FORUM WOOD BUILDING NORDIC

ADVANCED PROCESSES FOR ENHANCED PERFORMANCE

September 25–27, 2019
Aalto University, Finland
WEDNESDAY SEPTEMBER 25

Welcome reception
18:30–20:00 Welcome reception, Helsinki City Hall
Organized by the city of Helsinki

THURSDAY SEPTEMBER 26

Joint session Opening
9:00 Welcome and introduction
Gerhard Fink
Professor for Wooden Structures, Aalto University – Finland
9:10 Make complex structures affordable
Olivier Baverel
Prof. ENS Architecture Grenoble & Prof. Ecole des Ponts ParisTech – France
9:50 Digital craftsmanship: Growing buildings as eco-systems
Arthur Mamou-Mani
Architect, Director of Mamou-Mani Ltd – UK

Coffee break
10:30 Coffee Break
Sponsored by Ministry of the Environment

TRACK A
Digitalisation, engineering and fire safety

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<th>Session</th>
<th>Track A Session A1</th>
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The developments in building information modelling apply ultimately to a wide integration in the entire construction sector value chain. The present session offers a glimpse of how digitalisation (or BIM) is utilised and how these technologies are developing in the timber construction sector. Some aspects are reviewed on the state of art in the sector in general, on utilisation in the production processes at present and on modelling of performance such as acoustics.

TRACK B
Potential of architectural design and sustainability

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<tr>
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Tools have consequences. Today, architectural design is embedded into short- and long-term feedback loops of information, such as user, physical and environmental data as well as structural performance, fabrication- and assembly-strategies. Simultaneously a renaissance in geometry can be recognized, utilizing and revitalizing traditional craftsman’s knowledge. Digital simulation technology allows for quantified and qualified performance analysis, and enables designers to incorporate results into the design workflow. So, is wood just ready or already in the core of this future development?

TRACK C
Living, innovations and research

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Industrial wood construction not only offers the potential to decrease environmental impacts of the construction sector, it also provides social benefits such as pleasant living environments. Despite this, the expectations of end users have gained less attention among businesses and within the society. This session provides new results on this topic and presents new options to increase customer value and develop brands in housing business.
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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
<th>Affiliation</th>
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<tr>
<td>11:00</td>
<td>Chair’s opening words</td>
<td>Tomi Toratti</td>
<td>Dr. Senior Advisor, Federation of the Finnish Woodworking Industries – Finland</td>
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<tr>
<td>11:10</td>
<td>Current trends and developments in building information modelling</td>
<td>Arto Kiviniemi</td>
<td>Honorary Research Senior Fellow and Professor, Univ. of Liverpool – UK</td>
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<tr>
<td>11:30</td>
<td>Current state on the use of building information models in the timber sector</td>
<td>Tarja Häkkinen</td>
<td>Senior principal research scientist, VTT – Finland</td>
</tr>
<tr>
<td>11:50</td>
<td>A model to predict the acoustic performance of timber floors</td>
<td>Pekka Latvanne</td>
<td>Project Engineer, A-Insinöörit Suunnittelu Oy – Finland</td>
</tr>
<tr>
<td>12:10</td>
<td>Sweco Timber Hack: clarifying structural timber design dataflows for parametric and AI-enabled design</td>
<td>Katja Rodionova</td>
<td>Specialist at Sweco – Finland</td>
</tr>
<tr>
<td>11:00</td>
<td>Chair’s opening words</td>
<td>Günther Filz</td>
<td>Professor of Structures and Architecture, Aalto University – Finland</td>
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<tr>
<td>11:10</td>
<td>Architectural design through production</td>
<td>Andreas Folk</td>
<td>Researcher at KTH Royal Institute of Technology – Sweden</td>
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<tr>
<td>11:30</td>
<td>Reciprocal frames in mass timber. New applications of a historic building technique</td>
<td>David Bowick</td>
<td>President at Blackwell Structural Engineers – Canada</td>
</tr>
<tr>
<td>11:50</td>
<td>Innovative timber structures through digital methods</td>
<td>Christopher Robeller</td>
<td>Professor of Digital Timber Construction TU Kaiserslauern – Germany</td>
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<tr>
<td>12:10</td>
<td>Taiyuan Botanical Garden from sketch to reality</td>
<td>Michael Lohmann</td>
<td>Head of Design Technology/ Project Manager, Delugan Meissl Associated Architects – Austria</td>
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<tr>
<td>11:00</td>
<td>Chair’s opening words</td>
<td>Katja Lähtinen</td>
<td>Research Professor at Natural Resources Institute Finland</td>
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<tr>
<td>11:10</td>
<td>Healthy affordable living</td>
<td>Julia Ahvenainen</td>
<td>Partnerships and Sales, Stora Enso – Finland</td>
</tr>
<tr>
<td>11:30</td>
<td>Shared logic for creating value-added in wooden multistorey construction: comparison of three projects from Finland</td>
<td>Anne Toppinen</td>
<td>Professor, Director of Helsinki Institute of Sustainability Science – Finland</td>
</tr>
<tr>
<td>11:45</td>
<td>Institutional and policy frameworks shaping the wooden multi-storey construction markets: A comparative case study on Austria and Finland</td>
<td>Heini Vihemäki</td>
<td>Researcher at University of Helsinki – Finland</td>
</tr>
<tr>
<td>12:00</td>
<td>Consumers’ perceptions on the properties of wood affecting their willingness to live in and prejudices against houses made of timber</td>
<td>Katja Lähtinen</td>
<td>Research Professor at Natural Resources Institute Finland</td>
</tr>
<tr>
<td>12:15</td>
<td>Designing sustainable living with wood – consumer perspective and user involvement</td>
<td>Eliisa Kykilähti</td>
<td>Researcher, University of Helsinki – Finland</td>
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**Lunch**

12:30 Networking Lunch
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<tr>
<th>Time</th>
<th>Session A2</th>
<th>Session B2</th>
<th>Session C2</th>
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<tbody>
<tr>
<td>13:30</td>
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<tr>
<td>13:40</td>
<td>Timber housing developments in Russia</td>
<td>CLT-concrete-composite floors: serviceability considerations and shear reinforcements</td>
<td>Modern plywood products and applications</td>
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<td>14:00</td>
<td>Structural solutions for concentrated loads on floor systems</td>
<td>Active bending in timber structures: Two case studies</td>
<td>Recent developments in the standardization of LVL and of wood based panels</td>
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<td>14:20</td>
<td>Potential of cross-laminated timber as independent shear wall system</td>
<td>Algorithmic experiences in wood design</td>
<td>LVL structures in Wood City Supercell office building (and ATT residential building)</td>
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<td>14:40</td>
<td>Coffee break</td>
<td>Wood solutions in challenging geometry</td>
<td>A new truss concept for a targeted use of spruce glulam and beech LVL</td>
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**Construction systems Session**

The session highlights the state of the art and future of the wood based construction including log houses, massive and light frame construction and hybrid structures introduced by leading companies in the world.

**Experiments, experiences and expertise Session**

The discussion opens viewpoints to wood from renewing the tradition to new technologies and creativity in design solutions.

**Veneer products Session**

The Session presents the latest development of veneer based products and applications and gives an overview of the European standardization of wood-based panels and LVL.
Wood based systems are the solution for urban construction due to speed, light weight and environmental benefits. Wooden products enable increased prefabrication. This again means increased output, faster payback, high quality, and minimized disturbance. The use of laminated veneer lumber (LVL) has steadily been growing since the 1970’s. The initial driver for the development of LVL has been the good efficiency of the used wood material. Low waste of material and uniform quality improves the overall material and time efficiency especially in industrial applications and off-site production of construction elements.

The leading European LVL producers and technology providers have prepared a complete guidebook for architects, structural engineers, technical wholesalers, off-site element manufacturers, contractors, carpenters and other construction professionals, as well as for the educational sector. What is the big picture of LVL today and how has the use of LVL been developing? The session will offer participants a free copy of the new European LVL Handbook and introduce the contents of the publication.

Chair: Matti Mikkola
Managing Director at Federation of the Finnish Woodworking Industries – Finland

15:30  **LVL the big picture**
Matti Kairi
Emeritus Professor, Aalto University – Finland

16:00  **New LVL products and building concepts**
Antto Kauhanen
Business Development Manager at Stora Enso – Finland

16:20  **Recent developments and applications of LVL**
Frank Werling
Head of Technical, Engineering and Design, Metsä Wood – UK

16:40  **LVL Handbook presentation**
Jouni Hakkarainen
Leading Expert, Eurofins Expert Services Oy – Finland

**Dinner**

19:00  **Dinner, restaurant: Fazer Food & Co restaurant, A Bloc**
Otaniementie 12, 02150 Espoo
Sponsored by Stora Enso
We are living in unprecedented times – climate change, loss of biodiversity and a rapidly increasing global population are placing intolerable stress on the environment. It is well known that buildings and construction account for a significant share of these impacts and in this session, we will explore how the use of wood in construction can play a part in mitigating these effects in a sustainable manner. In the future, will we think of wooden buildings not just as living or working places, but also as carbon stores that will be recirculated into new buildings? Will the wood material contained in buildings be seen as a valuable resource that not only performs its technical function in the building but it also stores carbon and substitutes energy intensive materials, thereby helping to mitigate climate change? These questions and others will be explored.

Chair: Mark Hughes
Professor of Wood Technology, Aalto University – Finland

8:30  Forests in climate change mitigation and sustainable bioeconomy
Pekka Leskinen
Head of bioeconomy program, European Forest Institute – Finland

9:00  The sustainability performance of wooden construction products in a nutshell
Holger Wallbaum
Professor in Sustainable building, Chalmers University – Sweden

Coffee break

9:30  Networking coffee
Session A3
Room A
Fire safety of high-rise buildings

The session presents developments of new fire design rules of Eurocode 5 and methods of structural protection, as well as analysis of fire incidents and regulatory changes that allow higher timber buildings and wider use of wood-based products.

Session B3
Room B
Sustainable wood construction

Wood products used in buildings can store carbon for long periods and, by substituting materials like steel and concrete, can displace the emissions associated with their production. What is this potential for wood in construction to mitigate climate change and what strategies do we need to adopt to maximize this?

Session C3
Room C
New findings in wood research

In this session research activities relevant for the use of wood as construction material are presented. The session focuses on the structural behaviour of different types of metal type fasteners as well as the determination and consequences of moisture induced stresses in structural applications.

10:00 Chair’s opening words
Esko Mikkola
Chief Fire Safety Expert, KK-Palokonsultti Oy – Finland

10:10 New fire design rules for the new EC5, fire part
Joachim Schmid
Researcher ETH Zurich – Switzerland

10:30 Protections of timber structures (gypsum boards and others) – failure times and start of charring
Alar Just
Professor Tallinn University of Technology – Estonia

10:50 Fire accidents – case study analysis and/or statistics based information
Daniel Brandon
Researcher Rise – Sweden

11:10 Fire regulations based on justified performance for multi-storey timber buildings
Esko Mikkola
Chief Fire Safety Expert, KK-Palokonsultti Oy – Finland

10:00 Chair’s opening words
Markus Hudert
Dr. Research Fellow II, Singapore University of Technology – Singapore

10:10 Environmental impact assessment of CLT and glulam in two residential nearly zero energy buildings
Nicola Lolli
Researcher SINTEF Byggforsk – Norway

10:30 Wooden buildings as carbon storages – mitigation or oration?
Henrik Heräjärvi
Wood scientist at Natural Resources Institute Finland

10:50 Plastics in (wooden) buildings
Tarja Hääkinen
Senior principal research scientist VTT – Finland

11:10 Climate-KIC -Wood construction in climate change mitigation
Chiara Piccardo
Dr. Post-Doctoral Researcher, Aalto University – Finland

10:00 Chair’s opening words
Gerhard Fink
Professor for Wooden Structures, Aalto University – Finland

10:10 Determination of the moisture change behavior of cross laminated timber using optical flow
Markus Hofinger
PhD Student Graz University of Technology – Austria

10:30 Moisture induced stresses in glulam beams of timber bridges. Case-study: Vihantasalmi Bridge
Stefania Fortino
PhD, Senior Scientist at VTT – Finland

10:50 Probabilistic modelling of brittle failure in dowel-type steel-to-timber connections
Robert Jockwer
Professor at Chalmers University – Sweden

11:10 Properties of axially-loaded self-tapping screws applied in hardwood
Reinhard Brandner
Professor, Graz University of Technology – Austria

Lunch
11:30 Networking Lunch
The last session introduces alternative scenarios for the future of wood construction. The presented scenarios will be debated in a panel discussion, moderated by Philip Tidwell. The audience can also present their comments.

**Chair:** Philip Tidwell  
*Architect at Aalto University – Finland*

**12:30**  
**Construction at the crossroads: How to prepare for the Anthropocene?**  
**Matti Kuittinen**  
*Senior Specialist, Ministry of the Environment of Finland, Adjunct Professor, Aalto University – Finland*

**13:00**  
**Insights from various perspectives**  
*Panel discussion with representatives from finance, architecture, engineering, construction, and municipalities*  
**Anssi Lassila,**  
*Architect, director and founder of OOPEAA – Finland*  
**Rami Erkkilä,**  
*Manager, Lending at Municipality Finance Plc – Finland*  
**Ulla Loukkaanhuhta,**  
*Project director, City of Helsinki – Finland*

**Joint session**  
**Closing notes**

**13:20**  
**Closing notes**

**13:25**  
**Presentation Forum Wood Building 2020**

**Coffee**

**13:30**  
**Networking coffee**