Wood Adhesion Problem Solving:  
The Phenol-Formaldehyde Dimension  

December 7-8, 2005  

Presented by  
The Wood-Based Composites Center  

Location:  
Skelton Conference Center  
901 Prices Fork Road  
on the campus of Virginia Tech  
Blacksburg, Virginia  

What You Will Learn:  

Vast quantities of phenol-formaldehyde (PF) resin are used throughout North America in the manufacture of oriented strand board (OSB), plywood, LVL and PSL, as well as other wood-based composites. The development and use of PF resin has become more sophisticated as manufacturing processes have become more demanding and complex. Competition in the marketplace is tougher than ever, and recent supply shortages of other resins make optimizing the use of PF resin critical. Operations and technical support personnel must be well trained in order to consistently produce high quality products. 

During the course, you will learn:  
• Basic wood structure: hardwoods and softwoods  
• How PF resin is developed and manufactured  
• About the specifications of PF adhesive and why they are important  
• About the relationship between water and wood as it relates to adhesion using PF resin  
• The importance of wood surface quality and how it is evaluated  
• Tools for measuring and optimizing PF resin performance  
• About the issues surrounding volatile organic compound (VOC) emissions within the industry  

A strong understanding of the wood, adhesive, and their interaction during manufacturing will provide an edge needed to increase market share and keep customers satisfied. Academic and industry professionals will focus lecture material on both strand and veneer-based products. A panel discussion will address the issues and questions of course participants on the use of PF adhesives in their respective operations. Through class participation and networking, participants will take away new skills and knowledge to aid process optimization.
Who Should Attend:

This course is designed for individuals working in the forest products industry who wish to learn fundamental problem solving skills associated with the use of PF resin, including those working in:

- Quality assurance and technical support
- Machine-center operations affecting product quality and performance
- Adhesive sales or technical service
- Manufacturing management

Industry leaders considering the use of PF resin in their manufacturing process are also encouraged to attend. There are no prerequisites for participation.

Agenda:

Tentative Agenda:

DAY One

8:00 a.m.  Registration

8:30 a.m.  Welcome and Introductions

8:40 a.m.  Participant Introductions and Questionnaire

9:00 a.m.  Phenol-Formaldehyde Adhesives – An Overview

9:30 a.m.  Why Things Stick

10:00 a.m.  Break

10:15 a.m.  Inside Wood

11:15 a.m.  Wood as a Material – Part 1

12:00 noon  Lunch

1:15 p.m.  The Manufacture of PF Resin for Engineered Wood Products

2:00 p.m.  Specifications and Properties of PF Adhesives

2:45 p.m.  Break and move to laboratory

3:15 p.m.  Lab Exercises and Demonstrations

- Specifications and Quality Assurance Tests for PF adhesive users
- Adhesive Specifications / Material Safety Data Sheets (MSDS)
- Manufacture of an exterior plywood adhesive mix
- Microscopic bond-line evaluation

4:45 p.m. Questions and Discussion
Day One Wrap-up

**DAY Two**

8:15 a.m. Wood as a Material – Part 2

9:00 a.m. PF Adhesive Mixes for Veneer Applications

10:00 a.m. Break

10:15 a.m. Adhesive Penetration

10:45 a.m. Measuring and Improving Performance of PF for Strand Applications

11:45 a.m. Lunch

1:00 p.m. Measuring and Improving Performance of PF for Veneer Applications

1:45 p.m. VOC Emissions

2:30 p.m. Break

2:45 p.m. Mill Gluing Experiences / Solutions Panel Discussion

4:30 p.m. Questions and Discussion
Course Evaluation and Wrap-up

**About the Instructors:**

*Robert (Bob) Breyer* is the Senior Technology Manager for Wood Adhesives for Georgia-Pacific Resins in Decatur, Georgia. He has worked with GP Resins for 14 years and has been the technology manager for OSB, plywood and UF adhesives during this time.

*Charles (Chip) Frazier* is a Professor in the Department of Wood Science and Forest Products at Virginia Tech and the Director of the Wood-Based Composites Center. He specializes in adhesives and adhesion.

*Don McNary* is a Technical Manager for Georgia-Pacific Resins Inc. Wood Adhesives located in Lynchburg, Virginia. He has worked in the Wood Composite industry for 34 years spending time in management positions in Hardboard, OSB, MDF, & Particleboard. He has been with GP Resins for 10.5
years working in Sales and Technical Service in the U.S. and Internationally during this time. His experience includes several start ups of OSB plants within the U.S.

Gary Remillard is Dynea's NA Group Leader for Plywood, LVL, & PSL Adhesives: he's currently located in Springfield, Oregon. He has 30-years of experience in the formulation, development, and testing of PF and UF resins and adhesives supplied to the engineered wood products industry.

Audrey Zink-Sharp is an Associate Professor in the Department of Wood Science and Forest Products at Virginia Tech. She specializes in quantitative wood anatomy and microscopic analysis.

Cost: The cost for the two-day short course is $695.00 per person. Contributing Members of the Wood-Based Composites Center are eligible for a reduced cost of $625.00 per person, and Supporting Members for a fee of $525.00. Registration fee includes workshop materials as well as lunch and refreshments during the class.

Lodging: You are responsible for making your own lodging reservations. A block of rooms has been reserved at the Inn at Virginia Tech, 901 Prices Fork Road in Blacksburg, Virginia, at a special room rate of $95.00/single or $115.00/double occupancy per night plus tax. Reservations can be made by calling (877) 200-3360 or (540) 231-8000. Be sure to mention your participation in the “WBC Center Wood Adhesion Problem Solving” short course in order to receive the special room rate. The reserved rooms will be released to the public on November 14, 2005. Rooms are not guaranteed to be available after this date, and the reduced rate will no longer be offered, so reservations should be made early.

For More Information: Contact Linda Caudill, Managing Director, Wood-Based Composites Center at (540) 231-7092 or e-mail lcaudill@vt.edu.

To Register: Contact the Conference Registrar, Division of Continuing Education 810 University City Blvd., Suite D Virginia Tech Blacksburg, VA 24061 Phone (540) 231-5182 Fax (540) 231-3306