

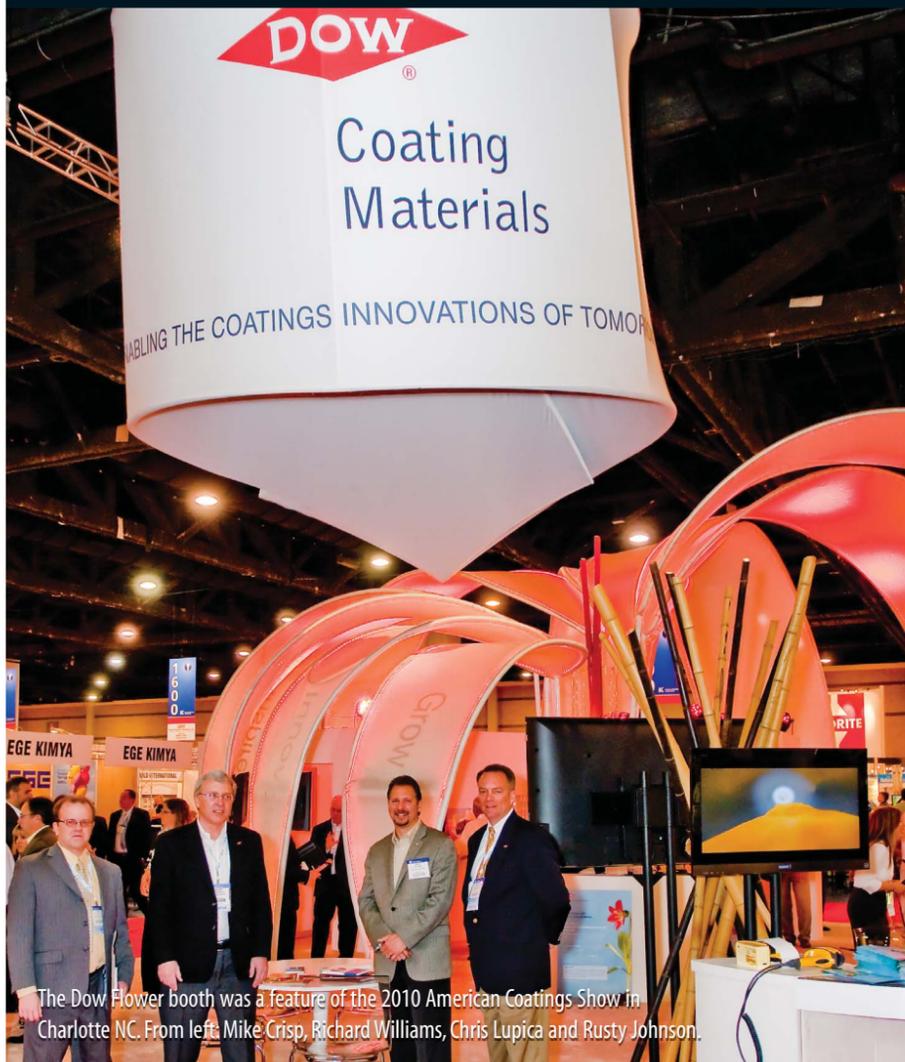


# CFCM

CANADIAN FINISHING & COATINGS MANUFACTURING MAGAZINE

\$12.00

June 2010



The Dow Flower booth was a feature of the 2010 American Coatings Show in Charlotte NC. From left: Mike Crisp, Richard Williams, Chris Lupica and Rusty Johnson.

## American Coatings Show & Conference 2010: another impressive success

Other than a volcano in Iceland closing European airports and preventing some international attendees from flying home right away, the second bi-annual combination of trade show and conference, the American Coatings Show held April 12-15, 2010 at the Charlotte Convention Center, NC, once again exceeded all expectations.

With 328 exhibitors, most from US, but several from China, Germany, India and Canada, 17 countries in all, the products and technologies they exhibited seemed to cover the main themes of Green Technologies and Sustainability on all aspects of paint and coating formulation. There were about 6,700 overall participants compared to 5,600 in 2008 with 331 exhibitors.

### ON THE SHOW FLOOR

It was evident by ACS exhibits that when it comes to paint and coatings formulation, manufacturers are listening to their customers. Green and Sustainability were the key words in just about every discussion.

Some of the highlights will be briefly mentioned here, but please see CFM's New Products and Technologies sections for more.

*continued on page 8*

### ALSO IN THIS ISSUE

- Automatic Plating Systems
- Corrosion Resistant Coatings
- UV Coating Formulation
- Automatic Liquid Paint Spray Guns
- Spray Booth Filters

AND MUCH MORE!

## Electroactive Materials

### Materials as Smart Corrosion Inhibiting Coatings for the Replacement of Hexavalent Chromium (Cr(VI))

BY PETER ZARRAS, N. ANDERSON, C. WEBBER, J. D. STENGER-SMITH, A. L. FOWLER, NAWCWD, USA, P. KINLEN, G. KOUSTIS, CROSSLINK, C. E. MILLER, ARL, USA, D. BUHRMASTER, WPAFB, USA, C. MAHENDRA, NAVAIR, USA, M. KOLODY, NASA/KSC, USA

#### ABSTRACT

Most military coatings on aluminum and steel alloys utilize hexavalent chromium (Cr(VI)) conversion coating (CCC), a Cr(VI) primer followed by a topcoat (Cr(VI)-free). Cr(VI) is a well known inhibitor, exhibiting both barrier and self-healing properties. However, Cr(VI) is a carcinogen and regulations regarding its use and disposal are under constant scrutiny. The Department of Defense must comply with current and future regulations regarding the use and disposal of Cr(VI) from the Environmental Protection Agency (EPA) and the US Occupational Safety and Health Administration (OSHA). Currently, there is no Cr(VI)-free pretreatment/primer system which can provide corrosion protection in neutral salt fog exposure chambers as well as a fully chromated military coating. A new "smart coating" system is needed that can pro-

vide "on-demand" corrosion protection and adhesion without the environmental liabilities of Cr(VI). The Naval Air Warfare Center Weapons Division (NAWCWD) in cooperation with its military partners (Army, Navy and Air Force) have developed and tested a Cr(VI)-free pretreatment for use with a total Cr(VI)-free paint system. This pretreatment system utilizes an electroactive polymer, poly(2,5-bis-(N-methyl-N-hexylamino) phenylene vinylene), (BAM-PPV) on aluminum and steel alloys in accelerated weathering tests. Currently, BAM-PPV is being field tested by the Air Force, Army and Navy on non-critical military hardware using this electroactive polymer as the pretreatment coating. Additionally, the NAWCWD in cooperation with an industrial partner, Crosslink has tested a Cr(VI)-free epoxy primer containing a corrosion-inhibiting

*continued on page 16*

### IN THE NEWS

#### Association News

##### Ontario Paint Industry Golf Tourney

After last year's success, the Toronto Society of Coatings Technology (TOSCO) is again combining with the Ontario Paint Association (OPA) to host a Golf Tournament for members and guests, to be held Tuesday, June 8, 2010, Glen Eagle Golf Club, Bolton, ON.

There will be a 1:00 pm shotgun start time and golfing will be followed by dinner at approx. 6:30.

Please send your registration ASAP, to confirm your attendance to Steve Nuyten, OPA Golf Committee Chairman or committee member Jacqueline Moore, L.V. Lomas Limited. Registration forms are available from TOSCO or the OPA, [www.toscot.org/events.html](http://www.toscot.org/events.html).

##### New Canadian Manufacturing Week Back Better Than Ever

Canada's premiere event for manufacturers unveils new streamlined format to help businesses find innovative solutions, technologies.

Now that the recession is declared over and economists are predicting an imminent turnaround, there's no better time for Canadian manufacturers to rediscover themselves. And with a new format, new location and an improved

*continued on page 4*

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## RadTech's UV/EB Technology Expo

The UV&EB 2010 Technology Expo and Conference set for May 23-26, 2010, Baltimore Convention Center, Baltimore, Maryland is being billed as the World's Largest UV & EB Event and is a 4-day conference and exhibition and is dedicated to fostering educational, technical, and scientific advancement in the manufacture and use of ultraviolet (UV) and electron beam (EB) curable products.

### TECHNICAL CONFERENCE

The Technical Conference portion of the event will consist of three elements:

- UV/EB University
- Global Technical Conference
- Poster Sessions

### THE EXHIBITION

More than 100 exhibitors will fill the show floor at RadTech UV/EB 2010. Whether you are involved in Adhesives, Aerospace & Defense, Automotive

OEM & Tier One Manufacturing, Automotive Repair & Refinish, Composite Applications, Commercial Printing, Converting/Packaging, Decorative Applications, Electronics/Electrical, Graphic Arts, Industrial Finishing, Opto Electronics, Metals, Photoresists, Plastics, Automotive, Wood Industries, and more, you'll find products and services on the RadTech UV/EB 2010 show floor for you.

### EXHIBIT HOURS:

Mon., May 24: 10:00 AM—6:00 PM\*

Tue., May 25: 10:00 AM—6:00 PM\*

Wed., May 26: 10:00 AM—2:00 PM

\*On Monday & Tuesday there is a show floor reception from 5:00 PM—6:00 PM

RadTech International North America is the nonprofit organization dedicated to the technical, educational and market advancement of Ultraviolet (UV) and Electron Beam (EB) Technology.

RadTech has over 700 members that supply and use UV/EB equipment, raw materials and formulated products.

[www.radtech.org](http://www.radtech.org)

## SURFIN 2010 READY TO HIT THE RAPIDS

SUR/FIN is the annual conference and trade show organized by the National Association for Surface Finishing and this year is heading to DeVos Place, Grand Rapids, Michigan. The Conference is held June 14, 15, 16 & 17, with Show Dates on June 15 & 16.

Seminars will feature topics such as Innovations, Sustainability, Micro Surface Characteristics, various types of plating and much more.

As the surface finishing industry's premier event, professionals from around the world assemble to share ideas, experiences, and to solve surface finishing and manufacturing problems while improving productivity.

Exhibitors as of April 1, 2010 were:

ACM Technologies, Inc.	821
Agmet Metals Inc.	203
Aldonex, Inc.	825
Almond Products, Inc.	109
American Plating Power, LLC	707
AMETEK Fluoropolymer Products	325
Applied Thermal, Hydro Miser	803
Associated Rack	817
Asterion LLC	606
Atotech USA, Inc.	601
Aucos Elektr. Geraete GmbH	713

B&P Plating	801
Canadian Finishing & Coatings Manufacturing Magazine	123
Canadian Finishing Systems Ltd.	815
CATHO-PIN Products Inc.	319
Chemquip Company Inc.	201
Columbia Chemical	329
Coventry, Inc.	607
Crown Solutions - Veola	
Water Solutions & Technologies	225
CST-SurTec, Inc.	318
Darrah Electric	210
Datalab	323
Dawn Research	327
De Nora Tech, Inc.	900
Doerken Corporation	102
DUALL, Met-Pro Corporation	401
Dynamix	214
Dynapower/Rapid Power Corporation	301
Dynatronix, Inc.	729
Elcometer	615
EPI Electrochemical Products Inc.	418
Fanta Equipment Co.	408
Faraday Technology Inc.	209
Finishing Concepts Inc.	428
Fischer Technology Inc.	100
GF Piping Systems	202
Gilbert & Jones Co. Inc.	529
Global Filtration Systems	208
Goad Company	827
Harrington Industrial Plastics	106
Haviland Products Company	719
Heatbath Corporation	222
Hubbard-Hall, Inc.	807
Hunter Chemical	614
Imperial Zinc Corporation	328
Indelco Plastics Corporation	809
Industrial Acura SA de CV	727
JBC (2001) Ltd.	629
Jessup Engineering	300
JPS Technologie, Inc.	104
JSA Metalline	800
KC Jones Plating Company	723
KCH Engineered Systems	501
Kontek Ecology	829
Lanco Corporation	407
Luster-On Products, Inc.	928
MacDermid, Inc.	313
Matrix Metrologies	728
Mefiag, Met-Pro Corporation	401
Metal Chem Inc.	215
Metal Finishing Magazine	310
Metalise It America Inc.	325
Met-Chem Inc.	701
Met-Pro Corporation	401
Midwest Air Products Company, Inc.	306
Palmetto Plating Co., Inc.	113
Pavco	226
PKG Equipment, Inc.	213
Plating Systems & Technologies	207
Price Industries	812
Process Electronics Corporation	422
Process Technology	413
Products Finishing Magazine	507
Progressive Surface	220
ProMinent Fluid Controls, Inc.	906
The Puro-lite Company	926
Pyromet, Inc.	814
Ritchey Metals Co., Inc.	429
RoMan Manufacturing Inc.	103
Ryan Herco	426
Scientific Control Labs	828
Sequoia Mfg.	703
SERDP/ESTCP - HydroGeologic Inc.	206
SERFILCO, Ltd.	407
Sethco, Met-Pro Corporation	401
Siemens Water Technologies	101
Sifco Applied Surface Concepts	115
Technic Inc.	613
Thermo Scientific Niton Analyzers	219
Titan Metal Fabricators	309
TrueLogic Company	711
Univertical Corporation	628
UPA Technology Inc.	725
Uyemura International Corp.	513
Varian, Inc.	308
Vulcanium	229
W.M. Watermark	813
Walgren	528
WMV Incorporated	119
Wolverine	822
World Resources Company	715
Yuken America Inc.	810

[www.nasf.org](http://www.nasf.org)

**HAVILAND PRODUCTS COMPANY**

# SUR/FIN 2010

IT'S MORE THAN JUST FOUR DAYS OF EDUCATION, GOLF AND PARTYING.  
(ACTUALLY, THAT'S PRETTY MUCH EXACTLY WHAT IT IS...)

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**PROUD TO SERVE**

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Haviland Products – National Sales Manager  
NASF President – Grand Rapids Branch

**PARTNERS**

**Canadian Finishing Systems** is the exclusive Haviland distributor in Canada. See them at booth 815.

**INTRODUCING**

**Gregg Romero** –  
New Regional Sales Manager  
Southwest

# How are Things?

So, we just got back from Charlotte, NC, and the American Coatings Show (ACS). The photo on this page, taken by Pete Wilkinson of course, is me with past TOSCOT president, Kamlaish Mudhar of Univar Canada Ltd. in front of CFCM's booth at ACS.

In this issue you will find a large spread of Pete's great photos and a blurb on show numbers and the tremendous amount of Canadians who attended. There was also significant global attendance especially from Germany and China. US, of course, had the largest representation of attendees. Walking the show, sitting at the booth, chatting with people at hotels and at the shuttle bus stops, those from other countries ask us one main question, "How are things in Canada?" Five little words, but really, it's loaded.

"How are things?" can be translated to mean:

"How is Canada recovering from the recession?" or

"How is the Canadian dollar being on par with US affecting your business?" or

"How are all the acquisitions affecting the Canadian industry?"

"How is Canada embracing green technology?"

"How is your company addressing technology?"

"Sustainability?"

The list goes on. Let's deal with my first translation of How Are Things... "How is Canada recovering from the recession?" The answer is "Better Than You, thank you very much."

It was reported in the Toronto Star recently that Canada's economy "is blowing its G7 peers out of the water" (namely France, Germany, Italy, Japan, United Kingdom, and United States) in terms of the speed and strength of its economic recovery.

The Paris-based Organization for Economic Development and Co-operation says Canada's economy likely grew 6.2 per cent in the first quarter 2010, well ahead of the 1.9 per cent overall growth estimated for the other countries.

This 30-member organization, representing the world's advanced nations including the G7, says Canada's economy will continue to expand in the second quarter at 4.5 per cent, about twice the G7 average.

Apparently, the Canadian economy grew at a surprisingly strong five per cent clip during the last three months of 2009, and kept going in January with a 6 per cent monthly advance that surprised analysts.



However, economists have cautioned that Canada's economic growth will likely slow down, noting the Bank of Canada is expected to raise interest rates in June or July, which could reduce domestic borrowing and spending.

Other encouraging developments are that financial conditions are improving and global trade has rebounded since the recession.

Meanwhile, back to the ACS...the themes this year were:

Green

New Technology

Sustainability

Basically manufacturers of everything the paint and coating industries need are listening to their customers when it comes to their research and development. Read more in these pages.

Another emerging technology is the large interest in our digital version launched with our first issue of 2010. Subscriptions are free to all Canadians. To subscribe please contact Brian Jones at [brian.jones@cfc.ca](mailto:brian.jones@cfc.ca).

Sandy Anderson

[sandra.anderson@cfc.ca](mailto:sandra.anderson@cfc.ca)

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continued from front cover

program, Canadian Manufacturing Week (CMW) 2010, October 5-7, Toronto Congress Centre, North Hall, 650 Dixon Road, Toronto, ON, is the place to do it.

Canadian Finishing and Coatings Manufacturing magazine (CFCM) will be exhibiting at this event.

New to this year's event is a three-zoned format that more clearly and conveniently groups the latest manufacturing technologies and solutions into specific areas:

**Weld Expo Canada:** Featuring F3, Forming, Fabricating and Finishing. This zone highlights everything required for sheet metal operations, from laser, arc and robotic welding to stamping, water-jet cutting and pressworking, to coating equipment, electroplating and automated finishing. The Advanced Manufacturing Zone: Zeroing in on the factory of the future, this area will focus on automation and assembly, design engineering and software, additive manufacturing and reverse engineering and electronics manufacturing. Innovative technologies on display will include robotics, sensors, machine vision, virtual reality, simulation, three-dimensional imaging and more.

**The Physical Asset Management Zone:** This is where manufacturers will learn everything they need to run an efficient operation. In addition to green solutions for fluid and waste management or air quality control, it will feature products for asset tracking and management, plant engineering and maintenance, as well as lean manufacturing.

**The Society of Manufacturing Engineers (SME)** is the world's leading resource for manufacturing information and knowledge. With Canadian headquarters in Toronto, the society promotes an increased awareness of the value of manufacturing among industry professionals and the general public, while supporting educational initiatives and introducing career options for those entering the industry.

[www.cmwshow.ca](http://www.cmwshow.ca)

## PaintExpo Expands – Even in Difficult Times

Lots of valuable leads and business transacted



directly at the event assured a good mood among the 327 exhibitors at the 3rd PaintExpo, which took place in Karlsruhe (Germany) April 13-16, 2010. Exhibitor numbers increased by 14 per cent, and PaintExpo visitor numbers grew by 8 per cent to a total of 6397.

The next PaintExpo, leading international trade fair for industrial coating technology, will take place in Karlsruhe April 17-20, 2012.

## Company News

### New Facility for Innovative Finishing

Innovative Finishing Solutions Inc. has purchased a brand new facility located at 41 Centennial Road, Orangeville, Ontario L9W 1R1 and have moved in effective April 23, 2010. The company's Telephone Number is (519) 943-1111, Fax (519) 943-1148 and their web site is [www.innovativefinishing.ca](http://www.innovativefinishing.ca)

### GFS Canada moves to new facility

Global Finishing Solutions (GFS) has moved its offices and warehouse in Barrie, ON Canada to a new facility, also in Barrie. The move has more than doubled the warehousing capacity and improved the functional workspaces of personnel as well as allowing for future growth.

"We are excited about the positive changes that will occur as a result for the Canadian market. GFS Canada will be more responsive to the Parts and Filters needs of our customers, and will be able to provide a greater level of service for our extensive distribution network," says the company's marketing manager Jonathan Barrick.

Effective April 30, 2010, GFS Canada's new office and warehouse are:

Global Finishing Solutions Canada, Inc.

131 Commerce Park Drive, Unit JK

Barrie, ON

L4N8X1Tel: 888-712-5777

Fax: 888-795-3680

info@globalfinishing.com

Web: <http://www.globalfinishing.com>

Twitter: <http://twitter.com/globalfinishing>

Facebook:

<http://www.facebook.com/pages/GFS-Global-Finishing-Solutions/112820838737828>

## Byers Bush Awarded CIPEC 2009 Industry Leader Award for Energy Conservation

Byers Bush, Mississauga, ON, has recently been recognized by NR Can for their leadership in the field of energy conservation. The CIPEC (Canadian Industry Program for Energy Conservation) Leader Award is in large part due to a lighting retrofit project that the company has undertaken that has improved the overall lighting in their building while reducing their consumption of energy.

Byers Bush Inc. has been providing top quality sandblasting and powder coating services to the metal industry for over 40 years.

## PPG Color Studio

PPG Industries Inc.'s industrial coatings business announced the opening of the Shmaze Color Design Studio, a facility near Irvine, Calif., that works to accelerate color design and prototype development by manufacturers and industrial designers.

The studio was created to serve manufacturers and industrial designers in industries such as consumer electronics, automotive parts and accessories, beauty products, appliances, sports and recreation equipment, and aerospace, PPG said. The studio is sponsored by PPG Trendcast, a program designed to communicate trends in colors, effects and feels, and to apply them to specific markets and products.

PPG Trendcast provides access to support personnel and a range of services, including color matching and monitoring of coating-facility operations. Additional support services include product-usage training, laboratory testing, operational troubleshooting, and process design, the company said.

[www.ppgindustrialcoatings.com](http://www.ppgindustrialcoatings.com)

## TF Warren to Expand Tank,

## Terminal Services

Following the recent acquisition of Tarsco Inc. with partner Atec Steel, the TF Warren Group of Ontario, Canada, has announced plans to expand its services to tank owners and terminal operators worldwide. The expansion includes design, procurement, shop fabrication, field erection, and repair.

Others members of the TF Warren Group, Brant Corrosion, Blastech, and Blastco, provide pre-coating, shop coating, field coating, and lining services.

Tarsco Inc. is based in Gardena, Calif. Atec Steel is in Baxter Springs, Kan. [www.tfwarren.com](http://www.tfwarren.com).

## Evonik Acquires Methacrylate Specialty Esters Business

Evonik Industries, a leading supplier of methacrylate chemicals, has acquired Arkema's Methacrylate Specialty Esters business. The acquisition was official at the end of 2009. With this acquisition, Evonik enhances its competence in the Performance Polymers business unit as a specialist in methacrylate chemistry and as a reliable global partner within the chemical industry.

The acquisition includes the following products: 2-ethylhexyl methacrylate (2-EHMA), dimethylaminoethyl methacrylate (MADAME), and n- and i-butyl methacrylate (n-BUMA and i-BUMA).

These monomers are mainly used for the production of paint and coatings, as well as chemicals for water treatment and plastics additives. The products will be integrated into the VISIOMER sales range for methacrylate monomers, which comprises of more than 50 monomers. The product VISIOMER DMAEMA will be marketed under the name VISIOMER MADAME™ in the future.

## BASF Named 2009 GM Supplier of the Year

BASF has received the General Motors' Supplier of the Year Award for 2009. This is the sixth time in the last eight years that BASF has won.

The General Motors Supplier of the Year program started in 1992, and each year a global team of purchasing, engineering, quality, manufacturing and logistics executives determines the winners. The decisions are based on supplier performance in the areas of quality, service, technology and price.

## Equity Firm to Acquire Container Maker BWAY

BWAY Holding Company, a major North American supplier of general-line rigid containers including containers for paints and coatings, will be acquired by a company organized by the private-equity firm Madison Dearborn Partners LLC.

The transaction is valued at approximately \$915 million, including the assumption of debt, and is subject to regulatory approvals, with completion of the transaction anticipated in the second or third quarter of this year.

BWAY Holding Company, based in Atlanta, operates 20 plants, excluding announced plant closures, in the U.S. and Canada. The company's product lines include metal cans and steel and plastic pails for paints, coatings, adhesives, and mastics. The company's businesses include BWAY Packaging, NAMPAC, and ICL Industrial Containers.

Madison Dearborn Partners LLC is a private-equity investment firm that has invested in more than 100 companies. The firm says it invests in

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businesses across a broad spectrum of industries, including basic industries, communications, consumer, energy and power, financial services, and health care.

### Visuron Technologies, Inc. Acquired by Hanson Group LLC

The Hanson Group LLC has acquired Visuron Technologies, Inc. The Hanson Group, LLC worked with Tom and Marcia Davis (previous owners of Visuron) for many years and recognizes Visuron Technologies, Inc. to be an innovative leader in the polyurea industry.

The company says Tom Davis was an outstanding visionary and a leading edge developer in Polyurea technology. His notable discoveries include patented high chemical resistant, toughened Polyurea elastomers (Warrior), patented Sprayed In Place Pipe Polyurea technologies (TrueSeal), Electrostatic Polyureas and many more custom products designed for fast cure, Zero VOC's and high performance (PolyArmor and PolyPro).

The Hanson Group, LLC will now offer Visuron's cutting-edge technologies and products.

[www.hansonco.net](http://www.hansonco.net)

### DSM and Berliner Glas reach agreement on licensing terms for KhepriCoat anti-reflective coating system

DSM Functional Coatings B.V., part of Royal DSM N.V., and Berliner Glas KGaA, a leading European supplier of refined technical glass, have agreed to a licensing deal for DSM's anti-reflective coating system, KhepriCoat. Berliner Glas intends to use KhepriCoat to improve the performance of its glass in lighting cover applications. The new deal is expected to be completed in the second quarter of 2010.

Anti-reflective glass plays an important role in lighting applications as it increases the light produced while at the same time reducing energy consumption. With DSM's high-efficiency KhepriCoat anti-reflective coating system, light transmission of lighting cover glass can be increased by up to 8 per cent while durability and flexibility are also improved.

[www.berlinerglas.com](http://www.berlinerglas.com)

### Bayer MaterialScience LLC is listed by the Master Painters Institute as a raw materials supplier

Bayer MaterialScience LLC is one of the first raw materials suppliers to get on board the Master Painters Institute Inc.'s (MPI) Starting Point Program and be listed by this well-regarded standards organization, which has a particular focus on architectural coatings. This is good news for Bayer MaterialScience LLC's customers, who are now in a position to save time, money and resources due to the company's participation in this new testing program for resin or additive technologies.

[www.bayermaterialsciencenafta.com](http://www.bayermaterialsciencenafta.com)

### Arkema Emulsion Systems Expands Customer Service Capabilities

Arkema Emulsion Systems has announced the expansion of dedicated customer service capabilities at its Cary, N.C. headquarters. The expansion includes the addition of four trained representatives who will work with customers to answer general product-related questions, assist in delivering specific product technical support and

accept orders for the company's full line of emulsion polymers. For general customer inquiries, customer service representatives will operate as the Arkema Emulsion Systems Latex Line Expertise Center, and can be reached in North America at 1-866-837-5532.

"Making it easy for our customers to do business with us continues to be an important goal for our company," said Tim Rhoads, supply chain director for Arkema Emulsion Systems. "By establishing our own in-house, dedicated customer service team, we believe we will be able to continue to be responsive to customer needs, and shorten the time to provide answers and support."

Arkema Emulsion Systems manufactures and markets products for use in architectural and industrial coatings, traffic paints, specialty coatings, adhesives, sealants and construction products.

### Acclaimed Designer Sarah Richardson partners with PARA Paints Signature Paint Collection Gives Canadian Homes a Designer Edge.

PARA Paints has launched a partnership with internationally acclaimed designer and TV personality Sarah Richardson. Canadians can find helpful painting tips and get inspiration from one of the best talents in design with the Sarah Richardson Designer Palette.

Richardson has individually selected 75 chic colours to be showcased in her collection.

PARA Paints has a steadfast commitment to remain market leaders in the paint industry and continue to inspire Canadians as the professional choice for designers and homeowners. This partnership ties in with the distribution of PARA Paints in all Lowe's Canada locations. Lowe's will carry three major PARA sub-brands including PARA Ultra specialty finishes, PARA Lifestyles paint for consumer markets, and PARA Professional Precision, which caters to both consumer as well as painting contractors. The Sarah Richardson Designer Palette is exclusive to PARA Paints.

[www.para.com](http://www.para.com)

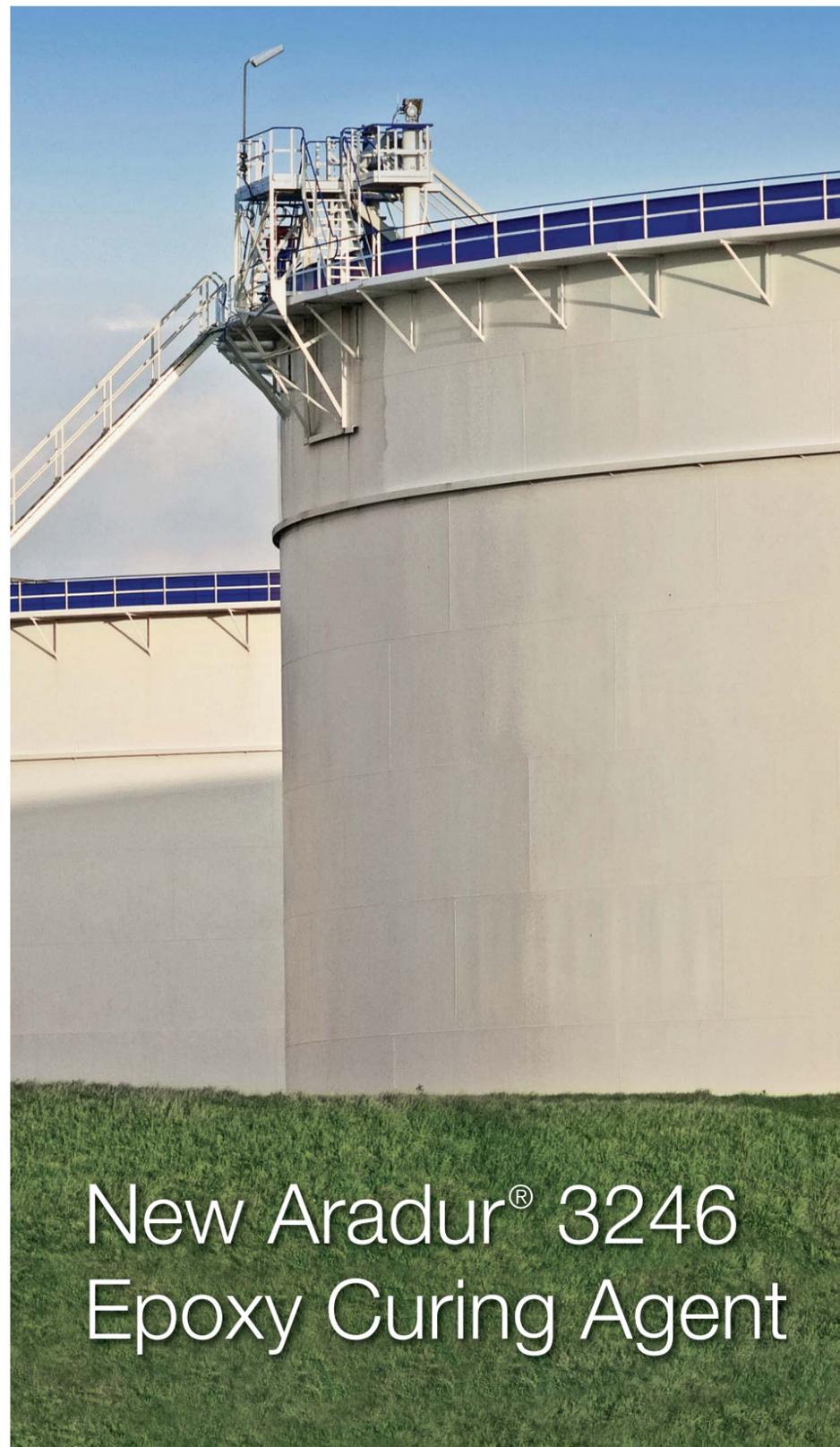
[www.sarahrichardsondesign.com](http://www.sarahrichardsondesign.com)

### Industry News CFCM July/Buyers Guide



The CFCM Buyers Guide is an accurate and up to date listing of all products and services offered in Canada for Industrial Finishing & Paint and Coating Manufacturing that combines a Journal Size Print Magazine and searchable On-line Buyers Guide. The listing is FREE.

- Web links in the online database will be live at no extra charge.
- The Buyers Guide is printed on Heavy Paper with an Extra Heavy UV Coated Cover for Durability



## New Aradur® 3246 Epoxy Curing Agent

Huntsman Advanced Materials introduces a new low-viscosity, rapid-curing amine hardener to help cut down application and cure time – saving your company time and money.

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## IN THE NEWS

and is a special journal size of 8-1/8 x 10-7/8 inches.

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  - Paint and Coating Raw Materials, Supplies and Services
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  - Custom Coaters and Job Shops
  - Associations, Education and Government
  - Listing Deadline: June 25th
  - AD Insertion Close: June 28th, Ad Copy Deadline: July 7th
- Contact: Pete Wilkinson, Publisher  
Canadian Finishing & Coatings Manufacturing Magazine (CFM)

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### Quebec to levy commercial water surcharge

Quebec companies that sell water-based products or use water for manufacturing will have to pay a provincial surcharge, starting January 1, 2011.

Provincial Environment Minister Line Beauchamp announced the new water charge at a news conference in Quebec City recently.

Two rates will be charged, in addition to municipal water fees.

Quebec's housing and agricultural sectors are exempt from the new fee, which is expected to generate an estimated \$8.8 million per year.

Revenues will go to Quebec's Green Fund,

which finances environmental initiatives.

### Canadian Bridge Conference

The stage is set for the CSCE 8th International Conference on Short and Medium Span Bridges, Aug. 3-6 at Niagara Falls, ON.

Hosted by the Canadian Society for Civil Engineering (CSCE), the conference is convened every four years as a forum for state-of-the-art design, engineering, construction, and maintenance of short- and medium-span bridges.

Tours of the Structural Engineering and Earthquake Simulation Laboratory in Buffalo, N.Y., and of recent bridge-construction projects in the Niagara area are planned.

[www.bridgeconference2010.com](http://www.bridgeconference2010.com).

### Coatings Report Forecasts Continued Expansion

Above-average demand in North America will help fuel overall increases in worldwide demand for architectural paint and coatings through 2013, new market research indicates.

Despite economic weakness in some major markets, worldwide demand for architectural paint is forecast to rise 3.6 per cent per year through 2013 to 22.8 million metric tons, valued at \$51 billion, according to the new study from The Freedonia Group Inc., Cleveland, OH.

The study, "World Architectural Paint," projects that demand growth will slow in comparison to the 2003-2008 period due to a decrease in global building-construction growth through 2013. But volume gains will remain strong by long-term historical standards as a result of global economic growth and continuing gains in the world's urban population that will put a strain on existing housing stocks, the report states.

The report forecasts that, as was the case over the past decade, the most rapid increases in architectural coatings demand will be seen in the world's emerging markets, most prominently in Asia.

North America will post slightly above-average volume gains through 2013. The housing and mortgage problems that have plagued the US since 2006 will subside, providing opportunities for coatings sales to the new-home market. Also, sales to the much-larger home-repaint segment

will benefit as sales of existing homes improve, since existing homes are often repainted when they are put up for sale or after they are sold.  
[www.freedoniagroup.com](http://www.freedoniagroup.com).

### Coatings Conference in Illinois

Chicago Society for Coatings Technology/SYMCO and PCI Magazine have partnered to host the Coatings Trends & Technologies (CTT) Conference. This two-day technical conference is an expansion of the Coatings for Plastics Symposium and will focus not only on coatings for plastics, but also on the latest coating trends for wood and metal. In addition, coatings suppliers will be invited to showcase their products and services through tabletop exhibits.

CTT will be held Oct. 5-6, 2010, at the Westin Lombard Yorktown Center in Lombard, IL. Technical managers, formulators, applicators, raw material suppliers, technicians, students and those involved in R&D, quality control, analytical testing and purchasing will all benefit from this technical conference. Learn more at [www.coatingsconference.com](http://www.coatingsconference.com).

### Boon Seen in Nanocoatings Market

Growing demand for eco-premium coatings will help drive "considerable growth" in the global nanocoatings market for the next five years, reaching \$11.72 billion by 2015, according to a new report by Global Industry Analysts Inc.

Nanotechnology in conjunction with material science helps manipulate/modify/alter material characteristics at the molecular level and develop materials that meet unique, exclusive and critical needs of end-users.

Nanotechnology-supported innovations in coatings include development of antimicrobial effects, thermal insulation, dirt repellency, corrosion-resistance, anti-graffiti, moisture-absorbing coatings, and self-cleaning coated surfaces.

The ongoing economic crisis has positioned nanocoatings to strengthen their market stance, given their cost, performance, and energy efficiency advantages. Neither research nor innovation in the nanocoatings sector have flagged during the recession.

Eco-premium coating solutions are forecast to rise in demand among all end-user sectors in the upcoming years, echoing opportunities downstream into the nanocoatings market.

More information about "Nanocoatings: A Global Market Report" is available at [http://www.strategy.com/Nanocoatings\\_Market\\_Report.asp](http://www.strategy.com/Nanocoatings_Market_Report.asp).

### Pricing Updates

#### Sartomer Increases Prices on Monomers and Oligomers

Sartomer USA, LLC has announced price increases for its monomers and oligomers sold in the Americas effective May 15 or as existing contracts allow. The company says the change applies to all oligomers, acrylate and methacrylate monomers, and MCure and Sarbox resins. Sartomer cites rising feedstock prices and tight supplies driving up the cost of many major raw materials and tight supply impacting outgoing shipments as the reason for the increase. The company says lead times will be a minimum of six weeks.

The specific changes are per pound: All Acrylate Monomers \$0.12; All Methacrylate Monomers \$0.12; All Urethane Acrylate Oligomers \$0.12; All

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## 2010 TOSCOT Scholarship Applications - Now Being Accepted!

The Toronto Society for Coatings Technology (TOSCOT) has always focused primarily on Education and has established a scholarship fund for members' children who are considering post secondary education (college or university).

The maximum \$2000 Scholarship is designed to encourage young people who have demonstrated excellence in their secondary school education, as well as those students already enrolled at university to further their studies toward attaining a degree.

Although preference is given to those considering enrolling in science programs, applicants who have elected a non-science related field of study will also be considered.

In the event that the number of applicants meriting a scholarship is greater than one, the amount awarded per applicant may be scaled down. Alternatively, should the growth of the scholarship capital fund warrant it, the trustees will increase the payout as deemed appropriate.

Four trustees from TOSCOT's executive committee manage the affairs of the scholarship fund; they also select the recipient(s). In addition to the money, Scholarship recipients will receive a framed certificate acknowledging their award. An invitation is also extended to them and their parents to join us for dinner on the night of a scheduled Society meeting, at which time the certificate will be formally presented.

To download the scholarship application form visit [www.toscot.org](http://www.toscot.org) or for more information please contact the Education Chairperson Jason Young at 416-461-0844 ext 242 or [Jason@dempseycorporation.com](mailto:Jason@dempseycorporation.com).

### More TOSCOT Education News

A new season of courses towards attaining the Diploma in Coatings Technology begin Thursday, September 02, 2010. The First Semester series of lectures cover the topic Raw Materials.

The courses may be of interest and rewarding to employers in paint manufacture, and/or those engaged in raw materials distribution to the coatings and related industries, who wish to train their new employees in the basics of coatings technology, as well as to those already working in the paint and coatings field wishing to upgrade their skills and knowledge by earning the Diploma.

Those interested in participating should contact Jason Young, Education Chairman 416-461-0844 x:242 or e-mail: [jason@dempseycorporation.com](mailto:jason@dempseycorporation.com)

Epoxy Acrylate Oligomers \$0.15; All Other Oligomers \$0.12; All MCure Resins \$0.12; All Sarbox Resins \$0.12. Globally based in Exton, Pa., Sartomer USA, LLC is part of Total's chemical branch. [www.sartomer.com](http://www.sartomer.com).

### Arkema Emulsion Systems Announces Price Increase for Latex Products

Effective May 1, 2010 or as contracts allow, Arkema Emulsion Systems has increased pricing on all latex products. UCAR acrylic, styrene-acrylic, styrene-butadiene and NEOCAR Acrylic latexes will increase by \$0.09 per wet pound. UCAR vinyl-acrylic, EVOCAR vinyl acetate-ethylene and NEOCAR Latexes will increase by \$0.04 per wet pound.

This increase is in addition to Arkema Emulsion Systems' earlier announced price increase effective April 1, 2010. The company says this further action is necessary due to the continued increase in the cost of key feedstocks and raw materials and the company's commitment to maintain margins that allow for ongoing reinvestment to meet customers' future needs.

In addition, Arkema Emulsion Systems will implement a sales control program on some acrylic latex products due to certain specific raw material supply constraints.

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

### Ashland to Increase Prices for Phosphate Ester Surfactant Products

Ashland Aqualon Functional Ingredients, a commercial unit of Ashland Inc., will increase the price of all Dextrol and Strodex phosphate ester surfactant products by 5 to 8 per cent in North America effective May 1, or as contracts allow.

The company says this action is driven by escalating raw material prices and that responding to changing market conditions allows Ashland to continue to invest in new capacity and product innovation.

Ashland Aqualon Functional Ingredients is a leading producer of cellulose ethers worldwide.

### Ashland Increase North American Pricing for Vinyl-acetate-based Polymer Emulsions

Ashland Performance Materials, a commercial unit of Ashland Inc., has increased the price of its homopolymer and copolymer vinyl-acetate emulsions, and its vinyl-acrylic emulsions, sold in North America by 3 cents per wet pound effective April 1, or as agreements allow.

### Eliokem Announces North American Price Increase

Eliokem announces a price increase in North America of \$.07 to .12 /lb for Pliotec acrylic and styrene acrylic resins depending on the grade and 3 to 5 per cent for Pliolite and Plioway acrylic copolymer resins depending on the grade.

The increase will be effective on April 5, 2010 or as contracts allow.

This price increase is required to partially offset the rise in the cost of raw materials, energy, and freight costs associated with producing these products. Eliokem remains committed to keep providing our customers with top quality products and the best service standards.

### OMNOVA Solutions Raises Prices

OMNOVA Solutions' Specialty Chemicals business has announced a price increase of \$0.04 per wet pound for all acrylic, styrene-acrylic and vinyl-acrylic emulsion polymers. The increase was effective April 15, 2010, for all specialty markets including coatings, tape and adhesives, floor care, graphic arts, nonwovens, textiles, and construction.

OMNOVA Solutions' Specialty Chemicals business has also announced a price increase of \$0.04 per dry pound for all GenFlo, GenCeal, OMNABOND, GenCryl and GenCal styrene-butadiene-based emulsion polymers. The increase is effective April 15, 2010, for all specialty markets including coatings, tape and adhesives, nonwovens, textiles, and construction. This increase is in addition to previously announced increases.

### Nuplex Resins Raises Prices

Nuplex Resins, Louisville KY, has announced a price increase for coating resins sold in North America effective April 26, 2010. The increase will be approximately 5-12 per cent for solvent acrylics and the acrylic emulsions. The increase will be 2-5 per cent for alkyds, polyesters and all other resins.

### EPS Materials Announces Price Increase

As a result of rising feedstock costs, EPS-Materials is electing to increase pricing for all solvent-based resin products by 4 cents per pound effective May 1, 2010. The increase in demand associated with the upcoming spring buying season and low inventory of key raw materials have led to a rapid escalation of costs.

### CCP Increases Prices on Chempol Coatings Resins

Effective for orders shipped on or after April 21, 2010, Cook Composites and Polymers (CCP) has announced a price increase of up to 15 cents per pound for most Chempol Coatings Resins.

The action is necessary due to the limited availability and rising cost of certain key raw materials used in the production of these resins.

### Flint Group to Raise Prices

Flint Group North America has announced a 6 per cent price increase on all energy-curable inks and

coatings for sheet-fed, liquid packaging and web-offset applications, effective immediately.

Customers will be notified directly by Flint Group's sales organization to discuss the impact on the particular products they purchase. Flint Group will honor its contractual obligations in implementing the increases.

### People on the Move

#### Byers Bush Inc Hires New Production Coordinator

Byers Bush, Mississauga, ON, is pleased to announce the hiring of Glenn Slack as its new Production Coordinator.



Slack has been in the painting industry for over 30 years, starting his career with Butcher Engineering and then moving to Tilton Industries.

Slack's new role will be to oversee the painters, focusing on increasing quality, speed and cost savings within the Paint Department.

## Calendar of Industry events 2010

**June 15-16, 2010:** Sur/Fin 2010, annual conference and trade show organized by the National Association for Surface Finishing, Grand Rapids, Michigan. [www.nasf.org](http://www.nasf.org)

**October 2-3, 2010:** CPCA 2010 Conference in Montreal. [www.cdnpaint.org](http://www.cdnpaint.org)

**October 5-7, 2010:** Canadian Manufacturing Week: at the Toronto Congress Center. [www.sme.org](http://www.sme.org)

**October 12-14, 2010:** parts2clean, International Leading Trade Fair for Cleaning within the Production and Maintenance Processes, Exhibition Center Stuttgart, Germany, Organizer: fairXperts GmbH. [www.parts2clean.com](http://www.parts2clean.com)

**October 12-14, 2010:** COROSAVE, International Trade Fair for Corrosion Protection, Preservation and Packaging, Exhibition Center Stuttgart, Germany, Organizer: fairXperts GmbH. [www.corosave.com](http://www.corosave.com)

**October 26-29, 2010:** NAI (The North American Industrial Coating Show), hosted by The Powder Coating Institute (PCI) and NACE International, The Corrosion Society (NACE), at the Indianapolis Convention Center, IN. [www.thenaicoatingshow.com](http://www.thenaicoatingshow.com)

**Nov. 2-4, 2010:** FABTECH with the debut of the Chemical Coaters Association International (CCAI) FINISHING TECHNOLOGIES Pavilion & Conference, Georgia, World Congress Center, Atlanta, GA. [www.fabtechexpo.com](http://www.fabtechexpo.com)

**Editor's Note:** Please see more industry events listed online at [www.cfm.ca](http://www.cfm.ca)

Perstorp wanted to get the message across that they have always been committed to environmental concerns and that now with the result of some acquisitions, the company spreads the full line of the polyurethane (PU) chain. Perstorp has significantly strengthened its PU coating portfolio through a number of key acquisitions of isocyanates, caprolactones and isophthalic acid business. In combination with its vast pallet of polyols, the extended product range and synergies in sales, production and development, have transformed Perstorp into a key-supplier for the entire PU chain. The company also introduced several new products at the show such as Tolonate, Charmor and Easaqua.

Dow held a special press event to let the industry know how they were preparing for the future at which people from several of their divisions spoke about the New Dow Coating Materials after the various marriages and acquisitions of other companies such as Rohm and Haas. They introduced Rhoplex VSR 2015 with Versar technology, a new latex binder based

on low odor technology as well as a new iPhone app among other technologies.

Dow Corning featured its broad range of innovative brand silicone additives and resins. The company also showcased its silane-based anti-stain coatings and water repellents for the protection of construction substrates.

Bayer MaterialScience has come up with a soft touch coating for automotive seats to meet the General Motors spec to basically prevent upholstery damage due to suntan lotion. Those product names are: Bayhydrol A 2542, Bayhydrol A 2546, Bayhydrol UH XP 2660, and Bayhydrol XP 2547. These products meet General Motors specification 14 445 for suntan lotion and DEET resistance. Bayer introduced several other new products at ACS as well.

Clariant showed an innovative ED Pigment range now available for all paint manufacturing applications: Easily-Dispersible pigments are organic pigments that can be incorporated into paint systems by using only a high-speed dissolver without an additional milling step.

Arkema also held a press event to let the world know how their company will be functioning after recent acquisitions. As a result of the acquisition by Arkema of UCAR Emulsion Systems from Dow, Coatex will be supplying POLYPHOBE products to the Paint and Coatings industry in the United States, Canada, Mexico and Puerto Rico. The POLYPHOBE trademark has exceptional market recognition as a family of tailored hydrophobically modified alkali soluble thickeners (HASE) for interior and exterior paints and coatings. Arkema also introduced UCAR Latex 320 is a new vinyl acrylic emulsion polymer for use in formulating paints and coatings for architectural applications featuring low levels of volatile organic compounds (VOC).

Michelman also introduced several new products.

There was so much innovation on the ACS exhibit floor, too much to mention in one issue. Please see our New Products section and features in this and future issues.

## THE CONFERENCE

In their keynote presentations on the first day of the conference Dennis Ryder product manager for liquid and powder resins for Cook Composites & Polymers (CCP) and Robert Enouen, associate director for customer business development, Procter & Gamble (P&G) spoke about how CCP and P&G, in a collaborative effort, have developed an innovative technology based on sucrose ester chemistry for low VOC coatings applications. This pioneering work has led to a family of alkyd products based on renewable raw materials, both in solvent and in water, which behave similar to conventional alkyd chemistry at significantly lower VOC's without compromising performance. The resulting high performance alkyd technology based on highly functional sucrose esters was the EPA's Presidential Green Chemistry Challenge award winner for 2009. P&G's Sefose technology is basically a mixture of sugar and vegetable oil.

The other keynote speaker was Kenneth Perry, BASE, USA who dealt with Sustaining Innovation and the Environment in

## CFCM magazine was there in full force at the American Coatings Show in April 2010 to capture the Canadian invasion...on camera that is.

PHOTOS BY PETE WILKINSON.



Mark DiLorenzo, Emerald Minerals and Ed Thompson L.V. Lomas



Jim O'Donnell, Q Sales, Eric Bos, Sansin and Mike Rausch, Q Sales.



Mark Gerard, and Andrew Tennant and David Fernee, Hexion.



Herman Persaud, Lorama Inc. (centre) with Trevor Wirsig and Luca McCarthy Godvari Biorefineries.



Catherine Norwood demonstrates the insulation properties of Nanogel, Aerogel by placing her hand on a 160 degree C plate coated with an Aerogel coating.

Difficult Times. He explained how BASF relies heavily on preparing and then adhering to a long term strategy as a way to ensure that short term attention does not effect long term profitability and competitiveness. It is important that the projects are well defined in time frame, financial return, and improvements in environmental effects.

The conference was a three-day event that covered every area of concern for coatings formulators.

Featuring almost 100 presentations and other events as well as 958 participants from 40 countries, the American Coatings Conference, which ran from April 12 to 14, had significantly more visitors than the premiere two years ago.

At the Conference, the best presentation was honored with the American Coating Award. Consisting of a 2,500 US\$ cash prize and a small sculpture, the award was given to Oihana Elizalde, Stephan Amthor and Collin G. Moore

(BASF) for their presentation on "Improving Waterborne Anticorrosion via New Binder Concepts."

In addition, the paper entitled "Role of Nanoparticle/Polymer Interface on Hybrid Coatings Performance" by Xiaohung Gu (NIST) and her co-workers received the Roon Award for "Best Technical Paper" at the Plenary Session on Monday.

The American Coatings Show & Conference is organized by the American Coatings Association, Washington DC, and Vincentz Network, Hannover, Germany, and run by NürnbergMesse North America, based in Atlanta, GA.

The next American Coatings Show & Conference is set for May 7-10, 2012. This time it will be held at the Indiana Convention Center in Indianapolis, IN, placing it in the middle of the "Manufacturing Belt," the oldest and largest industrial region in the northeastern United States. ■



Cindy MacIntosh, Dow Chemical, Noel Shahnazarian, John Maclean and Al Green Northspec Chemicals Corp.



Oliver Dixon, Martin Groen i'nt Woud, Johanne Sawaya, Dempsey Corp.



The folks from Arya Chem Inc.

# AMERICAN COATINGS SHOW & CONFERENCE 2010



Ron Anger, Buckman Labs and Dave Saucier, Unipex Solutions.



Janet Gauley, Dura Chemicals Inc.



Dean Lieby, Lubrizol, Scott Harvey, Chemroy, with Kevin Quinn and Dennis Carlson, Lubrizol.



Leon Karmazyn and Linda Adamson, Dow Chemical Company flank Darrin Noble, Beauti-Tone Paints.



Fred Veghelyi, Dick Olson, and Steve Holland, OPC Polymers.



Unimin Frank Cangelosi, Maaten Vanham and Peter Hanson.



Vernon Lo, Paul Proulx and Bert Papenburg, Debro Corp.



Randall Rogers, Protek Paint.



Darcy Vanneste, Bowers Process Equipment.



Giselle Brodeur and Sam Crimi, A.S. Paterson with Chris Crawford, Hydrite Chemical, (centre).



Luciano Zottig and Isabelle Gelinas, Societe Laurentide inc.



Trevor Cook, Inortech Chimie Inc, and Rick Duha, Duha Color Services.



Jim Biederman and Paul Macko, Canada Colors & Chemicals.



Xavier Masse and Brett Minken, Andicor Specialties Chemicals.



Bent Jensen and Dieter Vogelsang, Langguth America.



Eugene Ward and Robert Ruckle with Alan Shapira, Israel Ministry of Defense.



Maggie Lu, John E. Goudey Ltd.

**AC** American Coatings  
SHOW 2010

# Emulsion Polymerization and Low VOC

COMPILED BY SANDY ANDERSON

**A**t the recent American Coatings Conference held in Charlotte, NC, an entire session was held on Architectural Coatings, which featured several speakers and their technical papers. The following is a synopsis of their informative presentations.

It dealt with VOC regulations for architectural coatings and finishes and how the industry is adapting to the tightening guidelines through new technology. Several papers of this session address environmental concerns, offering solutions for the formulation of low-VOC coatings. A highlight of the session is the lecture on one of the most important polymerization processes used in architectural coatings, the emulsion polymerization.

Frontier in Emulsion Polymerization for Coatings was presented by Willie Lau, Dow Chemical Company (USA), who spoke about the recent development of polymer systems derived from the emulsion polymerization technology based on

Cyclodextrin as Phase Transport Catalyst. The technology delivers polymer compositions and molecular weight ranges not assessable by conventional processes with unique performance attributes.

Emulsion polymerization is the most important industrial polymerization process for the manufacturing of water based latex polymers. The many applications of latices include adhesives, textile and non-woven binders, paper coatings, caulk and sealants, and most importantly, architectural and industrial coatings. The heterogeneous nature of the synthetic process requires the diffusion of monomers from the emulsified monomer droplets, through the aqueous medium, into the polymer particles for the ensuing polymerization. Adequate solubility of the monomers is essential for the diffusion process to proceed effectively. Consequently, very hydrophobic monomers cannot be readily incorporated by emulsion polymerization.

Cyclodextrin is a powerful tool in emulsion polymerization allowing the design of polymer systems not assessable by conventional emulsion polymerization methods. Two examples were included in highlighting the attributes of hydrophobic latex and a Design Diffusion system. Hydrophobic latex showed superior water repellency and adhesion to hydrophobic substrates. Latex polymers made with in-situ oligomer modification are demonstrated to offer a unique balance of performance properties necessary to meet the regulatory and environmental demands of the coatings industry. These oligomers are designed to enhance both the soft and hard properties in coatings.

Careful design of the composition and molecular weight of the oligomer phase ensures facile transport between hard and soft polymer phases to achieve both film formation and final performance properties. Theoretical modeling was demonstrated to be an invaluable asset in the design stage.

Jason Ness, Arkema, Inc. (USA) presented Controlled Structure Polymer Latex by Nitroxide-Mediated Polymerization. A novel alkoxyamine capable of controlling free radical polymerizations in emulsion was discussed. This versatile tool facilitates manufacture of controlled architecture polymers with precise molecular and chemical structures in latex, at industrially relevant solids content, surfactant level and particle size. These controlled structure polymer latices exhibit distinctive properties not attainable with conventional latex technology. This presentation highlighted synthetic methodologies for producing such latices and their properties in paint/coating applications. Specific examples include, new block copolymer latex possessing a minimum film forming temperature <0°C and blocking temperature >50°C permitting VOC-free coatings, and high solids content surfactant-free acrylic-based block copolymer latex produced by a simple batch process using a controlled structure water-soluble macroinitiator acting as initiator, control agent and stabilizer.

Free radical emulsion polymerization is commonly employed industrially to produce polymer latex for a variety of applications, including paints and coatings. This technique gives emulsion chemists the ability to control a variety of latex and polymer particle parameters such as: particle size, particle size distribution (PSD), solid content, particle shape, morphology (e.g., core/shell), and functionality. Fine-tuning these parameters is often necessary for achieving cer-

tain final latex properties designed to meet end-use application requirements. Despite all this synthetic utility free radical emulsion polymerization does not provide a means to control polymer characteristics at the molecular level, i.e., polymer composition, molecular weight, polydispersity, copolymer sequencing, and chain architecture. Controlled free radical polymerization (CRP), in contrast, does facilitate manufacture of controlled architecture polymers having precise molecular and chemical structures. Arkema's BlocBuilder MA is a unique nitroxide-based technology well-suited for controlling free radical polymerization in both homogenous and dispersed media. This versatile alkoxyamine is able to control polymerization of a broad selection of monomer types and provides a practical, robust method for the design of novel materials spanning rich architectures (e.g., block, graft/comb, gradient copolymers, etc.) and tailored end-use application properties.

In emulsion polymerization, This nitroxide-based technology provides chemists a powerful tool for designing the aforementioned controlled structure polymers within the latex particles themselves, while still controlling typical latex parameters (e.g., particle size, PSD, etc.)

Optimizing Performance of Vinyl Acetate-Ethylene and Acrylic Latex Blends delivered by Wenjun Wu, Arkema Emulsion Systems (USA) dealt with how Vinyl acetate-ethylene (VAE) and all acrylic (A/A) latexes, possessing complementary performance benefits, are two important classes of dispersion polymers for architectural coatings. Blending of VAE and acrylic latexes is therefore especially attractive because of the potential to produce cost-effective, low VOC compliant binder systems with balanced application properties.

Wu explored the blends of a VAE latex with various conventional and low VOC acrylic latexes in a semi-gloss formulation. Influences of acrylic design parameters as well as blend ratio on wet adhesion, block resistance, and scrub durability were also investigated. The significance of surface characteristics and component distribution in the film were discussed. Fundamental to all heterogeneous polymer blends, compatibility of the VAE/Acrylic binary system controls the important material properties like scrub resistance. Vinyl acetate-ethylene (VAE) and acrylic latexes are two important classes of dispersion polymers for architectural coatings, each offering distinct performance benefits. VAE binders have

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been recognized for their performance advantages: outstanding scrub resistance and low temperature touch up properties. A higher scrubbing binder enables the coatings formulator to lower total formulation cost by shifting to higher pigment to binder ratios while still maintaining acceptable scrub performance. The potential cost savings and performance benefits have made VAE an attractive product choice for architectural coatings.

While VAE offers several advantages over conventional V/A and A/A, they have certain performance deficiencies, most notably wet adhesion and block resistance for high sheen interior applications. For VAE to extend its application into semi-gloss interior and exterior paints, it is necessary to address these major performance gaps.

Vinyl acetate-ethylene (VAE) and acrylic latexes are two important classes of dispersion polymers with complementary performance benefits. Blending provides a cost-effective solution to boost wet adhesion and block performance of the VAE technology. Improved wet adhesion and block resistance can be achieved with as low as 20 per cent acrylic in the blend. It has generally been observed that the scrub performance of VAE/acrylic blends were lower than those of their pure constituents. Scrub resistance as a measure of film strength is compromised due to incompatibility of VAE and acrylic polymers. However, acceptable scrub performance is attainable with a high scrubbing acrylic modifier.

Rajeev Farwaha, Celanese (USA) spoke about Vinyl Acetate-ethylene (VAE) Latex for Formulating Low VOC Freeze-thaw Stability. Vinyl acetate/ethylene copolymer emulsions have gained a significant share of the paint market in the last decade. One of the main drivers is the consumer trend towards environmentally friendly, solvent free paints. The majority of the volatile organic content (VOC) solvent in conventional trade sale paints is coalescing solvent and glycol which is added as a freeze thaw (FT) additive. Because of the stringent environmental concerns and legislative measures there has been a new driving force for the coating industry to develop low VOC formulations. In a lower VOC formulation (<50 g/l), the amount of anti-freeze agent such as propylene glycol that can be added as FT additive has to be significantly reduced and most likely not sufficient to provide freeze thaw stability in paint. This paper will highlighted the new developments in designing VAE technology for formulating freeze thaw stable paints without the use of coalescent and glycol. Cryogenic SEM was used to visualize microstructural changes in the VAE latex during FT cycling. Oscillatory rheology was used at freezing temperature to determine the modulus values of the VAE copolymer. Dynamic mechanical analysis was used to examine the film properties of VAE latex before and after FT. Co-Authors of the paper were Brigitte Cardinal and

Brett Beauregard.

The phenomenon of freezing and thawing is of importance for waterborne latexes used for formulating paints, because of the need to store and transport these raw materials and finished goods within northern climates during winter. A conventional paint uses glycols to assist with freeze-thaw stability. In a low VOC paint, these glycols typically are not present. Vinyl acetate/ethylene latex emulsions are often used to formulate low VOC interior paints because of their low MFFT in relation to their T<sub>g</sub>. One indication that a latex is stable to freeze thaw cycling is the absence of change in the particle size and particle size distribution of the latex. This was shown to be the case with the vinyl acetate/ethylene emulsion EcoVAE 408. Another indicator is visual examination of the emulsion and the formulated paint using cryo-SEM. Again, the EcoVAE 408 latex and resulting eggshell paint showed a similar surface structure before and after freeze thaw cycling. Three separate measures of the latex film properties, (dynamic mechanical analysis, glass transition temperature analysis and tensile strength and elongation measurements) all showed no change in the EcoVAE 408 emulsion after freeze thaw cycling. Finally, digital microscopy (LM) was utilized to show thawing phase of the freeze-thaw cycle. These light micrographs illustrated that a freeze-thaw stable latex polymer and its corresponding paint have the ability to freeze with smaller ice domains in the latex matrix, to retain water and to hold bulk structure upon thawing. All of these results lead to the conclusion that it is possible to have a low VOC paint that is freeze thaw stable.

Design of Low VOC Latex for High Gloss Applications with Excellent Block Resistance was presented by Jihui Guo, Arkema Emulsion Systems, USA, co-written by Wenjun Wu, Mike Kaufman, Jeff Schneider and Mike Anderson.

With greater domestic and international environmental restrictions, reducing VOC levels is becoming an increasingly important issue for the industry. Traditional high gloss paints, which use solvent-borne alkyds, have been gradually phased out of the market in favor of water-based products containing low or zero VOC. However, solvent-borne formulations typically provide significant performance advantages in a number of areas. The development and application of a novel water-based technology for high gloss paints was described in this presentation. The technology allows formulators to meet exceedingly low VOC levels (< 2g/L) while providing outstanding performance. Results are reviewed for tests of key improved properties for low VOC, high gloss paint systems including block resistance, wet adhesion, and gloss. Increased performance is achieved without the use of co-solvents or coalescing

agents. This technology allows the coatings formulator to design product for use on trim, wood and walls and across the base system where a non-flat finish is required. In this presentation a new experimental latex technology was introduced for use in formulating no- and low- VOC interior and exterior high gloss paints for use on interior and exterior trim and walls. In addition to achieving low VOC, model paints formulated with the experimental latex demonstrate superior block both at room and elevated temperatures, excellent scrub resistance and very good dirt-pickup resistance. These properties are attributed to the ability of the latex to obtain excellent surface hardness while achieving film formation without the use of coalescing solvents. In addition to use in architectural coatings, this technology has also been applied in floor, kitchen and cabinet coatings and clear sealers.

Lastly, Speaker Randolph Krafcik, Sherwin-Williams, USA, talked about Minimizing Viscosity Changes When Tinting in Architectural Latex Paints. Co-Authors were Jennifer Dickey and Noel Dichosa.

High performance architectural latex paints can experience large changes in viscosity when tinting with universal colorants. This can be especially true when tinting paints to darker colors that are popular in today's interior Architectural paints. These darker colors can use up to 12 ounces of colorant per gallon, with a resultant viscosity showing as large as a 40 KU drop in some interior paints containing associative thickeners. This paper explored the root cause of viscosity change when tinting with universal col-

orants. The effect of individual components in universal colorants on viscosity change was shown. Also, various structure/property relationships in latex, HASE thickeners and surfactants that contribute to viscosity changes were shown in model paint formulas. Studies looking at the contributions of the individual components in universal colorants identified the largest contributor to KU drop as a nonionic surfactant present in all universal colorants. This nonionic surfactant likely interacts with the associative thickener network by disrupting the thickener adsorption onto latex and lessening the self-association between certain thickeners.

Investigation of various hydrophobic monomers in HASE thickeners showed that viscosity changes with universal colorants can be minimized through proper selection of a combination of hydrophobic monomers. The optimized HASE thickener worked well in paint systems containing larger particle size (>200nm) vinyl acrylic latexes, but did not perform as well in smaller particle size (<124 nm) latexes. Smaller particle size latexes can be further modified with hydrophobic monomers to minimize their viscosity response to universal colorants. Selection of the correct combination of HASE thickener and HM latex can lead to paint systems that experience minimal viscosity change with universal colorants. ■

*For more information on this Session 6: Architectural Coatings from the American Coatings 2010 Conference contact [www.american-coatings-show.com](http://www.american-coatings-show.com)*

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# UV Chemistry

COMPILED BY SANDY ANDERSON

**A** trade show conference provides a unique opportunity to hear in one place all the newest technologies created to enhance the industry. The American Coatings Show and Conference in Charlotte, NC adequately answered the "What's New in UV Coating Formulation?" question with its many informative seminars and tutorials.

Michael J. Dvorchak, UV Strategic Specialist and scientist for Bayer Material Science LLC gave a recent tutorial highlighting UV-cure coatings, from the basics to emerging technologies at the American Coatings Conference, Charlotte, N.C. It was designed in collaboration with Radtech North America. Because of their performance, economic and environmental benefits, ultraviolet (UV)-cure coatings represent a growing segment of the coatings industry. As a key player in the UV-coatings market, Bayer Material Science LLC introduced formulators to the fundamentals of UV-cure coatings during this pre-conference tutorial.

Dvorchak, strategic technology manager for UV cure oligomers & PUDs government programs, provided an overview of the fundamentals of UV-curing coatings, examining both their benefits and limitations. Some of the advantages of UV-cure coatings include fast curing time, a range of application properties and their more eco-friendly chemistry, to name a few.

Overall, UV curable coatings have experienced growth of 7-8 per cent in many coatings markets.

"The prevalence of UV-cure coatings has recently grown due to their popularity with formulators as a way to meet govern-

ment mandates regulating levels of volatile organic compounds (VOCs) and hazardous air pollutants (HAPs)," says Dvorchak.

Some of the strongest growth areas for UV-cure coatings include UV A composite repair, Direct-to-Metal (DTM) applications, UV elastomers, UV A automotive clearcoats and primers, UV A aerospace coatings and UV polyurethane dispersions for plastic hard coats and soft-touch applications. How these UV coatings are formulated and applied in different markets was also covered in the tutorial. A variety of UV light sources both in automotive and industrial settings were also discussed.

He compared Coating Formulation between:

#### Conventional Coating

- solvents
- resins
- additives
- catalysts
- pigments/fillers and UV Curable Coating
- reactive diluents
- UV cure oligomers
- additives
- photoinitiators
- pigments / fillers

Also in a pre-conference tutorial, from Bayer, Dr. Myron Shaffer, product performance manager, highlighted the evolution of versatile polyurethane chemistry customization.

Since its discovery more than 70 years ago, polyurethane chemistry has evolved, lending itself to such diverse formulations as an additive to curing agents in coatings, aqueous polyurethane dispersions

(PUDs), two-component urethane coatings and more.

Visitors to the American Coatings Show (ACS) learned about this evolution, as well as the roles isocyanates, isocyanate coreactants, UV curable urethane acrylates and other polyurethane technologies play.

During the ACS Conference in a session on radiation curing, various speakers highlighted UV coating formulation and presented papers on novel binders, additives and methods. UV cured powder coatings contain resin, photoinitiators, additives and pigments. Standard resin chemistries are available for interior and exterior applications. Photoinitiators absorb high intensity ultraviolet light to cause molecular cross-linking throughout the coating. Additives modify the surface of the coating to improve a coating property such as scratch and mar resistance and pigments add opacity and color to the coating. A variety of colors, special effects, metallic, and multi-component powders provide a wide array of finishes and

appearances.

David Hood, ISP, presented A Novel, Cross-linkable Polymer and Application.

Insight to a novel cross-linkable, water sensitive polymer was presented. In detail, a functional derivative of poly(vinyl caprolactam-co-vinyl acetate) was discussed along with general structure and properties of this material. Prototype formulations demonstrating the cross-linking functionality of these polymeric materials via cationic UV cure was revealed. Additionally comparative properties to poly(vinyl pyrrolidone-co-vinyl acetate-co-glycidyl methacrylate) was discussed. Coauthors of the paper were John McKittrick, Surya Kamin and Osama M. Musa.

Use of Novel Matting Agent in UV Cure Coatings was presented by Hans-Dieter Christian, Evonik Degussa GmbH, USA. Co-Authors were Reinhart Behl, Uwe Schmeier and Maria Nargiello. While many technical advances have been made to produce low gloss, radiation curable clear coatings, they still present a challenge for most UV coatings manufactur-

#### ISP Launches Nano-scale UV Protection Additive for Water-Based Coatings Systems

*New ingredient efficiently protects binder integrity of clear to semi-clear coatings products*

The Performance Chemicals business of International Specialty Products Inc., (ISP) Wayne, N.J., a leading global supplier of specialty chemicals and performance enhancing products has introduced SunCare Topcoat, a technology for protecting the integrity of coatings from Ultra Violet damage.

This new technology is based on nano-scale emulsions of UV protective actives offering broad spectrum protection (290 to 380 nm) with outstanding performance in the UVA range. Tests have shown that SunCare TopCoat can be up to four times more effective than traditional water-based coating UV-protection additives. This breakthrough performance results from the use of dramatically smaller particle sizes of the UV active, with better particle distribution in the emulsion. Applications for SunCare Topcoat include exterior wood stains and varnishes, indoor wood coatings and wood care products, plasters, plastic and leather care products, UV blocking varnishes on printed materials and adhesives and bonding layers. SunCare Topcoat is an extension of the line of Wood Care Technology launched by ISP in March of 2009. The ingredient will be initially sold in Europe, the Middle East and Asia.

According to Scott Edris, Senior Director of Global Marketing, Performance & Agricultural Chemicals, SunCare TopCoat is the result of an initiative at ISP to create new technology for manufacturers of wood care products and is a perfect example of the company's broadening product portfolio for the coatings industry at large.

"In the last few years, ISP has set its sights on broadening and improving coatings technology for customers," says Edris. "While additives have always been a part of our portfolio, we have expanded the ways we can help coatings manufacturers improve their products by adding a full range of biocides, new acrylates chemistry and technically sophisticated products like SunCare TopCoat," he says. The company sees the product as being attractive to a broad range of coatings manufacturers who want to ensure long-term product integrity against the potential damage of UV radiation, on anything they make, not just for wood.

"The efficiency and economics available with SunCare TopCoat can help make this happen," says Edris.

#### Patent Pending, Advanced Technology for Water-Based Systems

SunCare TopCoat is a stabilized combination of UV-absorbers and Hindered Amine Light Stabilizers (HALS) – offering double action for maximum effectiveness. The patent pending microemulsion technology represented in SunCare TopCoat is responsible for most of its advanced properties, including excellent binder and dry film protection across a very broad spectrum of UV radiation. SunCare TopCoat's performance, however, stands out in the UVA range.

The high level of performance of SunCare TopCoat allows lower use levels – offering economic efficiency and a lower environmental profile. SunCare TopCoat is VOC and surfactant-free. ISP conducted tests with SunCare TopCoat that show it works synergistically with other products within ISP's Wood Care Technology line – specifically SunCare UV and SunCare 800. Both of these products are lignin stabilizers that prevent degradation of wood in primer formulations. The company says tests using both primers and topcoats featuring SunCare products have shown exceptional performance in the field.

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ers. Matting agents have been developed where particle size, treatment and structure have been modified to achieve low gloss. In this development, the combination of specific amorphous, synthetic silica combined with a specific Polydimethylsiloxane surface treatment was found to improve efficacy. Based on this experience, a new product especially designed for low gloss, high transparency and low viscosity was developed for UV-Coatings. This presentation featured results comparing this new generation of matting agent to the matting technology currently considered "state of the art" in UV application. The focus was on gloss vs. viscosity behavior. Photomicroscopy based on REM and TEM-Thin-Cut was shown to demonstrate the performance of this unique new of matting agent.

Matting agents or additives to increase surface roughness have evolved over the decades based on a variety of sources, including ground polymeric types to those based on silicon dioxide. This paper and presentation focused on those based on SiO<sub>2</sub> from precipitated and gel processes, which are marketed specifically for the UV coatings segment. This coatings segment presents its own unique challenges to achieve low gloss finishes compared to other coatings segments because there is typically no solvent, little film shrinkage, varying line speeds and curing conditions. The new matting technology noted as Matted Agent #4 was compared to those currently available on the market.

Physical-chemical review of grades included new versus market standards.

Performance properties compared were:

- Efficiency
- Gloss at 60° / 85°
- Viscosity
- Transparency
- Surface roughness

The presentation first outlines typical physical-chemical properties of the matting agents included in the study and then reviews the formulation used and data pertaining to performance. Values tested include: matting efficiency at 60 degrees and 85 degrees, viscosity build-up, which is a major consideration in UV coatings especially when trying to achieve low gloss finishes in the area of 10 at 60 degrees. Other results presented pertain to: transparency, surface smoothness and morphological differences in technology as assessed through SEM analysis of films.

In summary, the new reactive siloxane treated, precipitated silica technology represented by MA#4 gives the UV coatings formulator a new and novel option to achieve low gloss finishes, while maintaining low applications viscosity, high clarity & transparency and achieving high surface smoothness.

Synthesis of UV-Curable Hyperbranched Urethane Acrylates was covered by speaker Igor Khudyakov, Bomar Specialties, USA. Co-Authors were Ahmet

Nebioglu, James H. Aerykssen, Joseph A. Leon, R. David Zopf. Hyperbranched (dendritic) urethane (meth) acrylates are valuable oligomers for UV-curable coatings. The high acrylate functionality of these oligomers (up till 60 in the present work) leads to hard, abrasion resistant cured coatings.

"However, in our experience, a gelation of the oligomer occurs in the case of a reaction of diisocyanate D (fNCO = 2) with hyperbranched polyol P of fOH 4," said Khudyakov. "We report ways to overcome this obstacle."

He explained, "First, we used mono-functional isocyanates such as commercially available 2-isocyanatoethyl methacrylate and some others."

"Second, we have developed an original method of capping P designated as extreme reverse addition (a patent is pending)," he said.

Chemical and mechanical properties of similarly structured hyperbranched urethane acrylates obtained by both methods were described.

Je-ik Moon, Seoul National University, Lab. of Adhesion & Bio-Composites, South Korea presented Dual-curable Polyurethane Acrylate with Photopolymeric Acrylic Resins. Co-Authors are Hyeon-Deuk Hwang and Hyun-Joong Kim.

Silicone-containing polymer provides unique properties such as lower surface tension, longer durability, higher hardness and heat resistance. Adding these advantages of inorganic silicone to organic coatings, polyurethane coatings were synthesized with polypropylene glycol or poly(tetramethylene ether) glycol, isophorone diisocyanate, polydimethylsiloxane, dimethylol propionic acid and pentaerythritol triacrylate. Acrylic resins were prepared by a radical photo-polymerization. Butyl acrylate, methyl acrylate, methyl methacrylate, glycidyl methacrylate, and 2,2,2-trifluoroethyl methacrylate were reacted with a radical type photoinitiator at ambient temperature by irradiating a UV-curing machine. Epoxy-carboxyl reaction was occurred between glycidyl and carboxyl group at high temperature and then, interpenetrating polymer networks structure were made by dual curing. These IPN structures improved the durability and surface properties of cured coatings.

Lastly, Xavier Allonas, Department of Photochemistry, France, presented a paper on Photoassisted Drying of Alkyd Resins.

Co-Authors were C. Croutxé-Barghorn, C. Ley, G. Ye, and E. Courtecuisse.

A new three-component drying system containing thermal driers, photosensitisers and photoinitiators for photoassisted oxypolymerization of alkyd resins was investigated. Conversion profiles were recorded by real-time infrared spectroscopy. Multiple regression analysis was used to model the influence of drier, photosensitiser and photoinitiator on the final

conversion and total polymerization rate during photooxidation. Time-resolved chemiluminescence technique and laser flash photolysis were used to study the photochemical mechanism. ■

For more information on these and any other papers presented during the recent ACS contact [www.american-coatings-show.com](http://www.american-coatings-show.com).

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continued from front cover

compound (2,5-dimercapto-1,3,4-thiadiazole, DMCT) with BAM-PPV as the pre-treatment coating. The laboratory results showed that this completely Cr(VI)-free pretreatment/primer military coating has survived up to 4,500 hours in neutral salt fog exposure testing.

The aerospace industry and the Department of Defense (DoD) currently use chromate conversion coatings (CCC) and hexavalent chromium (CrVI) based primers to inhibit corrosion on aluminum alloys. In addition to their corrosion-inhibiting properties, Cr(VI) based coatings provide excellent paint adhesion to the metal surface and between the primer and topcoat. These coatings are applied via spraying onto both aluminum and steel substrates. Several recent studies have shown that unreacted Cr(VI) in both the pretreatment and primer provide corrosion protection via a "self-healing" mechanism. However, Cr(VI) is a known carcinogen and is highly regulated by the EPA and OSHA.

Any viable alternative to Cr(VI) coatings must meet or exceed the adhesion and corrosion-inhibiting performance of current Cr(VI) military coatings. Ideally, these alternative coatings must be able to passivate the metal surface. Over the past several decades, EAPs have received considerable interest as corrosion inhibiting coatings. Most of these studies have focused on polyaniline (PANI) applied as a primer onto steel substrates. More recent studies have focused on PANI and derivatives of PANI as replacements for Cr(VI) pretreatment applications. Poly(2,5-bis(N-methyl-N-hexylamino)phenylene vinylene, BAM-PPV coated onto aluminum alloys has also shown corrosion inhibition in simulated seawater and exposure to neutral salt fog spray.

There have been numerous reports that have described the versatility of EAPs on various substrates for corrosion prevention/inhibition of carbon steel, stainless

steel, iron, titanium, copper and aluminum alloys. Early work with respect to iron and stainless steel suggested that protection of scratches was provided through the observed polarization of the bare surface to a passive state. However, more recent results suggest that protection of iron and stainless steel in such imperfections can also stem from the inhibitor properties of the dopant and the ability of that inhibitor to migrate to the area suffering corrosion. The dopant migration mechanism is also believed to govern corrosion protection by some EAPs with respect to aluminum alloys via a "smart release" of inhibitor to the exposed metal.<sup>17-19</sup> Thus, this type of corrosion prevention/inhibition would deliver a similar mechanism to that of Cr(VI) without the environmental liabilities.

**Methods:** BAM-PPV solutions were prepared from either xylenes or Oxsol-100 solvent and applied via spray onto aluminum alloy (AA) 2024-T3. Crosslink inhibitor primer was suspended in an epoxy formulation and applied via a dual spray gun system.

Neutral salt spray exposure testing was performed to evaluate the ability of the coating systems to withstand a 5 weight percent sodium chloride solution, pH-adjusted to a range of 6.5 – 7.2.

This test was performed on full military coating systems using AA2024-T3 substrates.

UDRI/CTIO Laboratory Procedure CLG-LP-019, Salt Fog Corrosion, in accordance with ASTM B 117, Standard Practice for Operating Salt Spray (Fog) Apparatus, was used for guidance to run the test.<sup>20</sup> All samples subject to neutral salt spray exposure were photographed before and after the test to document the coating performance. There were three replicates per coating system.

BAM-PPV was coated with Cr(VI) epoxy and Cr(VI)-free epoxy primers. All coatings were topcoated with polyurethane and exposed to neutral salt fog chamber for

2,000 hours. A fully Cr(VI) coating system was used as control during the neutral salt fog exposure testing.

The samples were placed in neutral salt fog chamber and examined for their corrosion resistance.

The BAM-PPV using Oxsol solvent were coated onto AA 2024-T3 substrates. The BAM-PPV coated coupons were then compared to the performance of Alodine 1200S (chromated conversion coating, CCC) with the same primer and topcoat system. BAM-PPV was allowed a 1-hour dwell prior to application of the material using high volume low pressure (HVLP) spray gun.

The BAM-PPV was set-to-touch after 30 min but samples were not coated with primer until the following work day, giving these materials about 16 hours between pretreatment and primer application. Topcoat was applied 4 hours after primer application. Samples were left to cure at room temperature and ambient relative humidity (approximately 75 °F and 50% RH) for 14-days prior to testing. Neutral salt fog spray testing demonstrated that the BAM-PPV coating systems performed adequately, meeting the 2,000 hours neutral salt fog exposure requirement for alternatives to Cr(VI) military coatings (see Table 1). The BAM-PPV pretreatment systems demonstrated minor corrosion in the scribe, minor build-up after 2,000 hours, and minor undercutting at the intersection of the scribe. The Alodine 1200S coating system (standard CCC) showed typical corrosion build-up in the scribe with the topcoat, a phenomena that is well-documented in CTIO lab testing of this system. In comparison, the BAM-PPV slightly underperformed as compared to the Alodine 1200S system. Adhesion testing of these systems was performed using the 1-mm grid for primer-only systems and the 2-mm grid on the topcoated systems. Data consistently showed that for all pretreatments, when primer was applied, the adhesion rating was 5 (no loss of

adhesion), whereas when topcoat was applied, the adhesion rating was 4 (minor loss of adhesion). The data suggests that once primer is applied, the BAM-PPV does not demonstrate a debit on the adhesion to the substrate (AA 2024-T3).

After successful completion of the laboratory testing by the Air Force, a field test was demonstrated on non-critical military hardware using the BAM-PPV as a pre-treatment coating. The BAM-PPV pretreatment coating was applied onto the C-5 cargo plane's rear hatch door with and without Cr(VI) primer and topcoat (Table 2). A Cr(VI) full military coating (Alodine 1600 (CCC) + Deft 02-Y-40 (Cr(VI) primer) + Deft 99-GY-001 (polyurethane topcoat)) was used as the control for this field demonstration. The rear hatch door was divided into four quadrants and coated with the controls and BAM-PPV. The coated door was flown for 12 months and examined periodically (visual inspection) every 3 months. The door with the BAM-PPV pretreatments and controls survived the field demonstration intact without loss of adhesion or corrosion.

BAM-PPV dissolved in xylenes was sprayed onto AA 2024-T3 and top coated with a new primer developed by Crosslink. The Crosslink primer system uses a derivative of DMCT in an epoxy formulation. The Crosslink primer with BAM-PPV as the pretreatment coating (no topcoat) was placed in the neutral salt fog chamber. The BAM-PPV pretreatment/Crosslink primer coating was scribed and evaluated at 500 hour intervals (visual inspection with photodocumentation). The BAM-PPV pretreatment/Crosslink primer coating showed outstanding corrosion performance up to 4,500 hours. At 4,500 hours, blisters were found on the outer edges of the coating coupon and several small blisters in the scribe.

Further neutral salt fog exposure testing is needed to determine the effectiveness and robustness of BAM-PPV with alternative non-Cr(VI) primers vs. Cr(VI) military coating systems. The BAM-PPV pretreatment and Crosslink primer system will be topcoated with polyurethane and tested for adhesion and corrosion inhibition in neutral salt fog exposure chambers. These tests will help determine the robustness of the new non-Cr(VI) coating system for aerospace and DoD coating applications.

Financial support for this program by the Naval Air Warfare Center Aircraft Division, Patuxent River, Maryland, Mr. C. Coughlin, CIV NAVAIR 4.3.4.4 is greatly appreciated. Additional financial support by the Environmental Security Technology Certification Program, Program Directors: Dr. Jeffrey Marqusee and Mr. Bruce Sartwell are also gratefully acknowledged.

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# Best Paper Award for Water-borne Anticorrosion Coatings

**BASF** researchers received the outstanding paper award at the American Coatings Show (ACS) in Charlotte, N.C., for their work on the development of high-performance water-borne anticorrosion coatings.

Oihana Elizalde, Stephan Anthor, and Collin Moore received the American Coatings Award for their paper, about Closing the Gap Between Water and Solvent-borne Anti-corrosion Coatings via New Binder Concepts. The award was presented during ceremonies held on the opening day of the conference. The paper explained that

Water-based anticorrosion resins have gone through many stages of evolution. Despite steady progress, there is still need for improvements. Recent innovations in the area of polymer colloids and hybrids offer new opportunities to develop novel coatings for metal protection. By choosing the appropriate technology, it is possible to design acrylic binders with improved barrier properties, low water uptake, and improved anticorrosion properties. Different methodologies were discussed including: designed particle morphology, engineering of the water phase composition, and the use of hybrid binders. Also, a new technology exceeding basic barrier function was presented. This utilizes a built-in, enhanced corrosion protection mechanism resulting in outstanding performance in salt-spray testing and early-rain resistance.

## The Paper

The following is an edited version of the award winning paper.

“The more stringent environmental standards and new technology advances are pushing waterborne coatings for corrosion protection forward. Currently, most of the R&D effort is focused on reducing the volatile organic compounds (VOC) content in architectural and industrial coatings. Because the film formation in polymer dispersions is greatly assisted by the use of organic solvents, the pursuit of low VOC formulations can be detrimental to film formation and, therefore, result in poor barrier properties. As a result of the substantial effort in the field, many new waterborne paint technologies have been launched (high performance acrylics, epoxy esters, alkyds, zinc rich epoxies, fluoropolymers, polysiloxanes etc.). Despite the fact that waterborne systems hold still a relatively low share of the total market for anticorrosive coatings, the average growth rate (AGR) for waterborne coating technology is larger than the AGR for conventional solvent-borne coatings.

## Water-based acrylic dispersions: high performance and environmentally friendly

Waterborne acrylic dispersions are mainly used in mid and light-duty coatings for the maintenance (bridges, plant and industrial equipment, repainting, towers etc.), transportation (trucks, buses, trains, tractors, mining trucks etc.) and DIY (repair, general maintenance, steel building panels etc.) segments among others. Very often these coatings are applied as multicoat systems that include several layers:

- Primers, having the function of providing good corrosion protection and adhesion to the metal surface
- Intermediate coats, act as a barrier to moisture and aggressive chemicals and help to build film thickness
- Topcoats, responsible for the aesthetics, but also for better impermeability and weatherability

Alternatively a monocoat may be applied, the so called direct to metal (DTM) coatings, with minimal surface preparation. DTM coatings are attractive due to the reduction of application steps (no surface preparation and only one applied coating), the reduction of raw material costs (one coat versus many) and the lack of the necessity of using active pigments. DTM coatings, however, do not often display the superior properties of a multi coat system and are typically used in lighter duty applications.

A typical anticorrosion paint formulation is composed of four main components: a binder, one or several

co-solvents, barrier and active pigments and fillers, and additives. The push from the market to further reduce the VOC content (by reducing the organic solvent content) and obtain environmentally friendlier paint formulations can have a negative influence on the film quality, resulting in a poor particle coalescence, poor barrier properties and therefore, an early failure of the coatings. To further reduce the VOC content in waterborne paints it is necessary to move from standard styrene-acrylics towards more sophisticated polymer architectures that allow optimal film formation under low VOC conditions.

## Key factors affecting film formation, barrier properties and anticorrosion performance

In order to avoid early failure of the coating and ensure a good corrosion protection the use of a well performing binder is a must, but it is not the only factor playing a key role. In addition, in order to achieve an optimal film formation and thus avoid an early failure of the coating, good substrate preparation, the development of an appropriate formulation and the drying conditions are as important as selecting an appropriate binder system for the coating. Ideally, oils, corrosion and any other contaminants must be eliminated from the metal substrate prior to applying the paint. This is of paramount importance, since in many cases early failure of coatings is due to either inadequate surface preparation or improper application of the coating to

the substrate. In the special case of DTM coatings, there may be little or no surface preparation before coating. Often times, such coatings are applied over oily substrates without previous cleaning or other type of substrate preparation. Proper formulation will enable the manufacture of paints that overcome this challenge.

## New approaches to high-performance water-borne acrylic dispersions

The degradation of coated metal parts takes place when water and oxygen penetrate the coating film, causing the separation of the paint from the metal. When water and ions reach the polymer-metal interface, electrochemical reactions will take place that lead to the appearance of rust. This process starts in defects such as scratches, pores or regions of the paint with reduced cross-linking density. Therefore, a coherent and defect-free polymer film is the basic requirement for an effective protection of the metallic substrate, because interstices and film defects act as pathways for water and ion diffusion that accelerate the corrosion of the metal surface.

One way to avoid, or at the minimum delay, the corrosion process is the development of binders with improved barrier properties and adhesion to the metal surface. Approaches to achieve good adhesion between coating and metal are the incorporation of functional groups into the binder and decreasing the permeability of the polymeric film. This will prevent water and ions from penetrating through the coating



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and reaching the metal substrate.

Water-borne acrylic dispersions are commonly prepared via emulsion polymerization, which presents several advantages in comparison to solution polymerization. One advantage is the synthesis of polymers with much higher molecular weights. This reduces the need of post-curing the coating to obtain appropriate mechanical properties. Another advantage is that the resin is obtained in the form of a dispersion of high solids content (50 per cent or higher) and low viscosity, thus allowing fast air drying by evaporation of water.

## Designed particle morphology for improved anticorrosion performance

The particle morphology of a latex is a very important property, since it is directly related to the film morphology and quality. This has a direct effect on the anticorrosion performance of coatings. There are plenty of publications in the open literature where different strategies to achieve different particle morphologies (core-shell, inverse core-shell, raspberry, snow-man, etc.) are discussed. Among all the works, the largest amount of them is devoted to the production of core-shell particles, usually achieved by employing a two-stage polymerization process. Typically the core is produced during the first feed, and in the second one the monomer(s) forming the shell are added into the reactor.

In order to prove the effect of particle morphology on the quality of the resulting polymer films and on the anticorrosive behaviour of the coatings two dispersions of similar glass transition temperature (approx. 32°C) were synthesized (solids content = 50 per cent).

## Barrier and inhibiting waterborne dispersions

Utilizing the previously described know-how on structured styrene-acrylic dispersions, a new technology was developed to

design a binder having two roles, namely, it acts as a barrier and as a corrosion inhibitor. This was achieved via a built-in enhanced corrosion protection mechanism that results in improved salt-spray test and good early water-spot resistance. The concept behind this approach is to combine the previously described core-shell technology with functional groups that act as corrosion inhibitors. Important parameters to achieve optimal anticorrosive properties are the type and amount of functional groups incorporated into the binder and their distribution between the surface of the polymer particles and the water phase. As it is well known, the incorporation of certain functionalities can as well improve adhesion to the metal substrate and enhance pigment distribution.

## Dispersions Designed for Direct to Metal Coatings (DTM) via Superior Film Formation and Minimization of Water Soluble Components

The use of the emulsion polymerization process to produce coatings binders necessitates the presence of surfactants. These surfactants all have a degree of hydrophilic character and this can promote water transmission and the acceleration of corrosion. Also, although it is desired for all polymerization to occur in the emulsion particle, many monomers have a degree of water solubility. This is especially true for those that may be used to help stabilize the polymer particles and/or improve adhesion such as methacrylic and acrylic acid. Since free radicals are present in the water phase as well as the particles, these monomers may form water soluble oligomers that can increase the ease of transport through the applied paint film in which the polymer dispersions are used. All effort must be made to minimize the presence of these materials in the water phase.

Elimination of the water soluble components in the aqueous phase is only one

feature in designing a superior barrier coating. One must also provide superior film formation, at the desired application VOC and temperature. By careful design of the polymer composition and choice of solvent package, a chemist may achieve the optimum balance of VOC and film formation properties for excellent corrosion protection.

The choice of solvent (in addition to other formulations parameters) is critical to the performance of anticorrosive DTM coatings. Also, the substrate to which they are being applied has a dramatic impact. In the case of direct to metal coatings, anticorrosive pigments are not used.

Barrier properties improve dramatically at thicker film build. This is due to the fact that thicker films increase the time required for diffusion of mobile, corrosion promoting, molecules to reach the metal surface. Because this migration is delayed, corrosion is resisted for a longer period of time. These materials displayed excellent corrosion inhibition due to the effect of thicker films and their excellent barrier properties.

## Novel hybrid dispersions for anticorrosive primers

During the last decade many patents and publications devoted to composite and hybrid materials have been published. The objective of these works is to combine existing materials to form new hybrid products with superior properties than the ones of the original components alone. Hybrid materials can be obtained either by simple blending of two (or more) components, or by hybridization during the synthesis step. As often reported in the literature, blending can lead to incompatibility problems and phase separation of the different materials.

Therefore, films made of such blends have often macrodomains of each component and in many cases no improvement in the target property(ies) is (are)

achieved. A more promising way to obtain hybrid materials with improved performance and have a combination of the different components at nanoscale level is to perform the hybridization during the material synthesis. The main challenges in this approach with emulsion polymerization as the synthetic method, are the sometimes poor compatibility of different polymers (i.e. acrylates and alkyds) and the impact on the polymerization process (e.g. retardation, large residual monomer amount)

## Conclusions

Despite the fact that waterborne systems hold still a relatively low share of the total market for anticorrosive coatings, their average growth rate is larger than conventional solvent-borne coatings. The large R&D effort in the field of waterborne anticorrosion resins has resulted in binders showing excellent performance, when applied under suitable conditions (i.e. proper substrate preparation, appropriate T and RH). The results presented in this work confirm the high potential of waterborne acrylic binders to replace established solvent-borne systems.

The use of structured core-shell particles resulted in better film quality and increased anticorrosion performance. This example illustrates how by designing the polymer architecture of the latex particles in a way that assures better film forming, pigment distribution and high barrier properties, the anticorrosive performance of the existing styrene-acrylic binders can be enhanced. Additionally, by combining the know-how of structured particles with a new technology based on corrosion inhibiting functionalities, further improvement of the results in SST was achieved. This was done via a built-in corrosion protection mechanism resulting in outstanding performance in salt-spray testing and good early water-spot resistance. In the second part, minimization of the migration of corrosion causing agents was accomplished by optimizing film formation through polymer design and solvent choice, as well as minimizing water soluble components in the latex. This, and careful formulation provided superior direct to metal coatings. In the final part, two hybrid binders that provide protective coatings with improved barrier properties, extremely low water uptake and excellent anticorrosion properties, even at low dry-film thickness were described. This was done by combining two different materials (acrylic polymers with either a hydrophobic polymer or an alkyd resin) during the binder synthesis." ■

*This paper has been edited for space and many of the diagrams have been excluded. For more information on this award winning work, contact [www.american-coatings-show.com](http://www.american-coatings-show.com) or [www.basf.com](http://www.basf.com).*

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# Automatic Advantages

BY SANDY ANDERSON

Over the years, Plating Systems have gone through many changes. The trend or focus now seems to be on safeguarding the environment by limiting the wastes that go out the door. Meanwhile, process control and automation continue to advance. Many older automatic plating machines that were still serviceable and retrofitted with new rinsing systems to conserve water and reduce effluent are now being replaced with computer-controlled systems with a focus on process control and the idea of zero rejects. Today's Automatic Plating System has basically evolved from the addition of hoists and then the computer.

## HOIST IT

Meanwhile, manufacturers of automatic plating lines offer a wide range of hoists from traditional to exotic systems for both rack and barrel applications. There are small hoists with a load capacity starting at about 100 lbs all the way up to machines capable of handling in excess of 4,000 lbs per load. Typical uses for this hoist equipment are electroplating, anodizing, phosphating and electropolishing. Automatic lines are used to finish everything from tiny electronic IC clips to complete aircraft wings.

**Sidearm Hoists:** Sidearm hoists are designed so that throughout the plating process, only the work and control arm travel over the process tanks. They use gear drives that yield greater control, dependability and smooth movement. This significantly reduces the potential of bath contamination. A roller chain/sprocket operation eliminates the need for cables. Cables can stretch over time, which diminishes the systems' accuracy and dependability. Sidearm hoists are an ideal choice for retrofits/upgrades of existing lines.

**Overhead Hoists:** Overhead hoists are designed for plating tanks having long front-to-back dimensions. If the arm gets too long on a sidearm unit weight is a problem. These hoists are typically capable of handling rack or barrel loads of around 4,000 pounds. When equipped with variable speed AC motors and smooth gear drives, these overhead hoist systems provide smooth, dependable acceleration and deceleration of the load/flight bar.

## PROGRAM LOGIC CONTROLLERS (PLC) AND COMPUTERS

The "automation" of the plating line

starts with a simple PLC and runs to a full blown computerized system. Basic automated hoist systems use a monochrome touch screen with PLC that controls the hoist and all the safeguards associated with the hoist. The PLC follows a fixed timeway procedure through a series of travel, lift and drop commands. The time-way is a fixed sequence of moves that time after time will carry a flight bar through the process stations. There can be other peripheral control of hoist functions such as top sprays to rinse parts, mechanical agitation that starts and stops when the work enters/exits, solution temperature and load/unload cart position indication.

PLC Features can include the hoist positioning system via encoder; single or multiple hoist control; automatic, semi-automatic and manual/jog modes; reproducible time-way process control and an online help via modem/internet connection, which is a useful tool to quickly trouble-shoot PLC problems.

The computerized systems can use Multiple Process Scheduling (MPS), which eliminates the need to write inflexible time-ways. MPS can help custom design a process to meet "just in time" production by programming any process cycle that meets the needs of the parts.

The advent of very smart PLC's, as well as PC control systems, allow the imagination of the programmer to run free and the use of Variable Frequency Drives, allows the controller to implement speed control, along with motion control. Random motion is becoming common. The combination of absolute encoders, VFD motor speed control, and bright PLCs allow for many parameters to be brought into play to solve various problems including rack sway.

Other advantages of using a computer is the ability to use Statistical Process Control (SPC) to analyze data to improve product and process quality, and Networking Capability to retrieve information from the process and send it to an offline database for independent analysis and reporting functions.

## UNDERSTANDING THE DESIGN

Design in automatic plating systems has been a major improvement over the years, as have the reliability and flexibility of the electronics and the ease of programming. Drawing programs have made it possible to visualize the line and the interaction of the parts. Good design is based on an understanding of the wet

processes and the chemistry.

Drawings can be done in fine detail, and "put in motion" to allow interface with all the items the hoist will see during its travel and lift functions. All the issues that can present problems are made evident before the process has even begun.

The data collected is stored in relational database format to be used by the customer to generate reports. The customer can use off the shelf software packages such as Microsoft Access, FoxPro or DBASE to review and manipulate the data.

Automation Safety, Quality Safety is improved because if a machine is properly designed, no one is required to be on the plating/chemical deck, and chemical adds are done electronically based on anticipated use and throughput. The hoist lines, and controls, can be fitted with safety relay systems to monitor out of control situations and shut down equipment automatically.

Automatic lines can improve quality because absolute repetition can be guar-

anteed, as well as the control of solution temperature, concentration, and solution homogeneity, and filtration.

## MAINTENANCE A MUST

An old plater's rule of thumb said that 95 per cent of all problems were not system problems; they were people problems. While this is less likely to happen with highly automated systems, it can still occur. An automatic analysis unit cannot function if someone allows the sampling tube to become clogged; or fails to fill a titration unit reservoir, or worse yet fills it with the wrong reagent. Similarly, an automatic brightener feed is of no use if the reservoir is allowed to go empty or filled with the wrong brightener or filled with the right brightener at the wrong dilution.

A safeguard against these mishaps is a good preventive maintenance program that includes a series of checks and rechecks to insure that all maintenance procedures are carried out on schedule. Such a program would include regular



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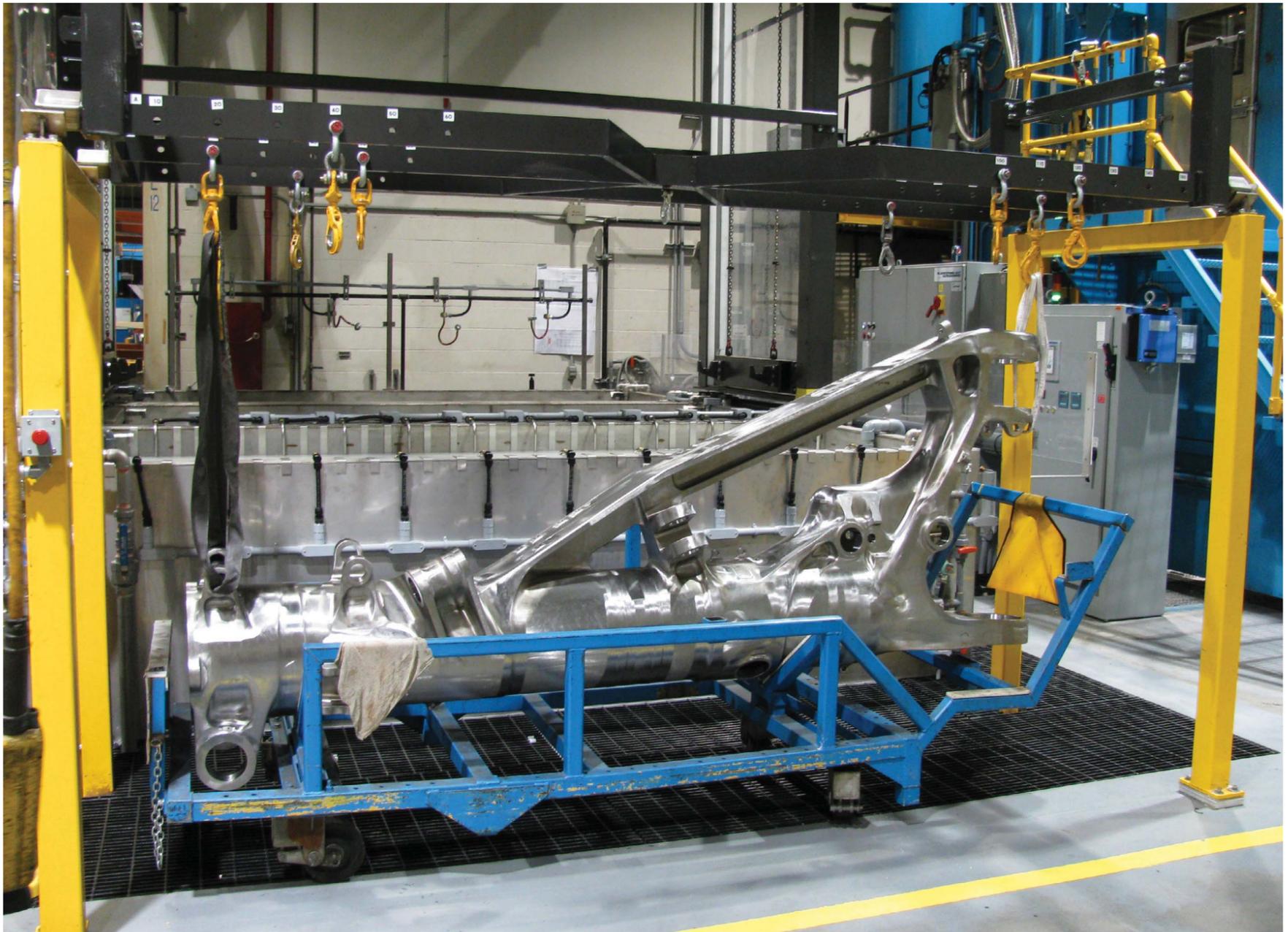
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analysis of the plating solutions, including all the critical preplating solutions such as cleaners, acids and descalers; a record of the results; and a regular review of the record. In particular, if automated or continuous analyses are made and recorded, maintenance of this analytical equipment is an absolute must.

An important aspect of analytical record review is the detection of trends

that signify possible trouble in the future if not corrected. Graphing of these records makes this process even simpler, especially with computer automation.

**WORK WITH YOUR MANUFACTURER/SUPPLIER**

Equipment lines include tanks, filters, pumped filtration systems, hangers, frames and power supplies, as well as unique and specialized products to meet specific plating needs.

The automatic system provider is available to help design your process, whether it be manual, semi automated or fully automatic plating.

These process lines can be complete turnkey operations, renovations of existing facilities or stand alone components.

Process line design, depending on the need can involve numerous process steps or just a few. Regardless of the complexity, some components involved are:

- Process line environmental containment linings (i.e. floor and pit)
- Mild steel, stainless steel and polypropylene tank construction
- Material movement hoists, of various sizes and designs
- Hoist positioning systems
- Process tank support systems
- Process control automation
- Chemical feed systems
- Rectifiers
- Exhaust ventilation and make up air systems
- Data tracking systems
- Support heating and cooling systems
- Part blow-off systems and dryers
- Electrical control panel configurations
- PLC and PC control systems

When deciding whether or not to go fully automatic, it is important to talk to the people who know. They have the experience and will be more than happy to work with you to discover a solution that is best for your operation. Several manufacturers and suppliers offer a full selection of equipment for your line, including both pre-treatment and post-treatment options. Many have provided effective processing solutions for customers that support functional coatings in the aerospace, automotive, currency and oil and gas industries as well as decorative coatings for automotive, bathroom fixtures, motorcycle, commercial and appliance industries. ■

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- Recirculating option to reduce the separation of fluid ingredients
- 18 fine ratchet positions in needle adjustment knob for a consistent finish
- Reduced number of parts helps reduce cost and simplify maintenance



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Graco introduces the AirPro EFX, an innovative solution designed for precision finishing in the small component finishing market. The 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 components market, which includes electronics, automotive and general metal. In addition, each gun is shipped with a serialized spray pattern imaging report that includes an actual spray pattern photo produced using laser-light sheet imaging. This allows users to not only see the high quality of the spray pattern and also view a report that lists spray pattern benchmarks that each gun must comply with before shipping.

Features of the AirPro EFX include: aircaps and nozzles that deliver superior spray performance; precision fluid adjustment with a micro-meter-telescoping knob; high wear components designed for abrasive materials, and excellent fluid flow rate stability and repeatability. "As demand for high-end small component finishing continues to grow, it's important to deliver the Graco technology that can meet these needs to stay competitive in the marketplace," said Wendy Hartley, Product Marketing Manager. "With its optimized precision spray finishing, the AirPro EFX is sure to be a tough competitor in this market."

Infused with the latest technology and



performance features, the AirPro EFX gun offers many other innovations for the fine finish market, including: five spray technologies including the exclusive HiTEch; six nozzles sized for flow rates as low as 10 cc per minute, three fluid adjustment knobs for greater flow rate precision, and two mounting styles for manufacturing line flexibility.

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. Minneapolis-based Graco serves customers around the world in the manufacturing, processing, construction and maintenance industries. Graco's Industrial Segment designs and markets equipment for the liquid finishing, process, sanitary, sealants, adhesives, composites, protective coatings and foam markets.

Closures and consolidations of many manufacturing facilities in North America have left an abundance of used robots on the market. According to ITW Ransburg,

as customers are working through the economic downturn and seeing some sign of recovery, they are looking for ways to reduce their manufacturing cost, which helps to boost their profits and meet pricing pressure from their end-users.

Tim Beckford, leading equipment specialist of Electrostatic Coating Equipment Ltd. says, "My experience has been successful in helping manufacturers get used robotic cells up-and-running with the compact versions of the ITW Ransburg electrostatic automatic spray guns (Evolver SE)." He adds, "This gun allows for solid or hollow wrist mounting and is easily integrated into any robotic platform. Consistent robotic paths coupled with the efficiency and process control of the SE, results in significant quality improvements and material savings for our customers."

This generation of automatic spray guns is volatile organic compound (VOC) compliant, delivering transfer efficiency that is 30 per cent to 50 per cent higher than non-electrostatic spray guns. This significantly reduces the environmental impact of your finishing operation in today's green environment. The gun's 85kV charging voltage delivers superior wrap for an eco-friendly application minimizing paint consumption and overspray.

ITW Ransburg, headquartered in Toledo, Ohio, offers a wide variety of technologically advanced electrostatic applicators that offers today's customers cost effective solutions. Based on this we have introduced the compact, automatic electrostatic Evolver SE spray gun. The gun's simple, rugged and reliable design is ideally suited to reduce coating usage while providing maximum uptime. Built on a proven platform, the gun offers high transfer efficiency and finish quality in a cost effective package.

SAMES introduces the PPH 707-SB Bell, a robotic atomizer dedicated to the application of the solventborne paints in the world of automotive and industrial finishing. This applicator has been installed in several paint shops at many of world's largest carmakers: GM, KIA, Peugeot, Renault, Honda Bumpers, FAW (China).

The Sames PPH 707-SB is equipped

with a high velocity air bearing turbine (HVT). In a world where productivity is the key point, all manufacturers are looking for speeding-up their paint lines and reducing the number of robots, which results in the applicators having to spray with higher paint flows. HVT is important because every atomizer must spray more paint in a reduced amount of cycle time. Consequently, the turbine of the rotary head spins faster to ensure that consistent paint particles are being atomized from this bell cup.

It permits spraying 700 cc/min at 70,000 rpm/minute. Due to the innovative air-magnet bearing, it allows a frictionless rotation without wear, which ensures a long service life of these components.

It can be mounted on any multi-axis robot. It is a highly compact applicator equipped with nano valves installed as close as possible to the bell cup in order to reduce paint loss and quick and efficient flush sequences during colour changes.

The unit meets all technical requirements of users in terms of:

- Paint savings due to greatly improved transfer efficiencies over traditional bells
- High flow rate capabilities
- High tip speed capabilities
- Ability of spraying on any process (primer, base coat, clear coat, etc.)
- Quality of finish and excellent colour match capabilities
- VOC control
- Easy Maintenance

This allows users to step up production rates, that will enable them to reduce the number of robots required for painting a vehicle and applying all metallic paints for base coats by using a bell-bell process.

In the constant search for paint savings, productivity enhancement, Automotive and Industrial users are very satisfied with the "Hi-TE" (High Transfer Efficiency) technology of PPH-707-SB Bell, which is located on the head of this atomizer. The atomizer head (assembly of bell cup & air shroud) is the key component of a Bell applicator, because this is what ensures and consistently delivers the finishing results.

"Hi-TE" is a system of combining Dual Shaping Air, located at the bell front end. Available with the following bell cups "35 EC", "50 EC" & "65 EX", the Hi-TE shaping air system makes the sprayer extremely versatile, allowing instantaneous control from a close pattern (about 150 mm) to a larger pattern (about 450 mm) instantly.

Design of PPH 707 is streamline, preventing paint particles from wrapping back on the bell applicator. Turbine assembly is crash resistant meaning if a sudden loss of turbine air, friction of rotor versus stator the bell comes complete with a pre determined silo of air to ramp the bell down gradually. If severe damage does occur, the

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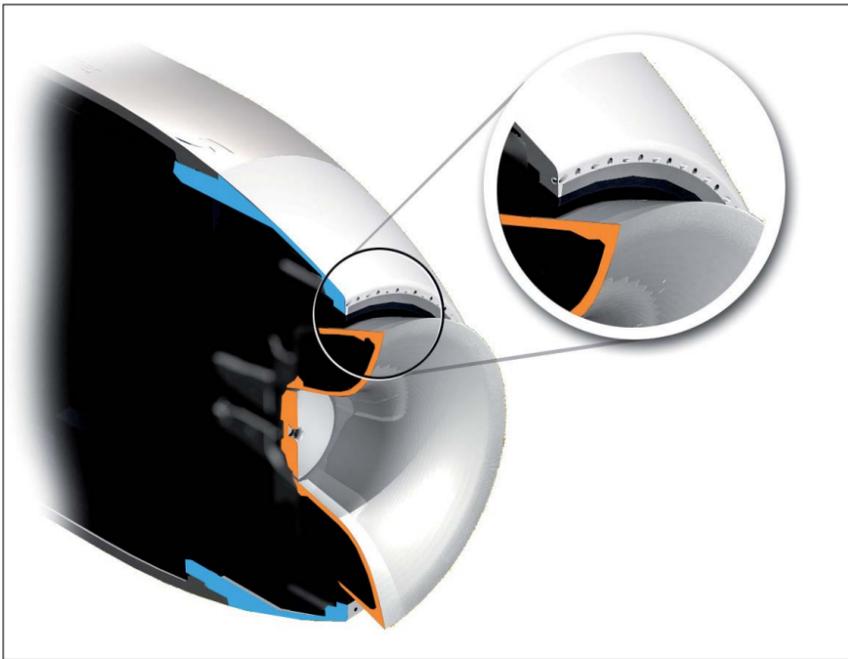
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turbine is field serviceable.

The bell cup is held onto the rotor of the turbine by an earth magnet. Operators can remove it very fast, without removing the outer air shroud of the bell. Reinstalling is also very easy as bell cup fits its location immediately due to the self locating magnetic force.

Two independent air outputs are integrated into the end of the stainless steel shaping air shroud, avoiding any disturbance during the spraying. The drilling of air outlets are made on the same diameter which makes a streamline head and eliminates the potential build up of dirt and debris. This new technology has reduced bell shroud and cup wash between colour changes or bell washes.



The Sames PPH 707-SB is also available in other versions, such as PPH 707-EXT, dedicated for waterborne paintings with external charge, or as PPH 707-SB 2K for plural components paints. All of the different versions of the PPH-707 provide the same benefits: Production increase, large paint savings and extreme reliability.

Manufacturers and supplier of spray guns are committed to finding innovative solutions to spray finishing problems. Don't hesitate to contact them with your questions. ■

*The companies mentioned in this article can be contacted at the following web sites:*

- [www.devilbiss.com](http://www.devilbiss.com)
- [www.graco.com](http://www.graco.com)
- [www.innovativefinishing.ca](http://www.innovativefinishing.ca)
- [www.itwransburg.com](http://www.itwransburg.com)
- [www.sames.com](http://www.sames.com)

*CFCM made every attempt to contact companies for the purpose of this article. If we missed you, please send new product press releases in ms word.doc format (no .docx please) and a high resolution (300dpi) image to [sandra.anderson@cfc.ca](mailto:sandra.anderson@cfc.ca).*



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# Knowing Your Filter

Having the right filter for your needs is key in good Spray Booth maintenance

COMPILED BY SANDY ANDERSON

There is a filter available for every spray booth need. CFCM asked manufacturers and suppliers to describe the different types and discuss their newest products.

## A FILTER IS A FILTER

Brad Wilson, President of Com-Pleat Filters Inc., Servair Filters, Georgetown, ON says when it comes to Filters in spray booths, "There are no new products in the spray booth filter industry."

Wilson explains, "The trick is in knowing which filter works best in each particular application. He says "there are 5 types of filter media, accordion style, baffle box, polyester pockets, paper mesh and fibreglass. "The problem is that each booth manufacturer puts the same filter in every booth they sell, regardless of the application. factors such as booth size, air flow requirements, type of overspray and changeout frequency all need to be matched with filters that provide the best life, efficiency and air flow tradeoffs. We find that over 50 per cent of the market should be using a different filter so we run a lot of trials to provide the best filter for the application."

Meanwhile, Binks has a new Receptor eco-friendly line of high efficiency booth overspray filters, made from recycled post-consumer waste PET plastic. Receptor's superior paint holding capacity rivals the efficiency of higher-priced filters. A dual-capture construction in a robust one-piece design, the first capture layer collects overspray and is white to reflect light within booth. The second capture layer is 100 per cent made from green

soda bottles. Engineered for 98.67 per cent arrestance efficiency, this environmentally sensitive green layer traps even more coating in the Receptor filter.



Norspec Filtration Ltd. a leading filtration solution provider to the paint & coatings industry, introduces Channel Media paint arrestor products.

Channel Media is the newest generation of synthetic media for single stage or primary media applications. Channel Media is a major technology development that delivers 30-100 per cent longer service life, with no compromise of paint arrestor removal efficiency. The media features graduated denier fiber construction combined with a corrugated surface for maximum surface area and depth loading. The channels are spaced at regular intervals to optimize paint holding capacity without sacrificing efficiency.



## TYPES OF SPRAY BOOTH FILTERS

Bob Jackson, President of Norspec Filtration Ltd. highlights the various types of spray booth filters and their applications available below:

### Booth Inlet Filters

There is a wide variety of inlet 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)

The SSP panels 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. Available in a wide variety of sizes and carton quantities.

### Dustlok Polyester Self Supporting Panels

The Dustlok SSP 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

The FR1 filter 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 cross draft 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

FF-560 GX Diffusion Media 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-

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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-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)

Paper paint arrestors 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

Fibreglas paint arrestors feature a progressive density construction that meets the needs of the widest variety of finishing

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.

#### Channel Media Paint Arrestors

The Channel Media paint arrestor is 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.

#### Accordion Pleated Paint Arrestors

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.

#### FILTERING THROUGH TRENDS

Colleen Ketteringham, Industrial Sales Consultant for Servair Filters says, "In this economy, customers are watching every



Plant manager Drew Thrower and president Brad Wilson examine the custom designed Servair accordion style filter manufacturing machine.

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 fibreglas paint arrestor is white/green in colour and is especially useful for heavy coating and wood working applications. This type of filter has an efficiency rating ranging from 91.5 per cent to 98.7 per cent.

#### Smart Media Paint Arrestors

Smart Media paint arrestors are manufactured as a high loft filtration product with progressively denser layers of fiber from

penny so they are more open to new approaches on things like filters." She adds, "In the past there was more of 'just get me what we have always used'. Now the questions are, 'how can I save money on filters and booth maintenance?'"

"I have one large woodworking customer out west who told me their production bottle neck was in the finishing department." Ketteringham says, "One way I helped them was in providing longer lasting and more efficient filters." She adds, "Their cost per filter went up but they saved way more by not having to clean the exhaust stacks and

## Spotlight on Business: Servair Filters

Servair Filters, Canada's only exclusive manufacturer of paint booth filters, operates just outside the GTA in Georgetown Ontario.

"We saw a need to supply inexpensive and compact pleated accordion style paint arrestors to industrial spray operations and began manufacturing in 1998," says Brad Wilson President. "We purchased our largest distributor in 2005 in order to offer a full line of imported booth filters to compliment what we were already manufacturing in house." He adds, "We are the only Canadian manufacturer who only services the spray booth market."

Servair has over 20 distributors across Canada.



Tyler Paterson cuts the custom Servair pleated filter. The accordion style filter can also be cut to size by the end user.

had far less booth down time since they changed the filters out once a week instead of every day."

Ketteringham says she is constantly trying to identify the non-filter costs associated with booth maintenance.

"Everything from fan blades that get covered with overspray and require early replacement to workers who complain that overspray is swirling around the booth and not even getting to the filters. There are so many factors to address and because all I do is spray booth filters, I am able to achieve customer specific solutions." Even though Servair manufactures two types of filters, they bring in other types from the US by the truckload.

"So my only concern is providing the specific filter that will work the best in each spray booth, whether we manufacture it in house or not," says Ketteringham.

Filters offer a dust free environment needed for a proper finish and are a key part of the process. Manufacturers offer a filter type for every application. ■

*Editor's Note: You can contact the companies mentioned in this article at the following email addresses:*

[www.com-pleat.com](http://www.com-pleat.com)

[www.servairfilters.com](http://www.servairfilters.com)

[www.norspec.com](http://www.norspec.com)

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## NORSPEC FILTRATION

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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# A Look at UV Curable Powder Coatings

**A**t the recent American Coatings Show in Charlotte, NC, Ryan Schwarb of Keyland Polymer Ltd., USA presented the topic UV Curable Powder Coatings for Heat Sensitive Substrates, co-written by Jim Cox. The following are excerpts of that paper and how combining UV cured powder coating chemistry with design requirements produce products of exceptional value.

UV curable powder coatings combine high performance material chemistry with low energy consuming and high speed finishing technology.

UV curable powder coatings are a rapidly developing segment of the coatings industry. Low process temperatures and UV light initiated cure are ideal for substrates such as wood composites, plastics, porous metal materials, and pre-assembled parts with internal heat sensitive components.

The market opportunities for UV cured powder coatings continues to expand as external drivers focus consumers of OEM coatings to seek materials and application technologies that meet environmental reg-

ulations, require lower energy consumption, generate lower total applied costs and produce a higher return on assets.

UV cured powder coatings have many inherent advantages; ease of material handling, durability, one coat processing, and breadth of palette. Additionally, they have significant environmental and economic advantages and benefits when compared to traditional solvent borne and waterborne coating technologies.

## HISTORICALLY

UV cured powder coatings and application systems were first developed and commercialized in the late 1990's and early 2000's. These initial systems were small scale and designed to achieve specific finishing requirements; an electric motor and an automotive radiator. In early 2000, two UV powder on wood (medium density fiberboard, MDF) systems were built in North America and less than a dozen were in Europe. The economic incentive for these capital investments was to expand the base of traditional powder coating application and coating chemistry by utilizing the inherent advantages of UV curing. Heat sensitive materials were a natural product market. UV powder could be used to finish products and materials that heretofore could not be finished with thermal powder coatings. UV powder coatings are manufactured on the same equipment as thermal powder coatings. They sell at a higher price per pound and generate higher gross margins. This appeared to be

a win – win opportunity for the consumer and manufacturer of powder coatings.

In the years since the introduction and commercialization of UV cured powder coatings, external market conditions have changed to make the benefits and advantages of UV cured powder coatings even more compelling. The advantage that is easiest to quantify is speed. A UV cured powder coating system is at least 3x faster than thermal powder coating and even faster than liquid finishing. Economic history shows that when two or more technologies compete the fastest technology will be the successful technology.

UV cured powder coatings have life cycle advantages that liquid coatings do not have. Solid materials are easier to blend, process, control and apply than liquid materials. UV cured powder coatings can be sprayed to re-use or sprayed to waste without the need for complex or specialized material handling equipment and containment requirements. The manufacture and application of UV cured powder coatings are not subject to any environmental permit restrictions or requirements.

## ENERGY SAVINGS

Energy productivity is another fundamental value associated with UV cured powder coatings. A typical UV cured powder coating system will utilize natural gas and electricity to energize the oven systems and electricity to energize the UV lamp curing system. A solvent borne and waterborne system requires four to eight times the oven capacity to flash and cure the coating. Solvent borne technology has additional energy requirements to incinerate hazardous solvents that cannot be released untreated into the environment.

## CHARACTERISTICS

A differentiating characteristic of UV cured powder coatings is the separation of the melt/flow and cure functions. This separation enables the processor to control melt/flow and cure functions with precision and efficiency; maximizing energy, improving material utilization and most importantly increasing production quality. The operator is able to control the application process and limit defects such as window paining, pin holing and out gassing. Out gassing is a common defect and is a result of substrate porosity and material composition. Heating the substrate causes gasses to escape through the paint.

Out gassing is a bubble or a series of bubbles that appear on the surface of the finished part.

## UV APPLICATION SYSTEM

A UV cured powder application system can have a plant footprint as small as 2050 ft<sup>2</sup>. A thermal cure system of comparable output can require a foot print in excess of 16000 ft<sup>2</sup>. Assuming an average rental of \$6.50 per square foot/year a UV system annual cost is \$13,300 and the

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thermal system is \$104,000.

When comparing a UV powder system and a solvent borne system, both with equal line speed and line density, the time required to finish 150 parts with an automatic spray UV powder system is 2.3 hours and the time required to finish with an automatic spray solvent borne system is 5 hours. The UV powder system provides a 220 per cent improvement in productivity, or 36 parts per hour. It is important to note that the longer the run the efficiency advantage will diminish, but system parity will never be reached. UV cured powder coating will always maintain a speed advantage which yields greater productivity and a faster return on capital.

Because a UV cured powder coating system does not generate VOCs it is reasonable to assume there is a cost advantage associated to the elimination of solvent disposal, permits, and incineration costs that were not included in our illustration.

Without knowing the BTU output of a comparable liquid system, it is not possible to correlate an accurate energy benefit of a UV powder system. However, it is reasonable to assume that when comparing systems of equal line speed, the thermal system consumes more energy per part than the UV cured powder system.

The UV lamp choice for a UV cured powder coating is important to ensure UV energy penetrates and cures the coating. Details of UV energy dosage and intensity for UV cured powder coatings are application specific and dependent on the coating, finishing speed, and UV light. Clear and tinted powder coatings contain the alpha-hydroxy ketone (-HK) type photoinitiator that absorb short wavelengths of UV energy from a mercury or "H" lamp. Pigmented or opaque powder coatings contain the phosphine oxide type photoinitiator that absorb higher wavelength UV energy from an iron or gallium doped mercury lamps, "D" bulb and "V" bulb respectively. This combination of photoinitiators and UV lamps provide complete through cure in an opaque powder coating.

#### APPLICATION & PERFORMANCE

UV cured powder coatings are suited for a number of heat sensitive materials and applications. The low temperatures and high speed of UV cured powder coating make ideal conditions to powder coat plastic and wood composite materials. Plastics have low melting points limiting the amount of a heat a part can withstand before physical deformation occurs. The high speed of finishing and low substrate thermal exposure make UV cured powder coating a very suitable finishing material to coat plastic materials. The low conductivity of these materials require pretreatment step to the substrate to provide a conductive surface for electrostatic powder application; surface activation may be necessary for improved adhesion.

Plastic substrates formulated for con-

## UV Applications instead of equipment at RadTech Show

Fusion UV Systems is one of the companies planning to feature new UV Applications at RadTech 2010 Conference in Baltimore April 12, 2010. This is a departure from earlier RadTech conferences in which it had been demonstrating UV curing equipment to current and potential customers. The shift in emphasis reflects not only the growing interest in how UV curing can solve complex problems in existing markets, but also new applications in emerging markets. This change supports the emphasis RadTech has placed on encouraging manufacturers with potential UV applications to attend the conference at no cost, in order to broaden the awareness and potential of UV Curing. The announcement was made by David Harboure, President of Fusion UV Systems.

"Fusion is the leading supplier of industrially robust microwave-powered UV lamp systems," Harboure says. "Fusion has been fulfilling the needs of customers for fully engineered industrial UV curing process solutions for over three decades. During that time Fusion changed from being the pioneer in the development of its first photon delivery system to being the global leader in fully integrated UV curing systems. The net effect of this shift in emphasis at RadTech 2010 is that anyone with even the slightest interest in learning about the potential use of UV in their application will receive the full and undivided attention of Fusion personnel at RadTech."

Harboure added "Fusion's customized process solutions, and our extensive process, formulations and applications experience has enabled our development of new UV curing processes. These have been utilized in the development of many successful customer conversions from conventional thermal processing to more environmentally proactive, energy efficient and cost saving UV curing processes. As a result, industrial manufacturers around the world have made Fusion UV Systems their UV systems supplier of choice."

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## INDUSTRIAL FINISHING: UV CURING

ductivity can eliminate the pretreatment process. UV cured powder coating can provide highly resilient and durable coatings for plastic substrates.

UV cured powder coating on engineered wood composite, MDF, provides unsurpassed design versatility.

MDF is a readily available bi-product of the wood industry. MDF is a uniform and highly durable substrate used in a variety of finishing processes. UV cured powder coating on MDF provides design flexibility and seamless finishing unmatched by wet and laminate finishing processes. MDF preheating enables the substrate to become conductive for electrostatic powder application. Performance results of UV cured powder coating on MDF below are equal to or in many cases superior to laminate materials. UV cured powder coating on MDF offers a plasticity of design and functionality not found in any other wood based product and coating. Product applications include point of purchase displays, work surfaces, and office furniture.

UV cured powder coatings are well suited to powder coat pre-assembled components containing heat sensitive materials. Pre-assembled components can contain a number of different parts and materials that are required for the assembly to function properly. These heat sensitive materials may be plastic, rubber

seals and gaskets or lubricating oils. Minimizing thermal exposure of these components is critical to maintain their performance and tolerances. The part shown below is an example of a pre-assembled part. The plastic tube is affixed inside the metal tube and then UV cured powder coating is applied to the threaded end of the pipe. In this application, UV cured powder coating maintains a low substrate temperature to maintain the functional integrity of the plastic material. UV cured powder coatings are well suited to provide durable and resilient coatings to a variety of preassembled and heat sensitive products.

### CONCLUSION

The market acceptance of UV cured powder coating is rapidly growing, as end users design and manufacture products that are finished with UV cured powder coatings. The challenge of educating the market about the benefits of UV cured powder coatings will continue. The other challenge to the success of UV cured powder coating is the ability of the embedded legacy materials and technologies to use price to maintain market position when confronted with a very viable and credible competitor. That said, UV cured powder coating being the fastest coating technology will be the winner over time, displacing the current incumbents.

As UV cured powder coating continues to grow in the market it is expected that increasing amounts of investment capital will flow into the UV cured powder coating segment of the coatings industry. As the demand increases the incremental cost of system components and constituent chemistries will decrease, lowering the total applied cost of finished products. UV cured powder coating is in a unique position to respond to the growing worldwide demand for environmentally friendly and energy efficient coatings. UV cured powders are high performance coatings materials applied with low energy consuming and highly efficient and productive application technolo-

gies. Investments in UV powder coating chemistry and application systems offer the opportunity to achieve higher economic returns than other coating material and processes. The future for UV cured powder coating looks very bright. ■

*UV Curable Powder Coatings for Heat Sensitive Substrates by Ryan Schwarb, Jim Cox, Keyland Polymer Ltd., USA, presented at ACS 2010 has been substantially edited for space in CFCM magazine. For the complete paper or more information contact [www.keylandpolymer.co.uk](http://www.keylandpolymer.co.uk) or [www.american-coatings-show.com](http://www.american-coatings-show.com)*

## NEW PRODUCTS

### PRODUCTS INTRODUCED AT ACS

#### New Additives from ISP

ISP introduced Jaypol performance additives at the American Coatings Show, Charlotte, NC, providing marketers of water-based coatings in North America a first look at functional products based on acrylates chemistry. A series of Jaypol dispersants, co-binders and rheology modifiers made available by ISP offer manufacturers new options to produce water-based coatings of superior quality with excellent efficiency and economics.

[www.resourceadvantage.com](http://www.resourceadvantage.com)

#### Dow Introduces Architectural and Roof Coating Innovations

In addition to showcasing its full portfolio of solutions for architectural coatings, Dow Construction Chemicals introduced two new roof coating polymers at the 2010 American Coatings Conference held April 12-14 in Charlotte, N.C.

For Elastomeric Roof Coatings:

RHOPLEX EC-3100 allows formulators to create coatings that extend the life of weathered thermoplastic polyolefin (TPO) roofing membranes, providing a solution for building owners who would otherwise avoid costly membrane replacements. Dow's breakthrough was in creating an acrylic polymer that allows the elastomeric roof coatings to adhere securely to TPO substrates, solving a challenge that has eluded the roof coatings industry since the membranes have started to wear.

Also 100 per cent acrylic, the new RHOPLEX EC-3000 polymer provides resistance to rain in a short 20 minutes, even in high humidity and overcast days. It offers excellent dirt pick-up resistance and can be applied in cooler temperatures, extending the application season for contractors.

For EIFS (Exterior Insulation and Finish Systems):

RHOPLEX EI-6000 is an acrylic binder for clear matrix aggregate finishes that provides excellent weatherability and dirt pick-up resistance.

RHOPLEX EI-2000 functions as a modifier for EIFS cementitious basecoats/adhesive components that is resistant to water, dirt pick-up,

yellowing and chalking. As a cement modifier, RHOPLEX EI-2000 offers strength, adhesion, water resistance, flexibility and durability.

For Metal Surfaces:

RHOPLEX RT-2004 is an acrylic thermoplastic polymer that offers excellent flexibility and exterior durability in basecoats for metal substrates.

For Cementitious Surfaces:

RHOPLEX CS-4000 is a water-resistant, high-gloss binder specifically developed for use in coatings for cementitious and other non-resilient surfaces.

RHOPLEX AC-630 is an all-acrylic aqueous vehicle for durable, water-resistant sealers that are glossy, clear, and easily compounded.

[www.dowconstructionchemicals.com](http://www.dowconstructionchemicals.com).

#### New From Lubrizol



The Lubrizol Corporation introduces Lanco 106 and Lanco 208 functionalized powdered surface modifiers for industrial and OEM coatings. With excellent wetting properties, these additives are easier to disperse than most powdered waxes, while improving scratch-resistance for more durable coatings.

Lanco 106 is a PE wax that is ideal for solventborne PU systems or other aromatic/ester-based systems; Lanco 208 is a polyolefin wax that can be used with solvent-based coil coating systems. Through the addition of proprietary Lubrizol technology, both products exhibit enhanced wet-out properties, which improve incorporation through better dispersibility even when using low-speed mixers.

Lubrizol also introduces Permax 805 vinylidene chloride emulsion – an APE-free, low VOC, small particle size vinylidene chloride acrylate copolymer emulsion that displays extremely low moisture vapor permeability and excellent corrosion resistance.

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## NEW PRODUCTS AND TECHNOLOGIES

Permax 805 emulsion is recommended for a variety of coatings in OEM and industrial metal applications – such as maintenance primers, underhood and underbody coatings, rust converting products and barrier coatings. Recommended at a film thickness of 3-4 mils (75-100 ) dry, this emulsion provides both superior corrosion and humidity resistance. It also adheres well to a variety of metal substrates.

The company also introduces Turboset Ultra Pro polyurethane dispersion – an innovative polymer that eliminates the need for additional crosslinkers and resists black-heel marks on high-performance wood floors.

A one-component product, Turboset Ultra Pro polyurethane dispersion employs proprietary Lubrizol self-crosslinking technology that delivers the performance of a two-component system without any external crosslinkers. Ideal for sports and recreation floors, the nano-sized polymer particles in Turboset Ultra Pro polyurethane dispersion crosslink after application and continue while drying. As a result, wood finishes produced with Turboset Ultra Pro polyurethane dispersion demonstrate exceptional floor-wear characteristics, including black-heel mark and scuff resistance.

Lubrizol also has Carboset CA-600 acrylic polymer and Doresco L91-208 solution acrylic. Carboset CA-600 acrylic polymer enhances the performance and appearance of most any mineral-based, horizontal masonry surface. Developed for horizontal masonry clear, semi-transparent stain and opaque coatings, this polymer provides excellent blush-resistance and superior weathering on driveways, sidewalks, patios, pavers, overlays, decorative concrete and garage floors.

Doresco L91-208 is a high-performance solution acrylic that protects and enhances the appearance of various concrete-based construction materials. Designed to impart a wet look on concrete, this product has a 50 percent solids content supplied in exempt solvent t-butyl acetate. As a result, Doresco L91-208 acrylic can be easily formulated into low to no VOC coatings, helping meet environmental regulations. It can also be used as a modifier in compatible systems to help achieve VOC compliance.

[www.lubrizolcoatings.com](http://www.lubrizolcoatings.com)

### From Bayer MaterialScience LLC

Contractors tasked with resurfacing North America's steel-based infrastructure and industry may find their jobs more manageable with the availability of a new aliphatic prepolymer from Bayer MaterialScience LLC. This prepolymer has been engineered specifically for high build moisture cure urethane (MCU) coatings used to protect structural steel in such corrosive environments as bridges, water and waste tanks, treatment plants, marine environments, chemical plants and offshore oil and gas piping refineries, among others.

Until now, the use of MCU topcoats has been limited by low-build films that made it difficult to achieve the required coating thickness, especially on complex structures with

tight angles. Current commercial aliphatic MCU topcoats are typically applied between 2-3 mils dry film thickness (DFT). Over-applying a coating to hard-to-reach nooks in a bridge truss, for instance, can lead to blistering. Traditional MCUs also have technical limitations that force them to be used in cooler, damp climates. These challenges can lead to additional costs associated with field maintenance, as well as poor appearance.

Also Bayer MaterialScience LLC is introducing new waterborne acrylic products to the North American market – Bayhydrol AH XP 2741 dispersion and Bayhydrol AH

XP 2754 dispersion.

Solvent-free Bayhydrol AH XP 2741 dispersion was developed for the formulation of environmentally friendly, one-component coatings for indoor wood construction, as well as for furniture. Clearcoats formulated with this waterborne styrene acrylate copolymer are characterized by high grain accentuation and good chemical resistance. This dispersion can be used to easily formulate primers, high-gloss and semi-gloss coatings. It can also be used in combination with polyurethane dispersions and in waterborne ultraviolet-cure formulations. Notably, the guide formula based on Bayhydrol AH XP 2741 acrylic dispersion passed MPI (Mas-

ter Painters Institute Inc.) 129, a standard for a water-based, clear, semi-gloss finish for interior wood.

Bayhydrol AH XP 2754 dispersion can be used to formulate one-component, clear and pigmented lacquers for single-layer coatings and topcoats. Formulations based on this technology exhibit excellent chemical resistance and very high hardness. This dispersion is especially well-suited for plastic coatings applications in consumer electronics and other markets.

Initially developed to treat concrete floors, two-component waterborne (2K WB) polyurethane coatings formulated with resins from Bayer MaterialScience

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LLC are now being applied to protect against the adherence of graffiti to vertical surfaces. These vertical surfaces include exterior walls of buildings, concrete poles, metal utility poles and more, all prone to this nuisance many municipalities face.

Bayer MaterialScience LLC scientists found that the raw materials used in concrete floor resins boasted enough chemical resistance to be an eco-friendly solution for protecting against graffiti on various substrates. Conventional coatings work well, but tend to contain a high level of solvents (volatile organic compounds, or VOCs). The 2K WB polyurethane resins from Bayer MaterialScience LLC can be formulated to produce an ultra-low VOC coating, thereby providing applicators with materials that meet the latest sustainable construction specifications.

In addition to ultra-low VOCs, high chemical resistance, low odor, light stability and easy cleanability, the Bayhydur® polyisocyanates and Bayhydrol® polyurethane dispersions from Bayer MaterialScience LLC can easily be formulated to obtain a high gloss or matte finish. [www.bayermaterialsciencenafta.com](http://www.bayermaterialsciencenafta.com)

## Clariant highlights innovations at American Coatings Show 2010

Specialty chemicals expert Clariant showed its diverse expertise and innovations in products for paints and coatings at the American Coatings Show.

The most recent developments featured include:

Innovative ED Pigment range now available for all paint manufacturing applications: Easily-Dispersible pigments are organic pigments that can be incorporated into paint systems by using only a high-speed dissolver without an additional milling step.

Simplifying the process: ED Pigments offer an important simplification of the paint manufacturing process that usually cuts production costs and raises productivity in comparison to conventional pigments.

Innovation in organic pigments: Clariant has developed an economical production process for ED pigments which includes surface treatment of the pigments with highly efficient and widely compatible dispersing additives.

ED pigments for all applications: New additions to the existing EDS range for solvent-based industrial coatings include EDU for universal use in water- and solvent-based industrial coatings and EDW for water-based pigment dispersions used for the coloration of decorative paints.

**Colanyl 500:** a broad range of APEO-free and VOC-free aqueous pigment preparations particularly suitable for tinting emulsion paints. These pigment preparations can be processed on automatic dosing and mixing equipment, leveraging their extremely narrow specification tolerances and using a wide-range of water-based coating systems.

**Hostatint 500:** meets the same ecological and technical requirements as the Colanyl 500 range; however, this new range is also highly suitable for water- and solvent-based modern decorative base paints.

Hostavin Light Stabilizer Dispersions for Water-borne Coatings: offers high-gloss protection, ease-of-use and environmental benefits

EcoTain: water-based, APE/NPE-free, low-VOC, formaldehyde-free surfactants, defoamers, biocides, polyglycols and special solvents. Efficiency improvements yield lower production costs.

[www.clariant.com](http://www.clariant.com)

## Michem Emulsion 47950

Offers Anti-Graffiti Capability, Water Repellency and Anti-Blocking in Concrete Coatings

Michem Emulsion 47950 wax emulsion from Michelman is a sacrificial anti-graffiti coating additive that also provides effective water repellency and anti-blocking. It is commonly used as a surface modifier in concrete coatings to reduce or eliminate concrete's susceptibility to damage caused by weather,

equipment, vehicles or foot traffic.

In concrete construction specifically, Michem Emulsion 47950 improves the resistance of finished concrete to water, scuff, abrasion, stains, graffiti and hot tire pickup. It can also be applied to freshly-poured concrete as a curing membrane to control and optimize cure rates, and is often added to "cure and seal" formulations to act as a long-lasting barrier coating.

Michem Emulsion 47950 is also ideal for use in fiber treatments during the production of cordage and twine to enhance slip resistance, as well as in industrial and wood coatings.

## Michem Emulsion 62330

Provides Superior Water Resistance in Exterior Wood Applications; Reduces Burnishing in Interior Applications

Michem Emulsion 62330 from Michelman is a fine particle-sized emulsion that delivers excellent water repellency when added to var-

nishes and other coatings such as architectural paints, stains and sealants, without affecting gloss. It is used to produce reliable water beading in decks and sealants, and burnish resistance in interior latex paints.

Under various exterior exposures and lab tests, Michem Emulsion 62330 displayed superior beading and sharp contact angle. Its small particle size allows it to be used at low levels in high-gloss systems to improve water resistance. Highly compatible with a range of polymers, Michem Emulsion 62330 can improve anti-blocking and maintains very low VOC levels.

Michem Emulsion 62330 is used in a wide variety of applications including exterior wood, wood composite, architectural and decorative coatings, interior furniture and floor coatings, furniture polishes, building and construction materials such as gypsum, and automotive upholstery.

[www.michelman.com](http://www.michelman.com)

General Metal Finishing

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