WOOD C&S

2026

12th Wood Coatings and Substrates Conference
Hybrid Conference

When and Where:
Thursday & Friday, September 24 & 25, 2026
Hybrid Conference
University North Carolina Greensboro
and Virtual

Featuring:
Industry and Research experts discussing new changes in wood substrates
Expert Speakers on coatings science, raw materials, and technology for wood coatings

Sponsored by:
University of North Carolina at Greensboro
Wood Coatings Research Group

Keynote Speakers:
Dr. Chip Frazier, Ph.D.
Thomas M. Brooks Professor of Sustainable Biomaterials
Co-Director of the Wood-Based Composites Center
Virginia Tech Blacksburg, Va

Dr. Victoria Scarborough, Ph.D.
VP Collaborative Innovation
The ChemQuest Group
South Boston, Va

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.
- Wood manufacturers, scientists, and technologists
- 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
https://chem.uncg.edu/
https://www.woodcoatingsresearchgroup.com/wood-coatings--substrates-conference-2026.html
For abstracts, registration information, directions, maps and corporate sponsors contact:
Ronald Obie
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WOOD C&S 2026

Program Overview

	Thursday Sept 24, Cone Ballroom C Wood Substrates and Additive Technologies in Coatings
12:00 – 12:50 p.m.	Sponsor Table Top Exhibits
12:50 – 1:00 p.m.	Welcome
1:00 - 1:30 p.m.	Advancing Skin Prevention, Dry Performance, and Regulatory Labeling in Linseed Oil Wood Coatings Melody Gibson Borchers: A Milliken Brand
1:30 – 2:00 p.m.	Advancing Stain and Dirt Pickup Resistance in Wood Coatings Karol Wielechowski*, Kathryn Sackinger, Nicholas Penrose, Andrew Keane BYK USA LLC
2:00 - 2:30 p.m.	Waxes in Wood Coatings: Navigating Regulatory Change Through Science and Sustainable Innovation Pietrina Peshel Clariant
2:30 – 2:50 p.m.	Sponsor Spotlight / Commercials
2:50 – 3:20 p.m.	Innovative additives for Coating Wood John Du Patcham USA
3:20 – 3:50 p.m.	Polyurethane 2.0: New Polyurethane Architectures for Versatile Wetting and Dispersing Additives Nick Penrose*, Mike Toth, Matt Burge, Gillian Lazarus Harris BYK USA LLC
3:50 – 4:50 p.m.	KEYNOTE ADDRESS It's a Wrap! Performance Films and the Reinvention of Wood Finishing Dr. Victoria Scarborough, Ph.D. The ChemQuest Group South Boston, Va **Dr. Victoria Scarborough** is Vice President of Collaborative Innovation at The ChemQuest Group, where she helps identify and commercialize emerging technologies across the specialty chemicals and materials industries. With more than 40 years of coatings industry experience, including leadership roles at The Sherwin-Williams Company, she has extensive expertise in innovation scouting, product development, and commercialization strategy. Dr. Scarborough holds multiple U.S. and international patents and is a frequent invited speaker and author on advanced coatings technologies, sustainability, and materials innovation. She serves on the American Coatings Association Science & Technology Committee and writes *Innovation Insights* for PCI Magazine.
5:00 – 6:00 p.m.	Sponsor Table Top Exhibits
7:00 p.m. - Until	Wood C&S Fellowship Dinner – Open to all; RSVP at time of Registration OUTBACK STEAKHOUSE 4518 W. Wendover Ave. Greensboro, NC 27409

WOOD C&S 2026

Program Overview

	Friday Sept 25, Cone Ballroom
	Cone Ballroom-BC Polymer Chemistry, Physical Chemistry, and Analysis of Coatings
7:45 – 8:20 a.m.	Networking Coffee and Welcome
8:30 - 9:00 a.m.	Horizontal Weathering Results of Autonomously Applied Wood Deck Stains Ronald Obie and Cameron Anderson Wood Coatings Research Group
9:00 – 9:30 a.m.	A Waterborne Exterior Wood Coating that Eliminates the Need for "VOC Exempt" Solvents Mary Chervenak Arkema
9:30 – 10:00 a.m.	Caprolactone Polyols in Aminoplast Coatings: Unlocking Faster Cure and Tougher Films Chuck Jones Ingevity
10:00 – 10:15 a.m.	**Break**
10:15 – 10:45 a.m.	First Principles Design of Biobased Aqueous Coatings with Multibarrier Functionality Julie Willoughby, Caleb Meredith, and Chloe Andreasen TerraSafe Holdings, Inc.
10:45 – 11:15 a.m.	Harnessing the Stark Effect for Good - On Creating a "Mass Starkometer" to Identify Molecular Isomers and Conformers. Dr. Liam Duffy University of North Carolina at Greensboro
11:15 a.m. – 12:55 p.m.	Open Lunch, Student Career Networking, Sponsor Table Top Exhibits
1:00 – 2:00 p.m.	KEYNOTE ADDRESS Frontiers in renewable feedstocks and the long search for value Dr. Chip Frazier Thomas M. Brooks Professor of Sustainable Biomaterials Co-Director of the Wood-Based Composites Center Virginia Tech Blacksburg, Va **Dr. Chip Frazier** is the Thomas M. Brooks Professor of Sustainable Biomaterials at Virginia Tech and the Co-Director of the Wood-Based Composites Center, an industrial research consortium dedicated to industry service. Frazier teaches about the structure and properties of natural materials, adhesion, and wood-based composites. His research focuses on adhesion, thermosetting resins, and lignin chemistry.

Thursday Sept 24, Cone Ball Room C

1:00 p.m.

Advancing Skin Prevention, Dry Performance, and Regulatory Labeling in Linseed Oil Wood Coatings

Melody Gibson
Borchers: A Milliken Brand

Wood is the primary renewable substrate across many market segments; however, if left untreated, it becomes brittle over time, leading to cracking, discoloration, and other signs of wear. Alkyd resins remain a preferred solution for wood protection due to their excellent long-term performance, bio-based content, and cost-effectiveness.
Regulatory scrutiny of alkyd formulation materials, including cobalt-based driers and oxime-based anti-skinning agents, is increasing. The European Union is proposing stricter Occupational Exposure Limits (OELs) surrounding cobalt. In the United States, the Environmental Protection Agency (EPA) is conducting an assessment of cobalt and cobalt compounds through their Integrated Risk Information System (IRIS). Oxime-based anti-skins, like MEKO, require hazard classification and labeling under OSHA's Hazard Communication Standard (HazCom).
At the same time, regulations on volatile organic compounds (VOCs) continue to drive the need for improved environmental and safety profiles, resulting in increased interest in waterborne and high solids alkyd formulations.
In response to these market and regulatory trends, this presentation highlights how cobalt-free high-performance catalysts and oxime-free anti-skinning technologies can enable improved labeling profiles without compromising drying speed, film quality, or durability. Results will demonstrate how key challenges such as drying performance, wrinkling, and color stability can be addressed relative to traditional cobalt and manganese drier systems. Additional highlights include the transformation of high-solids linseed oil into stable alkyd emulsions and the development of premium wood coatings using cobalt-free and oxime-free technologies.

1:30 p.m.

Advancing Stain and Dirt Pickup Resistance in Wood Coatings

Karol Wielechowski*, Kathryn Sackinger, Nicholas Penrose, Andrew Keane
BYK USA LLC

Stain and dirt pickup resistance (DPUR) are increasingly important performance attributes in wood coatings, as PFAS-related regulations and broader sustainability drivers push the industry toward new formulation approaches. For interior applications, stain resistance is critical for furniture, cabinetry, flooring, and other surfaces exposed to food, beverages, and household chemicals. While conventional coating formulations can deliver adequate hardness, gloss, and chemical resistance, achieving durable stain repellency without compromising appearance, adhesion, or mechanical integrity remains a significant challenge. For exterior wood applications, DPUR and weatherability are additional key performance requirements. As VOC regulations become more stringent, coating formulations often shift toward resins with lower glass transition temperatures (Tg). This reduction in Tg can lead to decreased dirt resistance, increasing the likelihood of contamination on the coating surface. Sunlight and weather exposure can further degrade DPUR performance, resulting in visible discoloration that negatively impacts both appearance and overall consumer acceptance. This presentation will provide an overview of stain resistance and DPUR in wood coatings and highlight surface additive strategies developed by BYK to enhance these performance properties.

2:00 p.m.

Waxes in Wood Coatings: Navigating Regulatory Change Through Science and Sustainable Innovation

Pietrina Peshel
Clariant

Waxes have long been essential functional additives in wood coatings, delivering critical surface properties including scratch and mar resistance, slip, anti-blocking, matting, haptics, and water repellency. Understanding the underlying chemistry — how wax particle morphology, polarity, and hardness interact with binder systems across solvent-borne, waterborne, and ultraviolet-cure platforms — is fundamental to formulating coatings that meet the performance demands of today's wood and wood-based substrate markets.
The industry now faces a significant regulatory inflection point. Increasing restrictions on polytetrafluoroethylene (PTFE) and the emerging European microplastics regulation are compelling formulators to re-evaluate historically reliable surface additive solutions. PTFE, long valued as a near-universal solution for slip and scratch resistance, cannot simply be replaced by a single alternative. Its removal exposes a broader formulation challenge: different wood coating market segments — furniture, flooring, cabinetry, and decorative wood — each demand a distinct balance of surface properties, requiring a more targeted, property -specific approach to wax selection.
This presentation explores how bio-based, renewable wax chemistries — particularly those derived from rice bran — offer a compelling platform for addressing these regulatory and performance challenges simultaneously. As a non-food-

competing, naturally sourced material, rice bran wax delivers a versatile yet tunable performance profile that enables formulators to develop application-specific solutions rather than relying on a one-size-fits-all approach.
The transition away from PTFE is not simply a substitution exercise — it is an opportunity to build smarter, more sustainable, and more market-differentiated wood coating systems.

2:50 p.m.

Innovative additives for Coating Wood

John Du
Patcham USA

Wood offers unique challenges for the coatings formulator. The perfect balance of wetting, spreading and penetration on a natural substrate that is porous, nonuniform at the cellular level and containing regions of varying hydrophilicity and hydrophobicity must be achieved.
PFAS Free additives will be discussed that support the formulation of such coatings for wood susbstrates.

3:20 p.m.

Polyurethane 2.0: New Polyurethane Architectures for Versatile Wetting and Dispersing Additives

Nick Penrose*, Mike Toth, Matt Burge, Gillian Lazarus Harris
BYK USA LLC

Wetting and dispersing additives are specialized chemicals that improve pigment dispersion by reducing colorant viscosity and controlling pigment spacing and orientation, enabling better color development during drying. They also enhance system compatibility, prevent pigment settling, and improve acceptance of external colorants in clear or white bases. While available in various chemistries, polyurethane-based additives are among the most versatile.
BYK USA LLC has developed a new polyurethane structure with excellent compatibility and multiple types of pigment-affinic groups, enabling strong incorporation of third-party colorants into bases. This reduces flooding and floating while maintaining stable color over time.
BYK USA LLC will demonstrate the performance benefits of this new polyurethane wetting and dispersing additives in solvent-borne and aqueous wood coatings versus other chemistries, including traditional polyurethanes.

KEYNOTE ADDRESS

3:50 pm Cone Ballroom C

It’s a Wrap! Performance Films and the Reinvention of Wood Finishing

Dr. Victoria Scarborough, Ph.D.
The ChemQuest Group
South Boston, Va

As expectations for aesthetics, durability, and sustainability continue to rise across furniture, cabinetry, retail fixtures, doors, panels, and architectural interiors, high-performance surface films are emerging as a compelling alternative to traditional liquid coatings for wood substrates. Much like the transformation seen in automotive wrap technologies, these engineered decorative and protective films offer design consistency, faster processing, enhanced durability, and a lower-emissions pathway for surface finishing. This presentation explores the expanding role of thermoplastic and thermoset film technologies, including PVC, PET, polypropylene, acrylic, polyurethane, and thermoplastic olefin (TPO) systems, in the lamination and wrapping of wood-based components. It will highlight the performance demands these materials are designed to meet, from scratch, abrasion, stain, chemical, and UV resistance to flexibility, thermoformability, and reliable adhesion across MDF, particleboard, plywood, and solid wood. The presentation also reviews the manufacturing methods enabling this shift, including flat lamination, membrane pressing, vacuum forming, and profile wrapping, with particular attention to productivity gains and reduced finishing emissions. Finally, it looks ahead to the next wave of innovation: digitally printed decorative films, low-VOC adhesive systems, recycled-content substrates, synchronized embossing, and soft-touch and antimicrobial surfaces that are redefining what is possible for next-generation wood products.

Friday Sept 25, Cone Ballroom-A

8:30 a.m.

Horizontal Weathering Results of Autonomously Applied Wood Deck Stains

Ronald Obie and Cameron Anderson
Wood Coatings Research Group

This talk will review weathering results of various water-based stains applied to treated lumber utilized for decking. Stains were exposed south facing, in a horizontal position. Horizontally exposed specimens may serve as an accelerated method of evaluating stain durability. Commercial as well as experimental stains were evaluated. Many of the stains were applied with a small robot utilizing a saturated T-bar applicator. This autonomous method allows controlled pressure of the applied stain to the wood substrate.

9:00 a.m.

A Waterborne Exterior Wood Coating that Eliminates the Need for "VOC Exempt" Solvents

Mary Chervenak
Arkema

Recognized as a renewable, sustainable, and climate-friendly resource, wood is one of the most responsible building materials on the planet. When wood substrates are continuously exposed to water, wind, and sunlight, though, they can degrade, which is manifested as discoloration, cracking, and decay. Protective coatings, however, can delay or prevent damage, improving the durability and prolonging the life of this vital natural resource. Coatings with low Volatile Organic Compound (VOC) content is now a market expectation; this requirement is often achieved with "VOC exempt" solvents. The use of common "VOC exempt" solvents may be permanently restricted in many applications because of proposed state-level environmental regulations. As an example, the South Coast Air Quality Management District in California rescinded exempt status of two "VOC exempt" solvents January 1, 2026, and proposed bans for these solvents in some applications by July 1, 2029. As a result, creative solutions to match VOC and performance targets are critical. A proprietary polymer has been developed that enables the replacement of these "VOC exempt" solvents with water. Using this unique technology, a low-VOC waterborne coating for exterior wood substrates has been formulated to provide exceptional protection, which meets or exceeds that of conventional wood coatings.

9:30 a.m.

Caprolactone Polyols in Aminoplast Coatings: Unlocking Faster Cure and Tougher Films

Chuck Jones
Ingevity

Fast early handling on original equipment manufacturer (OEM) wood coating lines is often achieved by increasing acid catalyst in aminoplast systems; however this can compromise long-term toughness and flexibility. This study evaluates caprolactone polyols as partial or full polyol replacements in acid-cured melamine-formaldehyde (MF) and hybrid urea-/melamine-formaldehyde (UF/MF) topcoats versus a short-oil alkyd control. Cure and property development were measured by in-situ evaporative dynamic oscillation (EDOT), dynamic mechanical thermal analysis (DMTA), pendulum hardness, and an automated dynamic dry time recorder (ADDTR). Panel tests covered gloss/clarity, blocking, flexibility, tape/scrape adhesion, cold-check cycling, and ANSI/KCMA A161.1 chemical staining.

In MF systems at a fixed methoxy/hydroxyl ratio, the caprolactone tetrol reached sol–gel more than 3.5× faster than the alkyd under the same 25→35→65.6 °C schedule. Both caprolactone polyols showed higher asymptotic viscosities, consistent with faster network formation and higher conversion. ADDTR indicated markedly better early mar and scratch resistance and higher loads to crack initiation and complete failure (toughness), with flexibility maintained. The fastest cure occurred near ~1 wt% p-toluenesulfonic acid at 65 °C; higher levels (≥3–5 wt%) showed signs of vitrification and performance drop-off. DMTA suggested low-temperature transitions in caprolactone-rich networks prior to anneal, aligning with EDOT temperature sensitivity.

In a UF/MF topcoat representative of production practice, replacing 10 wt% of the alkyd with either caprolactone polyol preserved or modestly accelerated sol–gel development; the tetrol cured slightly faster than the triol. Across catalyst levels and aging times, caprolactone-modified coatings showed roughly two-fold higher mar and scratch resistance than the alkyd-only benchmark, while retaining excellent tape adhesion and showing no scrape-adhesion failure within instrument limits. All systems passed five cold-check cycles, though caprolactone-modified panels exhibited somewhat greater loss of low-angle gloss after cycling.

Flexibility generally improved with caprolactone modification at a given catalyst level; the triol trended slightly more flexible, especially near ~1 wt% catalyst. In chemical staining, the tetrol-modified coating matched or exceeded the alkyd control at 24 h, whereas the alkyd-only system recovered slightly better by 15 days. Extending the 65 °C dwell improved hot-coffee resistance and indentation hardness for the tetrol-modified coating, emphasizing the value of cure-schedule optimization. At high catalyst levels, caprolactone-modified films showed modest reductions in low-angle gloss/clarity;

thick films from all systems displayed poor off-schedule block, indicating a need to adjust film build and/or oven parameters.
Overall, caprolactone polyols enabled faster network formation, stronger mar/scratch resistance, and improved toughness/flexibility in acid-cured aminoplast wood topcoats.

10:15 a.m.

First Principles Design of Biobased Aqueous Coatings with Multibarrier Functionality

Julie Willoughby, Caleb Meredith, and Chloe Andreasen
TerraSafe Holdings, Inc.

Developing high-performance coatings for lignocellulosic substrates requires understanding the interplay between interfacial chemistry and polymer physics to effectively connect coating composition with desired functional properties. Barrier coatings—designed to protect against oil, grease, oxygen, and moisture—are critical for making paper and paperboard suitable for commercial food packaging. For instance, a hydrophilic polymer can successfully prevent hydrophobic oxygen molecules from permeating its surface. However, when exposed to moisture, these polar polymer chains swell, increasing the material's pore size and inadvertently allowing oxygen to penetrate. Therefore, it is necessary to carefully manipulate the hydrophilic-hydrophobic balance and crystallinity of an aqueous coating to tune its functional properties for specific applications.

TerraSafe is a next-generation materials science company engineering high-performance, biomolecular barrier coatings. We leverage nature's building blocks at a molecular level, combining suberin-inspired biopolyesters with polysaccharides as oxygen barriers on lignocellulosic substrates to mimic the natural liquid, moisture, and oxygen protective barriers found in plants. By converging scientific principles with operational realities, we aim to deliver solutions that are regenerative by nature and engineered with a holistic, cradle-to-grave perspective.

10:45 a.m.

Harnessing the Stark Effect for Good - On Creating a "Mass Starkometer" to Identify Molecular Isomers and Conformers.

Dr. Liam Duffy
University of North Carolina at Greensboro

In our lab at UNCG we have been working for more than a decade to produce a first-of-its-kind practical instrument to identify isomers and conformers by the strength of their dipole moments, i.e., by how polar they are. The instrument is like a mass spectrometer but yields additional structural information through the polarity and rotational energy level structure of the molecules. Like the fingerprint region of FTIR, the rotational energy levels and polarity of a molecule are particularly sensitive to molecular shape, readily distinguishing isomer and conformers. The instrument results in 2D spectra with mass to charge (m/z) on one horizontal axis and mass to dipole moment (m/u) on the other horizontal axis; isomers and conformers are then distinguished along the m/u axis. In this talk, we will discuss the Stark Effect, how it differs from mass spectroscopy, how it can be utilized to distinguish between isomers and conformers, and discuss potential practical applications such as may exist in coatings and materials.

KEYNOTE ADDRESS

1:00 p.m. Cone Ballroom - BC

Frontiers in renewable feedstocks and the long search for value

Dr. Chip Frazier
Thomas M. Brooks Professor of Sustainable Biomaterials
Co-Director of the Wood-Based Composites Center
Virginia Tech Blacksburg, Va

Things might be changing; the big interest in renewable chemical feedstocks seems more persistent now. But there is no change in the decision process: we need equal or better performance at the same or better price. Focusing on performance, perhaps the greatest frustration in renewable feedstocks has been technical lignins, the waste-product from wood pulping like kraft lignin. Technical lignins are the antithesis of our petrochemical paradigm and infrastructure; they are chemically heterogeneous and therefore unpredictable with low performance and low value. Natural lignin, that is the way Nature provides it most times, is much closer to the purity, homogeneity, and predictability we expect from pure petrochemicals. And now finally a breakthrough has occurred! We can preserve the natural structure and remove the lignin! A new pulping procedure converts lignin into a stable, organic soluble derivative, and then removes that lignin in high yield. The new lignin demonstrates promise as a structural wood-bonding thermoset, implying that other industries could also use this new resin. What's the catch; isn't there always a catch? Yes! There are major pluses and minuses in this new technology. We

will learn about why lignin is so challenging and understand the new technology and how this breakthrough might finally provide competitive renewable feedstocks from lignin, just maybe.

Chip Frazier is the Thomas M. Brooks Professor of Sustainable Biomaterials at Virginia Tech and the Co-Director of the Wood-Based Composites Center, an industrial research consortium dedicated to industry service. Frazier teaches about the structure and properties of natural materials, adhesion, and wood-based composites. His research focuses on adhesion, thermosetting resins, and lignin chemistry.

Twelfth Wood Coatings and Substrates Conference

Thursday & Friday, September 24 & 25, 2022

Location: The University of North Carolina at Greensboro
Elliott University Center
Cone Ballroom
540 Stirling Street, Greensboro, NC 27412
Directions: https://parking.uncg.edu/
Conference Hotel: Greensboro-High Point Marriott Airport – Rate $135 by Sept. 10

Registration Form

Online registration at https://www.woodcoatingsresearchgroup.com/wood-coatings--substrates-conference-2026.html

Seating is limited, so register early

Last Name_____ First Name_____

Company or Affiliation_____

Mailing Address_____

Phone _____ Fax _____ Email _____

Registration Fee: The Cost of the Conference is Free.

Parking: Parking is available in parking decks throughout the campus for $10.00/day.
The recommended parking decks are Oakland Avenue Parking Deck, and Walker Avenue Parking Deck.

Lunch: There is a wide range of Restaurants within EUC and within walking distance of the UNCG Campus for lunch Thursday. Lunch will be provided Friday to allow opportunity for networking and visiting Sponsor booths. Please indicate if you will be attending lunch on Friday

Please RSVP me for dinner on Thursday evening YES / NO

I will be attending the Networking Lunch on Friday YES / NO
An Italian lunch will be served Friday. Menu includes Caesar salad, Mini cannoli and Parmesan herbed garlic bread. Please select your preference for pasta and entrée below (Note, this is not a reservation but a count)

Select your pasta

1. Fettucine Alfredo
2. Penne Marinara (VG)

Select your entrée

1. Rosemary white balsamic grilled chicken served with tomato basil bruschetta
2. Italian Meatballs

Questions: Please direct your questions to: Ron Obie r.obie@woodcoatingsresearchgroup.com

Please Return The Completed Form to:
Ronald Obie
Email: r.obie@woodcoatingsresearchgroup.com

Wood C&S 2026 Conference Committee

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