

Innovation and Challenges in Bio-based Composites

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The 9th Pacific Rim Bio-Based Composites Symposium co-sponsored by IUFRO [5.00.00](#) and [5.05.00](#) returned to its roots when it was held in Rotorua, New Zealand from 5 - 8 of November, 2008. The inaugural Symposium in this series was launched in Rotorua in 1992. The event under the theme of "Innovation and Challenges in Bio-based Composites – How Far to the New Frontier?" had a good international representation, with almost three quarters of the attendees coming from outside New Zealand.

Life Cycle Workshop

The main Symposium was preceded by a one day workshop that focused on Life Cycle Assessment and how Life Cycle Thinking can stimulate lateral solutions for environmental problems. Workshop attendees worked through case studies and examples in groups, which demonstrated how as researchers we can use a range of options to innovate beyond what we perceive as the initial problem.

The pre-symposium workshop was concluded with two presentations from North American speakers who gave perspectives on how North America is tackling environmental solutions for wood-based products. Paul Smith from Pennsylvania State University focused on how North American resin manufacturers are seeing formaldehyde emissions as the largest single environmental issue they need to address, while Mike Wolcott from Washington State University looked at the role of 'Green Building' standards or certification and how wood may play a role in Green Buildings of the future.

Looking at new technologies from different angles

The four keynote speakers gave different, complementary perspectives on bio-based composites. Mike Wolcott reviewed technologies used in wood plastic composites (WPC), and gave an excellent overview of the wider aspects of sustainability, such as function, life and design for deconstruction that must be considered to have truly sustainable materials and products.

Chris van Kooten from Dynea spoke about the role of a commercial adhesive supplier in wood-based composites, while Paul Smith looked at mechanisms by which new technologies, with a focus on WPCs, obtain market penetration and a 'tipping point' in growth occurs.

Philip Evans from the University of British Columbia demonstrated his world leading research by showing results of an integrated X-ray micro-computed tomography (CT) analysis of UF resin distribution in 3-D through particleboard.

Observations in this work led to the conclusion that significant resin migration across wood particles occurs during the hot pressing of the panel.



Photo: Innovatek. Ltd; Group exercise on Life Cycle Thinking from the pre-symposium. From left to right: Jake McLaren (Formway Furniture in NZ) and one of the workshop facilitators; Mike Wolcott (Washington State University, USA); Rob Wellwood (Alberta Research Council, Canada); Warren Grigsby (Scion, New Zealand); Lionel Crawley (New Zealand Trade and Enterprise).

Interesting data on panel manufacturing and hot pressing

After an intensive exchange of information on latest developments in the fields of adhesives, fibre reinforced plastics, volatile organic compounds and reconstituted panel products, a plenary session wound up the Symposium.

A revealing overview of the diversity in panel manufacturing facilities in China was followed by a presentation showing some interesting results from including essential oils in panel manufacture.

The final presentation covered the complex physical and chemical phenomena that occur in the composite hot pressing process. Interesting data were presented which suggested that marked increases in bond strengths could potentially be achieved through the implementation of cooling stages in the pressing process.

Next symposium

Feedback from delegates indicated that the 9th Pacific Rim Bio-Based Composites Symposium was a success. It was announced that Canada would be the host for the 10th symposium in the series. The organizing committee of the 9th symposium would like to wish Rob Wellwood and his team every success for the 10th Symposium which will be held in Banff in 2010.

Conference site: <http://www.biobased-composites.com/>