



Emulsion Polymers Consulting and Education, LLC presents

Water Absorption and Water Whitening of Solventborne and Waterborne Films*



A setting earth viewed from the moon
Artemis-II, April 6, 2026

***A 2-hour, On-line Tutorial
November 19, 2026***

Faculty

***Donald C. Sundberg, PhD
Michael F. Cunningham, PhD***

* Emulsion Polymers Consulting and Education (EPCEd) has a curriculum of 21 tutorials, treating both *fundamental* science/engineering topics and others treating *specialized topics*.

TUTORIAL OBJECTIVES: This tutorial might be described as “putting water back into dry films”. The presentations are designed to address the following questions: 1. What makes polymer films absorb water? 2. What is the physical structure of water in the films? 3. What is the saturation level of water in pure polymers – is it different in waterborne films? 4. What are the kinetics of water absorption into solventborne and waterborne films? 5. What causes water whitening in polymer films – how different is it in solventborne and waterborne films?

INTENDED AUDIENCE: This tutorial has been designed to address the application of synthetic latexes for films that are exposed to humid conditions, including liquid water. Participants will be engaged in discussions that contrast water absorption in solventborne films and waterborne films of the same polymer composition. Scientists and engineers tasked with developing new film products or solving problems with existing products will find this tutorial to be engaging.

STRUCTURE OF THE TUTORIAL: This on-line tutorial will be presented during a 2-hour period starting at 9:30 AM (EDT) on November 19, 2026. Participants will have received PPT slides prior to the date of the on-line session. Questions can be placed in the on-line Chat Box and discussed in a 30- minute session immediately following the formal presentation.

WORKSHOP OUTLINE: See next page for a topical outline. Faculty profiles follow on page 3.

REGISTRATION INFORMATION

The registration fee includes the tutorial PPT slide deck delivered to the registrant's email address. Presentations will be made on-line via Microsoft Teams. ***Early registration is recommended*** due to the tutorial size limitation of 30 participants.

Registration Fee: **\$450 USD**
Registration Form – **Go To Page 4**

Contact for further information:

info@epced.com

Water Absorption and Water Whitening of Solventborne and Waterborne Films

1.) What is responsible for films absorbing water?

Physical structure of water in polymers; saturation levels; effect on T_g (wet vs. dry T_g); copolymer composition effects

2.) Water saturation levels in waterborne films

Contrast with solventborne films for same overall polymer composition; effect of latex recipe on saturation levels (vinyl acids, surfactant type and level, including reactive surfactants); T_g effects via DSC and MFFT

3.) Water whitening in solventborne films

Where is the water? How does that cause whitening? Effect of polymer composition; effect of measuring temperature compared to T_g ; diffusion rates of water in solventborne films

4.) Water whitening in waterborne films

Comparisons between solventborne and waterborne films of the same polymer composition; brief review of the microscopic structure of *dried* waterborne films; diffusion of water in waterborne films

5.) Details of how water whitening begins, progresses and ceases

Water diffusion, nucleation of water domains, growth of domains, restrictions to growth

6.) Methods to restrict water absorption and whitening

Solventborne films – polymer composition, molecular weight, crosslinking, T_g (wet); waterborne films – all of the above plus reactive surfactants

7.) Reversibility of water whitened films

Thermal annealing

8.) Final thoughts and lessons learned

Faculty Profiles

Professor Donald C. Sundberg has been working in the field of emulsion polymers for 53 years. He received a bachelor's degree in chemical engineering from Worcester Polytechnic Institute (Massachusetts) and his Ph.D. from the University of Delaware. He worked on latex based impact modifiers for ABS resins with the Monsanto Company, scaling processes to the 10,000 gallon reactor size. He has extensive research experience in emulsion polymerization and is widely recognized for his work on structured latex particles. This has resulted in over 100 peer reviewed publications and many conference papers. In addition he has conducted many workshops, most notably the one on latex particle morphology control. He spent a sabbatical year at the Institute for Surface Chemistry in Stockholm and was Chair of the 1997 Gordon Research Conference on Polymer Colloids. He is the 2016 Mattiello Memorial Lecture awardee from the American Coatings Association. His research interests are in polymerization kinetics in solution, bulk and emulsion systems, interfacial science and polymer morphology control, diffusion in polymers, and coatings. He is an Emeritus Professor of Materials Science at the University of New Hampshire and is the founder of Emulsion Polymers Consulting and Education, LLC.

Professor Michael F. Cunningham has an extensive background in dispersed phase polymerizations, including suspension, emulsion, miniemulsion and dispersion polymerization. He received a bachelor's degree in Engineering Chemistry from Queen's University (Kingston, Ontario, Canada) and his Ph.D. from the University of Waterloo. He spent six years working on dispersed phase polymerizations in the Xerox Corporate Research Group, acquiring experience in process scaleup and technology transfer to manufacturing. He has an active research program in polymer colloids and emulsion polymerization, particularly in the area of living radical polymerization and stimuli-responsive particles, publishing over 250 peer reviewed publications, and holding 26 U.S. patents. He is Chair of the International Polymer Colloids Group, and holds a research chair at Queen's University. He has consulted with a number of companies in the area of emulsion and suspension polymerization, and lectured for over 20 years at industrial short courses on emulsion polymerization in the USA and Switzerland. He is a Partner with Professor Sundberg in the international consulting firm Emulsion Polymers Consulting and Education, LLC.

Water Absorption and Water Whitening of Solventborne and Waterborne Films
On-line tutorial

November 19, 2026

Registration Form

Name_____

Address_____

City/State_____

Postal Code_____

Country_____

Position or Title_____

Organization_____

E-mail_____

The cost of this tutorial is \$450 (USD). There is a non-refundable fee of \$60 (USD). Cancellation of registration can be made up until October 19, 2026 with a full refund less a \$60 processing fee.

Method of Payment:

- Credit Card (We accept Visa, MasterCard, American Express)

Please use this link to SwipeSimple to pay by credit card:

https://swipesimple.com/links/lnk_243005ffb323dcf906c3389aae254804

- Wire transfer from bank --- Please go to info@epced.com and request banking instructions.
- Company check (make payable to Emulsion Polymers Consulting and Education, LLC, 39 Nute Road, Madbury, NH 03823, USA)

Please submit this registration form as an attachment to info@epced.com. This registration form may serve as an invoice for those who register.