to deliver superior spray performance for the small electronics market, which includes computers, cell phones, consumer electronics and car electronics. Certain models of the AirPro EFX automatic air spray guns have high wear components that keep these guns lasting longer while spraying metallic coatings and abrasive materials. The modest size

and weight of this gun make it an excellent choice for fixed, reciprocating and robotic applications.

Wendy Hartley, Worldwide Product Marketing Manager says, "Customers that are spraying small components are asking for precision in the spray pattern and the fluid flow. The spray pattern must deliver a high quality finish in a precise, repeatable spray pattern. The gun has to be



Graco's AirPro EFX

designed to deliver a stable and repeatable fluid flow rate. In addition, the operator has to be able to adjust the fluid flow in fine increments. The ability to deliver a stable, high quality spray pattern is key for small component finishing."

Hartley also suggests, "The Finisher has to spray test the gun to determine if it delivers a high quality finish with their material." She adds, "The finisher should work with their material supplier to determine if the liquid is best sprayed with high pressure or low pressure. Once this is determined, there are a wide range of guns to choose from. For high pressure spraying, Graco's G40 Auto is a good choice. With this gun, the finisher will be able to choose the type and size of tip that best suits their application. For example, Graco offers an AAF tip, which is recommended for spraying lacquers and waterborne materials. The AAF tip is available in a variety of sizes depending on the finishers' material flow rate and spray pattern

width requirements."

Hartley further suggests, "For low pressure spraying, Graco offers the AirPro Auto or AirPro EFX. The AirPro Auto will fit the majority of finishing requirements for material flow rate. The AirPro EFX is designed for lower flow applications or air brush finishing. The finisher will be able to determine if AirPro Auto or AirPro EFX is the right gun, based on the material flow rate required for their application."

The **Lemmer AU-100** automatic air gun offers a high degree of flexibility to the small to medium manufacturer needing a precise, yet highly adjustable spray pattern. Both flow rate and spray pattern size are adjustable right at the gun to allow 'on the fly' changes. This top quality design addresses all of the most common concerns and questions posed by customers including wide range of adjustment, reliability, compact design, easy to mount and connect, no special threads or hose sizes



Lemmer AU-100

and low air consumption.

Lemmer also offers the Wiwa 300 automatic airless spray gun. It is ideal for medium to large manufacturing situations where the high flow rate and fast material build rate of airless spray is required. This innovative, heavy-duty design meets the requirements of the most demanding customers including high reliability, compact size, simple to mount and connect, industry standard threads used throughout, fast cycle times, low air consumption to activate and high flow rate in thick materials.



Lemmer Wiwa 300

Customers need a high application process security, low maintenance requirements, long-term spare parts availability and individual solutions for their needs. This is all characterized by the **SATA** Automatic and Robotic industrial spray guns.



SATA Automatic and Robotic industrial spray guns.

According to VOC legislation, coating systems with high material transfer rates should be used: i.e. equipment with HVLP or RP pressure technology. This helps protect the environment and reduce solvent emissions. SATA's strict controls during the manufacturing & assembly process secure consistently high quality in terms of spray performance, atomization and the achievable finish. Material savings also create significant economic advantages to the users. ■

Editor's Note: The companies mentioned in this article can be reached at:

www.canamengineered.com

www.exel-na.com

www.graco.com

www.lemmer.com

www.nordson.com

www.satacanada.com





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What's new in UV

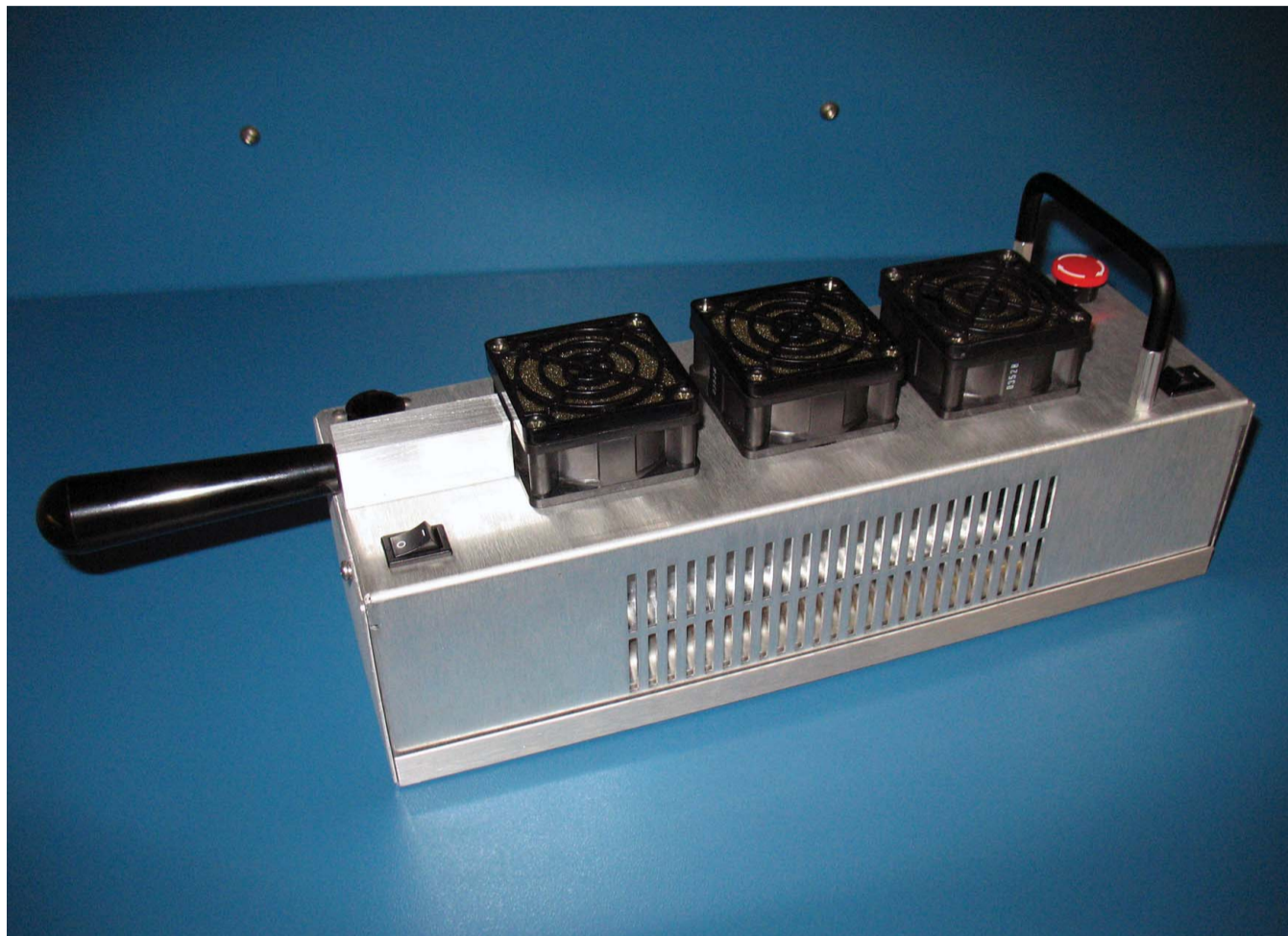
When it comes to UV curing in industrial finishing, equipment manufacturers are answering customer's needs with new products and technologies.

SURFACE/HANDHELD CURING

Because customers have requested ultraviolet curing solutions for many different, and sometimes quite unique surfaces, and hard to access applications, American Ultraviolet, along with its Lesco UV division, have developed Floor and Handheld equipment designed specifically to cure inks, coatings and adhesives.

Floor Cure systems cure clear coatings on concrete, marble, and even hardwood floors, and are commonly used in showrooms, manufacturing and processing plants, warehouses, hospitals, assisted living facilities, commercial office space and residential properties – anywhere solid surface flooring needs to look good and last a long time. These systems also cure clear coatings on walkways, safety striping and signage, allowing for quick and easy cleanups.

Handheld systems enable one person to easily cure surfaces and substrates that for one reason or another cannot be brought to more common curing equipment, like fiberglass bathtubs, countertops, automotive panels, wires, pool cues, and flooring that needs to be touched up. The handheld systems are also often used



Handheld from American Ultraviolet.

in testing laboratories and for new product development.

Floor Cure Systems are designed to provide UV-cured protection that improve the life, productivity and appearance of solid surface flooring. The FC Series is self-propelled, enabling the operator to simply walk behind the unit, guiding its direction – no pushing necessary. This “green” technology cures coatings very quickly, emits no volatile organic com-

pounds (VOCs), is low odor, and is the most cost-effective method for protecting and maintaining concrete, marble and even hardwood floors in showrooms, manufacturing and processing plants, warehouses, hospitals, assisted living facilities, commercial office space and residential properties.

The result is an immediately usable, long-lasting floor that is durable and easy to maintain. Annual floor maintenance

costs are reduced, because floors won't need to be recoated as often, and fewer maintenance supplies will be required.

Porta-Cure Handheld Systems enable one person to easily cure surfaces and substrates that cannot be brought to UV curing equipment. A few examples include fiberglass bathtubs, countertops, pool cues, and flooring that need touching up. Porta-Cures are also used in testing laboratories and for new product devel-

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INDUSTRIAL FINISHING: UV CURING



opment. All 3 models contain a medium pressure mercury vapor discharge lamp with high efficiency output in the 185-400nm UV cure range.

The QPC-6 is a portable, lightweight, all-in-one UV curing system that makes curing concrete and wood floors very simple. In addition to flooring, the QPC-6 can be handheld and used to cure inks and coatings on countertops and bathtubs.

The shuttered, proximity-sensor equipped lamp assembly assures exposure of only the selected surfaces, while the versatile lamp assembly allows the lamp to be mounted parallel, or perpendicular, to the "hockey stick" accessory's direction of travel.

MICROWAVE-POWERED ULTRAVIOLET (UV) CURING SYSTEM

Ed McGhee, Industrial Sales Manager, Nordson UV Systems Group says, "Nordson's newest offering for UV curing applications is the CoolWave 610I with internal blower."

The CoolWave 2 610 System offers adjustable UV output from 20-100 per cent, allowing the ability to match the exact UV output to specific application requirements, optimizing power consumption. Dichroic-coated reflectors precisely focus UV light only where needed without the damaging infrared energy.

With the optional internal blower there is no need for any external/remote cooling blowers. This self-contained lamp head simplifies installation and control. As the user increases or decreases the UV power setting on the power supply, the blower will automatically adjust lamp head blower speed to insure that proper lamp cooling is maintained. This is critical to maintain the proper spectral quality of the UV lamp.

"By using the internal blower CW2-610I lamphead, end-users can save thousands of dollars – in many cases \$10,000 to \$15,000 — by eliminating the labor associated with ductwork installation, valuable manufacturing space and the costs associated with cooling the blower," says McGhee

The CoolWave Controller is a fully variable power supply. UV power output is adjustable from 20 per cent to 100 per

cent of full UV output power in 1 per cent steps. CoolWave controllers are reliable, feature-packed systems. A single interconnect cable interfaces the lamphead directly to the controller, reducing installation time and spare parts inventory. This patented, highly flexible cable also features a unique indicator to ensure that installation has been performed correctly.

Every power supply features: Remote I/O as a standard feature Electrical noise filtration Simple operator interface CE approvals Clean efficient design for reduced costly downtime Digital display for ease of troubleshooting.

Cooling Pressure Readout – A patented cooling pressure digital readout is incorporated into the system, allowing easy monitoring of the actual lamphead internal cooling air pressure.

Remote Customer Interface – Two methods on connection. The first is a simple, hard-wired connection through the provided I/O terminal strip. For more advanced users, an optional PLC interface (DeviceNet) is also available.

CW2-610 Lamp head – No Internal Gasketing - The design has eliminated the maintenance intensive internal gasketing in the microwave cavity. This reduces operational and maintenance costs, as well as expensive downtime related to internal arcing.

Cooler Operation – The dichroic-coated reflector does not reflect all of the heat-generating infrared light waves back to the substrate. The result is precisely focused UV light where you need it without the damaging infrared energy that is inherent to non-dichroic coated metal reflectors.

Durable glass reflectors - Rather than use conventional polished metal reflectors, the CoolWave uses a proprietary reflector, that is constructed of tempera-

ture-stable glass with an engineered dichroic coating as a standard feature. The use of glass reflectors allowed Nordson the design flexibility to offer multiple reflector sets for the CoolWave

Internal Blower Option – With the optional internal blower there is no need for any external/ remote cooling blowers. This self-contained lamphead simplifies installation and control. As the user increases or decreases the UV power setting on the power supply, the blower will automatically adjust lamphead blower speed to insure that proper lamp cooling is maintained. This is critical to maintain the proper spectral quality of the UV lamp. ■ www.nordsonuv.com

Editor's Note: Every effort was made to contact suppliers and manufacturers of UV Curing systems. If we missed you and you have a New Product to share with our readers you may send it in .doc format to sandra.anderson@cfc.ca.



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For over thirty years, Chemcraft® has been proudly setting standards for industrial wood finishes. We've earned a reputation for innovative technologies and cost efficient systems; a reputation that will only grow stronger now that we're part of the AkzoNobel family. Our access to a worldwide network of technology and innovation experts will take our products and systems to a whole new level. A large part of that innovation is our eco-strategy; sustainability is a deeply embedded part of our philosophy, and the Chemcraft® brand of products embraces this vision fully. Our eco-friendly products give you lower Volatile Organic Compound (VOC) emissions without sacrificing performance properties and proves that there doesn't have to be a trade off for sustainability. Combine all that with our commitment to superior customer service and support, and you'll see that we have all the pieces in place to continue in our role as the industry leader for years to come. Chemcraft® is the *obvious* choice for industrial wood finishes. Visit www.chemcraft.com to locate your nearest distributor.

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BOOTH INLET FILTERS

For inlet filters there is a wide variety of filter types depending on the application and the preference of the customer. Proper selection of air intake filters for enclosed paint and powder coating booths requiring a dust free environment can go a long way in preventing product rejects. Filters vary from roll media or cut pads, flat media or extended surface, un-constructed or self supporting, tacky or dry texture. We will discuss some of the more common type.

Polyester Self Supporting Panels (SSP) are offered in a variety of materials and denier. The SSP-53 (dry tack) and SSP-55 (wet tack) are the most common. Manufactured from 2 ply polyester media and incorporating an internal wire frame, these filters are designed for velocities up to 400 fpm. Unaffected by humidity, these filters have a low initial pressure drop and an initial efficiency of 88.4 per cent. Avail-

able in a wide variety of sizes and carton quantities.

Dustlok Polyester Self Supporting Panels are used in applications requiring higher efficiency and/or higher dirt holding capacities. Dustlok's distinct Dual Density media provides maximum dust loading. The course open structure of the white, air entering layer is designed for depth loading. The orange, dense downstream layer prevents finer dirt particles from passing through the filter media. These filters are designed to withstand velocities of up to 500 fpm, and have an initial efficiency of 94.0 per cent.

FR1 Self Supporting Panels and media represent the latest advances in filtration technology for automotive spray painting applications.

These filters are engineered to assure superior performance for all crossdraft and semi-down-draft style paint booths. FR1 panels and blankets offer the ideal combination of maximum efficiency (for absolutely defect-free finishes), extremely high dust holding capacity (for economical operation and long life), and low resistance to airflow, for ideal air velocity in the paint booth.

FF560GX Diffusion Media Air Filter are synthetic fiber-based nonwoven filter products developed specifically for paint booth facilities. The filter media is constructed from selected high performance fine denier fibers in a gradient density multi-layering technique to ensure high depth loading with optimal lowest pressure drop performance.

These medias are thermally bonded and impregnated in full depth with a proprietary adhesive coating to prevent any release of fibers and migration of paint-damaging particles larger than 5 microns due to vibration of the system, even under varying temperature conditions. The clean air side is particularly dense and reinforced with a supporting woven open-



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mesh scrim. This results in a long filter life, high fractional efficiency, prevention of particle migration and reduced energy and maintenance costs.

PAINT ARRESTORS

Paint arrestors are the most varied and expansive filter group for the paint and coatings industry. Paint arrestors vary in weights, thicknesses, densities, sizes and materials of construction. From custom cut blankets to standard size pads, proper selection of paint arrestors is required to insure a quality filtering system with respect for all variables present in your finishing environment.

Paper paint arrestors (PPA) are a multi-layer product with design elements aimed at longevity and service life. Often used as a pre-filter or with two filters in tandem, the standard paper paint arrestors provide modest efficiency with steady airflow. Paper paint arrestors with polyester backing adds efficiency to the PPA technology by bonding it to a non-woven high efficiency polyester backing. Like standard paper paint arrestors, the poly backed PPA's provide longevity and steady airflow, but with far superior arrestance efficiency.

Fibreglas Paint Arrestors feature a progressive density construction that meets the needs of the widest variety of finishing applications. Depending on the thickness and weight, these filters are designed to provide longevity, efficiency, and economy for most painting applications. This standard 2" thick fibreglass paint arrestor is white/green in colour and is especially useful for heavy coating and wood working applications. This types of filters has an efficiency rating ranging from 91.5 per cent to 98.7 per cent.

Smart Media Paint Arrestors are manufactured as a high loft filtration product with progressively denser layers of fiber from the air entrance to air exit surfaces. Due to a patented process, they are softer to the touch than traditional fibreglas only products, making them easier to handle. Smart Media products are available in a variety of styles and demonstrate high particulate holding capacity as well as exceptionally high efficiency. What's more, Smart Media products possess unique compression qualities that allow them to be virtually flattened during packaging, yet return to 100 per cent of their original dimension when pressure is released. As a result of this unique property, SM products dramatically lower shipping costs and storage space

requirements. Efficiencies range from 99.1 per cent to 99.9+ per cent

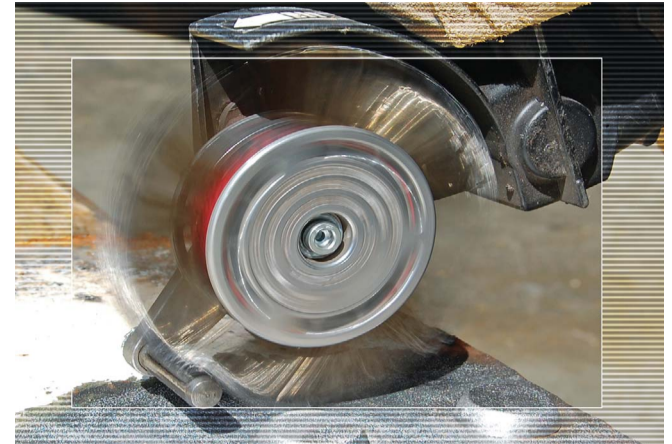
Accordion Pleated Paint Arrestors are an industry classic, the traditional accordion style design provides consistent air flow and efficiency with an extended service life. Available with or without poly backing, these filters are used on general spray applications and efficiencies range from 98.1 per cent to 99.0 per cent.

Channel Media Paint Arrestors are a 1.5" high-loft paint arrestor. Its channel construction provides maximum efficiency and optimal air flow. Channel Media is also widely popular as a pre-filter in multi-stage spray-to-waste powder coating applications. Efficiency rating of this filter is 99.7 per cent. ■

This article was provided by Norspec Filtration, Sarnia, ON. www.norspec.com

More on Filters and Spray Booth Management on page 21

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NORSPEC FILTRATION LTD. is an industry leader in the supply of filtration products, serving the paint and coatings industry for close to 25 years. Norspec offers filters for both the industrial paint spray market and automotive collision repair aftermarket. Filters for downdraft spraybooths, crossdraft spraybooths, panel filters, diffusion media pads and blankets, paint overspray filters, high temperature filters, replacement filters for powder booths, compressed air filtration, compressor filters or liquid filtration. We are Canada's single source for filters.

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continued from front cover

trolyte, which is chromic acid) and a source of direct current, which supplies an electromotive force to the cathode (the part which is to be plated with chromium).

However, to get to this point in the development of industrial electroplating technology (which includes chromium plating and all the other metals which can

be electroplated from chemical solutions) means that one must also understand the various and separate factors that needed to be “put in place” before we reached this point. And the starting point of any understanding of plating process is chemistry and the fathers of modern chemistry – The Alchemists.

The Alchemists and Alchemy operated several thousand years ago and in virtual-

ly all cultures. Their goal was the transmutation of base metals (mainly lead) to gold via the Philosophers Stone. Modern Alchemy saw its greatest evolution into a true science during the Industrial Revolution in England (which was from about 1760 to 1830) with advances in, to name a few sectors, manufacturing technology, chemistry, metallurgy, transportation, health, sanitation, the understanding of science, and the “scientific method”.

Geology (which is the study of rocks and an attempt to understand how the earth was formed beyond the religious interpretation) was one of the well

At this time there were also several key developments that needed to be made before electroplating could be established:

- Michael Faraday's laws of electrolysis (which govern all electroplating reactions) and the basics of electrochemistry
- The electric pile was developed in the early 1800's by Alessandro Volta
- Humphry Davy's work on electrolysis and the discovery of new elements from electrolysis, acid-base reactions, the theory of “chemical affinity” (which we now refer to Free Energy).



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“At the start of WW2 (from 1939 – 1945), chromium plating was a well established process that allowed real advances in engine and armaments technology. It is thought that WW2 would have been very different had it not been for chromium plating.”

known older sciences at this time and there were several metallic discoveries also at this time.

One important metal was called “chromium” which was discovered by Vauquelin in 1779 in a Siberian red lead called Crocoite (a lead chromate ore $PbCrO_4$). Chromium was first isolated in 1798 by the reduction of the chromate with charcoal at high temperature.

Davy is also known for the miners' safety lamp.

By the 1850's, just 50 years after Volta's electric pile, electroplating was already an established industry while the electrowinning of metals was introduced in the late 1880's following the work of Davy and Faraday. (Ref: Fleet, et al, ESE Magazine, 1992).

For chromium plating, the earliest work was done by Junot de Bussy who in 1848 was issued a French patent on the electrodeposition of chromium. In 1854 Bunsen published the first scientific paper on chromium electrodeposition. However more credit is due to Geuther who in 1856 in Göttingen, Germany, publishes the first detailed account of chromium electroplating. In this paper, Guether uses a chromic acid solution which may have contained residual sulphuric acid. To verify the work of Geuther, Dr. H. Buff of Giessen tried to repeat the work without success and casts doubt on the results.

Due to the expressed doubts, for the next 40 years many researchers concentrated research on trivalent chromium salts for chromium deposition with no real success (Placet and Bonnet, France; LeBlanc, France). The search for trivalent chromium as a replacement for hexavalent chromium in hard chromium plating applications continues to this day.

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LeBlanc found that he could not electroplate any chromium from solutions of chromium sulphate and there was much controversy about depositing any chromium from any solution.

In 1905, Carveth and Curry working under Dr Bancroft at Cornell University concluded that the findings of Placet and Bonnet were in fact correct and they also produced chromium plate from chromic acid solutions.

This led Bancroft to state in 1906:

“The real solution from which to deposit chromium is not chrome alum nor sulphate, it is chromic acid”.

In 1909, Salzer in Budapest, Hungary showed the benefits of adding chromium sulphate to chromic acid to improve the chromium plate.

From 1912 to 1914, Sargent at Cornell University carried out a systematic study of the electrolysis of various mixtures of chromic acid and chromium sulphate but did not publish the results until 1920.

By the early 1920's (after WW 1) in Berlin, Liebreich was studying the same subject as Sargent. This led to Liebreich in 1924 taking a patent on the ready electrodeposition of chromium and the first commercial procedures for chromium plating from chromic acid.

In the US work was also going ahead on a commercial chromium plating process. Building on the work of Sargent, Fink and co-workers Schwartz, Eldridge and Dubpernell did highly valuable work at Columbia University.

This results in the commercial deposition of chromium simultaneously in the USA and Germany. The year is 1924, which is noteworthy because this is only 15 years before the start of WW2.

In 1928, following on from work in the early 1920's by Fletcher, Ollard and MacNaughton, chromium plating processes were marketed commercially in the UK.

So, by the late 1920's chromium plating had been commercialized in the USA, the UK and Germany.

The first chromium deposits were plated from a cold solution and were thick, dull deposits which had to be polished to obtain a high luster. It was also found that chromium could not be used as a complete replacement for nickel plating but as a thin top layer over the nickel.

One of the greatest advances in chromium plating was with the introduction in 1932 of silicofluoride ions as catalysts in addition to sulphate ions. This solution has a cathodic efficiency of between 18 – 20 per cent, compared with the 12 – 15 per cent cathodic efficiency of chromic acid and sulphate only solutions.

At the start of WW2 (from 1939 – 1945), chromium plating was a well established process that allowed real advances in engine and armaments technology. It is thought that WW2 would have been very different had it not been for chromium plating.

In the early 1930's Rolls Royce broke the world air speed record with an inter-

Table 1: A summary of the parameters involved in chromium plating*

Parameter	Hard Chromium	Decorative Chromium
Chromic Acid (g/L)	250	250
Temperature (F)	120 - 140	90 - 120
Cathode	Part to be plated	Part to be plated
Anode	Lead – Antimony alloy	Lead – Antimony alloy
pH	< 1	< 1
Sulphate catalyst (g/L)	2.5	2.5
Plating time	5 minutes – 24 hours	Up to 5 minutes
Current Density	500 Amps/square foot	175 – 300 Amps/square foot

* Reference: Metal Finishing Guidebook, 2001

nal combustion engine that would eventually power the Spitfire fighter. Chromium plated internal combustion engine components (pistons, piston rings, cylinder heads, etc...) also allowed better oil lubrication and oil retention in the engine which allowed fighters to fly much faster (over 400 mph) and the long range bombers to carry greater payloads greater distances and return. Long range cannons (and rifles) had the interior of their barrels plated with chromium. This conferred hardness to the internal diameter substrate metal, which allowed higher temperature explosives to be used so that projectiles could be fired greater distances.

Chromium plating has not changed very much from these early commercial solutions patented in the 1920's. The electrolyte (plating solution) is chromic acid with sulphate as a catalyst present at 1/100 of the chromic acid concentration. The two types of chromium plating are hard (also called functional or industrial) chromium plating and decorative chromium plating.

The plating solution is the same for both processes in that the same chemistry is used (chromic acid and a sulphate catalyst) but the plating times are very different. Hard chromium plating can be up to 24 hours whereas decorative plating is up to 5 minutes.

The source of power for plating is the rectifier which converts alternating current (AC) to direct current (DC). There can be no commercial plating without rectifiers, which are the modern day equivalent of Volta's electric pile.

A summary of the representative conditions for hard and decorative chromium plating is presented in Table 1.

Chromium plating is an integral part of industrial manufacturing and many industrial parts are chromium plated. A list of the industrial sectors where chromium plating is necessary, and an integral part of, is shown below.

- Agricultural implements (plows, spades, hoes)
- Armature shafts for motors
- Automotive shock absorbers and struts
- Automotive parts (bumpers, door handles, interior trim)
- Ball valves
- Crankshafts
- Cutting saw blades
- Cutting, milling, turning tools
- Engine cylinders and piston rings

- Engine valve stems
- Gauges and pins
- Gun Barrels
- Hydraulic pistons and cylinders
- Jet engine components
- Aircraft landing gear
- Machine parts
- Moulds and Dies
- Railroad wheel bearings
- Rolls for the steel, paper, aluminum and plastic industries
- Rotogravure cylinders for the printing industry
- Seals
- Textile guides

The chromium plating industry is well established in Canada with the industry found in all provinces (except Prince Edward Island and the Territories). The province with the largest concentration of chromium plating is Ontario which has

about 45% of the industry and which is also evenly split between hard and decorative chromium plating.

Quebec has approximately 24 % of the industry.

In Ontario the split between hard and decorative plating is fairly even. Quebec has a large aerospace sector with hard chromium plating and also chromic acid anodizing.

Due to the requirements of energy sector in western Canada, many of the chromium platers in Alberta and Saskatchewan are hard chromium platers.

Chromium plating or the electrodeposition of chromium from a chromic acid solution (with sulphate as a catalyst) using chromic acid as the electrolyte, two electrodes (a cathode which is the part to be plated and an anode made of lead-antimony) and a source of power (the rectifier which replaces Volta's pile) has become an essential part of the industrialized world and an important industrial sector in Canada. ■

More of the Present and the Future will be in a future issue of CFCM. Peter J. Paine is a senior engineer at Environment Canada, Ottawa, ON. He has extensive experience working with the metal finish industry and is responsible for and administers the Chromium Electroplating Regulations for Environment Canada.

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Advances in Corrosion Resistant Coatings

Corrosion Resistant Coatings manufacturers have undergone changes in their products in the last few years.

Michael Wyrostek, Director of Marketing, NA for MacDermid explains, "Throughout the past 10 years, there has been a significant shift in the original equipment manufacturer (OEM) marketplace, resulting in strict new, performance requirements. Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) compliance, thermal shock resistance as well as consistent friction characteristics, while previously ignored, have now become mandatory." He adds, "Additionally, with global sourcing becoming more prevalent, consistency between tiered suppliers is imperative. Choosing the right technology is an integral part of success, however consistency within the supply chain is critical."

MacDermid has taken this change in market requirements very seriously, addressing it through the creation of a global applicator base under the brand ZinKlad.

This innovative brand approach not only supplies applicators with the latest innovative technology, it offers OEM's an added level of assurance that their most

critical requirements will be consistently met. This is achieved through a comprehensive approval process as well as routine auditing performed by industry experts.

"ZinKlad not only exceeds the current performance requirements, it makes the choice of coating easy, application methods simple and quality conformance more achievable," says Wyrostek. www.macdermid.com/zinklad.

Dynamix Inc. has extensive corrosion resistant solutions in their line of corrosion preventatives/top coats.

Dynacoat DFL is a unique, water-based emulsion wax coating, which is used as a dual-purpose dry film lubricant and corrosion preventative. It is recommended for use on artillery shell casings, small arms ammunition clips, and other weatherproofing military applications. It is also an excellent corrosion preventive and dry film lubricant for steel strapping and is a good piano stringing lubricant. Dynacoat DFL is used as a torque reduction and corrosion resistant lubricant on various fasteners and as a dry film lubricant in the installation of various rivets. This product is recommended for use as a corrosion preventive and decorative coating on cast iron and over treated surfaces such as

phosphated, bonderized, and anodized surfaces. It provides additional protection over all types of plating, including cadmium and zinc. The dry film lubricating and release characteristics of this product make it an ideal mold release. In addition, Dynacoat DFL can be used as a dressing on rubber, plastic and leather, or to provide surface protection and enhance the appearance of interior wood paneling.

Dynacoat No.1 is a Clear inorganic sealer that will enhance the corrosion resistance of chromated zinc and zinc alloys, along with nickel, steel, and chrome. Will increase the salt spray resistance of a trivalent chromate and can extend the resistance of a yellow hexavalent chromate to over 500 hours.

Dynacoat No.2 enhances the corrosion resistance of chromated zinc and zinc alloys, along with nickel, steel, and chrome. The thin, uniform, water-repellent barrier coating will repel humidity and salt spray mist and provide superior corrosion protection.

Dynacoat No.3 is a water based clear, high gloss, acrylic finish. Contains no organic solvents. The cured finish will not dissolve in water and the resulting finish has good resistance to scuffing and scratching.

Dynacoat No.4 is a water based clear, medium gloss, acrylic finish. Contains no organic solvents. The cured finish will not dissolve in water and the resulting finish has good resistance to scuffing and scratching.

Dynacoat TnT is a concentrated, water soluble, liquid product that is used to modify the lubricity of zinc and trivalent chromate coated fasteners, such that the load spreads at torque are reduced. This lubricating film, reduces the coefficient of friction with reproducible results, is dry to touch, non-evaporating and remains on the parts until ready to be used.

Dynacoat WS is a clear, medium gloss hard drying emulsion wax coating that is applied to metal surfaces. The resulting film will not rub off, has excellent adhesion, is ductile and offers good corrosion protection.

Dynafin CBS is alkaline, chrome-based, cathodic passivating solution for copper, brass, bronze and silver. Helps prevent spotting and bleed out, common with cyanide plating solutions, and will increase corrosion resistance while preserving the colour of the deposit.

Dynafin CI No.1 is a corrosion inhibitor used for protecting steel, nickel, aluminum, copper and copper alloys. Helps reduce staining and increases lubricity. Can also be used in burnishing operations.

Dynafin CI No.2 is liquid, chrome free, phosphate free corrosion inhibitor for zinc, ferrous metals and iron, zinc or manganese modified phosphate coatings.

Dynafin CI No.3 is liquid, chrome free,

corrosion inhibitor for un-plated areas on ferrous substrates following nickel and chromium plating.

Dynafin HCC is an additive used to reduce chromate leaching, rub off and staining. Will increase corrosion resistance on hexavalent chromates and can be used with yellow, olive drab and black chromates.

Dynafin ICS is chromium containing iron phosphate sealer to increase the corrosion resistance of subsequent oil or paint finishes.

Dynafin NC is a liquid inhibitive rinse applied on most phosphate surfaces and is designed to promote paint adhesion and reduce drip and run-down staining while increasing corrosion protection. Dynafin NC is suitable for use on iron, zinc, calcium and manganese modified phosphate surfaces.

Dynafin WD is a water displacing, non-staining rust preventive which will rapidly separate water displaced from metal surfaces after machining operations or after alkali cleaning. Ultra thin, highly protective films can be easily applied using spray, immersion, brush, roller or flow coating application methods. Dynafin WD applied films are dry-to-touch and are effective in the protection of ferrous and non-ferrous metals from atmospheric corrosion, even under conditions of high humidity. Dynafin WD also acts as a lubricant and contains no metals except calcium.

Dynapass HBS is a liquid additive used to seal hexavalent black chromates. When used as recommended, corrosion protection and uniformity will be improved while reducing scratching caused by bulk handling equipment.

Dynapass NPS is a liquid sealer utilizing nano-particle technology that will enhance the corrosion resistance of phosphate conversion coatings. Dynapass NPS is used as a post treatment.

Dynaphos Oil No. 1 is a water-soluble rust preventative for steel and zinc phosphated steel. Dry to touch formulation that will add good salt spray protection when applied to Dynaphos HZ.

Dynaphos Oil No. 2 is a water-soluble rust preventative for steel and zinc phosphated steel. Dry to touch formulation that will add 200 hours of salt spray protection when applied to Dynaphos HZ.

www.dynamix-inc.com

Manufacturers of corrosion resistant coatings have followed suit offering products that comply with the changes in the marketplace. ■

Editor's Note: Every effort was made to contact manufacturers and suppliers for this article. If we missed you and you have a new product to share with our readers, please send press releases in .doc format to sandra.anderson@cfc.com.

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What's New with Ethyl Alcohol as a Bio-solvent?

BY RON SHAMASH

The short answer to the above question, from a product perspective, is "not much!" What in fact is new is that the market has been taking a fresh look at the potential for incorporating Ethyl Alcohol as a bio-solvent into their end use products.

Ethyl Alcohol is arguably the most universally recognized volatile bio-solvent.

It is particularly environmentally friendly. It is fully soluble in water at all concentrations, and is easily biodegradable and decomposes rapidly in the environment. It is currently commercially produced predominantly from locally grown corn, wheat and other grains, which absorb carbon dioxide from the air when they grow, producing a relatively small carbon footprint from a lifecycle perspective.

As well, the future looks bright for the commercialization of cellulose-based ethyl alcohol. This will make the product even more environmentally friendly, as the cellulose is readily available in the form of waste paper, wood waste etc. Our company (and others) are getting close to making cellulose-based ethyl alcohol a commercial reality.

Ethyl alcohol is relatively non-toxic and as a result is relatively safe from a personnel handling/exposure perspective.

It is categorized as a GRAS (generally regarded as safe) product by the US Food and Drug Administration for direct and indirect food use, and so is used in printing ink formulations for food label manufacture, glaze coatings for food products and in many other applications.

It is a particularly effective solvent due to its polar molecular structure. It is clear and colourless, thus not imparting colour or haze to its many end use products. End users have incorporated ethyl alcohol into their formulations for such products as floor finishers, printing inks, solvents, coatings, and finisher applications.

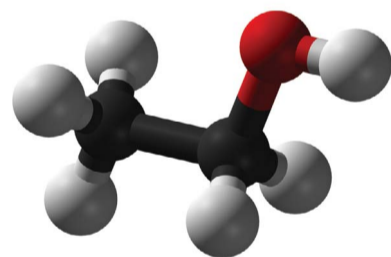
Ethyl alcohol is flammable. It is classified by the Transportation of Dangerous Goods Directorate as a Class 3 flammable liquid. However, it is much less susceptible to ignition from static electricity than most hydrocarbon based solvents. This is also due to the polar structure of the ethanol molecule – it makes the liquid electrically conductive so that static dissipates easily and rapidly from the liquid. For example, benzene, toluene and xylene have an electric conductivity of 1012

ohm-metres, versus ethyl alcohol's at 106 ohm-metres, i.e. a million times more electrically conductive than typical hydrocarbons.

Other characteristics that make it easy to handle include a very low freezing point (below minus 100C), low viscosity (close to water at room temperature, high stability, does not degrade over time), and compatibility with typically available metals and elastomers.

The Ethyl Alcohol industry in Canada is regulated by the Canada Revenue Agency, Department of Excise. If the ethyl alcohol is undenatured, it can be consumed as an alcoholic beverage, hence the Department of Excise's interest in the product. However, when a denaturant is added to the ethyl alcohol, it is rendered unfit to drink, and the Department of Excise is no longer concerned regarding it potentially entering the beverage alcohol market.

The Excise Regulations include a list of approved denatured alcohol formulations that describe which denaturants need to be added, and in what quantity, in order to



satisfy Excise criteria.

The table below lists the approved Canadian denatured ethyl alcohol formulations that are most popular in the solvents and coatings market (for the complete list, refer to Excise Regulation SOR/2005-22).

DA in the table above stands for Denatured Alcohol, and SDAG stands for Specially Denatured Ethyl Alcohol.

The DA grades can be purchased without restriction. The SDAG grades require that the purchaser obtain an SDAG permit from Excise Canada prior to purchase, however obtaining an SDAG permit is a relatively simple process.

The most popular of the above grades in the solvents and coatings market are DA-2A, DA-2I, and SDAG-13.

The particular grade chosen by the end user is the one that is the best fit with the end user's product formulation. If the end use formula contains hydrocarbons, then the "anhydrous" (meaning essentially water-free) version of the above dena-

Column 1- Grade	Column 2- Amount denaturant added to 100 litres of ethyl alcohol
DA-2A	16 L of methyl alcohol (methanol) and 1 L of ethyl acetate
DA-2D	10 L of methyl alcohol (methanol) and 1 L of petroleum naphtha
DA-2I	7.8 L of isopropyl alcohol (isopropanol) and 3.3 L of ethyl acetate
DA-2J	0.8 L of ethyl acetate and 7.1 L of acetone
SDAG-1	5 L of methanol
SDAG-7	500 ML of toluene
SDAG-13	1 litre ethyl acetate

tured alcohol grades is normally chosen for solvents and coatings applications. These are all available in drum as well as tanker truck quantities.

Ron Shamash is GreenField Ethanol's resident biosolvents expert. Greenfield

Ethanol is the largest Canadian manufacturer of industrial ethyl alcohol and has been servicing the Canadian and North American solvents and coatings industry through our Commercial Alcohols division for over 20 years.

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WATER PURE

Water is the perfect ingredient to make a resin environmentally friendly. CFCM asked manufacturers about their products.

In late 2010, Celanese Emulsion Polymers introduced a new line of water-based polymer emulsions, Avicor, and added a new member to its EcoVAE brand of emulsions for environmentally-friendly paints.

EcoVAE 501 is a vinyl acetate ethylene emulsion designed for flat through semi-gloss paints to help meet regulatory requirements such as VOC levels below 50 g/L, APE-free and the ability to achieve green certifications. Avicor 601, the first product introduced in the new line, is a



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GRADES	New CARBODILITE Sw-12g	New CARBODILITE V-10
Appearance	Clear Pale Yellow Liquid	
Chemical Characterization	Multifunctional Polycarbodiimide	
Solid Content	40%	
Solvent	Water 42% Dpm ^{*1} 18%	Water 60%
Viscosity(mPa s)	700 ^{*3}	100 ^{*3}
Carbodiimide Equivalent Wt. ^{*2}	470 ^{*3}	393 ^{*3}

1 Dpm: Dipropylenglycol-Mono-Methylether
2 Carbodiimide Equivalent Weight Shows "Chemical Formula Weight Per 1 Mole Of Carbodiimide Function"
3 Standard Value

100 per cent acrylic emulsion designed for excellent performance in architectural paints across the entire gloss spectrum. This APE-free emulsion has a low viscosity and fine particle size that offers very good adhesion and block resistance in flat through semi-gloss paints.

The two new products, Avicor 601 and

EcoVAE 501, each offer critical performance attributes to low VOC, architectural coatings. The paint manufacturer can also blend the two resins together to balance the performance, marketing and economic characteristics of their formulas. Together, EcoVAE 501 and Avicor 601 can be a platform for a wide variety of

contractor and DIY flat and non-flat paint formulas.

Waterborne resins need to work with cross linking agents. One of Inortech Chimie Inc.'s suppliers Nisshinbo has recently introduced two room temperature cross linkers that are safe to handle and are environment friendly.

When used with polyurethanes dispersions they yield dry films with exceptional adhesion and chemical resistance properties.

CARBODILITE SW-12G & V-10 is a multifunctional carbodiimide based crosslinking agent, which provides higher crosslinking performance over conventional Carbodiimides. It offers shorter curing time at lower and ambient temperatures. It also contains Carbodiimide [N=C=N] which reacts with carboxyl group. Product properties such as water resistance, chemical resistance and adhesion will be improved. ■

Editor's Note: Every Effort was made to contact manufacturers and suppliers for this article. If we missed you and you have a New Product release to share with our readers please email it as a word .doc and high resolution .jpeg images to sandra.anderson@cfc.ca.

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LATEST UV COATINGS TRENDS

DEMONSTRATE ADVANTAGES OF THIS VERSATILE TECHNOLOGY

BY MIKE DVORCHAK

Some think it's the technology of the future. Others see it as a solution to meet increasing environmental regulations and concerns. One thing is clear: ultraviolet (UV)-cure coating technology is one of the fastest-growing segments in the coatings industry. In fact, according to the Chemark Consulting Group, a firm focused on the coatings, adhesives and sealants industries, the global UV-cured coatings market is expected to reach approximately \$1.8 billion by 2012.

The UV-cure segment's growth can be attributed to the coatings' many competitive advantages, including low energy costs, no pot life issues, reduced environmental impact and a fast cure speed. In fact, one-component (1K) UV-cure coating technology is one of the fastest chemistries currently available. Depending on the application, 1K UV coatings can take seconds to minutes to cure, translating into reduced costs and a rapid return to service, which is particularly advantageous for public spaces, such as hospitals and schools, where a fast turnaround is often required.

There are two main UV coating platforms – a 100 percent solids UV formulation and waterborne UV systems. Both are sustainable chemistries, having ultra-low-volatile organic compound (VOC) levels.

Traditionally, UV-cure coatings have been used in wood applications. Because of their many performance, economic and environmental benefits, this technology is expanding into new markets. Driven by changing regulations and formulator preferences, emerging areas for UV-cure coatings include:

- Direct-to-metal applications
- Aerospace
- Composite repair
- Site-applied polyurethane dispersions (PUDs)/100% solids for flooring
- Sunshine-cure coatings for decking

DIRECT-TO-METAL APPLICATIONS

UV-cure coatings display excellent adhesion to metals like cold-rolled steel and galvanized iron, making them well-suited for direct-to-metal (DTM) applications. High-volume markets, including large construction vehicles, mass transportation, such as trains, and manufacturing and industrial equipment are among those being targeted. Additional benefits, including early water resistance, ease of application (can be applied by spraying, dipping or flow-coating) and ease of field repair, are contributing to growing interest in this area.

AEROSPACE

The conventional aerospace coatings process utilizing traditional, two-component (2K) polyurethane aerospace topcoats is time consuming, requiring up to 72 hours for the coatings to fully develop their physical properties. In an industry where time is money, applicators are turning to UV-cure coatings in an effort to speed up this process. The many advantages of UVA-curable coatings – rapid cure rates, low VOC levels, low volatile hazardous air pollutants (VHAPs), high performance properties and decreased refurbishing time – make this technology a

good fit for this market.

To meet the aerospace market's specifications, coatings must yield a good balance of physical properties including chemical resistance, flexibility, adhesion and weathering. Typically, UV-curable coatings lack flexibility but provide superior chemical resistance due to their high crosslink density. Aerospace coatings require a compromise of both chemical resistance and flexibility while maintaining hardness. These properties are primarily dictated by the filler concentrations and the resin(s) functionality/glass transition temperature. A mixture of hard and soft resins along with reactive diluents is required to get the balance of flexibility, hardness and chemical resistance required. Additionally, raw material selection is especially critical to obtain good weathering properties.

COMPOSITE REPAIR

Another novel application area for UVA-cure coatings technology is composite repair. This technology could be utilized for in-field vehicle surface repair as well as to rapidly manufacture replacement parts. Currently, carbon-fiber composites are cured by thermal baking, which requires a large amount of time and energy, and results in the emission of VOCs.

Studies are underway to advance this application. In particular, promising results have been obtained when using a dual-cure method. In this method, the composite is cured with UV light, followed by a reaction between dual-cure mechanisms when thermally heated. It is important to note that the dual-cure method has a pot life and therefore, the composite and UV light must be applied rapidly. Research in this area is ongoing.

UV-CURABLE PUDS FOR FLOORING

PUDs are well known in the coatings industry. These 1K, high-molecular-weight, aqueous dispersions develop properties without the need for additional crosslinking. 1K PUDs offer many of the outstanding features typically associated with polyurethane coatings. Likewise, UV systems have been recognized in the flooring industry for their high productivity. Combining two excellent chemistries – UV and PUDs – results in a UV-curable PUD system that is well suited to site-applied flooring.

The UV PUD is produced by a technique called the "acetone process." This technique allows for the prepolymer manufacture in acetone and, during a later step, the removal of the acetone via distillation. The resulting UV PUD is an ultra-low VOC and VHAPS product. Scheme 1 depicts the typical structure of the 1K UV PUD.

UV-curable PUDs are excellent binders that provide high performance in high-intensity, UV-cure flooring applications. They can also be formulated to display good gloss. These operator-friendly, high-molecular-weight UV resins feature a number of other beneficial properties: they are low odor and VOC, light stable for resistance to weathering, abrasion resistant, chemical resistant, and have good adhesion to the substrate. Wood, vinyl and concrete substrates can all be coated with UV-curable PUDs, which can be applied with existing equipment by spray, roller, squeegee, etc. Typical applications for these resins include large warehouses, restaurants and amusement parks.

Another key advantage of this technology is that multiple coats can be applied, dried, and then cured at once – with just one application of UV light. This translates into a faster return to service, which is appealing to both the contractor and customer. Contractors can use a variety of methods for UV curing. The coatings can be applied and cured onsite with portable UV lamps in less than four hours – a significant productivity improvement over alternative coatings. Another curing method for outdoor applications is shining through the industry: natural sunlight.

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SUNSHINE-CURE COATINGS FOR EXTERIOR DECKING

Today, common wood decking is made of CCA-treated southern yellow pine. There are a multitude of techniques available to give the deck a better appearance, including stains, as well as short-term and long-term coatings. The most common choice is a short-term coating that will last anywhere from six months to one year. The labor and material costs to maintain large deck coatings can be quite expensive. Because of this and emerging VOC and VHAPS regulations, the market is turning to water-based coatings.

Currently, the UV coating industry is seeing developments and examples in which UV energy from the sun is being used to crosslink UV-curable PUDs. These environmentally friendly "sunshine-cure coatings" also exhibit desirable qualities, such as good storage stability; excellent adhesion properties; application by brush, roller and spray; 1K formula; and fast water release.

Sunshine-cure coatings have the following characteristics and properties:

- Physically drying and UVA-curing properties
- UV-resistance – aliphatic polyurethane dispersion and UVAs and hindered amine light stabilizers (HALS)
- Fast water release

- User friendly
- Viscosity ~ 400 cPs.
- Less than 1.0 lb/gal VOC
- About 30% solids
- Excellent in-can stability of the formulated product during use in direct sunlight
- Excellent adhesion properties
- Good mechanical properties - flexibility, abrasion and chemical resistance
- Good storage stability

For outdoor applications, the sun provides sufficient curing when compared with artificial light sources. The sun supplies enough energy to crosslink UV-cure PUDs, providing several years of performance on exterior decking.

ALLOPHANATE OLIGOMERS

In addition to emerging markets described above, there is another evolution taking place within the chemistry itself. Dedicated research has refined polyurethane chemistry and delivered a next-generation product for the field of UV coatings – acrylated allophanate oligomers.

The chemistry behind traditional UV-cure coating formulations typically contains acrylated oligomers based on a polyurethane, polyether, polyester or

New Products in UV Coating Formulation Answering Customers' Needs

A couple other companies specializing in Ultra Violet (UV) Coating Formulation have the following to add to the previous article.

For several years, Cytec has been developing a range of UV acrylate based on renewal raw materials. Recently launched, EBECRYL 5500 is a bio-based glycerol derivative triacrylate. EBECRYL 5500 bioligomer was developed to be a bio-based alternative to the standard triacrylate reactive diluents such as OTA-480, TMPEOTA and TMPTA, all derived from petroleum-based feedstocks. Combined with the bioligomers EBECRYL 5000 Series, EBECRYL 5500 provides the ability to formulate an energy curable coatings and inks with significant bio-based renewable content. For instance, inks formulated based on EBECRYL 5500 and the other Cytec bioligomers were shown to contain more renewable resources versus standard diluents without the loss of printability, pigment wetting or performance properties. In addition to be produced partially based on renewable resources and have low viscosity, EBECRYL 5500 is also characterized by light color, low odor and excellent reduction of oligomer viscosity.

Cytec is deeply committed to environmentally friendly coatings. In just recent months, Cytec launched several products with unique performance:

- **Waterborne UV High Gloss Mirror Effect:** High gloss mirror effect finishes are generally obtained with solvent-based formulations (based on unsaturated polyesters for instance) while the required finish might involve a time-consuming labor-intensive step of polishing. The growing trend for no/low Volatile Organic Compound (VOC) environmentally friendly coatings is pushing the development of water-based alternatives for such mirror image finishes, preferably without a polishing step. A new solvent-free energy curable PU dispersion, UCECOAT 7710, just recently launched combines all of these features and delivers a high gloss and mirror image effect.
- **Easy-to-Clean, Easy Removal of Anti-fingerprint UV Topcoats:** EBECRYL 8100 is the first high performance 100 per cent solids UV curable aliphatic urethane acrylate designed for application requiring easy to clean and easy removal of anti-fingerprint without smearing properties with long lasting effect. Cured films of EBECRYL 8100 can be characterized as easy to clean, high gloss, high scratch and high abrasion resistance in combination with excellent stain and chemical resistance and excellent resistance to permanent marker stains and anti-graffiti.
- **UV Haptic Finishes:** Haptic properties are very subjective, not easy to define and their perception might vary from person to person. However, there is an increase trend of use of haptic coatings, i.e. coatings providing special tactile effects, in multiple coating applications such as consumer goods, electronics and flexible substrates. EBECRYL 8296 is a energy curable resin with features that makes it possible to obtain a broad range of haptic finishes with 1K formulations (meaning easier handling and low/limited VOC content).

In the UV area, Inortech Chimie Inc.'s supplier Rahn has introduced Genomer 7287, a low gloss oligomer for use in UV coatings to deliver matte finishes. Low gloss coatings are very popular in various industries such as packaging, furniture, wood coatings, automotive and others. They are traditionally formulated with conventional solvent and water-based systems or UV cured systems containing solvents. Although it has proven to be difficult, it was especially for environmental reasons deemed worthwhile to develop solvent-free UV curing systems which could be spray applied.

Therefore RAHN is introducing GENOMER 7287 for use in low viscous matt UV curing coatings (UV coatings). It is a unique oligomer which gives superior matting properties with only low amounts of fillers, while still maintaining a reasonable reactivity.

These are just a few examples of how manufacturers are answering the need for high performance low VOC Coatings with water-based products and much more.



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epoxy resin. The new acrylated products offer the advantages of low viscosity and reduced crosslink density due to the reduced isocyanate functionality, therefore allowing greater freedom in designing new high-solids systems. Low-viscosity resins are environmentally friendly, because they do not require reactive diluents or organic solvents. These acrylated allophanate resins also display good outdoor weathering ability, making them a suitable choice for use on a variety of substrates, including polycarbonate plastic and metals.

ON THE HORIZON

One of the next steps in the market appears to be expanding the scope of aerospace applications. The use of UV-cure coatings is also spreading into conventional coatings areas where the technology hasn't been previously used. This is illustrated by the technology's expansion into residential decking. Additionally, sunshine-cure coatings are potentially poised to spread from the contractor into the do-it-yourself market.

One of the latest markets for UV-curable coatings is the soft-touch coatings sector. Soft-touch coatings impart a silky

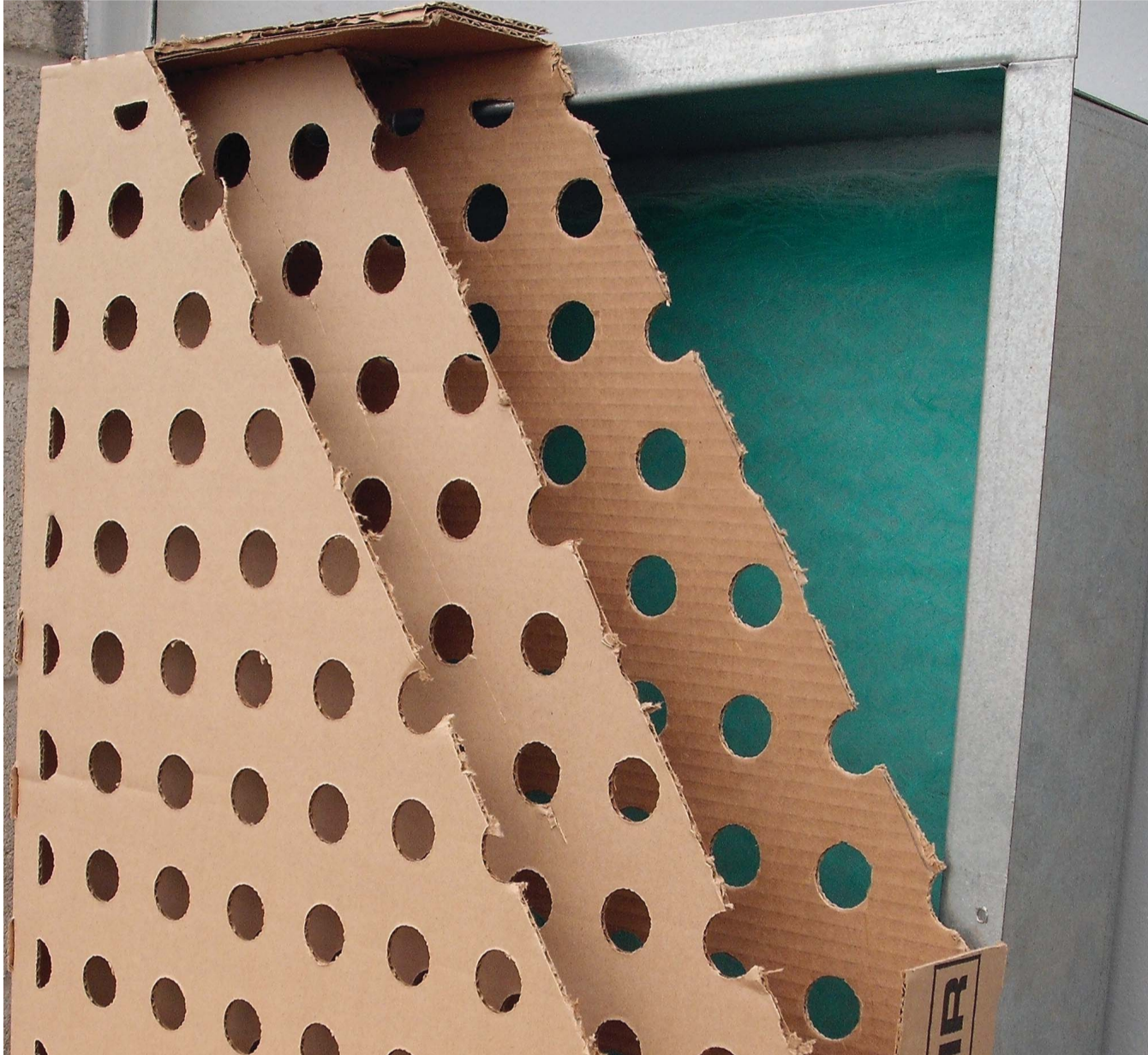
feel, while providing stringent performance properties. The end product appears leather-like but is actually created from a polyurethane coating. UV-curable PUD and 100 percent solids soft-touch coatings are currently being developed for use in cell phone, computer housing and automotive applications.

UV chemistry continues to evolve. And as the trend toward environmentally friendly coatings and the importance of a quick return-to-service continue to gain momentum, use of UV-cure coatings will expand into entirely new markets and more varied applications. ■

Mike Dvorcbak is Strategic Technology Manager, UV-Cure Oligomers and PUDs & Government Programs Coatings, Adhesives and Specialties, Bayer MaterialScience LLC, Pittsburgh, PA and has over 25 years experience in the industry. He has been on the Board of Directors of RADTECH NA since January 2005. He was recently nominated as president elect for the RadTech International North America board. He will assume the office of president for a two-year term beginning in 2013.

Spray Booth Management

Overspray Collection Filters



BY BRAD WILSON

Which type of filter?

There are many different types of overspray—solvent based, water based, adhesives, stains, baking enamel, and the list goes on. There are also two distinct types of filters used to collect overspray—“Impingement” and “Impaction”. Within each category there are several different filters, which can be broadly categorized by the material from which they are made (paperboard, fiberglass, polyester, paper, and corrugated cardboard). With so many possible combinations of overspray and filters, the goal of the filter supplier is to match the best filter with the type of overspray being collected, considering tradeoffs such as filter efficiency, air-flow, capacity, and, of course, cost. The problem of finding the best filter for the application is compounded by the fact that spray booth manufacturers tend to use one particular filter for every spray booth they make, regardless of the situation. There are specific variables that affect selecting the most appropriate filter for each application. Therefore, the first step in spray booth filter maintenance is to

determine which filter has the best combination of efficiency, capacity, airflow, and cost for the particular spray booth and overspray application.

Impingement vs. Impaction

Spray booth exhaust filters fall into two main categories - Impingement and Impaction. Each type has certain efficiency/capacity/air flow tradeoffs.

Impingement type include cardboard baffle style and accordion style filters. These high capacity filters maintain their efficiency level and air flow over the life of the filter. They do not adversely affect airflow until they are 95 per cent or more loaded. The main benefit of impingement filters are a good airflow and high capacity leading to long life.

Impaction type filter composition includes paper mesh, fiberglass and polyester pockets. As these types of filters load they become more efficient and airflow is continuously reduced over the life of the filter. In the end the filter is completely “blinded” and air flow virtually non-existent. The main benefit of impaction filters is efficiency.

Graduated Density Filtration (Two Stage Filtration)

Graduated density filtration (GDF) is the principle which dictates that overspray should meet the highest capacity filter or part of the filter first, followed by the highest efficiency filter or part of the filter. The most common example graduated density filtration in a single stage filter is an open weave paper mesh filter (capacity) sown to a dense polyester backing (efficiency). This type of filter adheres to the principle of GDF but because the filter components are sown together and disposed of at the same time it is rare that both the capacity stage and the efficiency stage are fully loaded. When this filter is changed out, it is because one of the component’s is “full” but the other component still has some unused capacity. A single filter that uses the principal of GDF is therefore not as effective as a multiple stage exhaust, which uses a high capacity primary filter and a high efficiency second stage filter.

A two-stage system, which uses an impingement filter in front and an impaction filter in behind, is the most economical means of filtration. This is because it gets full value out of the high capacity impingement primary filter and full value out of the high efficiency

impaction secondary filter when they are changed out separately. In Europe nearly all spray booths are made with multiple stage overspray collection. In these spray booths, it is a common practice to use a high capacity primary filter with a high efficiency second stage filter, which are changed out separately. This way you get full value out of every filter. The problem in North America, except in the aerospace industry, is that nearly all spray booths are made with a single stage exhaust. In order to get full value GDF in a typical local spray booth, a second stage must be created, such as The Grabber Filter System. As always, when considering the capital cost of an improvement, the return on investment (ROI), must be calculated. A good ROI calculation will include factors such as the frequency of filter change out and the labour cost of each change, the disposal cost of filters, as well as the cost of the filters themselves. Often times a high capacity impingement filter will cost twice as much but last three times longer than a cheaper impaction filter. When the frequency of change is reduced labour costs and “hassle factor” are also reduced and these costs must be included in an accurate ROI calculation. The Grabber Filter System is a two-stage system utilizing the highest capacity impingement type filter (corrugated cardboard baffle box) with the highest efficiency impaction filter. When fully loaded the the baffle box filter hold 8-10 pounds of overspray solids. Meanwhile, the second stage Grabber is twice as efficient as the EPA standard, to a theoretical emission rate of .0114 grams per cubic foot of air. Used as a finishing filter it produces no effectual resistance to airflow.

Filter types include:

Impingement:

- Baffle box style
- Accordion style

The features and benefits of this type of filter are: high capacity (lasts all week), less efficient, constant airflow and high cost per sq. ft.

Impaction:

- Fibreglass
- Polyester
- Paper/poly combo

These filters have less capacity (lasts all day), high efficiency (99%+), gradually decreasing airflow and lower cost per sq. ft. ■

Brad Wilson is president of Com-Pleat Filters Inc., Servair Filters, in Georgetown, ON, www.com-pleat.com

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Troy Introduces Mergal 753 Wet-State Preservative in Canada



Troy Corporation announced that The Pest Management Regulatory Agency of Health Canada, in accordance with the Pest Control Products Act, has approved the usage of Mergal 753 wet-state preservative for the in-package protection of paints, coatings, and allied products. Mergal 753 is a zero-VOC, formaldehyde-free dispersion with broad-spectrum efficacy against bacteria, fungi, and yeast, which

cause deterioration of aqueous systems. Mergal 753 is the highest concentrated product of its kind with free-flowing characteristics and a uniform homogenous nature. Additionally, Mergal 753 has a low toxicity profile and contains no alkylphenol-ethoxylates (APEs).

As a high-performing preservative concentrate, Mergal 753 provides effective in-package microbial protection using less total volume per product batch compared with all other competing technologies. The 'more using less' feature results in minimized environmental impact and reduced energy consumption, qualifying Mergal 753 as a truly 'green' preservative. "With Mergal 753, Canadian customers can meet or exceed market and regulatory demands for high performance and broad capability, while achieving their sustainability and environmental goals," says Bernie Franc, Wet-State Business Manager at Troy Corporation.

www.troycorp.com.

Objectively measure mottling of effect coatings with the new cloud-runner



BYK-Gardner, producer of complete QC solutions for measuring color, appearance, and physical properties of paint and plastic, is introducing the portable cloud-runner to efficiently measure mottling at the paint line.

Metallic and effect finishes are of great popularity in the automotive industry. The orientation of the effect pigments (e.g. alu flakes) is

very critical and is dependent on the "robustness" of the paint formulation as well as variations of process parameters.

Thus, irregular spots of varying lightness, also called mottling or cloudiness, may occur. These patches are most obvious on light metallic colors. Typical causes can be a disorientation of the metallic flakes and/or film thickness variations of the basecoat. Mottling is a very undesirable effect, which is especially noticeable on large body panels. Therefore, the surface quality needs to be analyzed over a large sample area. Up to now mottling was evaluated mainly visually and so the perceived results have been strongly dependent on the auditor and the different light conditions.

Production control as well as process optimization require objective measurement data, which furthermore allow defining tolerances. BYK-Gardner has developed a new portable solution to quickly scan the surface of a large area. The cloud-runner objectively measures the lightness variation at different detection angles simultaneously, as the visibility of mottling is also dependent on the viewing angle. The measurement signal is filtered in different mottling sizes and a "Mottling index" is calculated. The higher the measured value the more obvious is the mottling effect. Thus, target values can be specified for batch approval and process control.

Due to the scroll-wheel, the cloud-runner is very easy to operate. The large display offers enough space for all statistic data. The recorded measurement series can be transferred to a PC via a docking station, which also serves for charging the battery. The new software smart-chart offers flexible analysis functions and enables professional documentation of the measured quality.

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New CLEARLOK MAX Topcoat From Birchwood Casey

CLEARLOK MAX Topcoat is another finishing first from Birchwood Casey. New CLEARLOK



MAX Topcoat is a water-based blend of acrylic polymers that forms a scuff resistant clear coat finish on all metal surfaces.

This finish has a densely packed polymer structure that forms a tightly adherent barrier against corrosion while enhancing the beauty and durability of the surface. With these properties, the finish serves as an ideal topcoat for black oxide or other surface coatings such as phosphates and antique finishes. It can also be applied directly to clean or shot-blasted metal surfaces such as bare steel, aluminum, nickel and zinc plating.

Supplied as a liquid concentrate, CLEARLOK MAX Topcoat is pH neutral and non-hazardous, and is safe to apply without ventilation. The concentrate is diluted with water, applied to parts by immersion, then dried at 70-130° F, achieving a nominal film thickness of about .002 inches. Once dry to the touch, the parts are ready for assembly or packaging. Full hardness is achieved in about 24 hours.

Minimum humidity resistance is 400 hours (ASTM D1748), depending on film thickness. For severe duty applications requiring extra corrosion resistance, the dried CLEARLOK MAX finish can be sealed with DRI TOUCH Rust Inhibitor, to create an even more impervious barrier against humidity and corrosion.

Typical CLEARLOK MAX applications include all types of hand tools, machine components, power transmission components, pumps, valves and oilfield equipment.

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Publisher and Sales:
Pete Wilkinson
Tel: 1-416-255-1808
Fax: 1-416-519-1313
pete.wilkinson@cfcm.ca

Editor:
Sandra Anderson
Tel: 1-519-442-4071
Fax: 1-519-442-1359
sandra.anderson@cfcm.ca

Accounting, Circulation and Sales:
Brian Jones
Tel: 1-905-405-1500
brian.jones@cfcm.ca

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