



Forest products graduate students Yucheng Peng (left), Lee Mangum and Jinshu Shi remove a piece of formaldehyde-free oriented strand board from the pilot-scale press.

# Cleaning up Indoor Air:

## Formaldehyde-Free Building Materials Goal of MSU Research

By Karen Brasher

Some 29,000 FEMA trailers still dot the Gulf Coast almost 3 years after Hurricane Katrina swept away entire communities. Researchers at Mississippi State University are looking for ways to eliminate a problem with some of the materials used in the compact housing units.

The Centers for Disease Control has reported that some of the trailers have formaldehyde levels nearly 40 times higher than normal. Formaldehyde gas can be released from plastics, foams, vinyl tile, carpet, upholstered furniture and some composite wood products. The gas that causes the "new car smell" in vehicles also contains formaldehyde.

Formaldehyde is in so many products, it is hard to escape exposure altogether. However, toxic levels can cause respiratory problems, headaches, nosebleeds and a host of potentially long-term health problems. Additionally, some individuals are sensitive to relatively low levels of formaldehyde.

"While airborne formaldehyde has recently grabbed the headlines, it is something scientists have been addressing for years," said Rubin Shmulsky, head of the Department of Forest Products at Mississippi State. "Years of research and testing related to composite panel products has yielded significantly reduced formaldehyde emission levels and has helped tighten up air pollution quality standards."

Currently, scientists in MSU's Forest and Wildlife Research Center are working to develop formaldehyde-free adhesives for composite wood products such as plywood and particleboard. Their work is helping ensure that composite panels are not a significant source of free formaldehyde gas in homes.

"A patent is pending on a resin developed by MSU scientists that produces 80 percent less formaldehyde emissions, with a similar cost and similar strength and durability," Shmulsky said.

MSU scientists have also assisted in the development of a low-cost, real-time sensor that detects formaldehyde and other chemicals in the air.

"Since 1990, MSU scientists have contributed to federal standards that address methods for measuring formaldehyde and other chemicals that can be emitted from wood products," said Leonard Ingram, forest products professor. "We were one of the first universities to demonstrate the use of a pilot scale kiln for effectively measuring volatile organic compounds. This type of equipment has become a federally recognized and acceptable means of pollution measurement."

In fact, the Environmental Protection Agency's standards were based in part on MSU studies, Ingram added.

Scientists also have been working on methods to improve indoor air quality in homes through the collaborative efforts of the Southern Climatic Housing Coalition. The coalition includes MSU's College of Forest Resources, Bagley College of Engineering and College of Architecture, Art and Design, as well as the USDA Forest Service.

The program includes a demonstration house designed to highlight methods of design and construction that specifically improve indoor air quality, reduce energy consumption and increase durability.

"For many individuals along the Gulf Coast, the issue of airborne formaldehyde is a focal point of life," Shmulsky said. "We hope that there is some level of comfort in knowing that our efforts are working directly toward addressing indoor air quality to protect the health and well-being of Mississippians and others."

A primary goal of MSU's formaldehyde research is to improve and protect the quality of people's lives both today and well into the future, he added.