

Latex Film Formation Workshop

Day 1

AM: Introduction to the Workshop

1. Introduction to film formation
2. Creating latices with controlled properties
3. Colloidal Stability
4. Latex/coating rheology
5. Concepts of wetting and adhesion

PM: Latex film drying

1. Water evaporation
2. Vertical drying profiles
3. Techniques to study particle packing stage
4. Horizontal packing and drying fronts
5. Particle packing in “sparse binder” content coatings (as in paper coatings)
6. Latex and pigment particle packing - dynamic modeling

Day 2

AM: Deformation of binder particles

1. Geometric models of space filling rhombic dodecahedra
2. Driving forces for particle deformation
3. Resistances to particle deformation
4. Models for particle deformation
5. Effects of temperature on deformation
6. Effect of particle size and distribution
7. Determining deformation mechanisms for wet films
8. Other techniques to study particle deformation (AFM, TEM, etc.)
9. Introduction to film cracking

Day 2

PM: Polymer chain diffusion across particle interfaces

1. Thermodynamics of polymer-polymer interfaces
2. Development of mechanical strength and toughness
3. Polymer chain diffusivity
4. Importance of polymer Tg relative to drying temp.
5. Experimental techniques (FRET, TEM, SANS)
6. Influence of “hard particles” (e.g. pigments)
7. Influence of carboxylic acid comonomers
8. Influence of coalescing aids – issues of VOC
9. Crosslinking and diffusion

Day 3

AM: Surfactants and Composites

1. Surfactant distributions in wet latex films
2. Surfactant distributions in dry films – depth profiling
3. Effect of surfactants on film properties
4. Use of reactive surfactants
5. Composite latex films
6. Effects of pigments and fillers, CPVC
7. Water absorption into polymer films
8. Water whitening of polymer films

Day 3

PM: Future directions and challenges

1. Self-stratification during film formation
2. Film formation of anisotropic particles
3. IR processing of coatings
4. Textured coatings by IR assisted evaporative lithography
5. Marangoni effects
6. Open discussion and problem solving
7. Workshop evaluation by participants