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Academic Education Background

Degree	Institution	Date	Major Field
B.S.	Colorado State University	1969	Wood Utilization
M.S.	Virginia Polytechnic Institute And State University	1973	Forest Products
Ph.D.	Virginia Polytechnic Institute And State University	1975	Forest Products

Employment History

Assistant Professor- Department of Wood Science and Forest Products, Virginia Tech 1975 to 1981

Associate Professor- Department of Wood Science and Forest Products, Virginia Tech 1981 to 1988,
Director of the W.H. Sardo Jr Pallet and Container Research Laboratory 1980 to 2007

Professor- Department of Wood Science and Forest Products, Virginia Tech 1988 to 2007, Director of the
Center for Unit Load Design 1996 to 2007.

Professor Emeritus- Virginia Tech- Present

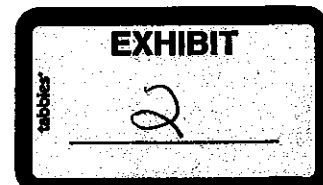
President – White and Company LLC- Present

Instructional Responsibilities Undergraduate Packaging Science Option

Wood 4224. Pallet, Container, and Unit Load Design
Wood 3224 Packaging and Materials Handling

Continuing Education Short Courses

Introductory Pallet Design Short Course
Advanced Pallet Design Short Course
Corrugated Packaging and Unit Load Design Short Course
Unit Load Design Short Course



Recent Publications **PUBLICATIONS**

REFERREED

- Hamner, P., **M. White**, J. Han, and R. Rupert. 2007. The effect of splicing method on the flexural performance of pallet deckboards and stringers. *Forest Products Journal* (in review).
- Hamner, P., **M. White**, and P. Araman. 2006. The frequency and level of sweep in mixed hardwood saw logs in the eastern United States. *Forest Products Journal* 57 (9).
- Chen, Z., **M White**, and W.H. Robinson. 2006a Preliminary Evaluation of Vacuum to Control Wood-boring Insects in Raw Wood Packaging Materials. *Forest products Journal* 56(7/8):21-25.
- Han, Jonkoo, **M. White**, and P. Hamner. 2007. Development of a finite element model of pallet deformation and compressive stresses on packaging within pallet loads. *Journal of Applied Packaging Research*. Vol. 1, No.3—March.
- Hamner, P., **M. White**, and P. Araman. 2006. The effect of curve sawing two-sided cants from small diameter hardwood sawlogs on lumber and pallet part yields. *Forest Products Journal* 56(10).
- Mitchell, H., **M. White**, P. Araman, and P. Hamner. 2005. Hardwood pallet cant quality and pallet part yields. *Forest Products Journal* 55(12).
- Clarke, J.W., **M.S. White**, and P.A. Araman. 2001. Comparative performance of pallet parts recovered from used wood pallets. *Forest Products Journal*, 51(2)55-62.
- Weigel, T.G. and **M.S. White**. 1999. The effect of Pallet Connection Stiffness, Deck Stiffness, and Static Load Level on the Resonant Response of Pallet Decks to Vibration Frequencies, Occurring in the Distribution Environment. *Packaging Technology and Science* (12):47-55.

Recent **TRADE PUBLICATIONS**

- **Hamner and M White. 2008. Analysis Improves Performance, Trims Costs of Block Stacked Unit Loads. *Pallet Enterprise Magazine*. March, 2008**
- Hamner, P and **M White**. 2007. Environmental Impacts from the Manufacture, Use and Disposal of Pallets. *Pallet Enterprise Magazine*. November, 2007
- Hamner, P., and **M. White**. 2007. A systems-based approach to unit load performance and efficiency. *MHIA - On the Mhove*. Vol 8 / Issue 2 pp. 12-13
- Hamner, P., J. Han, and **M. White**. 2007 Virginia Tech study maps stress distributions on pallets during use. *Pallet Enterprise magazine*. May, 2007
- Hamner, P. and **M. White**. 2007. Virginia Tech study compares methods for splicing pallet parts. *Pallet Enterprise magazine*. February, 2007
- Sin D-S, **M White**, J-K Han. 2007. Optimizing Pallet Sizes within the Global Supply Chain: Connecting Northeast Asia and North America. *On the Mhove*. Vol 8 / Issue 1 pp.8-9
- Hamner, P. and **M. White**. 2006. Is recycled plastic lumber a viable alternative for Pallets. *Pallet Enterprise magazine*. November, 2006.
- Hamner, P. and **M. White**. 2006. The next big idea: a case for systematic vs. component unit load design. *Pallet Enterprise magazine*. May, 2006.
- Hamner, P., and **M. White**. 2006. Virginia Tech study shows potential for finger jointing pallet parts. *Pallet Enterprise magazine*. February, 2006.
- Hamner, P., and **M. White**. 2005. How to design around a unit load. *Pallet Enterprise magazine*. November, 2005.
- **White, M.** and P. Hamner. ISO may demystify the application of RFID technology to pallets. *Pallet Enterprise magazine*. August, 2005.
- Hamner, P., **M. White**, and P.Araman. 2005. Analysis shows curved sawing small hardwood logs increases yield of side boards. *Pallet Enterprise magazine*. May, 2005.

Recent **MISCILANEOUS NON-REFEREED**

- Hamner, P. and **M. White**. 2004. Prevention and control of mold and mildew on pallets. National Wooden Pallet and Container Association (NWPCA). *Pallet Central magazine*. April, 2004.
- Hamner, P., and **M. White**. 2004. The relationship between pallet deck friction characteristics and unit load performance during materials handling. National Wooden Pallet and Container Association (NWPCA). *Pallet Central magazine*. August, 2004.
- Hamner, P., **M. White**, and R. Rupert. 2002. International phytosanitary standards for wood packaging materials. Research Update. Virginia Tech. Center for Forest Products Marketing and Management. 2 pages.

TECHNICAL FORUM PRESENTATIONS

- Hamner, P., and **M. White**. Feasibility of manufacturing pallet parts from short recovered hardwood segments using splicing technologies. Forest Products Society. 60th Annual Meeting, June 25, 2006. Newport Beach, CA.
- Hamner, P., **M. White**, and P. Araman. The effect of curve sawing two-sided cants from small diameter hardwood sawlogs on lumber and pallet part yields. Forest Products Society. 59th Annual Meeting, June 25, 2005. Quebec City, Quebec, Canada.
- Hamner, P., **M. White**, and P. Araman. Hardwood pallet cant quality and pallet part yields. Forest Products Society. 59th Annual Meeting, June 25, 2005. Quebec City, Quebec, Canada
- Chen Z., **M.S. White** and W.H. Robinson. 2006 The Application of Vacuum to Control Insects and Pinewood Nematodes in Wood Packaging Materials. In: Proceedings of International Wood protection 2006. March 21-23, 2006 New Orleans, LA USA.

Other Recent Publications

Rupert, R.L.M **White**. 2004. Effect of Southern Pine Dimension Lumber Grade on the Flexural Strength and Stiffness of CHEP USA Mark 55 Pallet Components. Center for Unit Load Design report submitted to Potomac Supply, Kinsale, VA, March 3, 2004, 16 pp.

Rupert, R.L., **M.S. White**. 2004. Optiledge Product Development Project: Test Results of Prototype HP-85-AD and LP-45-AD. Center for Unit Load Design report for Optilogistics, Dallas, TX, May 28, 2004, 19 pp.

Rupert, R.L., **M.S. White**. 2004. Preliminary Performance Evaluation of Wood Samples Treated with the Armacel Process . Center for Unit Load Design report for Armacel, Sydney, Australia, April 13, 2004, 12 pp.

Rupert, R.L., **M.S. White**. 2004. Comparative Performance Evaluation of Stanley Fastening Systems Pallet Plus Nails. Center for Unit Load Design report for Stanley Bostitch, East Greenwich, RI, Jan. 19, 2004, 19 pp.

White, M.S., R. L. Rupert. 2004. Intersol Cultured Marble Bath Products: Distribution Packaging Evaluation. Center for Unit Load Design report for DuPont Surfaces, Syracuse, NY, July 6, 2004, 11 pp.

Chen, Z., **M.S. White** and W.H. Robinson. 2004. Commercial Feasibility of Vacuum to Control Insects in Raw Wood Packaging Materials. Center for Unit Load Design report submitted to Limestone Bluffs Resource Conservation and Development. Limestone Bluffs, Iowa.

Chen, Z., **M.S. White** and W.H. Robinson. 2004. The Application of Vacuum to Control Insects in Raw Wood Packaging. Pallet Phytosanitary Project Bulletin No. 4. April 2004. Limestone Bluffs RC&D. Limestone Bluffs, Iowa.

Hamner, P.C. and **M.S. White**. 2004. Prevention and Control of Mold and Mildew on Pallets. Pallet Central July/August 2004. National Wooden Pallet & Container Association. Alexandria, Virginia.

White, M.S Characteristics and Unit Load Performance during Materials Handling. Pallet Central Sept. 2004 National Wooden Pallet & Container Association. Alexandria, Virginia.

Hamner, P.C., **M.S. White**. 2004. The Effect of Curve Sawing Hardwood Logs on Pallet Part Yield and Quality. Pallet Central, April 2004, pp. 14-15. National Wooden Pallet & Container Association. Alexandria, Virginia.

White, M.S., R. L. Rupert. 2003. Preliminary Performance Evaluation of the Prototype Hunter Paine Composite Lexite Pallet Designs. Center for Unit Load Design report submitted to Hunter Paine, Lafayette, CA, January 10, 2003.

White, M.S., R. L. Rupert. 2003. Preliminary Performance Evaluation of the Prototype BCI 48x40-inch Paperboard Pallet Design. Center for Unit Load Design report submitted to BCI Engineering, Newark, NJ, January 17, 2003.

White, M.S., R. L. Rupert. 2003. Comparative Performance of Threaded Pallet Nails Manufactured by Steeland Corporation of Seoul, Korea. Center for Unit Load Design report submitted to Steeland, Seoul, Korea, January 30, 2003.

White, M.S., R. L. Rupert. 2003. Relative Stacking Strength of Three Basalite Used, Repaired Pallet Designs (48x48, 40x48, 34x48) used to Ship Concrete Block and Bagged Concrete Mix. Center for Unit Load Design report submitted to Basalite, July 24, 2003

White, M.S., R. L. Rupert. 2003. The Effect of Radio Frequency Heat Treatment of Green Hardwood Pallet Parts on Pallet Performance. Center for Unit Load Design report submitted to Mississippi State University Department of Forest Sciences. Starkville, Mississippi. August 15, 2003.

White, M.S., R. L. Rupert. 2003. Evaluation of the Compatibility of Corrugated Common Footprint Compliant, and Returnable Plastic Containers within Mixed Unit Loads during the Order Picking, Storage, and Shipment of Fresh Produce. Center for Unit Load Design report submitted to Reusable Pallet Container Coalition and the Corrugated Packaging Alliance, October 13, 2003.

Hamner, P.C., **M.S. White**. 2003. Mold, Mildew on Pallets, Lumber, Can be Prevented, Eliminated. Pallet Enterprise, September, pp. 40-43.

White, M.S. 2003. Guidelines to regulate treatment, storage, and disposal of wood by product materials, the Virginia Department of Environmental Quality, Richmond, Virginia.

White, M.S. and R. L. Rupert. 2003. Preliminary Evaluation of a Mark 55 Pallet Design Manufactured with Brazilian Grown Pinus Taeda. Center for Unit Load Design report submitted to CHEP, Sao Paulo, Brazil, March 17, 2003.

White, M.S. and R. L. Rupert. 2003. Comparative Performance Evaluation of Stanley Fastening Systems Pallet Plus Nails. Center for Unit Load Design report submitted to Stanley, East Greenwich, RI on October 5, 2003.

White, M.S. R. L. Rupert, and P.C. Hamner. 2002. Preliminary performance evaluation of the BTD second prototype aluminum pallet designs. Center for Unit Load Design report submitted to BTD of Detroit Lakes, Minnesota. 16 pp.

White, M.S., R. L. Rupert, and P.C. Hamner. 2002. Comparative resistance of a prototype presswood and pine pallet block to simulated rough handling in the CHEP USA Mark 55 pallet design.. Center for Unit Load Design report submitted to Litco International of Vienna, Ohio. 22 pp..

White, M.S., R. L. Rupert, and P.C. Hamner. 2002. Comparative strength, stiffness and functionality of new and remanufactured 37x32 plywood deck Anheuser Busch block style pallet. Center for Unit Load Design report submitted to Smith Company of Pelhem, Alabama. 14 pp

White, M.S., R. L. Rupert, and P.C. Hamner. 2002. Performance evaluation of the Envirokare glass-filled polypropylene prototype plastic pallet. Center for Unit Load Design report submitted to Envirokare, Las Vegas, Nevada. 11 pp.

White, M.S., R. L. Rupert, and P.C. Hamner. 2002. Performance evaluation of the PECO 48x40, stringer prototype hardwood pallet design without butted top deck endboards. Center for Unit Load Design report submitted to PECO, St Louis, Missouri. 18 pp.

White, M.S., R. L. Rupert, and P.C. Hamner. 2002. Material properties of pallet parts manufactured from plantation grown eucalyptus grandis in Uruguay, South America. Center for Unit Load Design report submitted to Asun, Portland, Oregon. 24 pp.

White, Marshall S., R. L. Rupert, and P.C. Hamner. 2002. Comparative performance evaluation of two 37 x 32 prototype plastic pallets for use by Anheuser Busch. Center for Unit Load Design report submitted to Anheuser Busch, St Louis, Missouri. 15 pp

White, M.S., R. L. Rupert, and P.C. Hamner. 2002. Preliminary performance evaluation of 48x40, non-reversible, partial 4-way, three stringer green hardwood pallets assembled using miller wood dowel fasteners. Center for Unit Load Design report submitted to Miller Dowel, Chicago, Illinois. 14 pp.

White, M.S., R. L. Rupert, and P.C. Hamner. 2002. Preliminary performance evaluation of pallets made of green finger jointed hardwood components. Center for Unit Load Design report submitted to Auburn Machinery, Auburn, Maine. 21 pp.

Clarke, J.W., **M.S. White**, and P.A. Araman. 2001. The effect of stringer repair methods and repair frequency on the performance of GMA-style 48x40-inch wood pallets. Pallet & Container Research Bulletin No. 25. Center for Unit Load Design, Department of Wood Science & Forest Products, Virginia Tech. Blacksburg, Virginia.

Presentations

White, M.S. 2006. Pallet Performance Testing and Evaluation. China International Pallet Conference. Beijing, China November 28-29.

White, M.S. 2006. The Case for Developing Systems-Based Design for Unit Loads, Materials Handling industry of America, NA06 Conference and Expo, March 28, Cleveland, Ohio.

White, M.S. 2005. The Effect of Mechanical Interactions Between Pallets and Packaging on Packaging Costs. International Safe transit Association, Dimensions 05, March 8 to 11 Orlando, Florida.

White, M.S. 2005. Unit Load Design as a Profitable Sales Strategy for the Pallet Manufacturer. Presented at the Western Pallet Association Meeting, Rancho Mirage, CA, January 14-18, 2005.

White, M.S. 2004. International Phytosanitation Regulation of Raw Wood Packaging and Its Impact on Lumber, Pallet, and Container Manufacturers: The Latest Developments. Led seminar in conjunction with Expo Richmond 2004, June 3, 2004.

White, M.S. 2004. Molds on Wood Pallets and Containers: Control and Prevention. Presented at the Wooden Pallet Seminar. Houston, TX. August 26, 2004.

White, M.S. 2004. U.S. Wood Pallet Industry: A Brief Overview. Presented to Appalachian Lumberman Club, Greensboro, NC. January 13, 2004.

Maccubbin, Bonnie J., R. L. Rupert, P.C. Hamner, **M.S. White.** 2004. Expo Richmond 2004. Exhibited in tradeshow, June 4 - 5, 2004.

White, M.S. 2004. Overview of the US Pallet Industry. ISO TC51 Special Seminar, presented in Seoul, Korea, November 1, 2004

White, M.S. 2004. Wood Packaging Regulations for Export & Import. A seminar addressing ISPM #15 Guidelines for Regulation of Wood Packaging Material in International Trade (A Virginia Economic Development Partnership), Abingdon, Virginia, December 7, 2004

White, M.S. 2003. ISO TC51 Working Group Meeting. Milan, Italy; November 25-28, 2003, and Seoul, Korea November 2-4, 2004. Marshall White represents the USA on this working group and is the working group convener.

White, M.S. 2003. Implications of Product Standards on Markets for Wood Containers. ProMat2003: 3rd Annual Wood Container Technology Coalition, Chicago, IL, February 13-15, 2003.

White, M.S. 2003. Economics of Reusable Pallets. Annual Meeting of the Re-useable Pallet and Container Coalition, Dallas, TX, January 14-15, 2003.

White, M.S. 2003. Business Opportunities Associated with New International Phytosanitation Regulations of Raw Wood Packaging. Presentation to the Montgomery County Resource Conservation and Development (RC&D) group, Blacksburg, VA, May 15, 2003.

Maccubbin, Bonnie, Ralph Rupert, **Marshall White**. 2003. Exhibitor at ProMat2003. Center for Unit Load Design participated as an exhibitor (booth #C3560) at the ProMat2003 tradeshow sponsored by the Material Handling Industry of America, February 10-13, 2003, Chicago, IL.

White, M.S. 2003. NM-II: PDS New Release Overview and Challenging Your Business Future. NWPCA Annual Leadership Conference, Marco Island, FL, February 22-25; also served as Panel Member to discuss future industry standards; served on Research and Standards Committees .

White, M.S. 2003. First International Symposium of Pallet Testing. Fraunhofer Institut Materialfluss und Logistik, Dortmund, Germany, June 24-25, 2003. The Sardo Pallet Lab served as manager of the project (Dr. White is convener of the ISO TC51 "Pallets for Unit-Load Methods of Materials Handling," working group 2). White was conference moderator and presented the paper Determining Pallet Maximum Working Loads from Nominal Load Measurements (White, M.S., W. Dibling, R. Rupert, and J. McLeod, 2003).

White, M.S. 2003. Technical Developments in the Pallet Industry. 57th European Federation of Wooden Pallets and Packaging Manufacturers Congress, September 10-12, 2003, Edinburgh, Scotland

White, M.S. 2003. Wood containers of the Future. Meeting of the Container coalition. Atlanta, GA. September 18-19, 2003.

White, M.S. 2002. Spoke on the latest version of PDS, which features a model for predicting the performance of remanufactured pallets and combo pallets, The National Wooden Pallet and Container Association Recycling and Repair Conference. Charlotte, North Carolina.

White, M.S. 2002. Harmonization of International Standards for Packaging, Pallets and Unit Load Shipping Systems. World Pallet Council Meeting. Washington, DC. May 16, 2002.

White, M.S. 2001. Using the Pallet Design System (PDS). National Wooden Pallet & Container Association Annual Leadership Conference. Lake Buena Vista, Florida. February 24-27, 2001.

White, M.S. 2001. Pallets as Global Distribution Platforms. Interpal 2001. Bordeaux, France. May 16-18, 2001.

White, M.S. 2000. Performance of Pallets of Different Materials. 54th Congress of the European Federation of Pallet Manufacturers. May 13, 2000. Stockholm, Sweden.

White, M.S. 2000. Test Methods for Pallets and Comparative Performance of Timber, Plywood, and Plastic Pallets. PalMarknaden. November 21, 2000. Stockholm, Sweden

Recent Research Projects

Development of a Reliability Based Model for Predicting the Durability of Wood Pallets

Sponsor: National Wooden Pallet & Container Association

Amount: \$140,000

1998-2000

Effect of Load Bridging on the Distribution of Stresses Across Pallet Decks During Warehouse Racking

Sponsor: National Wooden Pallet & Container Association

Amount: \$109,000

2000-2002

The Effectiveness of Splicing Un-notched Hardwood Pallet Stringer Segments with Metal Connector Plates

Sponsor: Wood Education Resource Center and USDA Forest Service

Amount: \$60,025

2000-2001

The Effect of Curve Sawing Small Diameter Hardwood Sawlogs on Pallet Part Yields.

Sponsor: Wood Education Resource Center

Amount: \$44,879

2000-2001

Topographical Mapping of the Mechanical Stresses on Wood Pallets During Use

Sponsor: The Pallet Foundation

Amount: \$6,600

2002

Compatibility of Corrugated and Returnable Plastic Common Footprint Compliant Containers During Produce Storage and Distribution

Sponsor: Corrugated Packaging Alliance and the Renewable Pallet & Container Coalition

Amount: \$22,800

2003

Application of Vacuum to Control Insects in New Wood Packaging Materials

Sponsor: Limestone Bluffs RC&D Inc.

Amount: \$43,719

2003

Commercial Feasibility of Vacuum to Control Insects in Raw Wood

Sponsor: Limestone Bluffs RC & D Inc.

Amount: \$59,999

2004

Technical and Economic Feasibility of Manufacturing and using Pallet parts from Green Finger Jointed Hardwood Pallet Cants

Sponsor: The Pallet Foundation and USDA Forest Service

Amount: \$13,000

2004

Predicting Mechanical Properties of Dry Hardwood Pallet Parts

Sponsor: National Wooden Pallet & Container Association

Amount: \$60,200

2004

Developing the Semi-Empirical Model for Predicting the Fastener Shank Withdrawal Resistance of Annularly Threaded Nails in Wood Pallets

Sponsor: National Wooden Pallet & Container Association

Amount: \$6,000

2005

Feasibility of Manufacturing Pallet Parts From Short Hardwood Segments Using Splicing techniques

Sponsor: USDA Forest Service
Amount: \$102,984
2005

Development of a Finite Element Model of Pallet Deformation and Compressive Stresses on Packaging Within Unit Loads
Sponsor: The Pallet Foundation
Amount: \$15,000
2005

Investigation on the Efficacy of the Vacuum Control of emerald Ash Borer and Pinewood Nematode under Field Conditions
Sponsor: USDA Forest Service
Amount: \$65,353
2006

Preventing and eliminating Mold growth on Hardwood Lumber and Pallets
Sponsor: USDA Forest Service
Amount: \$100,353
2006

High Vacuum as a Treatment for Wood Packing Materials by the Asian Long Horned Beetle
Sponsor: USDA Animal Plant Health and Inspection Service
Amount \$16,474
2006

Non-Wood Pallets for use within the DoD/ DoN Logistics System
Sponsor: Department of Defense, Naval Inventory Control Point
Amount: \$25,000
2006

Furniture Packaging Efficiency Evaluation
Sponsor: American Woodmark
Amount: \$56,000
2007

Memberships and Offices in Professional Organizations

Member of American Society of Testing Materials (ASTM) D-10 Committee on Packaging and Subcommittee D10-22 on Handling and Transportation Test Methods

Membership in the Society of Wood Science and Technology, Forest Products Society, Institute of Packaging Professionals

Member of the ANSI MH 10 Committee, Unit loads and Transport-Packages.

ISO TC 51 Liaison to JTC 104/122 on RFID Applications to Transport Packaging.

Chairman of the American Society of Testing and Materials ASTM D10.21 Task Group concerning pallet testing

Head of the US Delegation to the International Standard Organization ISO TC-51 Technical Committee "Pallets for Unit-load Methods of Materials Handling."

Chairman of the Materials Handling Industry of America and American National Standards Institute, MH1 Committee "Pallets, Slipsheets, and Other Bases for Unit-loads."

Recognition and Honors

Named the Manager of the International Pallet Testing Project of the International Organization of Standardization. Geneva, Switzerland

Named one of the top ten professionals in the discipline of materials handling, Modern Materials Handling Magazine, December 1999.

Named Convener of the International Organization of Standardization (Geneva, Switzerland) TC51 - Pallets for Unit-Load Methods of Materials Handling, Working Group 2

Recent Consulting Clients

Dupont Surfaces

Dupont TiO₂

Mapei

COORS Brewing Company

GE Plastics

Home Depot

WalMart

Philip Morris

Department of the Navy

Georgia Pacific Corp

Coca Cola