

7th & 8th October 2015

# Review



This year the International Panel Products Symposium, organised by BC, teamed up with COST Action FP1303 – ‘Performance of bio-based building materials.’ Over 100 guests were welcomed to Llandudno with representatives from around Europe and as far afield as Canada, Uganda and South Korea. With a mix of academic and industrial delegates, the symposium was a perfect event to exchange ideas within the sector.

Keynote speaker Professor Phil Evans from the University of British Columbia, Canada opened the symposium with some stunning images of wood composites using X-ray micro-computed tomography and disproved a commonly held misunderstanding of resin being present as “spot welds”. Additional presentations in the first session were provided by Dr Martin Olmeyer from Germany and Dr Jakub Sandak from Italy. Dr Olmeyer demonstrated how the Fibre Cube can be used to provide information on fibre quality in MDF production while Dr Sandak highlighted a multi-sensor approach for characterising the surface of particleboard panels.



*Prof Phil Evans Key Note speaker during his presentation on his work using X-ray micro-computed tomography.*

Sessions over the two days covered:

- 1) fundamental characterisation
- 2) resins and additives
- 3) feedstocks, recycling and waste materials
- 4) durability and performance
- 5) Bio-based building materials sponsored by COST FP1303.

In session 2, presentations addressed the topical issue of bio-derived resins and a theme that has been at the heart of the wood composites industry for some years - no/low formaldehyde resins. Dr Anne Christine Steenkjaer Hastrup, from the Danish Technological Institute presented work on the performance of water-borne flame retardants. The need for new fire retardants in wood based construction products is another area of growing concern: most fire retardants available today are based on toxic or eco-unfriendly systems.



Craig Bartlett from MDF Recovery Ltd kicked off session 3, with a presentation demonstrating the potential for closed-loop recycling of MDF. He showed how reclaimed MDF fibre can be incorporated either back into MDF products or alternative products such as insulation. An alternative approach of what to do with waste MDF was highlighted by Dr Mark Irlle and colleagues from France. They used waste MDF fibre to extract nano-crystalline cellulose (NCC) which can then be used for the production of high value products such as emulsions, adhesives, paints and composites. Dr Serge Medved, from Slovenia, described the use of partial liquefaction as a method for remediation of waste wood. Partial liquefaction involves a mixture of chemical reagents, which are heated with wood waste. Contaminants such as paints and varnishes dissolve in the black liquor and the wood particles are then washed clean in distilled water.



Durability and performance was the largest session at this year's symposium with eight presentations. Prof Callum Hill opened the session with a note of caution when using generic figures for embodied energy and global warming potential from different databases. He also called to our sector to make sure that the positive environmental benefits of using timber products in the built environment, namely their ability to store atmospheric carbon dioxide over long periods of time be more widely promoted.

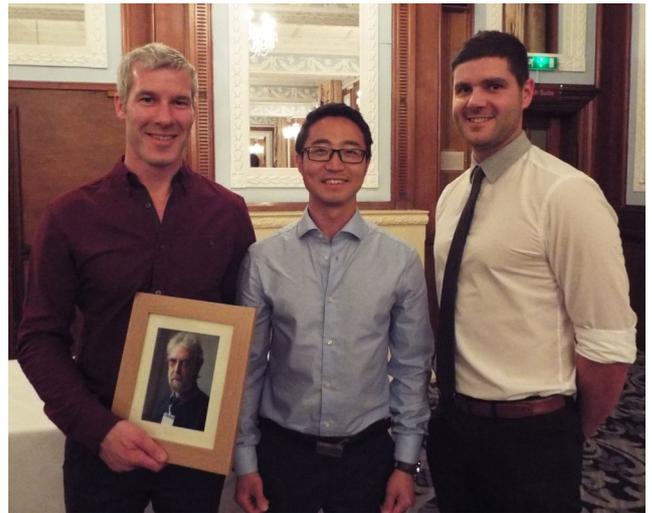
Other papers in session 4 included methods to improve performance such as reducing thickness swelling by creating a 3-dimensional adhesive network, by Wenchang (Will) He and the thermo-hydro treatments of birch ply to improve dimensional stability and biological durability, by Dr Juris Grinins. Two papers looked at the assessment of performance of wood-based materials in outdoor conditions whilst Bronia Stefanowski, from BC, showed the sorption of volatile organic compounds by modified MDF panels and the effect of this on mould colonisation and growth. The significant influence that blue stain infected spruce wood had on particleboard properties was demonstrated in the paper presented by Dr Martin Weigl and was explained by altered resin penetration.



The final session of the symposium was dedicated to COST Action FP1303 with Dr Denis Jones, chair of the cost action providing an overview. Entitled 'Performance of Bio-based building materials' this COST Action aims to help maintain and expand the market potential for bio-based building products in construction by ensuring that good performance data and suitable test methodologies to determine performance of many of these 'new' bio-based products are available. Linking into the previous papers on bio-based and low formaldehyde resins this session included presentations on the modelling of performance - including VOCs in indoor environments.

In addition to the main symposium a poster session attracted over 12 poster presentations for people to read and discuss during breaks. The winner of the poster competition was Matthew Schwarzkopf and colleagues from the University of Primorska, Slovenia, for their poster on 'Integrating optical measurement and modelling for quantitative analysis of the micromechanical load transfer in the wood-adhesive bond interphase'. The model that they developed can be used to analyse stress and strain patterns inside a bond interphase and from this to virtual investigations on the influence of adhesive penetration and polymer properties on the performance of adhesive bonds.

The Gala dinner was a great social event that was encouraged by the requisite IPPS Quiz, which as usual generated lively debate and competition between teams. We were honoured this year to be joined by Nathan and Joseph Earl the sons of the late Dr Harry Earl. Harry Earl was the technical director of Kronospan, Chirk and passed away in 2014. Through financial donations from Kronospan, CRC Chemicals and BC we were pleased to be able to award the first 'Harry Earl Memorial Scholarship Award' to Wenchang (Will) He from the University of British Columbia. The award is given to early career researchers specialising in wood products to help them achieve future career aspirations and is a fitting legacy in remembrance of Harry.



*Will He winner of the inaugural Harry Earl Memorial Scholarship Award with Harry's sons Nathan and Joseph Earl.*

Finally a big 'thank you' from all the organisers of IPPS to our delegates but especially to the speakers and our sponsors, without their help and generous support we would not have such a successful event. We look forward to meeting both old and new faces at the IPPS masterclass in Bangor in 2016 and back in Llandudno in 2017 for the next symposium. Keep checking our website for updates.

