

35th Annual

Future Of Coatings Under Study



INNOVATION

A PATH TO VALUE

Thursday, May 6, 2010

Michigan State University
Management Education Center
Troy, MI

**Two Concurrent Tracks with
12 Expert Speakers**

Leading Edge Coatings Technology

Keynote Presentation

Innovation in Automotive Design

Imre Molnar // Dean of the College,
College for Creative Studies

Two Tutorial Courses

**Polymer Science for the
Coatings Formulator**

Collin Moore // BASF

**Color Measurements and Control
Including Special Effects**

Greg Shrider // BYK-Gardner

Exhibitor Displays

Coatings Products Showcase

sponsored by: The Detroit Society for Coatings Technology
www.dsct.org

CONFERENCE KEYNOTER

8:30–9:30 a.m. // Main Auditorium

Innovation in Automotive Design

It is a commonly held misconception that cars are designed by engineers.

Point of fact, automotive design has evolved into an art form. In mature markets, such as consumer appliances and automobiles, a brand's reputation was once built on quality, reliability and functionality; however, advances in manufacturing techniques have now leveled the playing field. Kias are as reliable as Mercedes and BMWs. For the consumer, determining a vehicle choice is no longer arrived at through a rational process. It has moved into the realm of the emotional. Given this dynamic, business has come to understand that it's the artists who have the skills to imbue inanimate objects with emotional content.



Imre Molnar

Dean of the College, College for Creative Studies

The College for Creative Studies (CCS) has been an art school for 106 years. The institution has been graduating world-class automotive designers for nearly half a century. Now broadly recognized to be the leading automotive design school worldwide, its alumni are in leadership positions at most of the world's car makers. College for Creative Studies has obtained this stature because of its unwavering commitment to an education that holds artistic expression and experimentation as the highest ideal.

Dean Molnar's presentation will describe in detail the education process at CCS and the role of Innovation in that process; in particular, how the CCS education process replicates and in some cases leads current design practice in the automotive industry. Through this presentation, the audience will get a substantive overview of the most cutting-edge automotive design process practiced worldwide.

Biographical Sketch

As Dean of the College at the College for Creative Studies, (CCS), Imre brings a diverse international perspective to the academic leadership of the college. Dean Molnar joined CCS in the fall of 2001 following work in the outdoor apparel industries as Design Director for the industry leader Patagonia. He was also Director of Operations at the nationally renowned, industrial design-consulting firm Hauser, Inc. This commercial experience was preceded by a long tenure at Art Center College of Design, culminating in his appointment as Director of Education at the school's prestigious Swiss campus.

As a leader in design issues, Imre has been a featured lecturer on strategic design management for businesses around the globe, including Nokia, NCR, Volkswagen, BMW, the Ford Motor Company and JETRO (Japanese External Trade Organization), and at government symposia.

Imre received his training in design at the National Art School of Sydney in Australia, and earned a Master of Fine Arts from the Art Center College of Design. Those studies led him to a pivotal role with the Australian Design Council. In his position as State Director, Molnar raised coordinated initiatives to integrate design disciplines with industry. His federal government directive was to assist Australian industry to produce better products through design—thus enhancing that nation's economic global competitiveness.

Imre's experience also includes international multi-disciplinary design consulting and workshops at universities and design schools around the world.



sponsored by: The Detroit Society for Coatings Technology
May 6, 2010 • MSU Conference Center • Troy, MI

35th Annual
FOCUS Conference

INNOVATION: A PATH TO VALUE

Registration, Coatings Products Showcase and Continental Breakfast // Reception Area

KEYNOTE // Main Auditorium

Innovation in Automotive Design

Imre Molnar // Dean of the College, College for Creative Studies

Mark Nichols
Ford Motor Company

Dave Sufczynski
General Motors

TUTORIALS

Seating is limited to 40 students per class.
Pre-registered and Prepaid only.

MAIN AUDITORIUM

Innovative New Technologies for Color and Appearance Measurement of Effect Finishes

Richard Scott // BYK Additives & Instruments

AMPHITHEATER 102

Polyols Based on Isocyanates and Melamines and their Applications in 1K and 2K Coatings

Christy Stine // AkzoNobel Coatings

CLASSROOM 104

9:35 a.m. (includes break 10:10–10:30 a.m.)

Collin Moore
BASF

Polymer Science for the Coatings Formulator

Basic Concepts for the Beginner

- Key Concepts that Govern the Behavior of Polymeric Materials
- Basics of Polymer Synthesis
- Common Analytical Tools
 - » Analyze Paint
 - » Analyze Polymeric Systems
- Discussion: How These Tools Will Improve Quality of Our Formulations

7:30–8:30 a.m.

8:30–9:30 a.m.

Moderators

9:35–10:10 a.m.

10:10–10:30 a.m.

10:30–11:05 a.m.

11:10–11:45 a.m.

11:45 a.m. – 1:25 p.m.

Moderators

1:25–2:00 p.m.

2:00–2:15 p.m.

2:15–2:50 p.m.

2:50–3:30 p.m.

Break and Coatings Products Showcase // Reception Area

NAFTA Automotive Coatings Market—A Pigment Producer's Perspective

Nicolas Justeau // Toyal America, Inc.

2K Waterborne Soft Touch: A Day at the Beach

Kathy Allen // Bayer MaterialScience

Sustainable Solutions that Enable Improved Performance and Environmental Compliance in Automotive Coatings

Deep Bhattacharya // Eastman Chemical

Novel Hydrophobic Polyols for Low VOC, High-Solids, 2K Aliphatic Polyurethane Systems

Sunitha Grandhee // BASF Corporation

Luncheon & Student Poster Session // Main Dining Room

Debbie Linn
PPG

Mike Bennett
DuPont

MAIN AUDITORIUM

Environmentally Compliant Organic-Inorganic Hybrid Metal Pretreatment by Advanced Sol-Gel Technology

Vijay Mannari // Eastern Michigan University

AMPHITHEATER 102

Thin Film Research on Aluminum Alloys Used in Automotive Body Construction

Brian Schneider // Ford Motor Company

Break and Coatings Products Showcase // Reception Area

Analyzing Depth Profile of Double Bond Conversion as a Function of Film Depth and Benzophenone

Rong Bao // Fusion UV Systems, Inc.

Reduced Complexity Paint Line Innovations with No Paint Waste and Reduced Energy Consumption

Einar Endregaard // Durr Systems, Inc.

Improved Outdoor Acid Etch Test Method

John Boisseau // BASF Corporation

Layer Synergy Influence on Compact Process

Darren Soroczak // PPG Industries

1:00 p.m. (includes break 2:00–2:15 p.m.)

Greg Shrider
BYK-Gardner

Color Measurements and Control Including Special Effects

- Color Theory: Illuminants, Observers, and Color Tolerancing typically used in the paint and automotive world
- Tolerances for solid colors and special effect colors
- Apparent color differences under different illumination conditions
- New measurement criteria on appearance which will include orange peel and mottling

7:30-8:30 a.m.

MODERATORS

MAIN AUDITORIUM

Mark Nichols // Ford Motor Company

Innovative New Technologies for Color and Appearance Measurement of Effect Finishes

Richard Scott // BYK Additives & Instruments

With the increase in popularity and usage of special effect pigmented finishes, new technology is required to accurately quantify visual parameters. Existing technology for color measurement is not capable of properly simulating the way the eye responds to new and advanced pigment technologies. New developments in measurement of color as well as the geometric aspects of appearance such as sparkle, graininess, and mottling must be utilized to capture the total visual impression of an effect finish. This paper will explore the new developments in instrumental measurement of these finishes, and the use of new and innovative instrument technologies that help to understand the behavior of these effect finishes under different processing variables.

AMPHITHEATER 102

Dave Sufczynski // General Motors

Polyols based on Isocyanates and Melamines: Their Applications in 1K and 2K Coatings.

Christy Stine // AkzoNobel Coatings

Polyurethane Polyols (PUPOs) and Melamine Polyols (MEPOs), invented by AkzoNobel Coatings, offer a valuable alternative to the commonly used polyester and acrylic polyols and a new formulating tool for the development of novel coatings. The resin chemistry is based on the predominantly selective reactivity of α,β - and α,γ -diols with commonly used polyisocyanate and melamine crosslinkers. The resulting low molecular weight, hydroxy-functional resins are suitable for use in low VOC coatings. By choosing the appropriate crosslinker, diol, and modifier, the chemical structures of these resins can be altered to meet the desired properties of the coatings. Several examples of modified PUPOs and MEPOs and their beneficial use in one component and two component coatings are described.

9:35-10:10 a.m.

Break and Coatings Products Showcase // Reception Area

NAFTA Automotive Coatings Market—An Pigment Producer's Perspective

Nicolas Justeau // Toyal America

The NATFA automotive market has undergone some unprecedented changes in the past 2 years. What will a recovery look like? How will companies adapt to the smaller NAFTA OEM market in the coming years? How will color trends impact automotive pigment producers? The answers to these difficult questions vary widely; our best guesses will be presented.

We will also present our new technology that helps us to turn gray into gold.

2K Waterborne Soft Touch: A Day at the Beach

Kathy Allen // Bayer MaterialScience

For many years, two-component solventborne polyurethane coatings were the industry standard for automotive interior soft touch applications due to their very excellent feel characteristics, as well as resistance to commonly used cleaning products. Over the years, changes in VOC regulations, as well as changes in the perception of VOC, led to the need for these solventborne coatings to be replaced by two-component waterborne polyurethane (2K WB) coatings. These first generation 2K WB coatings met the OEM requirements for soft feel coatings until recently when additional requirements for chemical resistance became necessary. In particular, the General Motors specification for sunscreen and DEET resistance, has been a particularly stringent requirement for current automobile interior coatings over substrates such as ABS, PC/ABS blend, and PC. This presentation will give an update on the latest generations of 2K WB automotive interior coatings (both traditional and soft feel applications) which show improved chemical resistance meeting the new specifications.

10:30-11:05 a.m.

Sustainable Solutions that Enable Improved Performance and Environmental Compliance in Automotive Coatings

Deep Bhattacharya // Eastman Chemical Co.

Volatile organic compound (VOC) regulations and environmental awareness are driving changes in coating formulations to waterborne technology or to higher solids in solventborne systems and to "green" or "sustainable" products. This effort focused on understanding the structure-property-performance relationships of cellulosic additives in waterborne and high solids solventborne coatings to better tailor these materials for compliant systems. This paper will demonstrate how modification of such additives can affect basic properties such as solubility, compatibility, and VOCs. The impact of these parameters on application, property development, and appearance in a variety of end-use applications will be discussed together with additional fundamental investigations correlating the extensional viscosity, in-situ film formation, and structure development of automotive coatings with final film properties.

Novel Hydrophobic Polyols for Low VOC, High-Solids, 2K Aliphatic Polyurethane Systems

Sunitha Grandhee // BASF Corporation

Low VOC, high-solids, highly durable, 2K aliphatic polyurethane coatings continue to be of high interest for various markets including General Industrial, Automotive Refinish, Wood Coatings and Plastics. These coatings are applied and cured using ambient or forced cure conditions. Use of 98% solids hydrophobic polyols as a replacement to expensive caprolactone polyols offers a pathway towards achieving the VOC targets for the various markets. Information on the characteristics of these polyols and a complete set of data which includes acid etch, hardness, flexibility and impact resistance will be presented.

11:10-11:45 a.m.

Luncheon & Student Poster Session // Main Dining RoomArea

11:45 a.m. - 1:25 p.m.

INNOVATION: A PATH TO VALUE

Environmentally Compliant Organic-Inorganic Hybrid Metal Pretreatments by Advance Sol-gel Technology

Vijay Mannari // Eastern Michigan University

In the metal finishing industry, there is a critical demand for chromate-free metal pretreatment materials and technologies to meet stringent regulations controlling the use of chromium and other toxic and hazardous heavy metals. A number of alternative products have become commercially available in recent years. Among these, sol-gel technology has emerged as very promising platform since it combines the benefits of high-performance with simple processing steps. This presentation will highlight development of an advanced sol-gel pretreatment system for corrosion protection of aluminum alloys. A family of sol-gel precursors — bis-ureasil — with unique structural features has been designed and its processing optimized to derive highly dense organic-inorganic hybrid films that are covalently bound to the substrate. Fundamentals of this emerging technology and some key results of a corrosion study will be discussed.

Thin Film Research on Aluminum Alloys Used in Automotive Body Construction

Brian Schneider // Ford Motor Company

The use of aluminum alloys in automotive body applications continues to increase in an effort to reach fuel economy requirements. Aluminum sheet alloys have been used extensively in the aerospace industry and both the automotive and aerospace industries have invested significant research efforts in the understanding of coatings on these alloys. In the automotive industry, zinc phosphate has been used as a pretreatment coating for many years. This technology was originally designed for use on steels and with the addition of fluoride to the zinc phosphate bath can be utilized on aluminum. However, due to regulations of nickel in Europe and the other environmental concerns surrounding zinc phosphate, there is a desire to move to more environmentally friendly technologies. One category of environmentally friendly pretreatments is "thin film" coatings. Evaluation of the performance of "thin film" coatings requires a greater understanding of several factors in the automotive dip/spray pretreatment process such as cleaning, surface oxide formation/removal and the coating deposition mechanism. This presentation will discuss the benefits and disadvantages of "thin film" coatings, the potential processing issues, and how to detect the coating and test its performance.

1:25-2:00 p.m.

2:00-2:15 p.m.

Break and Coatings Products Showcase // Reception Area

Analyzing Depth Profile of Double Bond Conversion as a Function of Film Depth and Benzophenone

Rong Bao // Fusion UV Systems, Inc.

The purpose of this paper is to help formulators and end-users learn how to correctly use Benzophenone (BPh) and to choose UV lamps that improve and balance the surface curing and the through curing in their UV curing applications. It is very important to correctly utilize BPh and other photoinitiators (PhI) to balance surface cure and through cure for a UV cured film.

The influence of BPh concentration on double bond conversion at different depths of UV cured films was studied using a new approach that is a combination of traditional FTIR and statistical calculation to analyze the depth profile of conversion "layer by layer".

A combination of BPh and organic tertiary amines is frequently used to overcome oxygen inhibition at the outmost part of UV curable films in UV curing applications. A variety of film depth, different PhI mixtures, different ratios of BPh / MDEA in a PhI mixture in the presence of air and different UV light intensities with equal UV Dose was investigated. The new approach digitally demonstrated self-contradiction of BPh in reducing oxygen inhibition at the surface of cured films and increasing inner filter effect on UV light intensity at the bottom of cured films.

The efficiency of BPh / MDEA in different UV curable formulations was analyzed using the new method and the depth profile as a function of BPh/MDEA ratio optimized. A depth profile of C=C conversion for a commercial "off the shelf" LCD trim coating was also analyzed.

Improved Outdoor Acid Etch Test Method

John Boisseau // BASF Corporation

Acid etch testing to determine the environmental resistance of automotive coating systems has been attempted in many global locations. Test exposures in real world environments are at the mercy of weather conditions and pollution sources, and there is no guarantee that the proper environmental events will occur to determine the real etch performance of a coating system.

The global standard test location has been in Jacksonville, Florida for over 20 years, but the yearly results have been somewhat inconsistent due to the variation in exposure conditions during the short duration of the test exposure (3-4 months).

With proper understanding of the outdoor conditions and the specific contaminant of interest, it is possible to create laboratory and field scenarios for testing coating systems with good correlation to "real world" events. A new method has been developed for environmental etch resistance that allows testing at an accredited facility (in this project, Q-Lab in Homestead, FL), where environmental events can be created and controlled using applications of acidic rain spray. The overall results from 2007-2009 show good correlation to those seen in Jacksonville.

While the new method is for an acid rain exposure, the same concepts could be used to test coating systems for resistance to many different environments that could generate coating defects. Discussion will include the overall test method development cycle.

Reduced Complexity Paint Line Innovations with No Paint Waste and Reduced Energy Consumption

Einaar Endregaard // Durr Systems, Inc.

Automotive paint shop technologies face many challenges to cost and emission reductions in the years to come. Present concepts and equipment have reached levels from where it is difficult to envision further major reductions in investment cost or reduced impact on the environment. Redirecting development towards simpler, less expensive process technologies, will to reduce process complexity while at the same time improve overall efficiency.

This paper describes a range of breakthrough products for the paint shop that will offer a very suitable platform for 3-wet paint lines with close to zero paint waste and very low energy consumption with the first installations launching in 2011.

The new systems include a 3rd generation EcoBell3 for electrostatic painting of waterborne paint, which features a very compact built-in electrode system that also enables electrostatic waterborne painting for interior and cut-in applications without the traditional disadvantages related to voltage blocking, such as long color change time, paint losses and frequent maintenance. Combined with a new design linear style color changer, there are virtually no color change losses, yet ultra fast color change. To eliminate traditional sub systems, a Dry Scrubber concept is introduced, eliminating the need for a wet scrubber. When combined with robotic paint automation, energy consumption is dramatically reduced. The system can be enhanced with dual rail robotic painting equipment further reducing spray booth sizes and overall energy demand.

2:15-2:50 p.m.

Layer Synergy Influence on Compact Process

Darren Soroczak // PPG Industries

During the course of the past thirty years, the Automotive Industry has developed and deployed a five layer coating system (metal pretreatment, electrodeposition coating, primer, basecoat, clearcoat) that fully satisfies the demands of the BIG FIVE Automotive Coatings Imperatives: Appearance, Cost/Unit, FTC, Regulatory Compliance, and Warranty Performance.

This system, as fully defined and practiced, is now being transformed in the face of a changing dynamic within the BIG FIVE. Overwhelming emphasis on Cost/Unit and, to a lesser extent, Regulatory Compliance have driven significant innovation in both the process and materials used to protect and decorate automobiles. The advent of compact process systems, i.e., the elimination of layer or process steps, offers the promise of significant cost savings and reduced environmental footprints, but at what compromise?

The rush to deliver enhancements to Cost/Unit and Regulatory Compliance must not be allowed to diminish the focus of the coatings community on the other three areas of demand: Appearance, FTC, and Warranty Performance. Such a situation would certainly result in unintended negative consequences.

This presentation will highlight key considerations in the development of compact process systems for Automotive Coatings that must be understood fully in the deployment of those systems. Specifically, it will focus on the interactions of layer synergy with Cathodic Electrodeposition formulations relative to overall coating system appearance.

2:50-3:30 p.m.

Tutorial Short Courses

FOCUS 2010 again features separate morning and afternoon short courses. There is no additional charge for either course. Due to seating limitations, each class is limited to the first 40 pre-registered students. Telephone registration by credit card is strongly recommended. Indicate which course(s) when calling. Students will receive class notes and a certificate of attendance.

9:35 a.m. // Classroom 104

Polymer Science for the Coatings Formulator

Collin Moore
BASF Corporation

Course Purpose

Polymers are part of the reality of everyone's daily lives. From the automobiles we drive to the paints that protect them, polymeric materials are everywhere. Yet, polymers exist largely unnoticed by the world around them, and function without a great deal of fanfare. For those of us who have made a career out of the study of polymeric systems, encouraging knowledge in this area is of great interest.



This course is designed for those who work with paints on a daily basis, but have no formal education in polymer science. An understanding of basic chemistry is assumed. We will discuss key concepts that govern the behavior of polymeric materials, the basics of polymer synthesis, and common analytical tools used to study paint and polymeric systems. By discussing these systems and how they impact the paint formulator, we will be arming ourselves with tools that will improve the quality of our formulations. Open discussion will be encouraged.

Biographical Sketch

Collin Moore began his formal education at Grove City College in Grove City, Pennsylvania, where he earned a BS in Chemistry. His undergraduate research project focused on the photolysis of organometallic molecules in various solvents, and the purification and characterization of the resultant molecules. In addition, his course work included a heavy focus on physics which led to an interest in materials science, and the chemistry of advanced materials.

After completing an internship at the University of Akron: College of Polymer Science and Polymer Engineering, Collin enrolled in the Ph.D. program. There he studied the synthesis of polyesters through cyclic oligomers and the synthesis of methylene polyethers with nonlinear optical properties. After earning his Ph.D. in Polymer Science, Collin began his industrial career in Johnson Polymer's Technology Development. Collin developed resins for high solids, solvent borne coatings, as well as resins and dispersions for waterborne printing and packaging applications including pigment dispersions. In addition to synthesis, his main interest has been in the area of structure-property relationships and developing methods for rapid screening of coating resin systems. After Johnson Polymer's acquisition by BASF, Collin accepted a position as the Group Leader of the Polyol, Amino and Isocyanate Technology Team.

1:25 p.m. // Classroom 104

Color Measurement and Control: Including Special Effects

Greg Shrider
BYK-Gardner

Course Purpose

This short course will cover color theory, illuminants and observers, as well as color tolerancing typically used in the paint and automotive world. We will explore the differences between solid color tolerances as well as those tolerances set for special effect colors. This will include how colors look different under different illumination conditions such as direct sunlight versus indirect or cloudy sky conditions. Included will be a section on new measurement criteria on appearance which will include orange peel and mottling.

Biographical Sketch

Greg is the Vice President of Sales for BYK-Gardner USA, an instrumentation manufacturer that specializes in the measurement of Color, Appearance and Physical Testing Properties for paints and plastics applications. He is currently responsible for the sales and applications in the United States and Canada.



He is a graduate of Rochester Institute of Technology with 20 years of experience in the areas of color measurement, color quality control and color formulation. He has held positions in applications, sales as well as lab manager for development and production of color standards.

With 20 years of field experience working with industry to address and solve challenges in color matching, Greg has worked with numerous Fortune 500 companies to better manage color match issues within their production as well as within their supply chains. He has worked with several teams to improve quality and lower costs, and was awarded Ford Motor Company's Q1 award along with team members from Ford and BASF.

Registration: Phone: 248/546-2934 or Fax: 248/545-4355 (Credit cards only)

Or Mail form with completed Credit Card Information or Check payable to DSCT to P.O. Box 721186, Berkley, MI 48072

Questions? Contact Sarjak Amin at samin@emich.edu or 734/945-0046. Form also available at www.dsct.org; however, no registrations via the internet.

The Detroit Society for Coatings Technology

35th Annual FOCUS Conference

Thursday, May 6, 2010 MSU Conference Center • Troy, MI

- By 4/9 Early Bird **\$100**
- By 4/23 Advance **\$110**
- Group Rate ≥5 registered together **\$10/person discount**
- By 4/23 Courtesy Rate (Full Time Student, Educator, Unemployed, Retired) **\$50**
- After 4/23 Walk-in **\$125**

Company		Lunch <small>Choose one:</small>		Tutorials <small>Indicate choice(s)</small>					
Last Name		First Name <small>(As it should appear on badge)</small>		Morning	Afternoon	Early Bird <small>by 4/9</small>	Advance <small>by 4/23</small>	Courtesy <small>by 4/23</small>	After 4/23 & Walk-in
1				Collin Moore <small>Polymer Science for the Coatings Formulator</small>	Greg Shrider <small>Color Measurement and Control, Including Special Effects</small>	A	\$110	\$50	\$125
2						A			
3						A			
4						A			
5						A			
				Total from Columns A, B, C, D					
				Discount for 5 or more (minus \$10/person)					
				Total Payment					

Cancellations accepted (248-546-2934) by April 16 minus \$15 fee. No refunds after 4/16.

Group Rate: 5 or more together—Save \$10/person.

Mail CHECK payable to DSCT with this form or complete CREDIT CARD information below.

Registrations will be confirmed by email. Email Address: _____

Cardholder Name: _____ Company / Affiliation: _____

Mailing Address: _____ Cardholder Tel: _____

Type of Card: Visa _____ MC _____ Am. Express _____ Acct. No: _____ Exp. Date: _____

On LinkedIn? Join our group "Detroit Society for Coatings Technology" for updates and networking opportunities.



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A PATH TO VALUE

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www.DSCT.org

35th Annual *FOCUS* Conference

Date Thursday, May 6, 2010

Registration Form located inside brochure. Register by phone, fax or US Mail. Sorry, no Internet registrations. Check, VISA, MasterCard, American Express

Location MSU Management Education Center:
811 W. Square Lake Rd., Troy, MI

Directions I-75 to Exit # 72 (Crooks Rd.)
North on Crooks Rd to next major
street – Square Lake Rd.
Right onto Square Lake.
The 1st right turn is the MSU
Conference Center entrance.

Additional Info Contact Sarjak Amin at 734/945-0046
or email samin@emich.edu