



# CFCM

CANADIAN FINISHING & COATINGS MANUFACTURING MAGAZINE

\$12.00

March/April 2014

## Durable Manual Liquid Spray



Manufacturers of manual liquid spray guns are stepping up to the plate when it comes to customers' demands for performance, durability and exceptional quality.

**Finishing Brands**, manufacturer of Binks industrial finishing equipment, announces the availability of the new Binks Trophy Gun manual and touchup spray guns. Binks Trophy Series brings a unique combination of a lightweight, ergonomic design with robust engineering for use with a wide variety of coatings in diverse applications. Trophy's engineering generates maximum atomization efficiency producing uniform pattern distribution and excellent transfer efficiency to

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The Binks Trophy Gun.

Photo Courtesy of Finishing Brands

### ALSO IN THIS ISSUE

- Small Shop Wood Finishing
- UV Curing Equipment
- Waxes and PTFE
- UV Coating Formulation
- Regulatory Alignment with the US
- Barrel Plating Equipment
- Dangers
- Testing Equipment in Plating and Anodizing

**MUCH MORE!**

## Customers Looking for Ease and Consistency in Mixing and Dispersion

When it comes to mixing and dispersion equipment in paint and coatings manufacturing, manufacturers say that formulators in a paint and coatings lab are looking for equipment that offers consistency and ease of operation. Energy efficiency is also a demand...any equipment that provides a boost in versatility and efficiency, and enables development engineers to be more productive. New designs in mixing/dispersion equipment are making this possible.

Mixing equipment features available include air drive, electric drive, AC or DC with electrical specifications to suit operating conditions, single or variable speeds with horsepower to suit service

conditions and dimensional design to suit batch size or the existing tank. Power lift is also available providing means for quickly removing stirrer shaft assembly. Products available in the marketplace include machinery for grinding and dispersion, lab size to complete custom engineered systems, with capacities up to 65 tons per hour. High-speed dispersers, inline mixing, horizontal and vertical media mills, multi-shaft mixers, powder size reduction equipment (jet mills, classifier mills and universal mills), skid-mounted, turn-key processes and custom equipment and systems.

*continued on page 17*

### In the News

#### Canada's Largest Furniture Producing Province Welcomes Canada Woodworking East

Canada Woodworking East is the only show focused on Canada's French and Bilingual secondary wood marketplace. Taking place September 26 and 27, 2014 in Montreal's internationally renowned Olympic Stadium, this unique event will welcome a wide spectrum of secondary woodworkers from Quebec and across Eastern Canada.

Show management is pleased at the response to this market driven event. It is being very well received by the key players, gaining interest from industry associations, exhibitors, and visitors alike, all eager to find the best products, services, partnerships and solutions for their industry. Over 200,000 sq. ft. of exhibit space will attract Commercial and Residential Cabinet Manufacturers and Installers, Commercial and Home Furniture Manufacturers, Architectural Woodworkers, as well as Millwork, Molding, Door, Windows and Stair Manufacturers, and the list goes on.

Endorsed by the Architectural Woodwork-Manufacturers Association of Canada – Quebec Chapter (AWMAC-Quebec), Canada Woodworking East will be the venue for

*continued on page 4*

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# BEYOND CHEMISTRY

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# We Need Glowing Moose

Last issue I wrote about sexy snails. Now glowing reindeer. If Santa had these deer, he wouldn't need Rudolph. Perhaps something to think about in the next 9 months.

Twenty reindeer with glowing antlers are currently roaming around Finland as a test in order to prevent them getting hit by motor vehicles. Reindeer are caribou in North America.

According to the Finnish Reindeer Herders Association the fur and antlers of the reindeer are being sprayed with the paint designed to glow when light shines on it. Spraying the antlers has proven most effective because it is visible from every direction. It was not disclosed what kind of coating was used, but the association is testing the durability of the paint in various weather conditions. If the paint proves durable and harmless to the animals and effective in preventing accidents, more reindeer will be painted in the Fall. Attempts to keep the reindeer out of harm's way have included reflectors and

reflective tape but have proved unsuccessful because the animals tore them off.

An average of 4,000 reindeer die in Finland each year after being struck by vehicles. Due to icy roads and earlier sunsets, most accidents happen in November and December and the mosquito-infested months of July and August. The accidents prove much deadlier for the beasts than for the drivers. There are about 207,000 reindeer in Finland, with reindeer husbandry areas covering about 33 per cent of the country.

Canada has its share of moose and deer versus motor vehicle collisions. Perhaps something like that could work here.

Meanwhile, welcome to almost-spring, the time of year when paint manufacturers are releasing all of their newest spring colour trends. In architectural paints the manufacturers are going for natural shades you would find at a day on the beach, such as ocean greens and blues, sand, mud, driftwood, pinks, whites, yellows, and gentle pastel shades of the sky.

Sico paint is looking at rich reds, cool teals and bright yellows, reflecting the pairing of natural and industrial design elements. Dulux feels that greens will be popular this year reflecting a feeling of renewed energy, vibrancy and optimism in kitchens and family rooms. Beauti-Tone is looking at shades of grey and bright whites, blending greys and taupes for a relaxing look. Benjamin Moore names its earthy, natural colours with Breath of Fresh Air leading the palette of 24 designed to harmonize with each other.

In industrial paint and coatings, PPG Industries recently published its 2014 Global Color Trends book, a 100-page overview of PPG's collective forecast for color use in building and decor, automobiles, consumer electronics and aerospace. The book, produced by the company's global team of color experts, is accessible online at [www.ppg.com/global-colortrends](http://www.ppg.com/global-colortrends).

The Global Color Trends book highlights PPG's Pause & Refresh theme for 2014 and the company's colour of the year – a buttercream yellow. The book details colour families trending across industries and geographic regions, and it

showcases five colour trend "stories" for 2014, which are:

- Hi-Breed emphasizes a new design harmony between man and nature with a palette consisting of neutrals, pastels and bright hues.
- Mosaic is based on the wealth of artisan and craft patterns, shapes and prints, as well as their strong colorations.
- New Spirit reflects earthy, primitive, raw colours as well as a new consciousness.
- Magnificence combines the words magnificent and elegance, and the palette recaptures extravagant, dramatic styling and opulent, regal colours.
- Theorem is a precise and minimal palette that uses rich brown, purple and deep blue as accents for balanced neutrals.

So, it looks like across the board, colour trends for 2014 are a day at the beach in general.

Sandra Anderson  
[sandra.anderson@cfcm.ca](mailto:sandra.anderson@cfcm.ca)

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Volume 8 Number 2 March/April 2014

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CFCM Canadian Finishing & Coatings Manufacturing is published bi-monthly by Wilkinson Media Canada Inc. Subscriptions are free to qualified Canadian finishers and coatings manufacturers and their suppliers. Subscriptions (six issues): Canada \$60.00 per year plus taxes (GST #858877210 RT0001). United States U.S. \$57.00. Foreign U.S. \$85.00. Single copy \$12.00. Buyers Guide \$40.00 CDN plus taxes.

**Postal Information:**  
Printed in Canada. Publications Mail Agreement PM # 41515012  
Return undeliverable Canadian addresses to CFCM Magazine Return undeliverable Canadian addresses to CFCM Magazine, Suite 259, 2186 Mountain Grove Ave.

Burlington, ON Canada , L7P 4X4,  
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## In the News

secondary woodworkers to meet face to face with manufacturers and distributors of the machinery, hardware and accessories needed for their shops to run at maximum capacity and profitably every day. It has been over five years since secondary woodworkers in the Quebec market have had a bilingual show in their own market, and the timing for this event could not be better.

Canada Woodworking East will be co-located

at Olympic Stadium with InterSaw – the international sawmilling expo, endorsed by J.D. Irving, Limited (JDI) and Resolute Forest Products. Combined, the two shows are expected to attract some 250 exhibiting companies and over 5,000 tradeshow visitors. Tradeshow badges from either show will allow attendees to have admission to both events.

For more information, please visit:

Canada Woodworking East – [www.CanadaWoodworkingEast.ca](http://www.CanadaWoodworkingEast.ca)  
InterSaw – [www.InterSawScie.ca](http://www.InterSawScie.ca)

### Association News

#### No CASF 2014 Forum

The Canadian Association of Surface Finishing has decided not to hold its annual Environmental Forum this year. Instead they will be holding a golf tournament and two “Lunch and Learn” sessions, one in Toronto and one in Western Canada. Dates to be announced.

#### Annual CPCA Conference & AGM 2014 Set for Quebec City

Beautiful Quebec City is host for the Canadian Paint and Coatings Association’s 101st Annual Conference and AGM to take place October 5-7, 2014 .

This is the one time each year the paint and coatings industry comes together to look at the state of the Canadian paint and coatings industry. It also provides an excellent networking opportunity for all those doing business in the industry, whether a manufacturer, supplier, distributor or affiliated business. The business sessions will address relevant industry issues of importance to the industry, from the upstream suppliers to the manufacturer right down to the customers and consumers who rely on the many products delivered by the industry. There are many stakeholders with a vested interest in the Canadian coatings industry including governments, non-governmental.

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

#### State-of-the-Art Equipment Key for Quebec Manufacturers to Compete on a Global Scale

All Quebec manufacturers know it... In today’s competitive economy, they need to produce goods more efficiently, reliably and economically.

In December, they got a boost from La Caisse de dépôt et placement du Québec, the main sponsor of the Québec Manufacturing Fund (QMF), when it announced an injection of \$100 million into the fund to help manufacturing companies develop and grow.

Now, the province’s manufacturers can discov-



er the best places to put their investments to profitable use when the Montreal Manufacturing Technology Show (MMTS) 2014 opens its doors May 12-14 at Place Bonaventure, unveiling some of the industry’s most state-of-the-art equipment designed to help manufacturers compete on a global scale.

The technologies, many being introduced to the Quebec market for the first time, cover machine tools, tooling, metalworking, automation, additive manufacturing, design and physical asset management. Key exhibitors include Elliott Matsuura, Machineries B.V Ltee., Huron Canada, Megatel DMG/Mori Seiki/Ellison Technologies, Haas Automation, AW Miller and Single Source Technologies.

More than 5,000 people are expected to attend MMTS 2014.

MMTS 2014 is produced in partnership with The Canadian Machine Tool Distributors Association (CMTDA), The Canadian Tooling and Machining Association (CTMA), and Manufacturiers et exorateurs du Québec (MEQ) and supported in partnership with Business Information Group, STIQ and MCI.

SME, producer of MMTS 2014, connects all those who are passionate about making things that improve our world. As a nonprofit organization, SME has served practitioners, companies, educators, government and communities across the manufacturing spectrum for more than 80 years. Through its strategic areas of events, media, membership, training and development, and the SME Education Foundation, SME shares knowledge to advance manufacturing. At SME, we are making the future.

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#### Health Canada Proposes a Code of Practice for the Paint and Coatings Industry

Canadian Paint and Coatings Association (CPCA) members have agreed with moving forward on reducing the use of a substance called DEGME. It is used in some surface coating materials destined for the consumer market in Canada. As part of the federal desire to protect the health of Canadians and the consumer, Health Canada proposes to establish a Code of Practice for DEGME. CPCA expressed industry’s preference for moving forward on a collaborative approach provided by a Code of Practice instead of a regulation to manage associated risks inherent in the remaining products in the marketplace. This approach negates the need to proceed with an amendment to the Surface Coating Materials Regulations under the Canada Consumer Product Safety Act. The Code of Practice proposes to establish a maximum total concentration limit of one per cent of the substance for consumer surface coatings containing DEGME.

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government officials continue to consult with industry on necessary actions required for full compliance with the proposed Code. This is further evidence of the ongoing confidence government officials have in the paint industry's commitment to sustainability efforts, including the health and safety of workers and the consumer.

### Paint-Related BDTP Proposed Toxic and Meeting the Criteria for Virtual Elimination

On January 25, 2014, Environment Canada and Health Canada (EC/HC) published a Draft Risk Assessment Report for the Non-Challenge Substance Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-dimethylpropyl)- (CAS No. 25973-55-1), also called BDTP (Tinuvin 328). This substance was confirmed to be used in industrial and automotive (OEM and Automotive Refinish) coatings in Canada in 2011. It was also found in some aerosol paint products.

During the categorization of the Domestic Substances List, BDTP or Tinuvin 328 was identified as a priority for screening assessment as it met the criteria for persistence and inherent toxicity to non-human organisms. In previous CPCA Paint and Coatings Working Group (PCWG) discussions over the past two years, CPCA provided some confirmation on BDTP uses in industrial paint sold in Canada. The government informed the paint sector that EC researchers were currently monitoring some benzotriazoles in the Canadian Environment and that the testing and validation of an analytical method for BDTP was to be conducted in 2014. Some sampling of environmental media for BDTP is planned for 2014-15 under the CMP monitoring program.

BDTP reduces or prevents the absorption of ultraviolet (UV) light.

In Canada, BDTP is expected to be primarily released to the surface water and ultimately end up in sediment; however no monitoring data in any environmental medium in Canada has been identified. However, BDTP has been found in the environment (water, soil, sediment, and biota) in other countries.

There is a 60-day comment period associated with the Draft SAR and risk management scope document that ends on March 26th for industry and other stakeholders.

All companies using BDTP (Tinuvin 328) should carefully review the above DSAR and risk management scope documents and provide comments to CPCA before Mid-March, to allow sufficient time to prepare comments on behalf of the whole industry. If necessary, a teleconference will be scheduled.

### Health Canada Proposes to Add Ethylbenzene to Schedule I of CEPA, 1999

#### Background

Ethylbenzene is recovered from the mix of xylenes. Back in fall 2012, the CPCA Paint and Coatings Working Group (PCWG) responded to Health Canada's request for more information on ethylbenzene (EB). On February 8th, Environment Canada and Health Canada published their screening risk assessment report on the non-challenge substance Ethylbenzene (CAS RN 100-41-4) and proposed to recommend its addition to Schedule I of CEPA, 1999. A risk management scope document was also provided to initiate discussions with stakeholders on the development of a risk

management approach. Maximum concentrations of EB (including fraction of mixed xylenes) in Stain, Varnish, Lacquer, Concrete floor sealer; Expected future trends for the presence of EB in indoor consumer products (in particular in stain, varnish, lacquer and concrete floor sealers) that will remain on the market following the Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations.

Data collection initiatives will be undertaken by Health Canada to collect additional information on EB in the future.

### Canada WHMIS GHS Implementation Update

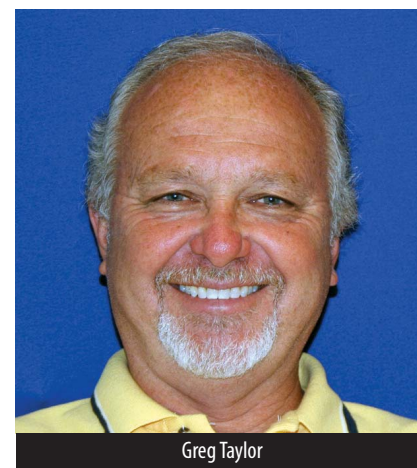
Canada and the U.S. have lagged many other countries in moving forward on the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) for workplace chemicals, but the U.S. has passed its GHS rules, which will be fully implemented in June 2015. Concurrent with US regulatory development, progress has been made in Canada in implementing commitments from the Canada-U.S. 2011 Regulatory Cooperation Council (RCC) Action Plan with several Canada-US

alignment initiatives including the GHS for workplace chemicals. One of the RCC's achievements has been to sign a Memorandum of Understanding (MOU) between the Health Canada's Healthy Environments and Safety Branch (HECSB) and the Occupation Safety and Health Administration of the United States (OSHA) for GHS implementation. Over the past years, the WHMIS Current Issues Committee (CIC) has played a pivotal role in preparing the implementation process with respect to GHS for Health Canada and in applying RCC's specific requirements in Canada.

CPCA and other Canadian industry associations recently undertook several actions to speed up the GHS process by asking that new WHMIS legislation be published as soon as possible. The Federal budget tabled on February 11, 2014, the Government officially committed to introduce amendments to the Hazardous Products Act and other consequential amendments to align and synchronize implementation of common classification and labeling requirements for workplace hazardous chemicals.

## People in the Industry

### Taylor Celebrates 25 Years with Gema



Greg Taylor

Greg Taylor is a Regional Manager for Gema USA Inc., the North American division of Graco Inc. His area of responsibility is Canada and Michigan. Greg has been in the Finishing industry for the past 33 years beginning with distribution role as the Sales Manager for ECE Canada where his role was distribution of Electrostatic Finishing equipment marketing Ransburg and Gema. He then became the Regional Manager for Gema for



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## In the News

Canada and Michigan and has been directly involved in powder system sales for the past 25 years. He has a wide experience in powder application and recovery systems in many fields in the industry supporting job coaters, automotive applications, furniture manufactures and has been very successful in the Agricultural Industry.

### New Additions to L.V. Lomas

L.V. Lomas is pleased to announce the addition of Christian Ouellet to the position of Technical Sales Representative – Industrial in Quebec.

Christian joins Lomas from Exova Inc, where he held the position of Site leader and Chemistry Manager for the Environmental and Regulatory Laboratory site. Previous to this, Christian held leadership positions at Dynergen Biodiesel, FP Innovation and TMA (Technologie du Magnesium et de l'Aluminium Inc).

Lomas is excited to have Christian join the sales team and increase our representation in the Quebec industrial markets.

L.V. Lomas is pleased to announce the addition of Dean Adams to the position of SBU Sales Manager – Coatings & Ink / RPA.

Dean was previously with Omya where he most recently worked as Vice President, Key Account Management, Life Sciences and Industrial Applications, based in Omya's global head office in Oftringen, Switzerland. Prior to his last position he was Key Account Manager for the Paint, Coatings and Building Materials Group. He worked for Omya for a total of 17 years in Canada, the U.S. and most recently Europe.

Lomas is excited to have Dean join the company and apply his sales and marketing experience in leading Coatings & Ink and RPA sales teams.

L.V. Lomas is driven by the expertise of more than 200 qualified professionals in four locations across Canada and in the US Pacific Northwest. It is Canada's leading distributor of ingredients, raw materials and packaging products, and one of the largest providers in North America. Since its founding in 1960 by Lloyd V. Lomas, L.V. Lomas Limited has remained privately-held and proudly independent.

### Pricing Updates

#### Clariant increases price for Waxes

Clariant, a world leader in specialty chemicals, announces a 4 per cent price increase across its Business Line Waxes product portfolio, effective April 1, 2014 or as contracts allow.

The adjustment is necessary to recover significant rising costs for energy, labor, and product safety, since the last price increase of the Business Line Waxes in 2011.

"Despite our best efforts to offset rising costs, it has become necessary to implement a price increase to ensure we can continue our strategy of innovation and expansion to support our customers," comments Bernhard Ehrenreich, Vice President and Head of Business Line Waxes.

#### Vencorex increases prices on Aliphatic isocyanates.

Effective March 1, 2014, or as existing contracts permit, Vencorex will increase prices on HDI (Hexamethylene Di-Isocyanate) and derivatives range (Tolonate and Esaqua).

Prices will be increased by 5 per cent to 10 per cent.

Prices are being increased due to current market situation and higher costs of raw materials.

## National Association of Surface Finishing (NASF) News

### U.S. Congress: Draft Toxics Reform Legislation is Released in House

A new draft bill to reform the U.S. Toxic Substances Control Act (TSCA) was released February 27, 2014, in the U.S. Congress. The new measure has not yet gained formal support of any Democrat.

Democratic leaders have expressed concern that the emerging legislation would weaken laws and adversely impact public health, and NGO representatives have already reacted with statements in opposition to the legislation. Bipartisan discussions have begun, however, and a revised Senate bill may be issued in the coming weeks.

### NASF Sur/Fin Manufacturing & Technology Tradeshow & Conference

The NASF Technology Advisory Committee, led by Brad Wiley of Rolls Royce, has announced the official program session outline for the 95th annual event to be held June 9-11, 2014, at the Cleveland Convention Center in Cleveland, Ohio. The schedule and sessions have expanded this year, as there's more to offer for attendees than ever:

SUR/FIN 2014 is well known for the quality of its in-depth sessions, exclusive networking events, and tradeshow exhibition featuring the best of the latest in technology, equipment, and services for the surface coatings industry worldwide. Registration for this year's event is now open. Visit [NASF-surfin.com](http://NASF-surfin.com) for complete details and regular updates on speakers, sessions and exhibitors.

NASF is excited to announce our SUR/FIN 2014 mobile app for attendees this year. This FREE app gives attendees access to the conference schedule of speakers, speaker information, maps, exhibitor

details, as well as tools to connect with other attendees. This app is now available at the App Store or at Google play for Android users, and assists our growing community to:

- Build a personal daily schedule
- Receive reminders and updates
- Engage and network with new colleagues and peers from across the industry

### Management Conference A Success



2014 Management Conference Mike Kelly leads an informative panel discussion on crisis management with industry officials.

### Navy Seal O'Neill and Disaster Preparation Key Highlights

The NASF annual Management Conference hit a record attendance in Maui in February. The meeting was held February 23-27th, with the conference program that showcased a relevant and timely peer-to-peer discussion of contingency planning for facilities under the heading "Are you prepared for a disaster?" The contingency planning panel discussion featured Mitch Marsh of Finishing Services, Jim Greenwell of Reliable Plating, LaVaughn Daniel of Danco, and Brent Bureson of Hubbard Hall. Coventya President and NASF Board Vice President Erik Weyls moderated the informative discussion.

Robert O'Neill, one of the most highly decorated Navy SEALs of our time, gave the keynote



Tony Revier of Uyemura International Corporation and Michael Siegmund of MacDermid, Inc. recognized during Management Conference closing ceremonies.

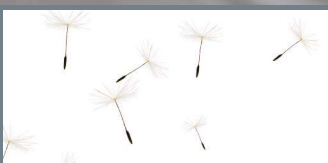
address. Mr. O'Neill delivered a riveting presentation on his experience as a former team leader with the Naval Special Warfare Development Group. Attendees also heard the latest on Washington and global developments from the NASF team, as well as the state of the association briefing by NASF President Rick Delawder.

Plans are already well underway for the 2015 Management Conference to be held February 15-19th in Palm Springs, California. Sam Bell, Metal Surfaces, will be serving as the conference chairman. We look forward to seeing you next year! Visit [NASF.org](http://NASF.org) for updates on this and other events produced by the National Association for Surface Finishing.

### NASF Presents New Resource for Finishers, Suppliers and the Oem Community

NASF has released the book *Advanced Surface Technology* as the most comprehensive reference to date on a wide range of coating and finishing applications. This two-volume hardcover set, authored by Drs. Per Moller and Lars Pleth Nielsen, with a foreword by NASF, contains the most current information in a concise, understandable format and is filled with numerous illustrations, charts and descriptive graphics.

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## ALBERDINGK BOLEY

Come see us at the **American Coatings Show 2014 in Atlanta at booth 2035** and **RadTech 2014 in Chicago at booth 313.**



# STRIKE OUT

## Arthritis Coatings & Plastics Industry Charity Challenge

The 15th Annual Strike Out Arthritis Coatings & Plastics Industry Charity Challenge event, held Saturday March 1, 2014 at the Classic Bowl in Mississauga, raised an amazing \$11,000 for the Arthritis Society. To date, this celebrated annual event has raised over \$341,000 for The Arthritis Society's education and community support programs and vital research funding.

The volunteer organization committee for the event is composed of Chris McDougall, Lisa Martella, Mary Bray and Jason Young. This event offers participants a chance to come together and enjoy a great afternoon of competitive bowling, lunch, a silent auction and contests while supporting the Society's mission to provide leadership and funding for research, advocacy and solutions to improve the quality of life for Canadians affected by arthritis.

Companies that sent teams to this event were: Unipex, Chemroy, LV Lomas, Univar, Brenntag, Cloverdale, Akzo Nobel, Dominion Colour Corporation and PPG-Dulux Paints.

The winning team was from PPG and boasted the Top Fundraiser Therese Giaschi.

### About The Arthritis Society

The Arthritis Society has been setting lives in motion for over 65 years. Dedicated to a vision of living well while creating a future without arthritis, The Society is Canada's principal health charity providing education, programs and support to the over 4.6 million Canadians living with arthritis. Since its founding in 1948, The Society has been the largest non-government funder of arthritis research in Canada, investing more than \$185 million in projects that have led to breakthroughs in the diagnosis, treatment and care of people with arthritis. For more information and to make a donation, visit [www.arthritis.ca](http://www.arthritis.ca).

Photos by Pete Wilkinson



Bowling Committee, Mary Bray, Chris McDougall, Lisa Martella, Jason Young and Pasky Oliveria.



Sandra Kirec, Veronica Kirec, Stephanie Hunter-Ng and Scott Harvey.

# waves in the pond

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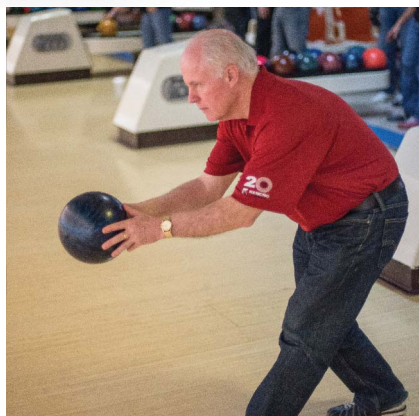
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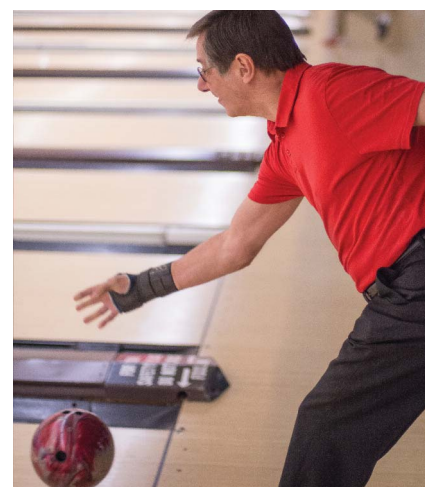
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# TAKING ACTION FOR INDUSTRY

## Red Tape Reduction Act Will Make the One-for-One Rule Law

On January 29, 2014, Treasury Board President Tony Clement introduced Bill C-21, the Red Tape Reduction Act, in Parliament to enshrine the One-for-One Rule in law. This fulfills a commitment made in the Government of Canada's October 2012 Red Tape Reduction Action Plan and reaffirmed in the October 2013 Speech from the Throne. As of December 12, 2013, under the One-for-One Rule, the government had reduced administrative burden by almost \$20 million and achieved a net reduction of 19 regulations.

### CPCA Renews Equivalency Certificate for TDG

On behalf of all valid members of the Canadian Paint and Coatings Industry, CPCA proceeded with the renewal of Equivalency Certificate on behalf of members for the 14th time on February 3, 2014 (Expiration date: February 29, 2016). This certificate refers to provisions for four labels or two placards on an IBC, which is an amendment to Part 4 in Canada Gazette 1. Publication in the Canada Gazette, Part II is scheduled for spring 2014, prior to coming into force in the Transportation of Dangerous Goods Regulations. The Equivalency Certificate No. SU 0408 is still required until this amendment is officially published. CPCA will keep its members informed of the publication date and ongoing developments.

CPCA also reminded its members that the current Equivalency Certificate is still needed until Transport Canada officially publishes an exemption rule with regards to the acceptance of international Limited Quantity (LQ) markings. The official TDG amendment is now expected in Canada Gazette Part I in the summer of 2014.

### CPCA Comments on a Proposal to Amend the TDG Regulations with Respect to Safety Standards

On January 11, 2014, Transport Canada proposed changes to the Transportation of Dangerous Goods Regulations that go beyond rail car design/evaluation and testing of crude oil. The title of the January 11, 2014, Canada Gazette I is "Proposed Regulations Section" – i.e. "Regulations Amending the TDG Regulations (Safety Standard TP14877)". Despite the focus on containers for Transport of Dangerous Goods by Rail the proposal included two items applicable to all Dangerous Goods and modes of transport (shippers, carriers, tank car owners or leasers), which

goes beyond the safety of transport of crude oil by rail alone. The proposal requires a special shipper certification as well as proof of classification, as part of the usual reporting requirements. A failure to obtain satisfactory proof of classification will require the importer and/or consignee to conduct testing in order to validate the classification of a dangerous good; and that a material safety data sheet (MSDS) on its own is not a valid proof of classification.

On February 10, along with the MAC (Multi-Association) TDG Committee and other associations, CPCA submitted detailed comments to Transport Canada asking for a longer transition time associated with the certification procedure and challenging the new classification scheme for all industries including the proof of classification and reporting requirements. CPCA stressed the need to more fully assess the unintended impacts of the new measures on industries other than just crude oil. CPCA further emphasized that the classification record would be very onerous to the paint industry and that keeping records of classification for paint products would not be useful since these products do not change often and when they do the changes are always reflected in an updated MSDS. CPCA contended that the MSDS should remain a proof of classification.

### The Canada Transportation Act Up for Review Beginning in 2015

This review will provide an opportunity for wide-ranging discussions and research on transportation issues and priorities. The last comprehensive review was done in 2001. Potential issues for the next review include: user pay models for roads and other infrastructure; supply chains for the movement of both passengers and goods; the role of competition; the impact of changing technologies and growing data availability; the implications of an aging society; and the growing role of public-private partnerships in prioritizing and driving a life cycle view of transportation infrastructure investments.

### CPCA Collecting Members' Opinions on the GHS Transition Timeline for Health Canada

At the last CPCA Health and Safety and Environment meeting, CPCA members relayed a special request received from the Health Canada CIC (Current Issues Committee) for

feedback with regards to the Health Canada proposed transition phases and GHS timeline. The CIC sought more information about related issues and challenges for association members. CPCA had already sent several comments to Health Canada urging a quick publication of the proposal and more flexibility with respect to GHS label acceptance from the present up until the start of the transition period.

A copy of the proposed timeline by Health Canada was communicated to the membership last October and posted on the CPCA website for members. All CPCA members were urged to closely look at the timeline of the GHS implementation process for each of their companies and to communicate concerns to CPCA before March 20. Health Canada is seeking feedback on the appropriate amount of time for each of the stages of transition after the

GHS launch of June 1, 2015, and any other considerations that should be taken into account regarding the timing of transition. To this date, all large member companies expressed the need for a two-year transition period for all manufacturers and importers, rather than the current one-year proposal.

### CPCA Updates Members on GHS Legislation

Following the Budget Implementation Act, New Hazardous Product Regulations expected for June 2014, June 1, 2015 is still targeted for Canada's GHS launch date. Amendment to the current Hazardous Product Act required for the GHS was included in the budget plan tabled on February 11, 2014. The subsequent steps are the Budget Implementation Act (B-I Act) to be published in spring 2014. Since

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four to six weeks usually separate the budget announcement and the B-I Act, CPCA expects the B-I Act publication at the end of March or early April. Further consideration of the Act by Parliament requires an additional eight weeks prior to receiving Royal Assent (towards the end of May). The Gazette publication of the new GHS regulations would follow shortly thereafter in June 2014.

Health Canada officials on the CIC (Current Issues Committee), confirmed Health Canada's intent to publish the new GHS regulations through Canada Gazette I and Canada Gazette II. However, the pre-consultations completed in the fall of 2013 would allow for a shorter lapse of time between Canada Gazette I and II. The comment period for Canada Gazette I can be as early as 30 or 60 days. It should be noted that the launch date for Canada's

GHS remains unchanged: June 1, 2015.

CPCA requested that the GHS Hazardous Products Regulations be published straight into Canada Gazette II in order to speed up the GHS implementation process and make workplace preparation and training more manageable for companies in Canada and in the USA, as well as for Canadian provinces and territories. The association remains hopeful that the government can still decide to exercise this option.

### CPCA Collects Comments on Proposals for Two Non-Challenge Substances: Ethylbenzene and BDTP

CPCA members have been asked to closely examine the recently proposed screening risk assessment (RA) reports and risk management (RM) scope documents released by Environment Canada and

Health Canada that relate to two non-Challenge substances: Ethylbenzene and BDTP. Both substances are proposed as being toxic and recommended for addition to the Schedule I of CEPA (1999). In addition, BDTP is identified as a candidate for virtual elimination. The paint sector appears to be the main industry targeted for both substances. CPCA developed a questionnaire jointly with Health Canada and distributed it to members in an effort to respond to specific questions and fill in certain data gaps. CPCA also encourages all non-members of the industry to consult these documents and respond to the government's need for industry feedback.

### CPCA Provides Update on the Status of Codes of Practices for Batch 7 MEKO and Batch 3 DEGME

CPCA recently learned that the publication

of Health Canada's two codes of practice for the paint and coatings industry is expected in the coming weeks. Health Canada is now targeting a spring publication for the final Code of Practice for 2-butanone oxime (MEKO) and a summer/fall 2014 period for the draft Code of Practice for DEGME. In the case of DEGME, Health Canada is still targeting summer but acknowledges that fall may be a possibility depending on comments received from industry. CPCA continues to provide ongoing leadership on the codes to ensure that industry's concerns are expressed in the new codes given that the coatings industry will have to live by them in the coming years.

### Environment Canada Provides CPCA with Revised Timeline for Adding Chemicals to VOC Exclusion List

The government intends to publish the proposed VOC exclusion list order for 13 chemicals (including TBAC, DMC and PC) in the Canada Gazette, Part I, in the fall of 2014, followed by a 60-day comment period. A final order will follow in Canada Gazette, Part II. Full enforcement might not happen before the spring of 2015.

### CPCA Still Validating the Health Canada PSSA 4 Product Database on Low Boiling Points Naphthas (LBPNS) and Solvent Subgroups

Before the next CPCA Paint and Coatings Working Group meeting on April 24 CPCA would like to ensure that all CPCA members have had the opportunity to review the information included in the database for their own products containing certain PSSA 4 substances. Health Canada conducted an online search of MSDS and collected this information in a single product database to assist their risk assessment/risk management exercise for these two subgroups in which commercial (and possibly consumer) paint applications appear the most widespread. This information may be wrong, outdated or not representative of members' products sold in Canada.

### Ontario's MOE Posts 2011 and 2012 Public Data on Toxics Reduction

The MOE published its 'Living List Framework' inviting the public's views and opinions until May 12, 2014. The 2011 and 2012 public data on toxics reduction is now available online. The data was compiled from the public annual reports and plan summaries submitted by regulated facilities. Regulated facilities have the opportunity to correct information by updating their submissions through Environment Canada's Single Window. The discussion paper on the Living List Framework is available on the Ontario Government's website.

*Gary LeRoux is the president of the Canadian Paint and Coatings Association based in Ottawa, ON.*

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# FabTech Canada Takes Toronto

Organizers are pleased with the attendance and response to FabTech Canada held in Toronto March 18-20, 2014. In its three days the show offered approx. 70 exhibitors specializing in fabricating, metal forming, welding and finishing. The show also offered several well attended educational sessions about Laser/Cutting, Management, Lean, Forming and Fabricating, Finishing, Welding, Stamping and Robotics. The event was sponsored by SME, the Fabricators & Manufacturers Association (FMA), the American Welding Society (AWS), the Precision Metalforming Association (PMA), and Chemical Coaters Association International.



Michael Bresolin, Jean Murray, Regan Murray, S.T. Rajan and Bob McKenna, Exel North America.



Stephane Girardin, International Surface Technologies.



Glenn Spurr and Conn Casey, Bex Spray Nozzles.



Ian Townshend-Carter, Caps'n Plugs.



Greg Taylor, Karen Walters, Ryan Allen, Gema.



Nanveet Johal and Patricia Kelly, Colourific Coatings.



Brad Graham, Mike Kurceba and Chris Ashour, Prism Powder Coatings.



Ted Duda and Mike Gallagher, TTX Thermo-Tron-X.



Jay Cressman, Uni-Spray.



Euriah Vold, Global Finishing Solutions.



Michael and Ernie De Angelis, The Blastman.



Brad Syrowski Nordson, Martin Bier, EFQ and Lanny Hypes, Nordson.



Alex Koza, Nikko Track and Vulcan Catalytic.



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# Regulatory Harmonization, or Not: A Constant Preoccupation

BY GARY LEROUX

As a trading nation, Canada trades predominantly with the United States, which accounts for 82.2 per cent of coatings exports at \$324 million in 2012; and imports from the US represent 92 per cent of the total imports to Canada at \$1.04 billion, wholesale cost. A little known fact is that Canada is the United States' largest goods export market with 37 States counting Canada as their number one export market, not China or Europe. Under the Canada-US Free Trade Agreement (FTA), tariffs on paints and coatings and the raw materials required for production, traded between Canada and the US, were completely eliminated in January of 1993. Under the North American Free Trade Agreement (NAFTA), tariffs on paints shipped between Canada and Mexico were also completely eliminated in January 2003. This has given rise to the growth of US coatings products exported to Canada from 20 per cent of the total in 2004 to 40 per cent in 2013. A third of the Cana-

dian Paint and Coating Association's (CPCA) members are US-based companies with significant operations in Canada. This has also given rise to the need to ensure regulations in both countries are aligned as much as possible.

Environmental, health and safety considerations continue to motivate much of the ongoing technological development in the coatings industry in both Canada and the United States. The coatings industry understands the necessity to be 'inside the tent' on important legislative and regulatory discussions that have impacted the entire industry, as a highly regulated sector of the economy. That is one of the areas on which CPCA is keenly focused on behalf of members. In recent years there have been significant strides made to ensure the industry's products are safe for both consumer and industrial use. CPCA has been there every step of the way to ensure that appropriate, science-based decisions form the basis of legislation and regulations impacting the industry. This has led to several successes for the Cana-

dian paint and coatings industry, benefiting our members, and the industry generally, in both Canada and the US

## GLOBALY HARMONIZED SYSTEM (GHS) FOR CHEMICALS IN THE WORKPLACE

There are many regulations impacting the coatings industry in Canada and no other issue illustrates this more profoundly than the current effort to align regulations for the Globally Harmonized System (GHS) for Labelling of Chemicals in the Workplace. This effort has been ongoing for several years and has now come to a head wherein the federal government must take action to ensure effective alignment of GHS in Canada with that of the US, as the deadline of June 2015 looms large for full implementation in Canada. This is happening at a time when US companies are already compliant under the new GHS rules in that country and made urgent the need to align as soon as possible. Canadian officials are seeking ways and means of ensuring Canada's timing, clearly at variance with the US regulations; do not negatively impact companies doing business in Canada. For an 18-month period (January 2014 to June 2015), US paint manufacturers shipping products to Canada will experience higher costs of complying with two different regimes for GHS compliance. Those costs are estimated to be between US \$29.5 and \$55 million, based on a recent survey conducted by CPCA. Given the difference related to implementation these costs will likely continue in the coatings industry into 2015-2016, at about the same rate (US \$66,000 - \$206,000 per month per company division). This will be the case until the GHS labels become mandatory in Canada and mechanisms to address any remaining differences between the two GHS systems are resolved (e.g. French requirements and other specific label requirements).

These estimated costs do not include those incurred by all US suppliers of raw materials with Canadian operations, who ship paint or other industrial products into Canada. Those costs would be similar and at least double those of paint manufacturers, for a total cost of US \$59 - \$110 million. CPCA continues to monitor and advocate for appropriate implementation of the GHS regulations in such a manner that it does not negatively impact the coatings industry.

The GHS initiative has been overseen by a Working Group of the Regulatory Cooperation Council (RCC), based on an agreement signed between Canada and the US in 2011, seeking to establish greater regulatory harmonization. In addition to GHS, there were 19 other areas identified with respect to issues of concern for member companies of CPCA. CPCA continues to work on both sides of the border, in conjunction with the American Coatings Association, to fully understand the requirements of legislation in the respective jurisdictions and how to better align regulations in both countries. This continues to be a significant effort by the Association.

We believe that the RCC initiative must continue because regulations clearly impact the cost of doing business. A recent study by the Canadian Federation of Independent Business pegged the annual cost of regulations at approximately \$1,500 per employee for small- and medium-sized enterprises and more for larger companies. Often conflicting regulations on both sides of the border cause confusion for companies and have the potential for some companies to be non-compliant or exit the business in certain product lines altogether. CPCA has outlined its views on this regulatory alignment effort with specific current initiatives and recommendations on what might be considered in future Joint Action Plans between Canada and the US. Some of the areas of importance for the paint and coatings sector are outlined below.

## TRANSPORTATION OF DANGEROUS GOODS

The transportation of dangerous goods is an important consideration for members in the manufacturing, supplier and distributor categories. Companies are responsible for moving large quantities of toxic materials and must comply with regulations on both sides of the border. When these regulations are harmonized, the flow of commerce is greatly facilitated and the cost of doing business reduced. This ultimately means lower costs for customers along the supply chain.

CPCA strongly supports close cooperation on matters affecting the packaging and transport of paint and coatings products. The industry's products are already subject to strict regulatory controls based on defined hazardous materials per established transport criteria, and both countries acknowledge the need to coordinate consistency in their approaches. This can be achieved bilaterally and through close cooperation with the United Nations Subcommittee on the Transport of Dangerous Goods (TDG). With respect to ongoing efforts within the RCC related to TDG activities, CPCA has suggested the goal is to establish true harmonization of requirements, either through established and consistent approaches, or through a clear

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Memorandum of Understanding that products conforming to either the US or Canadian requirements are compliant in either jurisdiction. The Memorandum of Cooperation signed between Canada and the US on this matter in September of 2012 covers a broad spectrum of products that include important supply materials for our members. CPCA remains hopeful that approvals are coming for the alignment of Transport Canada's Hazardous Materials Guidance Document with that of the US Department of Transportation. Once complete it will greatly facilitate the safe movement of dangerous goods by rail between Canada and the US.

### PRODUCT APPROVALS FOR HEALTH AND WORKPLACE CHEMICALS

Health and safety is of paramount importance for businesses using chemicals for various product formulations. This is true in the workplace and for consumer products covered under consumer product safety rules that exist in both countries. The electronic submission gateway is the foundation that will allow for increased review of collaboration between the two regulatory agencies, Health Canada and the US Food and Drug Administration. An electronic Submission Gateway has been completed and a service agreement allowing the US FDA to implement the node on Health Canada's behalf is pending approval. When in place, this will allow companies to make online regulatory submissions (e.g. marketing applications /market authorizations for approval of pharmaceutical products) to Health Canada as they currently can to the FDA.

CPCA noted that effective electronic submissions are constructive for closer collaboration with respect to establishing regulatory requirements impacting consumer products more broadly (e.g. house paints) in both countries. Going forward, it is recommended that the RCC do the following:

- 1) Implement a Common Electronic Submission Gateway to allow industry applicants the ability to submit large electronic documents related to products simultaneously to US and Canadian authorities and further encourage increased review and collaboration on these products. However, we understand that specific requirements with respect to new or existing chemicals - in existing formulations of consumer products or in their design and packaging - will continue as the domain of each respective government, but that any additional requirements will be addressed via the RCC.
- 2) Develop and adopt common monographs (e.g. including properties, claims, indications and condition of use) for consumer products.
- 3) Align and synchronize implementation of common classification and labeling requirements for consumer products similar to what is being done with the

GHS implementation of workplace hazardous chemicals within the mandate of the US Occupational Safety and Health Administration (OSHA) and Health Canada.

### PARTICULATE MATTER AND GOOD MANUFACTURING PRACTICES

CPCA pointed out to the RCC that while the broader treatment of the environment is "on the agenda" for the RCC, current efforts only address the larger question of climate change. Particulate matter acts a precursor for volatile organic compounds (VOCs) and VOCs are also emitted directly into the atmosphere as a result of various manufacturing and application processes. Although industry strongly believes the efforts with respect to climate change should be continued and enhanced, we also believe the next RCC work plan might focus on other issues of direct importance to the paint

and coatings industry more specifically. For example, adopting a US chemicals management plan similar to the one included in the Canadian Chemicals Management Plan process with respect to VOC species, adopting similar or representative VOC control techniques, VOC photo reactivity lists and VOC-exempt definition lists. The goal of such an initiative would foster greater harmonization in both countries where it makes sense to do so for certain sectors, like architectural coatings and aerosols. There also needs to be greater collaboration on enforcement and compliance with respect to good manufacturing practices, which might be enhanced by increasing mutual reliance on each other's routine surveillance related to good manufacturing practices (GMP) inspection reports of manufacturing facilities.

There are other important issues for the paint and coatings industry related to regulatory alignment such as nanotech-

nology, non-alignment of PMRA list of products with the US EPA; differences between US EPA and Canadian VOC exclusion lists; Chemical Management of CMP-declared toxics substances; management of third country import risk; and more. Full submission details of these and other issues are available on CPCA's website under Member's Only.

Increased collaboration between regulatory agencies in Canada and the US will help reduce unnecessary duplication of costs for manufacturers, streamline decision-making, and minimize the delays in bringing products to the marketplace. This will result in expanded consumer choices without compromising the safety, efficacy and quality of products.

*Gary LeRoux is President of the Canadian Paint and Coatings Association, [www.canpaint.com](http://www.canpaint.com)*



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# American Coatings Show Set for Georgia



The American Coatings show will be held April 8-10, 2014 in Georgia World Congress Center, Atlanta, GA. The Conference will be held April 7-9, 2014. The American Coatings CONFERENCE, offered in conjunction with the American Coatings SHOW, is the leading science and technology event for the paint and coatings industry in North America providing innovative solutions for the industry. This year, attendees can look forward to a diverse program of 96 high-level technical papers, providing a perfect forum for the exchange of information and perspectives from leading scientific experts.

The global coatings industry will meet in Atlanta for the American Coatings SHOW from Tuesday, April 8, through Thursday, April 10, 2014, as well as the American Coatings CONFERENCE from Monday, April 7, through Wednesday, April 9, 2014. All these events take place at the Georgia World Congress Center.

After a successful Call for Papers with nearly 200 submissions, the program committee for the American Coatings CONFERENCE has established a comprehensive conference program that will include a keynote address entitled "Energy as a Driver of Coatings Innovation in the 21st Century," given by Dr. Charles Kahle II, of PPG Industries. Dr. Kahle will discuss technology drivers that are shaping current coatings technology innovation.

The CONFERENCE comprises almost 100 lectures delivered during sixteen distinctive session, as well as the Mattiello Lecture, an interactive poster session, eleven focused pre-conference tutorials, and the presentation of the American Coatings AWARD and the Roon Award, and offers a unique opportunity to network and gain insight from experts involved in different areas of the industry research and academia.

#### SHOW DATES/TIMES

Tue April 8 - Wed April 9  
9am to 5pm

Thu April 10  
9am to 1pm

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# The Impact of Waxes and PTFE IN COATINGS

Waxes and PTFE enhance the surface qualities of coatings and inks, make composites tougher, and expand the possibilities of paper and film with barrier, functional, and aesthetic features.

## WAXES

Among the several additives available for coatings and inks, waxes have a significant impact on many formulations or processes. Even if used in relatively small quantities, typically below 3 per cent solids content of the total composition, waxes impart or improve attributes such as slip and lubrication, abrasion resistance, anti-blocking, matting and water repellency, all critical properties in the coating formulation. Waxes are often classified as surface conditioner additives.

The term wax encompasses a broad range of naturally occurring and synthetic compounds constituted from high fatty

acid esters (typically C36 - C50) or from polymers (700 < Molecular weight < 10,000). They differ from fats in that they are generally harder and less greasy. It is important to realize that chemical composition alone does not define a wax. Rather, the term "wax" should be used as a generic term for materials that are or have the following properties:

- solid at 20°C, varying in consistency from soft and plastic to brittle and hard;
- melting point of at least 40°C without decomposing, (this characteristic uniquely distinguishes waxes from oils and natural resins);
- relatively low viscosity at temperatures slightly above the melting point and non-stringing (i.e., producing droplets—a characteristic that excludes most resins and plastics).

There are a large variety of waxes available, often classified according to their origin.

To have a significant impact on the coating, the wax must migrate to the surface and be present in sufficient quantity to impart the desired characteristic.

Molten wax particles float (or bloom) to the surface. The coating cools and re-crystallization of wax particles takes place, forming a thin but continuous wax-enriched surface layer. Generally, the softer the wax or lower the melting point, the more predominant is the blooming mechanism. The compatibility between the wax emulsion and other formulation components determines the wax migration rate.

In the case of the ball bearing mechanism, solid wax particles migrate individually or protrude through to the surface. By protruding slightly above the coating surface like ping-pong balls floating on a

pool of water, they act as a physical spacer and prevent another surface from coming into close contact. Hard and high melting point waxes like HDPE, as well as PTFE which exhibits wax like characteristics, operate using this mechanism under certain conditions. Both the particle density and the extent of protrusion influence the magnitude of the effect.

Once at the surface, the layer of wax particles has the ability to modify the Coefficient of Friction (CoF) of the substrate, imparting the desired characteristics.

## FORMULATING WITH WAX EMULSIONS

Wax emulsions are extensively used in aqueous formulations such as paints, coatings and inks. These ready-to-use wax emulsions can be easily incorporated into a formula by simple mixing. Their very fine particle size ensures thorough, homo-

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There are a large variety of waxes and PTFE products available on the market to enhance the surface qualities of any coating, paint or ink.

geneous incorporation with other ingredients of the formulation, maximizing the required effects. And because of their inherent smaller particle size are less likely to detract from gloss.

Wax emulsions can be stabilized by either a steric mechanism (using non-ionic emulsifiers) or by an electrostatic mechanism (using ionic emulsifiers, most often anionics). Combining anionic and nonionic emulsifiers provides the emulsion the optimum stability because wax particles are protected through both stabilization mechanisms. This is referred to as the electro-steric stabilization mechanism.

In addition, each stabilization mechanism not only has its own advantages and limitations but also significantly impacts the overall formulation giving added flexibility in formulating.

The wax properties that have the greatest impact on formulation performance include the chemical composition, the molecular weight, the melting point, the hardness and, in the case of emulsions and dispersions, the particle size.

**SELECTING A WAX**

The end application and the coating process (including the curing) also substantially influence selection of the

most appropriate wax. When selecting a wax, it is important to consider: Melting point of the wax should be lower than the curing temperature when curing is required. Particle size and particle size distribution should be chosen to allow particles to migrate to the film surface. pH of the wax emulsion should be within approximately one unit of the system to which it is added. Type of surfactant can also influence compatibility with the other components, as well as the overall formula stability. Order of component addition in water-based formulations can be a critical factor in maintaining stability.

**PTFE**

PTFE is a highly useful plastic material polytetrafluoroethylene (PTFE). PTFE is one of a class of plastics known as fluoropolymers. A polymer is a compound formed by a chemical reaction, which combines particles into groups of repeating large molecules. Many common synthetic fibers are polymers, such as polyester and nylon. PTFE is the polymerized form of tetrafluoroethylene. PTFE has many unique properties, which make it valuable in scores of applications. It has a very high melting point, and is also stable at very low temperatures. It can be dissolved by hot fluorine gas or certain molten metals, so it is extremely resistant to corrosion. It is also very slick and slippery. This makes it an excellent material for coating machine parts, which are subjected to heat, wear, and friction, therefore the first choice for most engineering solutions. PTFE has low electrical conductivity, so it makes a good electrical insulator. and it is essential to the manufacture of semi-conductors. PTFE is also found in a variety of medical applications, such as in vascular grafts, although there are restrictions as to the use of PTFE associated with medical devices, please consult us on specific application requirements.

PTFE can be produced several ways, depending on the particular traits desired for the end product. Many specifics of the process are proprietary secrets of the manufacturers. There are two main methods of producing PTFE. One is suspension polymerization. In this method, the TFE is polymerized in water, resulting in grains of PTFE. The grains can be further processed into pellets, which can be molded. In the dispersion method, the resulting PTFE is a milky paste, which can be processed into a fine powder. Both the paste and powder are used in coating applications.

Formulations of PTFE coatings are created to produce a coating that operates under differing circumstances, as well being able to produce a film that can be sprayed. Nonionic PTFE dispersion as an additive provides mar, abrasion and high temperature resistance for a variety of applications within the paint and coating industries. It also improves slip in coatings. Waterbased PTFE dispersions add optimum abrasion/mar resistance without the use of solvents. With 4-19 micron particles, they also provide a matting effect for a more natural appearance. PTFE coatings are not designed as a decorative product, pigments play an important role in tandem with other products to produce the final coating system.

There are a large variety of waxes and PTFE products available on the market to enhance the surface qualities of any coating, paint or ink.

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Continued from front cover

In several sectors of the industry, successful dispersing, (the targeted separation of agglomerated particles) is still presenting a challenge. Manufacturers of dispersion equipment are meeting this challenge with energy efficient units through utilization of turbulence, cavitation and shear forces, thus providing real energy and time saving potential. Technical benefits can include efficient dispersion, small particle sizes, significantly reduced heat, reproducibility and easy cleaning/product changing.

Machines should accomplish effective dispersing of particle and pigment agglomerates as well as emulsions. In addition to being energy efficient, difficult dispersions should take fewer passes, which helps keep wear and tear at a minimum. A low pressure, low maintenance machine can offer viscosity up to 150,000 mPas and provide gentle thermal process conditions for delicate active ingredients, with no moving parts.

Manufacturers say customers seem to be interested in mixing more challenging materials, such as viscous or highly filled materials that make the mixing part of the process more important. There are applications where the mixing process has to be done in just a few seconds. With advances in development and availability of nano tubes, carbon and glass fibers and trying to mix these new materials more efficiently in various liquids, mixing has become a more important factor. Fast, uniform mixing with no need for secondary de-gassing needs to be possible.

Many coatings manufacturers have found that traditional high-speed dispersers (HSD) are not always the best way to make contemporary products. Times have changed. Waterborne systems require the higher shear of a rotor/stator mixer to achieve a product with the desired droplet size, stability, agglomerate size and colour development.

Waterborne products are extremely vulnerable to air and the vortex created by the HSD can cause foaming problems. Although a defoaming agent can be added, the problem can be averted by switching to a bottom-vortexing rotor/stator mixer. Compared to the HSD, the rotor/stator mixer generates an inverted vortex and much less surface violence, sharply reducing the air entrained in the batch. The high shear rotor/stator mixer can produce a better pre-mix in both solvent- and waterborne applications.

The reality in many coatings labs today is that engineers must consider both high-speed dispersers and rotor/stator mixers in development to ensure that they identify the optimal process for their new product.

Items to consider when it comes to agitators: Any agitator change that requires more than five minutes is too slow. If it requires specialized tools, it is too complicated. If it causes a mess with exposed

bearings, seals and shaft replacements, it has no place in the lab. The answer is to design the agitators specifically for fast interchange with no need to touch the bearing assembly or the shaft.

A mixer that accepts a variety of agitators saves space in the lab. Coatings development labs require the ability to compare test results using a rotor/stator mixer and a traditional high-speed disperser.

There is a difference between a mixer that enables the changing of agitators and one that is engineered to allow the change and preserve process comparisons with properly balanced shaft speeds and agitator tip speeds. The agitators must be sized correctly to allow for the best lab results. The operator must be able to adjust the shaft speed easily, quickly and precisely over a speed range of at least 690 to 6,900 rpm.

## THE BLADES

The blades in the high-speed dispersion equipment need to be properly maintained and changed and updated regularly for consistent results. This relatively inexpensive part could be the difference

in time will eventually erode away until there are no teeth left. The blade should be replaced before this happens.

When installing a new impeller, run a standard batch of material and record the amps required to run the impeller in the said batch. Check the amp draw of the machine in the same type of batch, maybe once a week or month depending on the abrasiveness of your products. When there is a noticeable decrease in the amp draw for the same batch, the impeller is losing its effectiveness and should be replaced.

Every batch of material has a specific recipe including a dispersion time. After installing a new impeller, check the batch several times during the dispersion phase and record how long it takes to bring the batch up to specifications. This recorded time should be the guideline of how long it takes to make a batch properly. As the blade starts to wear, it will take longer to produce the desired results, costing the company time and money. Blade manufacturers say the dispersion blade should be replaced when you can no longer achieve a proper dispersion in the same amount of time as

replace, and could be the difference between making and losing profit. Check the blade often for worn or damaged teeth, check the amp draw of similar batches of material on a periodic schedule and check to make sure that batches are being produced in the right amount of time. If the teeth are worn or damaged, amps have dropped or it is taking longer to make batches to specifications, it is time to replace your impeller.

Blades available on the market include Intensive Type for agitation, positive but gentle material flow, low shear smooth fast mixing without air inclusion. Intensive Type Cutter for shear and agitation, positive material movement, good blending and shear for the more fibrous additives and fillers. Intensive Type with Teeth for high shear and agitation, most positive material movement, best combination where high shear is required for a rapid and smooth blend or when high shear is not required but is not detrimental.

A blade should be suitable for low shear blending or high shear dispersion. There is multi-piece construction available for entry through small manways.

A formulator needs to select a

Test a variety of equipment. Select an equipment manufacturer with a well-equipped laboratory for testing prior to purchase.

between making and losing profits on every batch produced. A newer blade makes for shorter batch times. A blade needs to be changed right after it becomes damaged and before it wears out. Checking the teeth of a new impeller, the edges of a well-made dispersion blade are crisp, clean and squared off. These squared off edges are designed to give the impeller the most efficient grind. As the blade begins to wear, the teeth will start to round off and

when using a new blade.

There are coatings available on the market to make blades last longer, such as tungsten carbide spray welded to the tips of the impeller to give them abrasion resistance. A typical tungsten carbide coated blade will last up to four times longer than a non-coated blade. Dispersing highly abrasive materials will need a coated blade.

Blades are relatively inexpensive to

mixer/disperser product line that is intelligently designed to facilitate scale-up with operating parameters that logically relate each product model to the others in the line. This will reduce problems when it is time to increase production.

Test a variety of equipment. Select an equipment manufacturer with a well-equipped laboratory for testing prior to purchase.



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# 1K Formulating Versus 2K

Formulating coatings using ultra violet UV light is a key solution to meet increasing environmental regulations and concerns. UV cure coating technology continues to be a fast growing segments in the industry.

Its growth can be attributed to its low energy costs, no pot life issues, reduced environmental impact and a fast cure speed.

One-component (1K) UV-cure coating technology can take seconds to minutes to cure, translating into reduced overall costs.

The two main UV coating platforms are:

- 100 per cent solids UV formulation
- waterborne UV systems

Both have low volatile organic compound (VOC) levels.

UV-cure coatings have traditionally been used in wood applications, but this is expanding into new markets due to their many performance, economic and environmental benefits.

UV-cure coatings display excellent adhesion to metals such as galvanized iron and cold-rolled steel.

UV-cure coatings are replacing the conventional aerospace coatings process that uses traditional, two-component (2K) polyurethane topcoats because UV has rapid cure rates, low VOC levels, low volatile hazardous air pollutants (VHAPs), high performance properties and decreased refurbishing time.

To meet the aerospace market's specifications, coatings must yield a good balance of physical properties including chemical resistance, flexibility, adhesion and weathering. Typically, UV-curable coatings lack flexibility but provide superior chemical resistance due to their high crosslink density. Aerospace coatings

require a compromise of both chemical resistance and flexibility while maintaining hardness. These properties are primarily dictated by the filler concentrations and the resin(s) functionality/glass transition temperature. A mixture of hard and soft resins along with reactive diluents is required to get the balance of flexibility, hardness and chemical resistance required. Additionally, raw material selection is especially critical to obtain good weathering properties.

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

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

UV-curable PUDs are excellent binders that provide high performance in high-intensity, UV-cure flooring applications. They can also be formulated to display good gloss. These operator-friendly, high-molecular-weight UV resins feature a number of other beneficial properties: they are low odor and VOC, light stable for resistance to weathering, abrasion resist-

ant, chemical resistant, and have good adhesion to the substrate. Wood, vinyl and concrete substrates can all be coated with UV-curable PUDs, which can be applied with existing equipment by spray, roller, squeegee, etc. Typical applications for these resins include large warehouses, restaurants and amusement parks.

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

Common wood decking is made of CCA-treated southern yellow pine. There are a multitude of techniques available to give the deck a better appearance, including stains, as well as short-term and long-term coatings. The most common choice is a short-term coating that will last anywhere from six months to one year. The labor and material costs to maintain large deck coatings is high.

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

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

Sunshine-cure coatings have the following characteristics and properties:

- Physically drying and UVA-curing properties
- UV-resistance – aliphatic polyurethane dispersion and UVAs and hindered amine light stabilizers (HALS)
- Fast water release
- User friendly
- Viscosity ~ 400 cPs.
- Less than 1.0 lb/gal VOC
- About 30% solids
- Excellent in-can stability of the formulated product during use in direct sunlight
- Excellent adhesion properties
- Good mechanical properties - flexibility, abrasion and chemical resistance
- Good storage stability

Research and development has refined polyurethane chemistry and delivered acrylated allophanate oligomers to the field of UV coatings.

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

Future UV expansion in aerospace applications is inevitable.

One of the latest markets for UV-curable coatings is the soft-touch coatings sector. Soft-touch coatings impart a silky feel, while providing stringent performance properties. The end product appears leather-like but is actually created from a polyurethane coating. UV-curable PUD and 100 per cent solids soft-touch coatings are currently being used in cell phone, computer housing and automotive applications.

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

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# The Choice of UV Curing

Manufacturers of Ultra Violet (UV) Curing Equipment say that their customers are asking for heavy duty, high performance and versatility.

UV curing effectiveness is determined by exposure to the right wavelength light, at the right intensity, for the right amount of time. That light can come from a microwave unit, an arc lamp or a UV LED. It is the properties of the light that matter when curing a coating or ink.

Deciding on the UV light source to install depends on budget, size, features, quality and reliability.

Mercury lamps have been common in industrial UV curing for decades, but recently UV sources using light-emitting diodes (or LEDs) have become available. These UV sources are made by arranging a large number of tiny semiconductor chips into large matrices. When voltage is applied to each LED chip, a burst of UV light is emitted through a process known as electroluminescence. Unlike mercury lamps, the spectra of an LED is very specific and narrow. Today's LEDs are available at various wavelengths, (determined by the chemical composition of the chips), from 365 nm to around 405 nm. Mercury-based (arc and microwave) lamps along with UV LEDs are the most common industrial UV sources currently used in the industry. Each produces light useful to curing, but there are pros and cons to each.

## UV LEDs

The UV LED rely on tiny semiconductor chips to generate UV light. They have consistent output and a long life. UV LEDs are equal in service to the highest quality arc lamps. LEDs can be turned on and off instantaneously. The LED is a spike of energy in the longest wavelength regions of the UV spectrum. On the positive side, UV LEDs are safe as there are no emissions or excess heat, ideal for curing paper, wood and thin plastics or electronic components. However, since the vast majority of existing UV-cure inks and coatings were formulated for mercury sources, curing with an LED source often requires more time, slower speeds, higher-powered LEDs, or adjusting the formula so it responds better to the longer LED wavelengths.

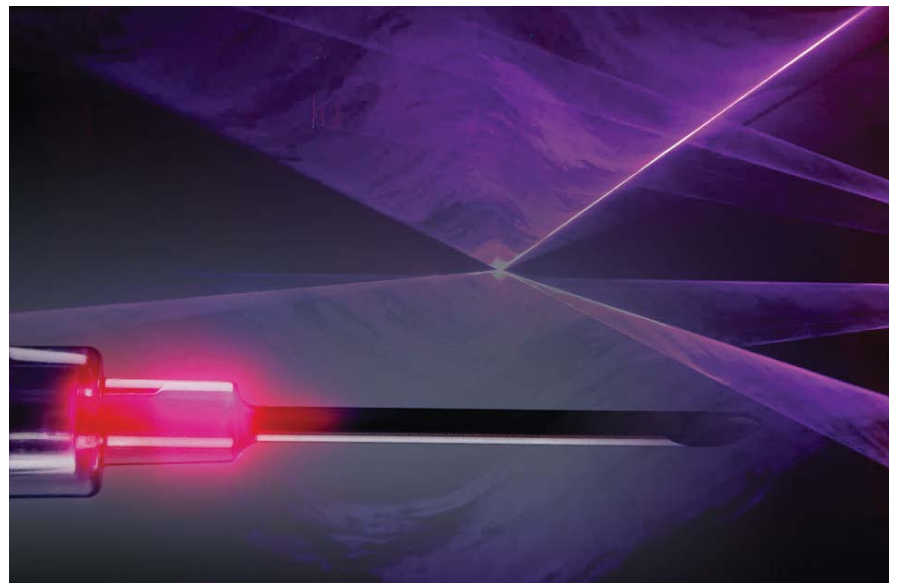
## MICROWAVE LAMPS

Without electrodes, microwave lamps do not suffer some of the problems inherent to arc lamps. There is no aging of the lamp due to decomposition of the electrode, or reduction in output due to blackening of the lamp. Microwave lamps have more consistent UV output and gen-

erally last longer than arc lamp counterparts. However, the physics behind the microwave coupling in the lamp restricts the bulb length to certain sizes such as 3", 4.5", 6" and 10" in length. Other curing lengths need several shorter lamps be placed end-on-end, making microwave lamps good for smaller applications, but a bit complex for larger areas. Microwave lamps can be refired in a matter of seconds not minutes as with the arc lamp.

## ARC

The arc, or electrode lamp, is the most common of all UV light sources due to it being simple and versatile. Arc lamps are available in a wide range of types and styles. Arc lamps require a high-voltage, high-current power supply, sometimes referred to as a "ballast". The arc lamp is usually mounted in a metal enclosure, outfitted with a reflector that redirects UV light away from the part. Reflectors can be made of materials such as quartz and borosilicate, though aluminum and metals coated with specialty coatings are commonly used to improve their performance and reliability. Hi voltage needed for the arc amp can be a drawback and each time the lamp is fired, small amounts of the electrode material evaporate resulting in darkening, or blacking of the lamp near the terminals. This deterioration results in a loss of UV output as the lamp is used and makes each following strike of the lamp more difficult. Another drawback of arc lamps is that when started, the internal pressure in the tube rises



sharply. If the lamp is shut off, it takes sometimes as much as 20 minutes to restart it. Keeping the lamp on to avoid these delays is inconvenient on lines where starting and stopping the line needed. One technique to manage this problem is to outfit the lamp with a shutter so the lamp can be kept on at a lower power level, but shielded by the shutter.

## HOW TO CHOOSE

Quality of construction should always be taken into consideration when choose a UV system. The quality of UV light sources affect performance.

Control features are an important factor as UV systems allow you to easily change power output levels, provide feedback on the condition of the power supply or cooling system, or diagnostic information in the event of trouble. Some LED sys-

tems monitor cooling temperature and coolant flow rate. More sophisticated LED systems allow you to selectively turn on and off various portions of the array to accommodate different size parts.

The UV light source should be easy to maintain and quick to replace. Spare parts should not be too costly. All this is a concern.

Service and support. Choose a supplier who will follow through on the "great service and support" they are offering. Make sure the product is supported with good operating manuals and technical documentation, even on the web.

Each UV curing system, whether UV LED, microwave or arc lamp has its advantages and disadvantages. The choice depends on your needs and preferences, differences in quality, features, maintainability and technical support.



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# Wood Finishes IN THE SMALL SHOP



If you ask any woodworker what their weakest skill set is, they will probably say finishing.

Small shop owners learn valuable lessons over the years through trial and error, such as when coloring a hard, close-pored wood like maple, try using dyes instead of pigment stains. The problem with pigment stain is that the pigment particles are too large. Without large, open, oak-sized wood pores to get lodged in, the pigment has no place to go. It never builds color or worse, it covers unevenly. Dyes, on the other hand, use color that is completely dissolved in its carrier. Therefore, dyes color closed-pored hardwoods much more evenly and with much greater control than pigment stains. When coloring raw wood with water-based dyes, sand the piece with up to 220 grit sandpaper. Next, take a damp sponge and go over the portion to be dyed in order to raise the wood's grain. After the water dries, sand off the fuzzy fibers with 220 grit sandpaper. Now, wet the piece again with the sponge and immediately apply the dye. The water from the sponge acts as a wood conditioner and guarantees a uniform appearance with little chance of splotching.

When it comes to dust nibs, most small shops don't have the luxury of a dust-free finishing room. Fast-drying finishes like shellac and waterborne polyurethane will help but finishing the finish, rub-

bing out, should be a consideration. Let the finish fully cure before you start rubbing it out. Wait 24 hours for shellac and 2-5 days for water-based polyurethane, depending on the weather, if it is being done outside. Once the finish is cured, you will need to flatten it with 600 grit or P1200 grit sandpaper to get a uniform sheen or scratch pattern. Make sure you lubricate the paper with soapy water or mineral spirits to avoid cutting through the finish. Always sand with the wood grain, and stop frequently to check your progress. If your goal is a flat or matte finish, just wax and buff.

Many small shops use an industrial post catalyzed lacquer finish on most of their commissions. Although it dries in 8 minutes, applying this type of finish requires some expensive equipment. If it takes 24 hours for a finish to dry, you probably aren't making any money on the job. The key is to pick an appropriate finish for the project.

## SHELLAC

Shellac dries fast, looks good, touches up easily, and is relatively safe to use. When mixed fresh from shellac flakes and used within a couple of weeks, it is quite durable. Aside from being a world-class topcoat, dewaxed shellac is also a universal sealer. Put it over a water-soluble dye before top coating with a water-based finish to prevent the color from bleeding through.

## WATERBASED

Waterbased finishes generally come in acrylic and polyurethane. The polyurethane is slightly tougher and can be used on floors and tabletops. Today's tough waterbased finishes dry fast, clean up easily, and you don't need a fireproof spray booth. They also cure

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## Calendar of Industry Events, 2013-2014

**April 8-10, 2014:** American Coatings Show, Georgia World Congress Center, Atlanta, GA, [www.american-coatings-show.com](http://www.american-coatings-show.com)

**April 22-24, 2014:** ECOAT14, Rosen Centre Hotel in Orlando, FL, [www.electrocoat.org](http://www.electrocoat.org)

**April 25, 2014:** Annual Night at the Races with the Ontario Paint Association at Woodbine Entertainment, 555 Rexdale Blvd, Toronto, ON. Gates open at 6:40, Post time 7:30. Contact [jmoore@lvomas.com](mailto:jmoore@lvomas.com)

**May 12-14, 2014:** Montreal Manufacturing Technology Show (MMTS) 2014, Place Bonaventure, Montreal, QC, [www.mmts.ca](http://www.mmts.ca)

**May 12-14, 2014:** RadTech 2014, UV & EB Technology Expo & Conference, Hyatt Regency O'Hare Rosemont, IL, [www.radtech.org](http://www.radtech.org)

**June 3, 2014:** Annual OPA Golf Tournament, details TBA.

**June 9-11, 2014:** SUR/FIN 2014, Cleveland Convention Center, Cleveland, OH, [www.nasfsurfin.com](http://www.nasfsurfin.com)

**September 16-18, 2014:** Powder Coating Show, Indiana Convention Center & Lucas Oil Stadium, [www.PowderCoatingShow.com](http://www.PowderCoatingShow.com)

**September 26-27, 2014:** Canada Woodworking East, co-located with InterSaw. The international saw milling expo, Olympic Stadium, Montreal, QC. [www.CanadaWoodworkingEast.ca](http://www.CanadaWoodworkingEast.ca), [www.InterSawScie.ca](http://www.InterSawScie.ca)

**October 5-7, 2014:** Canadian Paint and Coatings Association Annual Conference & AGM 2014, Quebec City, QC. [www.cdnpaint.com/cpca-conference-2014](http://www.cdnpaint.com/cpca-conference-2014)

**November 11-13, 2014:** FABTECH 2014, Georgia World Congress Center, Atlanta, GA, [www.fabtechexpo.com](http://www.fabtechexpo.com)



fast, so the wait may only be a couple of days if you need to rub out the finish to a high gloss. By adding a few drops of amber colored dye in the finish, the final coat can look remarkably like an oil based film without the slow drying time of oil. Waterbased finishes can be brushed on or sprayed.

### OIL

Sometimes a job gets specified for oil or you have a piece made from walnut or cherry that needs it. The key to using an oil based finish is not to use oil. Natural oils like tung oil, linseed oil and oil varnish blends take too long to dry and don't offer much protection. Plus they're expensive and you wind up paying mostly for paint thinner. A solution is to buy a true short oil varnish and cut it back with equal parts paint thinner so it can be wiped on. These varnishes are much more durable than the true oils, and they have dryers in them.

### EPOXY

If a job needs epoxy finish, the type of finish that looks like 50 coats of polyurethane, it is best to use a very viscous epoxy product designed for this. Make sure you follow the manufacturer's instructions to the letter or you may end up with an uncured, bubbly mess. Also, epoxy finishes don't hold up well in sunlight. If the piece will be outside, it is best to coat the dried epoxy with several coats of a good spar varnish.

### SPAR VARNISH

Spar varnish is the choice for clear coating exterior jobs. There are some two-part super-performing products. When choosing a spar varnish, make sure it is a true long oil varnish loaded with a UV light-protecting mineral. Decent spar varnishes are typically made from tung oil and have a very slow curing rate, so they remain relatively flexible to accommodate the seasonal movement of wood. Also they contain minerals that act in a similar way as paint pigment, which helps keep the sun from breaking it down so quickly. The thing to remember about spar varnish is that more is better. The more film between the world and the wood means better protection. Apply all varnishes with a high quality natural bristle brush. Cheap brushes will shed hairs in the finish.

Source: [www.biglandwoodworking.com](http://www.biglandwoodworking.com)



### Pentco Industries Inc. speaks out about great products and great relationships

We traveled to Surrey, just outside of Vancouver, BC, Canada to talk with Pentco about why they like working with Chemcraft products and with their Chemcraft distributor, Omega Coatings.

Pentco Industries Inc. was founded in 1979 and is one of Western Canada's largest manufacturers and distributors of cabinet doors. They produce industry leading products for single/multi residential developments, and commercial and institutional projects.

"We do a lot of multi-family high rises," said John McNulty, one of Pentco's two owners, "You can't have inconsistent colors rolling through hundreds of units. That's when we started using Chemcraft."



Chemlife® 24 Conversion Varnish

"Chemlife 24 has great fill, you can use it as a self-seal and it has higher solids than most products out there," continued McNulty.

"It's a go-to product. Very user friendly and cost effective. Using this product, you can cut waste by up to 30%. Consistent. Sprays the same every time," said McNulty.

"Pentco is known for quality products. We have to feel confident that every cabinet door lives up to what we say it will. That's why we have to use good coatings - and that's why we have to have good support. We can't wait a 'couple of days' for someone to show up."

"Our Chemcraft distributor representative is in here all the time," McNulty said, "Having

"Every company has a good, better, best product. Chemcraft has the greatest - Chemlife 24."



Front, L to R: Dallas McNulty - Manager, Pentco Industries. John McNulty - Owner, Pentco Industries. Sandra Filsof-Schipper - President, Omega Coatings. Back, L to R: Frank Brams - Sales Representative, Omega Coatings. Ian Jackson - Owner, Pentco Industries.

someone like Frank (Brams) to bounce problems off of and bring you solutions is key."

"We have sales reps in here constantly trying to get us to switch," said Dallas McNulty, Pentco's Manager. "So I asked one rep, how many changes of clothes do you have in your car? And he said to me, 'what are you talking about?' I said, 'Exactly!' Frank will stick his head in a machine and get dirty to insure our products are 100%, so he keeps a couple of changes of clothes in his car."

"That's the difference Omega and Chemcraft bring; you're buying insurance when you buy good coatings and work with good people."

Visit [chemcraft.com](http://chemcraft.com) to locate your nearest distributor.



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## Clariant's Exolit Flame Retardants Keep Pace with Trends and Challenges of Transport Sector

Clariant, a world leader in specialty chemicals, is making fire safety and sustainability a realistic and achievable goal for transportation applications with its cost-efficient, non-halogenated flame retardant solutions. Clariant's high-performance Exolit AP Ammonium Polyphosphate based and Exolit OP Phosphinates based flame retardants for thermoset systems address the key challenges of modern vehicle manufacture, with its increasing trend toward lightweight structural parts.

Exolit flame retardants for unsaturated polyester and epoxy resins support the aviation, road, rail and shipping sectors in fulfilling today's stricter flammability requirements, meeting environmental targets through the use of materials with corresponding health and environmental profiles, and in achieving greater cost-efficiency without compromising on fire protection and hazard levels. Their advantage lies in their effectiveness for composites and laminates, which enables very low concentrations to be used, while at the same time meeting stringent flammability requirements.

Available for sole use or as synergistic formulations with aluminium hydroxide (ATH), Exolit AP enables thermoset resins used in fiberglass reinforced composites to reach high flammability requirements and fire standards such as under the new EU wide railway standard EN 45545-2 for interiors. With Exolit flame retardants the customer can prepare composites and laminates which fulfil the Hazard Level (HL) 2 and HL 3 requirements under EN 45545-2. Composites with the halogen-free Exolit flame retardants show advantages in smoke toxicity measurements (EN ISO 5659-2) and have in addition low heat release rates. If tested under ISO 5660-1 in the cone calorimeter, the required low MARHE (Maximum Average Rate of Heat Emission) numbers

for HL 2 and HL 3 can be reached.

In addition, Exolit grades can be used to formulate intumescent (gel)-coats which drastically improve the fire endurance of the whole composite part. Exolit flame retardants are suited to traditional hand lay-up process, as well as pultrusion and other advanced techniques. For electrical markets, all Exolit products are fully compliant with current WEEE and RoHS regulations (European Directives on Waste Electrical and Electronic Equipment and Restriction of certain Hazardous Substances in Electric and Electronic Equipment). For thermoset systems, Exolit AP grades allow low smoke density and do not release corrosive gases.

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

## New Natura Renew

Benjamin Moore & Co., one of North America's most respected paint and coatings manufacturers, today announced its newest product, Benjamin Moore Natura Renew, the first premium, bio-renewable paint with zero emissions. Natura Renew is highly durable and plant-based, the first of an entirely new class of innovative, eco-friendly paint. Launching in the most eco-friendly region in the US, Natura Renew is now available at select Benjamin Moore retailers in the Pacific Northwest and will roll out nationwide later in 2014.

Through Natura Renew, Benjamin Moore is catering to consumers in the growing LOHAS (Lifestyles of Health and Sustainability) US market, which includes goods and services related to the environment, health, social justice and sustainable living. This market is estimated to be \$290 billion, of which \$100 billion is spent on green building. Research shows that one in four adult Americans is part of this group making it ripe for innovative products and consumer goods.

"Benjamin Moore is excited to continue our history of pioneer-

ing products with this launch of the first-ever, premium paint product made with bio-renewable materials and zero emissions," said Mike Searles, President and CEO of Benjamin Moore & Co. "The size and growth of this market shows that greener, more sustainable products matter to consumers, interior designers and architects. With Natura Renew, we're able to offer these discerning customers an authentically sustainable paint without compromising performance, colour and durability. This sort of breakthrough innovation, delivered through our network of independent dealers, is the hallmark of Benjamin Moore."

Natura Renew, which contains up to 40% bio-renewable materials, is an extension of Natura®, Benjamin Moore's most sustainable and eco-friendly paint. Natura Renew delivers zero emissions, offers easy application and is both durable and washable for a long-lasting finish. Available in thousands of colours with an eggshell and semi-gloss finish, it was developed in partnership with DSM, a global leader in sustainability and bio-renewable science. Natura Renew is the first product to market with a low odour, zero emission paint made with plant-based renewable ingredients.

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

## Arkema Expands Binder Options for Cool Roof Coatings

Arkema Coating Resins, a business unit of Arkema, has added to its line of waterborne emulsion binders for use in formulating roof coatings. The new product is ENCOR Flex 192, a modified acrylic latex binder designed for coatings used in the restoration of low-slope, commercial thermoplastic polyolefin (TPO) roofing membranes. Properly formulated, ENCOR® Flex 192 offers outstanding dirt pickup resistance and adhesion to TPO, and can eliminate the need for a solvent primer to help lower roof maintenance and restoration costs.

*Continued on page 33*






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## INDUSTRIAL FINISHING: MANUAL LIQUID SPRAY GUNS

Continued from front cover

deliver high finish quality.

Key highlights include:

### Binks Trophy Configurations:

- Sizes – full size and touch up
- Spray Technologies - HVLP, LVMP (Compliant), Conventional
- Fluid Nozzles and Needle Set-ups - hardened stainless steel nozzles, tungsten carbide, plastic tip needles, and feathering needles
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### Engineering Features:

- Air caps are designed to produce uniform spray patterns and excellent transfer efficiency
- Large stainless steel fluid passages for compatibility with industrial coatings
- Long lasting brass inserts and seals
- Hardened stainless steel fluid nozzles
- Large air passages
- Anodized forged aluminum gun body provides durability

Binks pioneered the development of liquid spray finishing technology over 100 years ago and continues to set the global standards for industrial finishing in both atomization and fluid handling. The company says that customers involved in challenging finishing applications in particular, and the industrial marketplace overall, will benefit from Finishing Brands' advanced technology from DeVilbiss atomization, to Ransburg electrostatics, BGK curing and controls, and Binks atomization and fluid handling.

Finishing Brands provides technology, expert support and solutions as a one source with world-wide resources and experience for industrial customers' finishing needs.



Guardair Corporation's Flame Pattern Syphon Spray Gun.

Eric Mills, VP Sales for **Guardair Corporation** says, from customers, "The primary response seems to be – better quality, that which is out in the market today or what they are using is not up to the task and doesn't last. He adds, "Several guns are made out of plastic and simply don't hold up, others skip over features like the brass sinker tube or regulated flow noz-

zle. Ergonomics is also a primary focus especially if the product is used for extended periods of time. Our Classic Plus handle design was, in part, a response to better ergonomics."

Guardair Corporation's Flame Pattern Syphon Spray Gun, model number 79SG012F, features an original flame design on its 12" aluminum extension for hard-to-reach locations and uses compressed air to produce a high vacuum suction to deliver a powerful spray of up to 12+ gallons of liquid an hour. Designed for heavy-duty use, the versatile 79SG012F Syphon Gun's uses include, but are not limited to spraying of solvents, spraying oils, cleaners, disinfectants, insecticides, degreasers, mold release agents and coatings. Adjustable nozzle tip controls flow and spray pattern while pistol-grip style handle provides maximum user comfort.

The syphon spray gun features include:

- A 12" aluminum extension with flame design



The Trilogi Guns from Nordson Corp.

## SATAjet® 1000 B Lignum



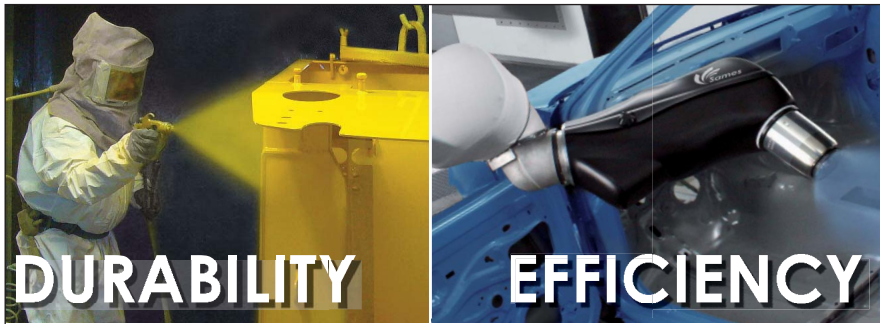
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Robust and easy to clean, this universal spray gun is tailor-made for the wood-finishing industry. With a comprehensive selection of nozzle sizes ranging from 0.8 to 5.0 and the availability of pressurised as well as agitator cups allows to apply a large spectrum of different paint materials: from low-viscosity wood stains, single stage materials and clear-coats to thick film stains, glues and thixotropic materials.

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Founded more than 60 years ago, Guardair Corporation is a world-class manufacturer of safety air guns, syphon spray guns, pneumatic vacuums, and accessories. Guardair products are designed to maximize power, performance, and operator comfort, while meeting all applicable OSHA Standards.

**Nordson Corporation's** line of Trilogy non-electrostatic manual spray guns encom-



Prona Tools R-403 gun designed for surface finishing.

**Prona**, a brand since 1985, popular in Italy, Germany and Asia, is launching a full line of products in North America. Prona R-403 is a new series for Prona. This line is specially designed to produce the best surface finishing result. The Prona R-403 has all stainless steel passage ways, so are the needles and nozzles within it, aiming for excellent performance with a long life-span. This compliant gun has great atomization and stable performance with its state-of-the-art new air cap to improve its performance and increase efficiency while saving paint. This gun's ergonomic design fits perfectly with hand to reduce tiredness from long period of use.

Lucy Lu of Prona says, "When customers come looking for liquid spray guns, they want something easy to use that has great performance." She adds, "Nothing is more important than smooth flawless even surface finishing with the function of saving paint as the key balance. Durability and easy to maintain must be a given because customers want not only a gun with great performance, but also a gun that could keep that level of performance for a long period of time."

**Eurotech Spray Products Ltd.** offers a hand-held liquid paint gun called the SATAjet 1000 B Lignum, featuring a wood-grain looking finish, designed to target the



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The SATAjet 1000 B Lignum from Eurotech.

wood industry and wood coatings, but durable, industrial, and all-purpose for every industry. Robust and easy to clean, this universal spray gun offers a comprehensive selection of nozzle sizes ranging from 0.8 to 5.0 and the availability of pressurised as well as agitator cups allows the application of a large spectrum of different paint materials: from low-viscosity wood stains, single stage materials and clear-coats to thick film stains, glues and thixotropic materials.

When asked what customers are looking for in Manual Liquid Paint Spray Guns, Jorge Flores from **Walther Pilot North America**, LLC says,

“Our customers are looking for a number of qualities in manual liquid paint spray guns that have eventually led them to our products. They are looking for top tier

spray guns with premium features.” He adds, “Top quality atomization and finishing appearance are usually the primary attributes. Durability is another extremely important quality as longer equipment cycle lives equate to financial savings and a longer, uninterrupted workflow. We have also been seeing a lot of calls for some type of material and energy savings. For a spray gun, this usually means higher transfer efficiencies and lower energy use. With everyone looking to cut costs and save on the bottom line, we have been taking a lot of orders for HVLP gun models with higher transfer efficiencies.”

The **WALTHER PILOT** Premium HVLPPlus is the company’s most versatile and fully-featured spray gun. In direct response to consumer demand, WALTHER PILOT engineered a spray gun that delivers the best of all worlds. The HVLPPlus technology delivers material savings alongside dramatically improved atomization characteristics over standard HVLP models. In addition, transfer efficiencies of up to 88 per cent have been documented by an independent testing facility. With the industry standard for HVLP being 65 per cent, it is easy to see that the Pilot Premium is in the upper echelon when it comes to HVLP material savings and spray performance.



The WALTHER PILOT Premium HVLPPlus.

Spray gun manufacturers strive to offer customers the best quality and durability in answer to every Industrial Finisher’s need.

*Editor’s Note: Manufacturers contributing to this article may be reached at:*  
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**Superior Cabinets** of Saskatoon, Saskatchewan is a privately owned manufacturer of custom kitchen cabinets and serves both builders and consumers from six company-owned showrooms throughout Saskatchewan and Alberta. Superior also sells through a network of approximately 75 dealers in the two provinces. In business for more than 30 years, Superior embarked on a business improvement project in 2008 to reduce cost, improve efficiency and increase its sustainability-related initiatives.

As part of the effort, Superior looked at ways to improve its purchasing and ultimately determined that its supplier relationships needed to be more than “just buying something over the counter.” Superior’s desire was to form strategic partnerships in which suppliers could provide suggestions for overall process improvements in their respective field of expertise. Working as partners with their vendors, Superior would develop annual plans to accomplish agreed upon goals with a target of an overall three percent

cost reduction per year.

One of the core purchasing categories to be reviewed involved coating products. Superior sought to develop a partnership with a supplier that could provide overall coating line improvements and help the company meet sustainability goals in addition to cost savings. Of several potential suppliers reviewed, Superior selected Sherwin-Williams to supply technical expertise in addition to more than 85 finishes, including conversion varnishes, spray stains, glazes and sealers.

#### HITTING THE GROUND RUNNING

With a primary goal of the partnership being to improve processes by increasing throughput while maintaining quality but shrinking costs, Sherwin-Williams kicked off its work with Superior with the development of a technical support program. There was a review of Superior’s coating lines, which comprise three finishing work centers – an automated flat line with six colour changers that apply stains and clear coats; a conversion varnish/paint work center in which colour selection, mixing and spraying is automated while the line is loaded and unloaded manually; and a manual spray/specialty finishes area in which specialty cabinets are finished by hand through spraying, glazing and wipe staining.

Plant Manager Brent Boechler oversees a Monday through Friday two shift finishing operation responsible for finishing four cabinet product lines. The cabinets are constructed of a variety of materials that includes five natural wood species, medium-density fiberboard (MDF) and other substrates. He believes the establishment of a technical support program was a significant first accomplishment for Sherwin-Williams.

“We have a Sherwin-Williams technical representative assigned to our account who spends two days a week in our plant reviewing processes to ensure that everything is running properly,” Boechler said. “He works directly with our 45 employees, and together they develop ideas about how to improve coating line processes such as stain formulations or sanding

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processes. The rep makes proposals to the maintenance manager or electrician, and they streamline operations.”

“When the primary representative isn’t available, Sherwin-Williams provides another technical representative who may have a different skill set – more of an equipment expert than a coatings expert, for example,” Boechler added. “That brings in a fresh set of eyes. They’re all helpful. In one instance, the rep established a baseline for the transfer efficiency at our lacquer finishing work center. The tools he developed allow us to regularly measure transfer efficiency and make adjustments accordingly to achieve consistency and reduce costs. That’s not something we could have done on our own.”

#### A SUSTAINABLE PARTNERSHIP

One of Superior Cabinets’ operating tenets is a commitment to the environment. Because the company relies on the forest industry to provide premium wood products for its cabinets, it makes a point of ensuring that all of its operations are performed in tandem with minimizing environmental impact and replenishing resources.

The commitment to sustainability is another area in which Superior’s partnership with Sherwin-Williams has succeeded. Two examples include a catalyzed conversion varnish mixing operation and the creation of a program to clean and recycle finishing line solvents instead of disposing of the solvents as hazardous waste. Both solutions employ a complete finishing solution program offered by Sherwin-Williams called ProVisions – a collaboration between the coatings manufacturer and select equipment and components suppliers with the goal of solving customer coatings line issues through teamwork.

“The catalyzed conversion varnish mixing operation involved products that were mixed by hand,” said Boechler. “Everything was dialed in manually but

that left us at risk for human error as well as the potential for waste. Once the materials are catalyzed, the clock begins to tick; if you don’t use the finish in a certain amount of time, it becomes waste. When we offered only four or five colours, it wasn’t that big of a deal, but when we started using 10 colours in a single shift, we found ourselves wasting gallons of coatings as well as hundreds of dollars a day.”

Sherwin-Williams studied the mixing operation and returned with a solution developed by its design engineering team and ProVisions partner Kremlin. The program, which was implemented in June 2013, utilizes a Kremlin plural component mixing system that allows the finish to be mixed at the spray gun instead of in batches. The system uses less finish; only what is needed is sprayed, eliminating waste in terms of both product and dollars. In addition, 20 gallons of solvent had been required at the end of a shift to

flush the system; that has been reduced by 75 percent, another savings of both material and cost.

The solvent cleaning and recycling program began in 2011. It replaced an in-house effort focused on recycling the solvents used to clean and flush the finishing lines.

“That’s not our core competency,” said Boechler. “Sherwin-Williams and its ProVisions partner Nexeo developed a program that resulted in a closed loop system where all the waste solvents are picked up once a week from the manufacturing facility, cleaned and filtered and sold back to Superior. It’s been fantastic.

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## INDUSTRIAL FINISHING: CASE STUDY

It's not only good for the environment – we estimate that it saved us \$75,000 in disposal fees in the first year. Plus we reclaimed valuable manufacturing floor space when we stopped trying to do the process alone. Our responsibility now is to make sure that the proper solvents go into the proper barrels.”

### TEAMING UP TO LAUNCH NEW PRODUCTS

When manufacturing countertops and tabletops from MDF for some of its retail locations, Superior experimented with a finish that included stain, a clear coat, and a chalk coat followed by sanding. The result was a wood grain appearance that looked great. The company thought: “Why not offer an affordable cabinet with recycled material that has a terrific look?” The challenge: achieving a consis-




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tent finish on a substrate not known for its ability to be stained.

“We call it our Fusion line of cabinets, and it's unique,” said Boechler. “The MDF is a recycled product, which makes it a sustainable product – but you're not supposed to be able to stain MDF. We found that the process we devised actually gave us the look of a five-piece cabinet door. But we wanted to make sure we could keep the finish consistent. We're not coating experts, and our initial chalk supplier couldn't keep up with the demand. Sherwin-Williams stepped in and developed a chalk to work for the new finish. They changed the formula a bit to make it more of a standard operating procedure for us and to ensure that the finish had a good life span.”

Superior's marketing department and the Sherwin-Williams Global Color and Design Center also conduct an annual colour palette assessment to ensure that the finishes offered on the cabinet lines remain current with market trends. The annual reviews have helped Superior refine its colour offering .

### KEEPING SCORE

Measuring success is a key part of Superior Cabinets partnership program with Sherwin-Williams and all other suppliers. The company keeps “score cards” on all

significant initiatives agreed upon at the beginning of each year. Quarterly meetings between the two companies ensure that program initiatives and cost reduction goals are being met.

In the coating area, Boechler said that Superior is getting something today that the company didn't have in the past: a resource that they can depend on beyond just the coating products.

“It's a good fit both culturally and economically,” he said. “We have a 99 percent fill rate; very few gallons are delivered that are non-conforming. On-time delivery is in the mid-90 percentile. They supply us with 85 different finishes, help us with our processes, help us keep track of atmospheric conditions in the plant – and then, keeping the finish consistent. No two trees are the same. Consistency requires some maintenance, and they can help us reformulate slightly to keep us production ready.”

“We were impressed with what they brought to the table five years ago, and they have more than filled their side of the agreement,” he said. “They're not as well known in western Canada, but they're a rock solid company with which to work and they've filled their end of the agreement.”

# Stopping Problems Before They Happen

In plating and anodizing and surface finishing there are several ways to carry out practical plating tests. Plating testing instruments are used in testing applications involving weathering testing, coating thickness testing, color matching, pH testing, scratch hardness testing as well as in other testing applications.

Testing a plating bath is especially important in order to achieve the most desirable results.

## TESTING PLATING BATHS

To apply coatings at a well-defined plating rate with a well-defined composition, electro-plating companies must monitor and control the formulation of their plating baths closely. Metallic coatings such as AuCuCd, AuCuIn, RhRu must be applied absolutely homogeneously over the entire surface to ensure an even color finish.

The quality of metallic coatings depends heavily on the formulation of the plating bath, which consequently needs to be monitored. Compared with other methods, XRF (x-ray fluorescence) analysis of such solutions is straightforward: sample preparation is quick, and the only consumables required are small pieces of plastic foil, as opposed to other analytical methods where gases (Ar) or purified water are used.

## ANALYSIS CELL

Several testing instruments from various manufacturers can be easily outfitted for analyzing plating solutions by mounting the optional solution analysis cell.

First, the specialized cell is filled with the solution to be analyzed, and then it is covered with a thin but robust Mylar foil and sealed with a plastic ring. Different cells are available which vary only in the material of the cell's base from which they are made. Choosing the correct material can considerably improve the measurement performance. Matrix effects (Cl, SO<sub>4</sub>, CN) in the solution can be corrected via the absorption of fluorescence radiation of the cell's base material (e.g. Mo or Ni).

Due to the easy handling, bath analysis can be carried out directly during production without specially qualified personnel being required. Measurement results are available within minutes, which provides short reaction times regarding changing the bath. In addition, the cells are resistant against chemicals and can be re-used. There are no further operational costs involved.

There are specially designed cells for carrying out practical plating tests on electroplating solutions. The cells are designed so that the cathode is at a pre-defined angle to the anode to produce a range of current densities. The current

densities produced in the cell are above and below those that would be used under normal production parameters. This allows any potential problems in the plating solution, such a lack of an additive, to be observed before any problems are seen on the production line.

There are test cells available for nickel, copper, tin, zinc, flatinised titanium and more.

There are salt spray chambers that work as salt spray testers and are designed as per relevant testing standards. They find the assessing ability of rust resistant components to withstand corrosion because of adverse atmospheric conditions. The systems comprise double walled (glass wool insulation) coated finish with system coming in temperature range from ambient to 60 degree Celsius (Temp Requirement 35 +/- 2 Degree C).

Features include temperature controller indicators that are made available with special corrosion proof PT 100 sensors, moisture oil filter & air regulator in range from 0 to 30 PSI, air purging support, time totalizer support, cyclic timer support, regulator support, gauges support and specimen racks support.

Accelerated weathering testers assist in bringing quality enhancements in existing materials, for selection of new materials and for understanding evolution of how changes in formulation affects durability of products.

The systems also provide for working as proprietary product related to natural light and laboratory light sources in applications involving large capacity as well as accelerated laboratory weathering. The test data achieved assists in bringing quality enhancements in existing materials, selection of new materials and in understanding evolution of how changes in formulation affects durability of products. Systems have enhanced memory capacity as well as additional features and history record functions such as humidity value, UV exposure, temperature and humidity record.

Features of these chambers include: system providing working as proprietary product related to natural light and laboratory light sources; UV weathering chamber with enhanced HMI feature that provides operators optimum flexibility and control in accelerated weathering testing based process; system provides for perfect weathering testing for applications involving large capacity as well as accelerated laboratory weathering; modern, full-color HMI screen display. Display with intuitive icons that provides for easier interpretation of operating parameters. Adds to the capability of operators for efficiently analyzing monitoring test parameters and instrument performance.

The system simulates effect of sunlight with fluorescent ultraviolet (UV) lamps while simulating rain & dew with water spray/condensing humidity.

System reproduces in few days/weeks outdoor damages occurring over months/years.

These systems can be used for checking damages such as fading, colour change, chalking, cracking, crazing, embrittlement strength, system also used as indoor weathering instruments for testing moisture, humidity and temperature. Conditioning humidity chambers are ideal environment chamber that creates designated temperature and humidity conditions and features lowest heat loss ratio because of high quality insulation using imported glass wool. Coming with digital control support, its ergonomic user friendly design support also provides for easy handling of the functions. Features:

Highly accurate functioning based PRESTO Conditioning Chambers

Systems providing for ideal environment chamber with use of latest technology support for creating designated temperature & humidity conditions Sys-


tem featuring lowest heat loss ratio because of high quality insulation using imported glass wool

Ergonomic user friendly design support. System features complete digital control support. Working as ideal environment chamber for creating designated temperature conditions and humidity conditions. Motorized scratch hardness testers carry out tests related to scratch resistance under specified loads. With involved tests conducted on go/no go basis, the testing is performed at single specified load on needle as well as on the basis of process comprising increasing loads for determining minimum load at which coating penetration is achieved.

Several testing equipment manufacturers offer products in a Test Set that can be used to analyze various components of anodizing, passivating, dichromate and phosphating Metal Finishing Process baths. There are tests for cadmium and zinc plating baths, and for measuring sulfates in chromic acid based plating baths and sets to measure additional impurities or components of a chromic acid based plating bath.


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# Dangler Design

Dangler design and manufacturing is extremely important for successful barrel plating according to manufacturers and suppliers of dangles.

Manufacturers have seen several cases where the design or quality or selection of the Barrel Dangler significantly influences the success or failure of the electroplating process.

Some dangler heads are too heavy and cause impact damage to the parts/components during barrel rotation.

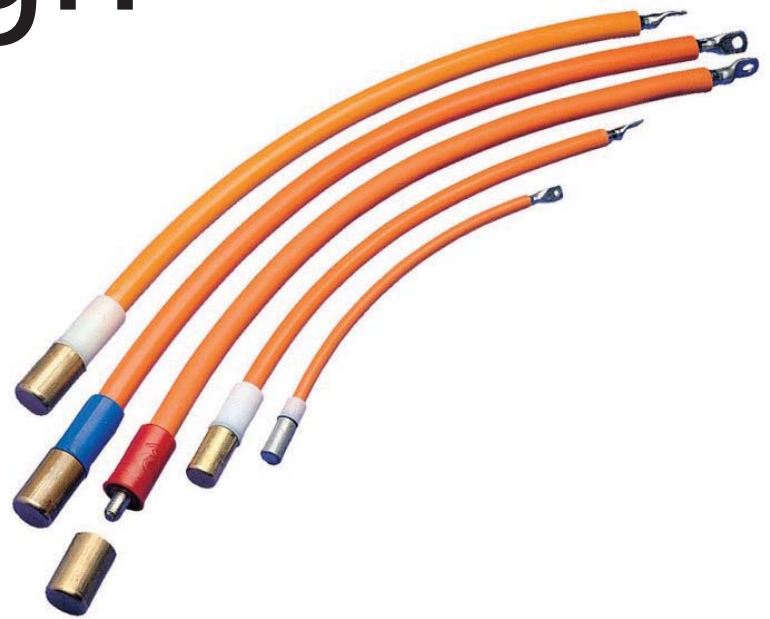
Low quality dangler sleeves can be easily cut and torn and therefore require frequent and annoying replacement.

Some dangler heads are too small and do not provide enough electrical

contact surface area... therefore causing "burning" and many other types of plating problems.

Cathode dangles are used in the barrel plating industry.

There is a large variety of dangles available in the marketplace including plain, PVC sleeve, full length pvc sleeve, baked plastisol coated, vulcanized custom rubber and OEM Dangles. There are custom EPDM jacketed cables with a large (0.78) OD. There are ball, rod and slip on dangles, slotted dangles and disposable heads. There are also stainless steel heads in various sizes. Most dangler manufacturers will offer a free sample for testing and evaluation.



Some dangles have a completely vulcanized sleeve. The rubber sleeve can be molded directly to the cable, reinforcing

the cable jacket to resist cuts and bends. No significant loss of flexibility occurs with a molded sleeve, as is commonly seen in time with a plastic sleeve. This superior design substantially extends the life of the dangler, reducing maintenance and downtime, lowering operating costs.

Extended life is one benefit of the sleeve. The quality of the plated parts are important. The sleeve reduces the carry-over of chemicals from tank to tank often found in plastic sleeves.

Dangler manufacturers often custom manufacture to fit a customer's individual barrels. Most cable sizes are available. Special requests for knobs and moldings are often considered. Crimped over knob design gives a positive electrical connection and added strength not found in soldered knobs.

Cathode dangles are manufactured from flexible welding standard cable in diameters from 16mm<sup>2</sup> to 240mm<sup>2</sup> with fixed or detachable contacts in brass or steel. They are supplied in rubber, polyurethane or PVC for durability and extended life. Dangler contacts can be fixed or detachable. Detachable tips (contact bombs) can be provided and are particularly useful for copper and nickel plating where the tips can become coated, resulting in reduced plating efficiency. The screw-in tips can be replaced without the need for a new dangler. Dangles are durable and flexible to aid the efficiency of the plating process. Safe plating operation is assured through uniform compression fixings.

Dangles are available as 4/0 dangler with steel cathode head, copper mounting terminal, and EPDM jacket. Recommended for small to medium loads and sized parts.

Also available on the market are 4/0 dangles with a PVC protective sleeve for abrasion resistance, steel head, copper mounting terminal and an EPDM jacket. Recommended for all size loads and parts. These have medium durability.

There are also 4/0 dangles with a full length PVC sleeve that passes through the bearing hole to above solution, standard

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# Barrel Plating TECHNOLOGY

head, terminal, and EPDM jacket. Recommended for all sized parts and loads. These have better durability.

There are 4/0 dangles with a Baked Plastisol coating, thick inside barrel coating, thin taper through bearing, standard head, terminal, and EPDM jacket. Recommended for all sized parts and loads. These have excellent durability.

There are 4/0 dangles with Vulcanized Coating designed for superior durability with 1.25" OD coating, 1" OD cable. Stays flexible for life. Standard head and terminal. Recommended for all sized parts and loads.

There are dangle quick connects available to change dangles in two minutes. Add 10-12 minutes of production per dangle change with no tools. Mounts to existing dangle locations. Corrosion resistant copper coated and stainless steel construction. Plastisol coated handle. Used with custom TDG terminal.

4ga Mini Dangles have a 24" w/ 3" baked plastisol coating over the head and trimmed back. 3/4" OD and 2" length steel head.

## BARREL DANGLERS

Dangles are an important components of a plating barrel. They exist mainly to carry current from the electrified saddles to the parts inside the cylinder to be plated, although they may provide some parts agitation.

Making a good connection at the horn on the superstructure is important because without a good connection the amperage will be lessened or possibly absent. Broken or frayed dangles need to be replaced. Another consideration is the possible dragout from a vinyl sleeve as opposed to a plastisol dip (preferred dangle). Although there is an initial higher cost per dangle, this needs to be compared with the cost of chemistry carried from one tank to the next and the possibility of chromate leakage into the parts at the unload station. Also typical dangle longevity is better with plastisol dipped compared to a vinyl sleeve. However, the vast majority of customers use a vinyl sleeve in their plating barrels according to manufacturers.

Barrel plating line employees need to visually inspect dangles each time the barrel is unloaded. Sometimes there is sufficient time to replace a dangle without removing the plating barrel from the line. There are quick-change tools that make the process easy and quick. Replacement of barrel dangles, or the contact tips, should be part of any ongoing maintenance program. A damaged or worn dangle can impede the plating process and add to production costs.

Dangle manufacturers highly suggest paying close attention the selection, design and supplier for your barrel dangles.

Barrel plating is an efficient and relatively low cost method of plating. Parts are placed inside a barrel that slowly rotates while it is immersed in the plating solution. Electrical contact is made through the use of dangles or centerbars that are located inside the barrel. This plating method is usually recommended since high volumes of parts can be plated with uniform coverage.

The four most important requirements are:

- Engineering applications, such as building up the thickness of metal to change the physical size of a part or to provide a good surface for some other treatment such as painting or screening.
- Decorative coatings such as Bright Nickel, Brass, and Antiquing.
- Cosmetic uses such as Zinc plating to improve shelf life and salability.
- But by far the most important use of barrel plating is to extend the corrosion protection of the parts.

Some parts may be too large or delicate to be barrel plated. There is always a possibility of part damage or bending due to the nature of the tumbling process. In cases where parts cannot be barrel plated, rack plating is an option.

## THE BARRELS

The two most common types of barrels are the horizontal barrel, which is a hexagonally shaped cylinder, and the oblique barrel, which closely resembles a cement mixer in both looks and operation.

While the barrels may be made out of virtually any material they are usually constructed of rigid polypropylene because of its chemical resistance.

In order to allow the plating solution to enter and exit the barrel without loss of the parts to be plated, holes are drilled along each side of the barrel and the removable panel called the door. The number of holes should not exceed 30 per cent of the surface area of the barrel because it may weaken the structure of the cylinder. The holes must be properly sized so that parts do not fall through while being large enough for solution to easily drain to minimize wasted chemicals. For this reason platers keep a variety of hole sizes available along with a variety of barrel sizes. These sizes can include barrels with diameters of an inch up to 24 inches wide by 60 inches long.

The interior surface of the barrel must also be designed correctly to promote

adequate tumbling of the parts. Ridges or dimples are added to prevent parts from sticking to the sides and "nesting", which could be detrimental to good plating distribution.

The exterior is shaped like a hexagon to provide a pumping action so plating solution can be replenished as the barrel rotates.

There are several different methods to carry the electrical current to the parts to be plated. Some barrels have small metal buttons strung along their inside surface, which are connected through a cable to an external power supply. This method might be used for large parts, which could become tangled to assure they all are making electrical contact. Another method is to place large discs on each of the two sides of the barrel to assist in the plating of long thin parts, which might damage internal protrusions. The most common way to supply current to the parts is the dangle. (See article on Dangles this issue of CFCM). This is usually a coated cable with a large metal ball crimped onto the end, which terminates inside the barrel and simply rides on top of the parts as they tumble in the cylinder. They enter the barrel through a hole machined out of each end of the barrel and are then connected to the rectifier which will supply the D.C. current to power the chemical process.

The maintenance of the barrels is greatly reduced by constructing them of chemically resistant materials such as polypropylene, poly-glass, and stainless steel.

Because of the large amounts of parts, and thus the large amounts of surface areas being plated at the same time, the tank must be large enough to accommodate a greater amount of the metal being plated. These are more commonly called the "anodes". Thus anodes in barrel plating tank are always kept at a maximum.

## BARREL PLATING PRODUCTION PROCESS

Parts need only to be free-flowing enough to enter the mouth of the barrel.

Loads should not exceed half the volume of the barrel or improper tumbling will occur and a loss of plating uniformity.

The surface area of the plated parts should generally be about 25 sq. feet for every foot length of the barrel at a 14 inch diameter.

Parts must be able to tumble freely to insure a good plating distribution. Such interior protrusions as breaker bars, dimples or ribbed sides should be used

as necessary.

The rotation of the barrel while in the plating tank is also very important. Typically a speed of 3 to 6 RPM is considered adequate but faster speeds facilitate a more uniform deposit even though there may be some physical wear on the barrel itself. As long as the parts themselves will not be harmed it is more desirable to maintain as fast a rotational rate as is practicable.

Barrel sizes and hole perforations should be chosen with care depending on the size of the parts to be plated. Too small a hole will trap solution by capillary action and drag the chemicals all along the plating line. Too small a barrel and the parts will not tumble properly.

Experience and testing has proved that there is no more cost effective and robust material than Ultra High Molecular Weight Polyethylene for manufacturing electroplating barrels.

Some manufacturers use Ultra High Molecular Weight PE 1000 for its barrel construction primarily because it is resilient and robust. It resists component entrapment resulting in zero rejects in most cases. It allows for larger open area for solution to pass over product.

## WHY BARREL PLATE

Barrel plating can accommodate a wide variety of shapes and sizes as well as different metals and alloys. These parts can then be plated in an equally diverse amount of plating baths each with their own properties and formulations.

Generally any part that can fit through the opening in the barrel can be plated provided good procedures are maintained, excepting long & thin parts.

The quality of the finish can equal that of still or rack plating and is usually more economical.

Typically parts having a volume of 125 cu. in. or less can be routinely barrel plated.

The rotation of the barrel and the parts within it lend themselves to other advantages. The mechanical energy of the rotation produces a burnishing action that helps to clean and descale the parts to a greater degree than rack plating.

The tumbling action is also responsible for the high degree of plating uniformity, which can be achieved in the barrel.

Manufacturers and suppliers of barrel plating equipment offer a range of products to suit every plating need.

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Conference sessions are 8:00 am - 5:00 pm

Exhibition is 10:00 am - 6:00 pm

Opening Reception is 5:00 pm - 6:00 pm

Tuesday, May 13, 2014

Conference sessions are 8:00 am - 5:00 pm

Exhibition is 10:00 am - 6:00 pm

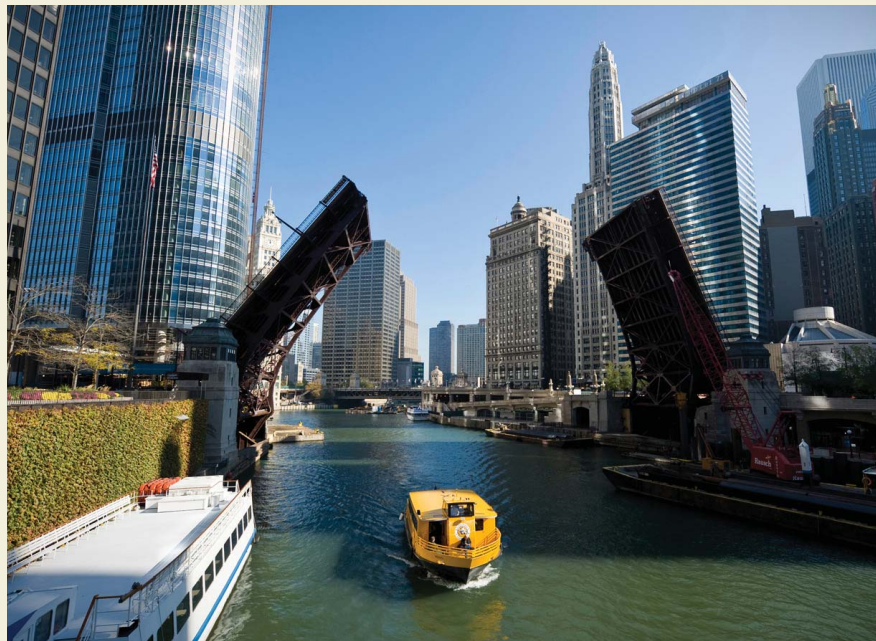
Presidents Reception is 5:00 pm - 6:00 pm

Emerging Awards Dinner: 6:00 pm to 8:00 pm

Wednesday, May 14, 2014

Conference Sessions: 8:00 a.m. - 2:00 p.m.

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The AC Cool Roof Binder systems are based on Kynar Aquatec PVDF binders, developed by Arkema's fluoropolymer group, and ENCOR Flex polymers from Arkema Coating Resins.

Currently three systems are available, allowing greater formulation flexibility across different applications:

- AC III Binder System – This system uses a Kynar Aquatec FMA-12 PVDF based topcoat and ENCOR Flex 187 all acrylic or ENCOR Flex 192 modified acrylic basecoat to provide the highest possible level of performance and durability. It is designed primarily for the most demanding cool roof coating applications.

- AC II Binder System – Utilizing a proprietary ENCOR Flex 187 all acrylic polymer or ENCOR Flex 192 modified acrylic latex, this base and topcoat system delivers excellent performance and meets ASTM D-6083, Standard Specification for Liquid Applied Acrylic Coating Used in Roofing.

- AC I Binder System – This ENCOR Flex 3186 styrene acrylic system provides a good mix of performance and value for less demanding applications.

[www.arkemacoatingresins.com](http://www.arkemacoatingresins.com), [www.kynaraquatec.com](http://www.kynaraquatec.com)

## Arkema launches a revolutionary range of Elium liquid resins

Arkema is launching its first range of liquid thermoplastic resins under the brand Elium, which is transformed using the same processes as composite thermosets. This award-winning new technology is lightweight, cost-effective and recyclable. Elium resins polymerize quickly and can be used to design structural parts as well as aesthetic elements in a number of applications anywhere from the automotive and transportation industries to wind power, athletic equipment and the building sector.

Composite parts made from Elium are 30-50 per cent lighter than the same parts made from steel, but offer the same resistance. When combined with Arkema Luperox peroxide initiators, Elium can be molded into complex design forms for composite parts and perfectly blends with glass or carbon fibers. As a bonus, it is also compatible with conventional thermosetting resin transformation technologies (Resin Transfer Molding, Infusion, Flex-molding), which cuts down the costs of transformers.

Elium is designed for high-performance parts that are recyclable and easy to thermoform

Out of a growing interest in biomaterials and recycling and to meet the insatiable demand of composite manufacturers for higher performance, Arkema has developed resins and polymers that offer the perfect solution to the quest for lighter materials. In addition to the Elium range, Arkema is developing a polyetherketoneketone (PEKK) called Kepstan to replace metal in extreme conditions (offshore, aviation), the Rilsan® range, a high-performance powdered or granulated polyamide that is 100% bio-sourced and makes thermoset composites resistant to abrasion and shock at very high or low temperatures.

Additives like Nanostrength, Orgasol polyamides and Luperox® organic peroxides significantly improve the natural resistance properties of composites. Lastly, AEC Polymers, an Arkema subsidiary specialized in structural glues and adhesives, markets BlackManba waterproof sealant adhesives and SAF structural adhesives – imperative bonding agents for complex composite assemblies.

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

## Positest AT Verifier

The PosiTest AT Verifier is ideal for checking the accuracy and operation of adhesion testers and is an important component in fulfilling both ISO and in-house quality control requirements.

Features include:

- High precision load cell and handheld smart sensor indicator
- Ready to use with all PosiTest Pull-Off Adhesion Testers
- Portable—requires no external power source
- Peak hold and real time reading display
- Ideal for field or laboratory use
- Bonded foil strain gauges are hermetically sealed for protection against industrial environments
- Comes with a Sample Certificate of Accuracy and Measurement Uncertainty Worksheet
- Certificates of Calibration showing traceability to NIST are included for both the load cell and smart sensor indicator
- Fitted with a permanent steel 20 mm loading fixture (dolly). A conversion factor is used to verify other sizes.
- One year warranty

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



## Brookfield Introduces New Family of RST Touch Screen Rheometers

Brookfield welcomes three new instruments into its touch screen family of rheometers: the RST-CPS Cone Plate Rheometer, the RST-CC Coaxial Cylinder Rheometer and the RST-SST Soft Solids Tester Rheometer. The new RST Series offers the quickest and most comprehensive capability for making rheological measurements, whether it's single point viscosity for QC or complete flow curve analysis for R&D.

The RST Rheometers are unique because they operate in both controlled stress and controlled rate modes and can perform all of the following tests: viscoelastic modulus, yield stress, viscosity vs. shear rate profile, thixotropy calculation, creep behavior, recovery after flow, and temperature sensitivity. Every RST Rheometer offers the widest torque range available to handle the broadest range of sample materials (500 to 1 million dyne•cm). They provide exceptional versatility with the largest range of shear rates and DIN spindle geometries. The sturdy, rugged design of the RST is ideal for use in R&D, working in the QC lab, or on the production floor.

All RST models come with the standard option for 21 CFR compliance, including controlled user access and data integrity/security.

[www.brookfieldengineering.com/products/rheometers/laboratory.asp](http://www.brookfieldengineering.com/products/rheometers/laboratory.asp)

## Oil And Gas Drilling Components Corrosion Protected Using Birchwood Technologies' TRU TEMP Finishing Process



Manufacturer's of oil and gas drilling components asked for an in-house metal finishing process to provide robust corrosion protection, break-in lubricity and galling resistance. Birchwood Technologies provided the answer – today's TRU TEMP low temp black oxide process.

The TRU TEMP process operates at 200 degrees and forms a satin black magnetite finish that protects critical surfaces in storage, shipment and startup, resists galling and aids in break-in – all without a dimensional change. The process takes just 30 minutes.

The TRU TEMP finish is Mil Spec and RoHS compliant, and withstands up to 100-150 hours of neutral salt spray or several hundred hours of humidity, verified by independent testing. The finish is 0.5 microns thick (20 millionths) and has no effect on material hardness or load-bearing properties. Its crystalline structure allows it to effectively hold a rust inhibitor and serves as a sacrificial barrier to provide break-in lubricity and galling resistance. Critical parts are protected in storage or overseas shipment.

Oil and gas component manufacturers are rapidly making TRU TEMP low temperature black oxide the preferred finish because of its many benefits. The process can be installed in any plant setting, without endangering personnel or surrounding equipment. The operating solutions contain no EPA regulated chemicals; process rinse waters are normally sent to sewer as non-hazardous discharge. Most process lines do not require waste treatment equipment.

In areas with restricted water/sewer availability, the TRU TEMP process can be configured to utilize the NEAR-ZERO Water Recycler to reduce process water consumption by 90+ per cent. This benefit simplifies installation and allows the line to operate with very low water usage. TRU TEMP process lines are available in any size to fit part size and production volume. Please see the website for details on 100 gallon and 40 gallon systems.

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

## 5000F ELECTRIC TRUCK OVEN

Grieve Corporation introduces No. 911, an electrically-heated, 500°F truck oven, currently used for paint baking. Workspace dimensions measure 39"W x 36"D x 48" H, while 30KW installed in Nichrome wire tubular heating elements and a 2,000 CFM, 2-HP recirculating blower provide heated horizontal airflow to the workload.

This truck oven features an aluminized steel exterior, 4" thick insulated walls and Type 304, 2B finish stainless steel interior with continuously backwelded seam construction. A 650 CFM powered forced exhauster, plus motorized dampers on the fresh air intake and exhaust for accelerated cooling, are also included.

Two pairs of oven truck wheel guide tracks are built on top of the 2" insulated oven floor of this Grieve unit.

A digital indicating temperature controller, strip chart recorder, SCR power controller and a 4-color tower light to indicate process status and over-temperature alarm are onboard No. 911.

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



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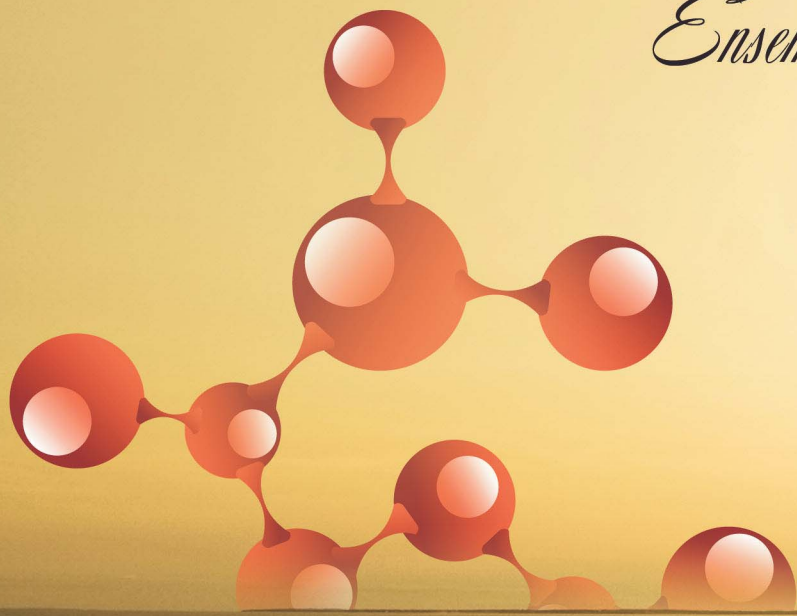
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