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# Furniture

## HIGHLIGHTS



May 2004

*Helping furniture manufacturers achieve and sustain international recognition and competitive advantage through nationally recognized research, technical assistance and educational programs.*

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## Weyerhaeuser and the American Furniture Manufacturers Association provide funds for distance learning

The Weyerhaeuser Company Foundation and the American Furniture Manufacturers Association Foundation are taking the lead in providing new technology to deliver educational programs to Mississippi's furniture manufacturers. Each foundation has donated \$25,000 to support distance learning capabilities for the Institute of Furniture Manufacturing and Management (IFMM) which is housed in the Franklin Center at Mississippi State University.

These contributions will be used to purchase instructional technology tools and equipment to allow the institute to provide workforce education and training to the state's furniture manufacturers. In addition, the advanced instructional capabilities at the Franklin Center will provide enhanced learning opportunities for forest products and furniture students in the department of forest products. These technologies will aid the department in recruiting more students to the program. The technologies also afford opportunities for collaboration with MSU's division of continuing education to provide distance learning for both credit and non-credit courses.

The Franklin Center's 100 seat auditorium will be outfitted with an instructional technology podium complete

with lap top, document camera, gooseneck lamp, wireless microphones, DVD, VCR, and projection system as well as a customized display and control system for distance learning. A large classroom—with a capacity of 40 students—will also be outfitted with similar instructional technology. A portable cabinet with multi-media tools will enhance presentations and facilitate group collaboration and information sharing in the computer classroom and the conference rooms at the Franklin Center. The executive conference room will be equipped with a suspended LCD projector, lap top, and audio conference system.

The purchase and installation of multi-media and distance learning equipment will be completed in two phases. Phase I has been fully funded and equipment, which includes the portable multi-media cabinet with equipment and tools, three LCD projectors, 3 lap tops, 12 pc's, a multi-media podium unit, and an audio conference system has been ordered. Fund raising efforts are underway to secure donations to help complete Phase II. If you or your company would like to contribute toward this effort, please contact Mr. Keith Gaskin, Development Officer, 662.325.3815.



*Weyerhaeuser executives met with College representatives to discuss distance learning. Seated, left to right, Ben Jones of Weyerhaeuser timberlands, Forest and Wildlife Research Center director Bob L. Karr, Randy Darracott of Weyerhaeuser building materials. Standing, left to right, Liam Leightley, forest products department head and Steven Bullard, institute director.*

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## MSU furniture institute recognized for industry contributions

The university's Institute of Furniture Manufacturing and Management is being honored with the 2004 Southern Growth Innovator Award for its role in boosting the Mississippi industry in the face of increasing global competition.

"While furniture manufacturing is important to the state, many companies and suppliers have been impacted in recent years by imports, primarily from countries where wages are much lower and costs of production are less because of fewer environmental regulations," said institute director Steven Bullard.

Bullard said furniture manufacturing has an economic impact of \$4.1 billion in Mississippi each year, and is the state's No. 1 employer among the durable manufactured goods industry. The MSU institute provides research, service and education to help increase the international competitiveness of manufacturers, he added.

More specifically, the Southern Growth Innovator Award recognizes the MSU institute for assisting Mississippi furniture manufacturers in a variety of ways to prevent job dislocation.

The institute conducts multi-disciplinary applied research to address current and future manufacturing needs of the furniture industry. This includes the implementation of "lean manufacturing" processes, which are designed to produce superior quality

products at a low cost for furniture and supplying businesses.

"It has been estimated that furniture research at Mississippi State University is saving the state's manufacturers around \$3 million each year," said Liam Leightley, head of MSU's department of forest products.

He said creation of the institute in 2001 and the opening of MSU's Franklin Center for Furniture Manufacturing and Management earlier this year represent novel moves to help furniture manufacturers and supplying businesses reach their full potential.

"Our expertise in furniture manufacturing and management will allow our state's manufacturers to thrive and prosper in an ever-increasing competitive global marketplace," Leightley predicted.

Mississippi State established the furniture institute as an interdisciplinary unit that includes the College of Forest Resources, Forest and Wildlife Research Center, College of Business and Industry, Bagley College of Engineering, College of Architecture and the MSU Extension Service.

The Southern Growth Policies Board is a non-partisan public policy think tank based in North Carolina. The board is a public-private partnership devoted to strengthening the South's economy and creating the highest possible quality of life.



*The Franklin Center for Furniture Manufacturing and Management was officially opened during a dedication ceremony January 23. Governor Haley Barbour joined MSU President Charles Lee and other state and university officials to open the 35,000-square-foot facility. Rep. Billy McCoy of Rienzi, new speaker of the Mississippi House of Representatives, and Senate Appropriations Committee Chair Jack Gordon of Okolona also participated. Pictured, left to right, Forest and Wildlife Research Center director Bob Karr, forest products department head Liam Leightley, Governor Haley Barbour, MSU president Charles Lee, lead contributor Hassell Franklin, Senator Jack Gordon, Representative Billy McCoy, IHL board member Bryce Griffis, IHL board member Scott Ross, and institute director Steven Bullard.*

## Doing is believing with Easy Life Chair company

by Philip Steele and Duane Motsenbocker

A trip to the “Easy Life Chair Company” turns lean manufacturing processes into more than a pipe dream for both company management and employees. Tour guide Duane Motsenbocker can take employees on a visit to “Easy Life” without leaving the comfort of their facility. The secret to the “easy” visit to “Easy Life” is the fact that this is a simulation of a chair company that is made for ease of travel.

Relying on the principal that “doing is believing”, Mtsenbocker has been taking companies on such visits for over the last two years. By participating in a test of both a current batch processing manufacturing line and a new lean manufacturing line, the principles of lean are understood by employees at a basic level not attained by reading a book or attending a seminar.

Easy Life Chair company produces one product, the Easy Chair Model EC-299792-01.

“The model number includes the speed of light in meters per second (299792 mps) for Easy Life’s product. This high speed symbolizes the increase in productivity that is aimed for by the lean conversion that we simulate,” Mtsenbocker said.

Duane’s simulation consists of hundreds of PVC pipe components that it takes to make the chair. These are assembled into the final chair by crews from the audience. The crews are first assigned to typical batch production-line work stations which include raw material supply, top back assembly, bottom back assembly, seat assembly, leg assembly, final assembly, and warehouse. The group is challenged to use this batch organization to produce 18 chairs in 5 minutes.

“Each group that has participated differs in their approach and energy level applied. One thing is consistent however, groups are never able to produce 18 chairs with the batch method. Seven is the highest number of chairs a group has produced using the batch method and many groups are unable to produce a single chair,” Mtsenbocker said.

A second consistent feature of the group performance by the batch system is

considerable idle time at some operations as workers wait for the previous station to complete its work and for materials movers to move the work in process to the next operation. This exercise demonstrates to the group that considerable manpower is diverted to non value-adding processes such as materials handling with batch manufacturing.

After the simulated chair is built under the batch method, the groups are reorganized into a lean manufacturing system, which is comprised of a one-piece flow line supported by work cells. Work is organized in such a way that the workers themselves move single pieces of work-in-process to adjacent workers.

“Batches of work-in-process are not allowed to accumulate between work stations in the lean system. Partially assembled work pieces move downstream as completed work is pulled away by the downstream workers. Raw materials are delivered and finished products taken to the warehouse,” Mtsenbocker added.

The productivity of the lean system at the end of five minutes always differs radically from that of the batch system. All groups are able to complete 18 chairs in less than five minutes.

The difference in performance between the two systems is immediately apparent to those who have participated in the simulation. It doesn’t matter how fast workers perform tasks under the batch system, they are always defeated by the inherent constraints of the system itself.

“To those of us who are members of a society that has participated and believed in the efficiency of the batch system for generations, a demonstration such as this is almost a necessity to indicate a need for change,” Mtsenbocker noted.

Companies, or other groups, who would like the “Easy Life” chair company demonstration performed at their site should contact Duane Mtsenbocker at 662.325.2160. Duane also has a kit available with all the required PowerPoint presentations, facilitator’s notes and a list of the materials needed to run the simulation.





# New Publication

***The Double-D Cell for Assembling Hardware in Upholstered Furniture Production*** by Steve L. Hunter, Steven H. Bullard, Philip H. Steele, and W. Duane Motsenbocker is now available. This publication is Case Study #1 in the series of studies of lean manufacturing in furniture and supplying industries to foster increased international competitiveness. This research bulletin is available free of charge from the Forest and Wildlife Research Center. You can download this publication from the Institute Web site at [www.ifmm.msstate.edu](http://www.ifmm.msstate.edu). To receive a printed copy, contact Karen Brasher at 662.325.8083 or E-mail at [kbrasher@cfr.msstate.edu](mailto:kbrasher@cfr.msstate.edu).

*Past issues of the Furniture Highlights Newsletter are also available on-line at [www.ifmm.msstate.edu](http://www.ifmm.msstate.edu).*

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## Visiting Scientist Phillip Darby

Phillip Darby, mechanical engineer in the Building and Non-Metallic Department of the Bureau of Standards in Jamaica is now visiting the Department of Forest Products as a visiting scientist.

Darby is working closely with Dr. Jilei Zhang and others in MSU's furniture research unit to fine tune his testing and manufacturing process skills. He will be trained on all aspects of furniture testing, manufacturing, and other furniture related processes in a customized eight-week course.

In Jamaica, Darby prepares standards, technical regulations and testing procedures for the furniture unit. The furniture unit is a new component within his department and is the only one of its kind in the Caribbean Region. The unit will soon begin implementing furniture standards for monitoring manufacturers in the Caribbean Region.

At MSU, Darby will learn basic furniture concepts such as strength design, computer-aided design, analysis and performance testing. He will also be briefed on the physical and mechanical properties of wood and wood composites.

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