WORKSHOP PAVES WAY FOR FUTURE RESEARCH ON LUMBER

Research needs, strategies, and priorities for improving our understanding of how the mechanical properties of lumber respond to processing and use environments were evaluated in a May workshop at the U.S. Forest Products Laboratory (USFPL) in Madison, Wisconsin. The workshop was titled "Research Needs on How the Environment Affects Mechanical Properties of Lumber."

The workshop was organized by Duane Lyon, Mississippi Forest Products Laboratory, and Bill Galligan (USFPL) as a follow-up to the Symposium on Structural Use of Wood in Adverse Environments that was cosponsored by SWST in 1978. This workshop was cosponsored by SWST, the U.S. Forest Products Laboratory, and the Mississippi Forest Products Utilization Laboratory.

After a welcome by Bill Bohannan, USFPL, Lyon defined the scope of the workshop and suggested several general research approaches needed to obtain useful information on the degradation of wood by biological or chemical factors, temperature and moisture content, and load history factors. Then Galligan emphasized the importance of developing a data base of information for lumber and timber for environmental problem areas and reviewed how this data base could be interpreted and applied in the engineering community. Joe Murphy, USFPL, outlined concerns of European and Japanese scientists that were expressed at a recent IUFRO meeting he attended, and he discussed possible international research cooperation. Bob Meyer, State University of New York, summarized thoughts from the Symposium on Structural Use of Wood in Adverse Environments in a paper coauthored by Bob Kellogg, Forintek Canada Corp.

The remainder of the first day and half of the second day were devoted to short papers that reviewed past and current research and identified gaps in the data base on environmental effects.

One series of papers focused on biological and chemical factors. Warren Thompson, Mississippi Forest Products Utilization Laboratory, discussed the effect of preservative treatments and treating conditions on properties and performance of wood products. Rod DeGroot and Wally Eslyn, USFPL, and Wayne Wilcox, California Forest Products Laboratory, discussed aspects of biological degradation of wood and identified research needs in this area. Al DeBonis, Virginia Tech, presented a paper on strength properties of blue-stained wood from beetle-infested southern pine, authored by Tom McLain and Geza Ifju. Roger Rowell, USFPL, focused on the influence of the chemical environment on the strength of wood fibers.

The effect of temperature and moisture content on lumber properties was the subject of papers presented by DeBonis, Dave Green, USFPL, and Eddie Price, Southern Forest Experiment Station. Dave discussed procedures for adjusting the strength of lumber for moisture differences. Al gave a progress report, coauthored by Tom McLain and F. Wilson, on a study of the strength-moisture content relationship for southern pine structural lumber. Eddie's paper reviewed high temperature drying of southern pine.

Three papers were concerned with load history. The effects of prior loading with emphasis on rapid loads of short duration were reviewed by Roy Pellerin,

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Washington State University. The effect of temperature and moisture content on duration of load of lumber was summarized by Chuck Gerhards, USFPL. R. C. Tang, Auburn University, presented two models for predicting degradation of lumber by environmental factors.

The formal portion of the workshop concluded with papers by Arno Schniewind, California Forest Products Laboratory, and Erv Schaffer, USFPL, which stressed the importance of developing modeling techniques to evaluate damage under adverse environments. Borg Madsen, University of British Columbia, presented his view of timber engineering research priorities based on research that he and others have carried out in Canada.

After the formal presentation of papers, a half day was spent in small group discussions. Each group dealt with a different environmental factor and then reported their deliberations to a plenary session the final day of the workshop.

Dave Barrett, Forintek Canada Corp., and Stan Suddarth, Purdue University, circulated among the small group discussions. This enabled them to summarize and wrap up the workshop. Dave concluded that future research is needed on: (1) factors affecting strength of lumber, such as duration of load and moisture; (2) nondestructive testing, particularly for evaluating the effects of adverse biological and chemical environments; (3) effect of hazards such as snow and wind loads; (4) response of fasteners to corrosion and to long-term and dynamic loading; and (5) maintenance requirements and schedules. Dave emphasized the challenge to develop a data base to serve future needs even though the needs may not yet be understood. Stan discussed strategies for research implementation. Suddarth emphasized, with several examples, the need for research that will improve industry's position, and concentrate on the right problem. Stan discussed how the truss lumber research program was organized, and he drew parallels for a program on environmental effects. He stressed the need to look at both the lumber and the fastener systems. Stan concluded by commenting on the role of mathematical modeling and simulation in research.

The workshop focused on broad areas of concern that will require interdisciplinary cooperation and interlaboratory coordination to provide fruitful research results. Copies of the proceedings from the workshop will be distributed gratis to all full members of SWST. A limited number of additional copies will be available from the U.S. Forest Products Laboratory. *Wood and Fiber* readers are encouraged to study the workshop proceedings, which will soon be available. Comments and further input from individuals and laboratories are invited. These should be directed to Duane Lyon, P.O. Drawer FP, Mississippi State, MS 39762, or to the U.S. Forest Products Laboratory, Madison, WI, 53705.

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