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## **The Journal of Adhesion**

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### **Foreword**

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## Foreword

It was not that long ago that I had the good fortune to work with several friends and colleagues on a major research proposal. This proposal, entitled “Surface Characterization of Wood by Fourier Transform Infrared and Laser Raman Spectroscopy: Implications for Adhesive Bonding”, was carefully prepared and sent off to a major federal funding agency. After four months of waiting, I received a call from the head of the *civil engineering* section of the agency, to whom our proposal had been sent for review. He had expressed concern that he was not sure how he should review it and asked me for comment. My first question was why his unit had been selected for the review of this proposal in the first place. While he was not altogether sure himself, he suggested that the selection process for review had something to do with the fact that we had put the word “wood” in the title of the proposal, and everyone knows that wood, in the form of dimension lumber, is used for building small structures.

This type of response concerning the most widely used engineering material in the world is quite common. Wood is an interesting material. Were it not so incredibly plentiful, we would be forced to invent it. As it is, we have wood in relative abundance in a form that is virtually ready for end use, or so it would seem to the metallurgist or polymer composite specialist.

Why people often fail to appreciate the sophisticated nature of wood can be understood from one very important perspective. While other engineering materials have evolved in their sophistication wood, for all its value to modern society, has changed very little in the last four thousand years. I suppose the wood beams and lumber sold to Noah were not very different from the wood beams and lumber one buys today in any lumber yard. However, there is one very obvious and important difference. Noah could not buy a structural grade durable sheet of plywood. A very good argument could be offered suggesting that the development of panel products was the single most important new manipulation of wood since some caveman used a piece of wood for the ridge pole of the first lean-to. Panel materials lend themselves to totally new forms of engineering with wood that simply are not available with lumber and planks. The only reason we now have wood panels is because of the excellent wood adhesives available to manufacturers.

I have picked on the structural panel as an obvious innovative use of wood

with glue, but the importance of wood adhesion and adhesives touches our daily lives in innumerable ways. Simply look about you. The wood in the pencil you hold in your hand, the chair you sit on, and the doors and floors of many of your rooms are both glued and painted—processes which are intimately related to adhesion. It has been estimated that 70% of all wood currently in use relies on adhesion and adhesives in some form.

Louis Sharpe, editor of *The Journal of Adhesion*, felt strongly enough about the importance of wood to encourage the publication of papers relating to wood and adhesion in this special issue of *The Journal of Adhesion*. These papers all came from the First Annual International Symposium on Adhesion and Adhesives for Structural Materials, held at Washington State University in Pullman, Washington, U.S.A., Sept. 29–Oct. 1, 1981. Authors from this meeting were encouraged to submit their papers for publication. Obviously, not all speakers submitted their work. Those who did had their manuscripts subjected to a vigorous peer review, consistent with the high standards of this journal. Perhaps I am biased, but I would like to think that several of the best papers which were presented are included in this dedicated issue.

As a substrate in adhesion research and industrial bonding, wood offers challenges and problems not found with other materials. The papers published here discuss the use of isocyanate binders, the control of formaldehyde release from urea-formaldehyde resin, joining of wood *via* direct chemical bonding, fracture mechanics of wood joints and chemistry of furan binders, to name but a few of the subjects. I would like to call special attention to the first paper, which is on the economic importance of wood adhesives and bonding, because it delineates the fiscal impact of the papers which follow.

The materials and techniques being discussed in the papers in this issue will not be those normally found in this journal. Also, the chemistry will not strike a familiar chord with, for example, the people who glue metal airplanes together. That's OK. The ultimate hope of this issue, and of those which we hope will follow, is that the materials researchers who typically do not think of wood as a high technology substrate may gain a new insight into this most interesting biological polymeric composite. Also, by publishing papers of importance to the wood industry in this journal, the traditional wood technologist will be exposed to other materials, concepts and research techniques that he or she would not normally consider. We hope this is the beginning of something new, interesting and useful.

William E. Johns  
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and Ad Hoc Editor