

# WOOD C&S

## 2020

### 9<sup>th</sup> Wood Coatings and Substrates Conference

#### When and Where:

Thursday & Friday, September 24 & 25, 2020  
Virtually via Zoom – See page 4 to register  
Or register at  
<http://www.woodcoatingsresearchgroup.com/wood-coatings--substrates-conference-2020.html>  
to obtain link via email

#### Featuring:

Industry and Research experts discussing wood substrates  
Expert Speakers on coatings science, raw materials, and  
technology for wood coatings

#### Sponsored by:

University of North Carolina at Greensboro  
Piedmont Section of the Southern Society for  
Coatings Technology  
Wood Coatings Research Group

#### Keynote Speakers:

**Thursday: The Status of the U.S. Forest Products Industry**  
**Professor Dr. Urs Buehlmann**  
**Department of Sustainable Biomaterials; (Virginia Tech)**

**Friday: How Wood Properties Influence Coating Performance**  
**Dr. Chris Hunt**  
**Chemist**  
**Forest Products Laboratory (FPL); Madison, WI**

#### Who should attend Wood C&S?

- Chemists and Formulators dedicated to improving wood coating performance and ease of manufacture.
- Raw material and equipment suppliers requiring competency in the wood and wood coatings discipline.
- Students interested in pursuing a career in the coatings, material sciences, and chemical sciences disciplines.
- Educators interested in the wood coatings market and related material science technologies.
- End users who need coatings to add value to their products.

#### Complete **WOOD C&S** Conference Information:

[r.obie@woodcoatingsresearchgroup.com](mailto:r.obie@woodcoatingsresearchgroup.com)

<https://chem.uncg.edu/>

<http://www.woodcoatingsresearchgroup.com/wood-coatings--substrates-conference-2020.html>

For abstracts, registration information, and corporate sponsors contact:

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# WOOD C&S 2020

## Program Overview

	<b>Thursday Sept 24</b> Scratch and Abrasion Resistance, and Cure of Green Coatings Technology
1:00 – 1:15 p.m.	Welcome, recognition of Sponsors Platinum Sponsor
1:15 - 1:50 p.m.	Scratch Resistance Advancements in Water-Based Wood Coatings Michelle Bauer, Tanya Hunter, Yvette Gomez ICL-Halox
1:50 - 2:25 p.m.	Mar, Scratch, and Abrasion: Beneficial Effects of Liquid and Solid Additives in High Performance Coatings Michael Pauley, K. Michael Peck, and Fadia Namous Evonik Corporation
2:25 – 3:00 p.m.	UV Measurement & Process Control for Wood Applications: Do You Have 2020 Vision? Jim Raymont EIT LLC
2:30 – 3:00 p.m.	Sponsor Spotlight
3:00 – 3:15 p.m.	Break
3:15 - 4:15 p.m.	<b>KEYNOTE ADDRESS</b> <b>The Status of the U.S. Forest Products Industry</b> U. Buehlmann, M. Bumgardner, and D. Alderman Urs works in the area of manufacturing systems engineering and business competitiveness. He practices and promotes Lean as a way to improve business results and assists industry in Virginia and beyond. He holds a PhD and a MBA from Virginia Tech, an industrial engineering degree from Bern University of Applied Science in Switzerland and a cabinet making degree from the professional school in Thun, Switzerland.
4:15 – 4:45 p.m.	Sponsor Spotlight and Wrap up
	<b>Friday Sept 25</b> Formulation Design; Durability of Green Coatings Technology and the Wood Substrate
9:00 – 9:15 a.m.	Welcome, recognition of sponsors Platinum Sponsor
9:15 - 9:50 a.m.	No Pain with Stain(s) in Water-borne Furniture Coatings Anymore Marcel Krohnen, Michael Toth BYK-Chemie GmbH, Wesel Germany
9:50 – 10:25 a.m.	Resistant Acrylic Dispersions for Wood Surfaces Derek Koonts Alberdingk Boley, Inc.
10:25 – 11:00 a.m.	Organofunctional Silanes for Wood Coatings Applications Jacob Shevrin Evonik Corporation
11:00 – 11:35 a.m.	Wax Additives for Wood Coatings Jeanine Snyder Sasol
11:35 – 12:00 Noon	Sponsor Spotlight
12:00 – 1:00 p.m.	Lunch Break, Sponsor recognition
1:00 – 2:00 p.m.	<b>KEYNOTE ADDRESS</b> <b>How Wood Properties Influence Coating Performance</b> Dr. Chris Hunt Dr. Chris Hunt is excited to share his love of practical wood science with the paint community. He is a research chemist at the Forest Products Laboratory (FPL) in Madison, WI, the federal lab for making better use of wood. He is author of the chapter “Finishing Wood” in the upcoming 2020 edition of the Wood Handbook. His research focuses on how water and chemicals inside wood cell walls impact the properties and performance of wood products. Currently his work is focused on two sided paint (adhesives) and how modifying the chemistry of wood imparts decay resistance. All of his 50+ publications can be downloaded for free at the FPL website, <a href="http://www.fpl.fs.fed.us/people/bios/employee_level_bio.php?alias=cghunt">www.fpl.fs.fed.us/people/bios/employee_level_bio.php?alias=cghunt</a>
2:00 – 2:35 p.m.	Innovative Highly Reactive Polyols and Formaldehyde-Free Crosslinker Systems for High Performing Industrial Wood Coatings Letitia Luu Allnex USA Inc.

Thursday Sept 24

1:15 p.m.

**Scratch Resistance Advancements in Water-Based Wood Coatings**

Michelle Bauer, Tanya Hunter, Yvette Gomez

ICL-Halox

Demand for high performance water-based coatings continues to be the trend throughout many coatings market segments. Wood cabinetry, furniture and floor coatings are a major component of this movement. To supply this demand, development of innovative solutions is required to provide long-lasting coatings performance. End-users are seeking increased durability partnered with the lower environmental impact that comes with water-based technology. Enhanced scratch resistance will improve the long-lasting aesthetics and service-life that wood coatings provide. A novel, easy to use approach to improve scratch resistance in water-based wood coatings has been newly developed by ICL. Demonstration of this new scratch additive versus many commercially available alternates in a clear high-gloss waterborne UV-curable system will be presented.

1:50 p.m.

**Mar, Scratch, and Abrasion: Beneficial Effects of Liquid and Solid Additives in High Performance Coatings**

Michael Pauley, K. Michael Peck, and Fadia Namous

Evonik Corporation

The durability and resistance of coatings to the physical effects of mar, scratch, and abrasion can be significantly enhanced with the use of additives and particles. Whether by mitigating a damaging force through deflection with hard particles, improved crosslinking around reinforcing structures, or reduction of coefficient of friction with lubricating products, the use of secondary additives can be valuable in the formulation of high performance top-coats. The mechanisms of these effects vary with coating type as well as the nature of the destructive force, and the benefits of additive technologies can differ significantly. This paper will discuss these surface effects, detail the mechanisms of surface damage and describe how different additives impact the behavior of the coating surface.

2:25 p.m.

**UV Measurement & Process Control for Wood Applications: Do You Have 2020 Vision?**

Jim Raymont

EIT LLC

Wood lines utilizing UV curing most often use multiple sources and lamp types. Are you driving your UV process and maintenance needs with clear 2020 vision or is your vision a little old and foggy? This presentation will use actual UV wood line examples to help you understand UV measurement & process control basics. How do you establish needed UV parameters, identify changes and most importantly get back on track to save time and money? What are the differences between UV broadband (mercury) and LED sources? How are they being used on wood lines and how are they measured?

**KEYNOTE ADDRESS**

3:15 p.m.

**The Status of the U.S. Forest Products Industry**

U. Buehlmann, M. Bumgardner, and D. Alderman  
Virginia Tech - Department of Sustainable Biomaterials

While the United States forest products industry is navigating the current COVID-19 pandemic, the industry is also facing profound changes to its business model with, for example, the ongoing digitization of all aspects of its business, with the ongoing changes of the international supply chains, and with the performance of the U.S. housing market.

A recent survey of the industry reveals that digitization, often referred to as Industry 4.0, has gained considerable attention in the industry but also found that the availability of a trained work force, access to programs that can provide such training, and access to the necessary capital are issues that the industry is struggling with. Over the past three decades, global competitive pressures have taken their toll on many sectors of the U.S. forest products industry and have had a dramatic effect on several sectors. However, today, with a changed attitude towards globalization and disrupted supply chains due to the pandemic, the domestic industry may be able to recapture some of this outsourced business. At present, the industry definitely could benefit from such opportunities as their single largest market, housing, is under strain due to the restrictions and hardships imposed by the pandemic. This presentation will discuss the current state of the United States forest products industry and will present scenarios about possible developments in the future.

Friday Sept 25

9:15 a.m.

**No Pain with Stain(s) in Water-borne Furniture Coatings Anymore**

Marcel Krohnen, Michael Toth  
BYK-Chemie GmbH, Wesel Germany

In order to meet ever-growing global customer demands with respect to safer, healthier, and environmentally sound coatings formulations in the furniture industry, the share of water-borne formulations (particularly single-component formulations) continuously increases. Due to the comparably high system polarity, the lacking chemical crosslinking in one-component systems and the trend towards white and brightly colored finishes, these formulations can be sensitive to staining by coffee, tea, red wine, juices, mustard, ketchup, as well as household cleaners and liquids. The tendency for staining becomes higher and more pronounced, whenever hydrophilic structures and higher polar non-volatile coatings ingredients remain in the cured coating. Therefore, wetting and dispersing additives, whose application in high-quality pigmented coatings is inevitable, can negatively contribute to the surface staining of water-borne furniture finishes if not wisely selected. This presentation discusses the development, the chemical background, as well as the application results of novel wetting and dispersing additives designed to offer outstanding pigment stabilization in water-borne furniture coatings yet to provide the least negative impact on the stain resistance possible.

9:50 a.m.

**Resistant Acrylic Dispersions for Wood Surfaces**

Derek Koonts  
Alberdingk Boley, Inc.

Waterborne acrylic polymers are one of the dominant resin technologies used in industrial coatings today. Unlike solvent based polymers, waterborne acrylic polymers are more environmentally friendly with lower volatile organic compounds (VOC's) and hazardous air pollutants (HAPS). This in turn allows end users to reduce their environmental footprint while maintaining final product quality. They can offer excellent UV resistance, good physical properties, good durability and multiple options for polymer design to meet various application needs. With the rise of the COVID-19 pandemic and a higher focus on sanitized surfaces, robust coatings are needed that possess a high resistance to various cleaning agents while maintaining other critical properties. An innovative waterborne multi-phase acrylic has been developed that withstands exposure to strong cleaning reagents. This acrylic shows versatile performance and can be used on wood for interior and exterior applications at low VOC capability. The properties and performance of this acrylic will be discussed.

10:25 a.m.

**Organofunctional Silanes for Wood Coatings Applications**

Jacob Shevrin  
Evonik Corporation

Organofunctional silanes represent an important class of materials that are commonly used for a wide variety of wood coating applications. Usually known as adhesion promoters, silanes can act as a bridge between many different types of organic coatings and wood surfaces. This adhesion promotion can be achieved by directly adding a silane into a wood coating formulation or by diluting the silane down in water to use as a stand-alone wood coating. In addition to adhesion promotion, silanes can also enhance the surface passivation, hydrophobicity, oleophobicity, weatherability, chemical resistance, and durability of wood surfaces. Through the use of several ASTM/ISO testing methods, these silane-related performance improvements will be demonstrated and analyzed in three different applications. The first application is the use of a waterborne fluoroalkyl-functional silane as a stand-alone treatment to impart water resistance, stain resistance, and weathering resistance on wood surfaces, thereby greatly extending the lifetime of the wood. The second application details the addition of an epoxy-functional silane oligomer into a waterborne acrylic wood coating for improved hardness, water resistance, stain resistance, and chemical resistance of the wood surface over time. Lastly, the use of unsaturated silane additives to improve the weatherability, water resistance, and stain resistance of waterborne, UV-curable wood coatings will be investigated.

11:00 a.m.  
**Wax Additives for Wood Coatings**  
Jeanine Snyder  
Sasol

Wood coatings provide both aesthetic and protective properties to unfinished surfaces. In addition, new coats of varnish or paint can transform old pieces of furniture into works of art and decking boards into relaxing oases. Whether coating for appearance or to provide protection to the surface, it is critical to choose the proper additives when formulating wood coating systems. Waxes are a unique group of additives used in a variety of coatings and inks formulations. They can provide slip, mar and wear resistance, blocking and abrasion resistance, and in the case of wood coatings, most importantly, water resistance. Choosing the right wax may also provide the formulator with tools to modify the gloss of the coating. A discussion on the types of waxes and mechanisms for performance in coatings and inks will be reviewed along with how to choose the appropriate surface modifier for your formulation. Several examples will be shown illustrating the role waxes play in protecting wood surfaces.

1:00 p.m.

**KEYNOTE ADDRESS**

1:00 p.m.

**How Wood Properties Influence Coating Performance**

Dr. Chris Hunt  
Forest Products Laboratory (FPL)  
Madison, WI

My goal in this talk is to introduce coating professionals to some of the key properties of wood that differentiate it from other substrates. I will explain how the anatomy and chemistry of wood conspire to challenge coating professionals, but also provide opportunities. The talk will cover basic wood anatomy, wood-water relations, ideal coating penetration and how to achieve it, sunburned wood, properties of the ideal wood coating and coating challenges presented by wood substrates.

2:00 p.m.

**Innovative Highly Reactive Polyols and Formaldehyde-Free Crosslinker Systems for High Performing Industrial Wood Coatings**

Letitia Luu  
Allnex USA Inc.

The mounting pressure to eliminate formaldehyde from conversion varnish systems for wood coatings has stimulated significant R&D and applications work over the past few years and has led to the development of a formaldehyde-free crosslinking agent to replace typical urea-formaldehyde products. The need for faster early property development with this formaldehyde-free crosslinker has led to the development of highly reactive polyols designed specifically to close the gap in performance noted with currently used backbone resins.

The polyols involved are non-oxidizing oil-modified polyols which give low color and yellowing resistance in the finished coating as well as improved flexibility upon aging due to lack of post-cure via oxidative cross-linking. In addition, the polyols have been optimized to give better reactivity with the formaldehyde-free crosslinker to give improved cure speed. The balance of primary versus secondary hydroxyl as well as the stearic hindrance of the hydroxyl are important factors in the design of these polyols.

The benefit of these reactive polyols also extends to low formaldehyde systems that are based on a unique high solids melamine resin with very low free formaldehyde. This unique melamine resin offers better catalyzed stability to the formula and better hydrolytic stability to the film relative to typical urea crosslinkers. The purpose of this study is to present formulation options and end performance attributes of various wood coating systems designed around specific oil-modified polyol/amino crosslinker combinations

The University of North Carolina at Greensboro  
The Wood Coatings Research Group  
The Piedmont Society for Coatings Technology

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### Registration Form

Online registration at <http://www.woodcoatingsresearchgroup.com/wood-coatings--substrates-conference-2020.html>

**You must provide your email to receive log in credentials**

Last Name \_\_\_\_\_ First Name \_\_\_\_\_

Company or Affiliation \_\_\_\_\_

Mailing Address \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

Registration Fee: The Cost of the Conference is Free.

Questions: Please direct your questions to: Ron Obie  
[r.obie@woodcoatingsresearchgroup.com](mailto:r.obie@woodcoatingsresearchgroup.com)

Please Return The Completed Form to:  
Ronald Obie  
Email: [r.obie@woodcoatingsresearchgroup.com](mailto:r.obie@woodcoatingsresearchgroup.com)

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