

Sunday 19 May		
7:30	Durability fun run	
10:00	Excursion (registration required)	
13:30-17:00	Registration Crown Plaza Hotel - ground floor	
17:30-20:30	Welcome Reception World's Fair Park Sunsphere	

Monday 20 May		
	Opening Plenary Session President: Rod Stirling Vice-President: Miha Humar Secretary-General: Mats Westin	
08:30-08:50	Opening Ceremony of the 55th Annual Conference Opening address by Rod Stirling , President, The International Research Group on Wood Protection Jeff Lloyd , Local Organizing Committee	
08:50-09:30	Plenary 1. Opening of the meeting 2. Approval of the agenda 3. Membership issues - New regular and student members, new corporate members and members deceased 4. Announcement of this year's award recipients - Honorary Life-Long Membership - Ron Cockcroft Award	24-60533

Scientific Main Session – keynote Chair: Miha Humar		
9:30-10:00	State of U.S. Forests: Status and Projections from the 2017 Forest Resources Report and the 2020 Resources Planning Act Assessment S Oswalt	24-50399
10:00-10:30	The past, present and future of hardwoods in North America D Brooks	24-50400
10:30-11:00	Coffee / Tea	

Scientific Main Session – section papers Chairs: Miha Humar, Mark Mankowski, Gerald Presley, Kévin Candelier, Jan Van den Bulcke, Boštjan Lesar		
11:00-13:00	»RCA« Research on gaseous COS degradation by brown-rot fungus <i>Gloeophyllum trabeum</i> R Iizuka , R Tsukida, Y Katayama, M Yoshida	24-11033
11:20-11:40	»RCA« Studies on the treatability of selected pine species and corresponding efficacies of a new non-biocidal treatment T R da Silva Lins , L Emmerich, H Miltitz, P H Gonzales de Cademartoni, R J Klizke, M Pereira da Rocha	24-20721
11:40-12:00	»RCA« Influence of the substitution of phenol with lignin cleavage products in phenol-formaldehyde impregnation resins for wood modification on the fungal decay resistance and impregnation depth J Karthäuser , L Tarentino, A Treu, H Miltitz, G Alfredsen	24-30805
12:00-12:20	»RCA« Changes in decay risk of wood in ground contact over Europe, from analysis of historic climate conditions P B van Niekerk , B N Marais, G Alfredsen, C Brischke	24-41008
12:20-12:40	Keeping Wood Greenest: Maximizing the Unique Benefits of Preserved Wood Through End-of-Life Planning to Realize Carbon Sequestration and a Circular Economy J D Lloyd , B Poe	24-50387
12:40-13:00	Discussion and questions	
13:00-14:00	Lunch	

Parallel Session - Pinus		
14:00-15:30	WP 2.1 Wood preservatives Convener: Richa Bansal & Jae Woo Kim	
	Why Preserved Wood Is Used for Infrastructure <u>S T Smith</u>	24-20711
	Comparison of Residual Methylisothiocyanate (MITC) in Australian and South American Hardwood and Softwood Treated with a Solid Compressed Dazomet Fumigant Stick <u>R Tungal</u> , M Powell, J J Morrell, T Singh	24-20712
	»RCA« Enhancing UV resistance and decay resistance of wood by nanoparticle dispersed linseed oil nanoemulsion <u>R Bansal</u> , R Kumar, K K Pandey	24-20706
	»RCA« X-ray micro-computed tomography of copper distribution in CA, ACQ and MCA treated wood and changes in microstructure of ACQ-treated southern pine following natural weathering <u>D Feng</u> , M Turner, P D Evans	24-20707
	Discussion and questions	
15:30-16:00	Coffee / Tea	

16:00-17:30	WP 2.1 Wood preservatives cont. Conveners: Richa Bansal & Jae Woo Kim	
	Exposure tests on railroad ties treated with DOT L Arthur, <u>J-W Kim</u>	24-20705
	Barriers of Polyglycol/Borate Treated Wood Prevent Termite Attack to Untreated Wood Above Them in 10-Year Field Tests K W Ragon, <u>J D Lloyd</u> , T L Amburgey	24-20709
	Benefits of Borate Dual Treatment <u>S T Smith</u> , J D Lloyd, S McKinney	24-20710
	Discussion and questions	
17:45	President's RECEPTION (upon invitation) The Star TN River Boat Paddle Steamer	

Parallel Session - Quercus		
14:00-15:30	WP 1.1 Microorganisms Convener: Katie Ohno	
	»RCA« Time-lapse evaluation of <i>Aureobasidium pullulans</i> growth on selected lignin derivatives and chitosan A Gubensek , F Poohphajai, A Tošić, K Butina Ogorelek, W Pajerski, A Černoša, V Hribljan, A Sandak	24-11032
	Characterization of cell wall morphology and water-soluble extractives in Japanese larch decayed by white-pocket-rot fungi Y Mori , H Arai, T Ito, H Hashitani, K Yamashita, Y Ota, M Kiguchi	24-11034
	Cellulose nanomaterials in growth media for wood decay fungi K Ohno , R Arango, R Sabo, C Clemons, G Kirker, A Bishell	24-11035
	Discussion and questions	
15:30-16:00	Coffee / Tea	

16:00-17:30	WP 1.2 Insects & Marine borers Conveners: Rachel Arango & Mark Mankowski	
	Prevention of Termite Tubing on Foam Insulation Materials Q Wu , J Curole, J D Lloyd	24-11039
	Protocol of action in urban areas affected by subterranean termite attacks in Spain. Example of management in the old town of Areatza D Lorenzo , J Benito, J Arancon, D Luengas	24-11037
	Laboratory evaluation of PA1b, an insecticidal protein extracted from pea seeds (<i>Pisum sativum</i>), as bait active ingredient against the subterranean termite <i>Coptotermes gestroi</i> (Blattodea: Rhinotermitidae) in tropical zones J Vuillemin , D Messaoudi, P da Silva	24-11038
	Do naturally sequestered biocidal metals contribute to the marine borer resistance of turpentine? P D Evans , H Matsunaga, D Feng, M Turner, C Kewish	24-11036
	Discussion and questions	
17:45	President's RECEPTION (upon invitation) The Star TN River Boat Paddle Steamer	

Tuesday 21 May

Parallel Session Pinus		
8:30-10:10	WP 5.3 Environmental impact Convener: Gerald Presley & Davor Kržišnik	
	Copper migration from preservative-treated Douglas-fir decking: models vs laboratory leaching data M J Konkler, G Presley, J J Morrell , T Singh	24-50390
	Quantifying metal migration from a deck constructed with copper-azole-treated lumber G Presley , M Konkler	24-50391
	Quantitative Assessment of Wood Preservative Emissions to Waterways K J Rader , R Carbonaro, C Mackie	24-50393
	Exploring the Migration of Creosote in Freshwater Environments: A Study on Treated Wood Immersion I Rashidijouybari, M Konkler, K Quigley , G Presley	24-50392
	»RCA« Phytosanitary treatment of roundwood for oversea shipping - on the suitability of dry heat treatment as alternative to climate-change effective fumigation G Weber , L Schrader, J Trautner	24-50394
	Discussion and questions	

10:10-10:40

Coffee / Tea

10:40-12:30	WP 2.3 Other protecting chemicals Convener: Véronique Landry	
	»RCA« Terpene-Based Latex Synthesis for Exterior Wood Protection M Carrère , V Landry	24-20715
	»RCA« Investigation on the use of whey ultrafiltration permeate as a biosourced agent of wood protection A Keralta , J Wwinner, J Chamberland, V Landry	24-20718
	Surface Treatment of Cross-Laminated Timber to Improve Water Repellency and UV Resistance M Chen , S Uphill, J Hilsenbeck, A Hughes	24-20716
	Potential of heartwood extracts as wood preservatives combined with linseed oil in 8-year above-ground and in-ground field trials M E Mankowski , G T Kirker, B Hassan	24-20719
	Determining the minimum water vapor permeability of exterior wood coatings by means of hygrothermal simulations U Hundhausen , S Ullah, D Kraniotis	24-20717
	Discussion and questions	

12:30-13:30

Lunch

13:30-15:40	Special Session: Towards a Circular Economy for Wood Protection Conveners: Boštjan Lesar & Jan Van den Bulcke	
	Analysis and performance of spruce alternative species and discarded wood for windows production B Lesar , J Levanič, M Humar, A Treu	24-50386
	Overview of Canadian CRD wood waste recycling ecosystem G Boivin , D Schorr	24-50395
	Evaluating the potential for re-using timber from deconstructed sea defence groynes from the Bournemouth groyne field J R Williams	24-50397
	Biofabrication of composite materials – Utilizing lignocellulosic biomass and mycelium in 3D printing D Kržišnik , B Žuran, M Kariž, M Humar	24-50396
15:40-16:10	Coffee / Tea	
16:10-16:50	Special Sess.: Towards a Circular Economy for Wood Protection cont. Conveners: Boštjan Lesar & Jan Van den Bulcke	
-	Bio-based thermal insulation panels – a way of cascading utilization of post-consumer wood W Perdoch , A Szelag	24-50388
	Timber Circularity discussion: Waste hierarchy and prioritising reuse opportunities! T Singh	24-50398
	Discussion and questions	
16:50-17:30	Poster Session Convener: Miha Humar	
	A novel cellulose-binding domain from the brown-rot fungus that can be used to evaluate cellulose in wood Y Kojima , N Sunagawa, S Tagawa, T Hatano, S Nakaba, M Aoki, M Wada, K Igarashi, M Yoshida	24-11046
	X-ray fluorescence microscopy of copper ion distribution in decay of copper-treated wood by <i>Fibroporia radiculosa</i> K Ohno , J Jakes, A Bishell, L Li, Q Jin, E Maxey	24-11047
	Adaptability of <i>Reticulitermes flavipes</i> (Kollar) in a northern climate R A Arango , K M Ohno, A B Bishell, G T Kirker	24-11048
	Laboratory and field evaluations of bio-based termiticide containing Arnica extract from Berkem Biosolutions® against native and Formosan subterranean termites D Messaoudi, J Curole, Q Wu	24-11049
	Efficacy performance of Pea Extract as bait toxicant for termite control in Reunion Island J Vuillemin , D Messaoudi, A Robert, P da Silva	24-11050
	Virtual Reality of Wood Protection D Feng , Y Liu, M Turner, A Iimaye, P D Evans	24-20727
	Suberinic acid from birch bark and its suitability in wood protection A Treu , M Altgen, J Rižikovs	24-20708
	Assessment of hydrophobic properties of acetylated and furfurylated Korean wood species S-M Yoon , Y-S Choi, H-M Lee, Y Park, W-J Hwang, S-K Jang	24-30812

	Field Facility for Conducting Wood Durability Tests at LSU Agricultural Center Q Wu , J Curole	24-41012
	Field test method for wood in above ground situation - The full CEN/TC 38 guideline for the Sandwich method. Part 1 - Determining the relative protective effectiveness of a wood preservative. M Westin , R Ringman, A Christof, M Klamer, F Friese	24-41013
	Preservative properties of boron treated paulownia wood T Khadiran, M A M Abdullah, S Lipeh	24-20729
	A new wood preservative system based on basic copper compound nanosols J O Kim, J-G Kang, Y-S Choi , S-M Yoon, H-M Lee, J-G Park	24-20728
	Comparison of Copper Leaching from Alkaline Copper Quat and Copper Compound Nanosol-based Wood Preservatives Treated Wood Y-S Choi , S-M Yoon, J O Kim, J-G Kang, J-G Park	24-20726
	Durability of Malaysian Plybamboo to Mold S Lipeh , A Mustapha, A S Yusoh, M K A Uyup	24-41014
Posters will be exhibited in the hall Liquidambar		

Parallel Session Quercus		
8:30-10:10	WP 4.2 Service life Conveners: Joris Van Acker & Tomoko Osawa	
	How personality traits influence the perception of fungal decay in a wooden cladding – A survey in three European countries G W Gustavsen, G Alfredsen , P B van Niekerk, J Niklewski, C Brischke	24-41002
	Modelling the service life of wood in ground contact – Verification of remotely sensed soil data from the reanalysis dataset ERA5-Land using in-situ measurements at a test site of utility poles in Eastern Norway U Hundhausen , P B van Niekerk, B Marais	24-41003
	Modelling wood moisture content in outdoor conditions from measured data J Niklewski , P B van Niekerk, L Meyer-Veltrup, J Sandak, C Brischke	24-41005
	In service performance of wood sound abatement barriers S Kus, D Wong, R Stirling	24-41006
10:10-10:40	Coffee / Tea	
10:40-11:10	WP 4.2 Service life cont. Conveners: Joris Van Acker & Tomoko Osawa	
	Assessment of historical pilings from Lisbon D Jones , S Duarte, J A J Huber, L Nunes	24-41004
	Service life of poplar, a low durability hardwood J Van Acker , X Jiang, L De Ligne, J van den Bulcke	24-41007
	Discussion and questions	
11:10-12:30	WP 1.3 Natural durability Convener: Grant Kirker	
	Intra-species variability of moisture dynamics in wood C Brischke , H Purps, L Emmerich	24-11040
	The Durability and Mechanical Properties of 40 Years Old Black Locust Poles M Humar , J Malik, J Levanič, D Kržišnik, E Keržič, B Lesar	24-11042
	»RCA« Wood above ground Project – Results and future Plans A W Christof , R Digaitis, P Fynholm, J Stenbæk, N Morsing, B Lindegaard	24-11041
	»RCA« Unlocking the Potential of Paulownia in Malaysia: Durability Assessment to Mold S Lipeh , T Khadiran, N A Siam, R Jalil, N F N M Isa	24-11043
	Discussion and questions	
12:30-13:30	Lunch	

Wednesday 22 May

Parallel Session Pinus		
8:30-10:10	WP 3.2 Chemical modification Conveners: Johannes Karthäuser & Diane Schorr	
	Preliminary Investigation of the Durability and Performance of 1,3-dimethylol-4,5-dihydroxyethylene urea (DMDHEU) Treated Aspen Strandboard S Johnson , F Kamke, G Presley	24-30804
	Durability of acetylated beech (<i>Fagus sylvatica</i> L.) laminated veneer lumber (LVL) M Slabohm, H Militz	24-30807
	Citric Acid and Sorbitol Treatment: A Comparative Study of Canadian and Norwegian Species D Schorr , Erik Larnøy, R Stirling, G Boivin	24-30806
	Discussion and questions	

10:10-10:40

Coffee / Tea

10:40-12:00	WP 3.3 Other penetrating modifications Conveners: Liang Liang & Kévin Candelier	
	Manufacturing of Bamboo Hybrids with high Strength, Superior Fire Retardancy, and Dimensional Stability W He, Rui Wang, W Li, G Hu, T Singh , Q Fu	24-30808
	»RCA« Bio-durability and weathering performances of cardanol-treated wood L Liang , AG McDonald, L Cai	24-30809
	Developing thermal-energy storage systems based on Kraft lignin-glyoxal and organic phase-change material modified wood C-F Lin, O Karlsson, D Jones , D Sandberg	24-30810
	Discussion and questions	

12:30-21:00	Excursion Open air local fresh market – Market Square (lunch on own) Name Badge required – 1pm to 6pm Optional Visits to: East TN Historical Society Blount Mansion – oldest wood frame building this side of the Appalachian Mountains, James White Fort – Oldest European settlement and wood building this side of the Appalachian Mountains Pretentious Beer Co. & Woodruf Brewing Company TN Food and Festivities at Calhoun’s on the River 6 til 9	

	Parallel Session Quercus	
8:30-9:00	WP 2.2 Fire retardants Conveners: Noah Babik & Shane Johnson	
	Binder-free, fire-resistant, light-weight fiberboard materials encrusted with expandable graphite and borax W Perdoch , W Grześkowiak, B Mazela	24-20714
	Discussion and questions	

9:00-10:10	WP 2.4 Treatability of wood & quality control of processes and materials Conveners: Noah Babik & Shane Johnson	
	Effectivity of Zinc Borate in Medium Density Fiberboard (MDF) for Ground Proximity Testing S M Vega Gutierrez , T Olivadoti	24-20723
	Phytosanitary heat treatment of wood in a laboratory drying oven and, in a pilot-scale kiln using the house longhorn beetle (<i>Hylotrupes bajulus</i>) larvae as a model B Rubio , C L'Hostis, M Montibus, I Paulmier, C Brunet, L Charron, J-P Gaussorgues, C Guiberteau, V Vlahakis, F-R de Cibon, I Le Bayon	24-20722
	Discussion and questions	

10:10-10:40	Coffee / Tea	
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10:40-12:00	WP 5.1 Health and Safety Aspects Conveners: René Herrera & Gabrielle Boivin	
	Levels of chromated copper arsenate in aged radiata pine vineyard posts T Singh , T Yi, P Mitchell, J Norton	24-50389
	Leaching and chemical redistribution of CCA components in refractory heartwood of <i>E. nitens</i> J R Vargas , L Yermán, K C Wood, T Singh	24-41011
	Exploring bio-based chemicals in the residual stream from the thermal wood modification process R Herrera , W Willems, W Pajerski, A Selmanović, A Sandak	24-30799
	Discussion and questions	

12:30-21:00	Excursion Open air local fresh market – Market Square (lunch on own) Name Badge required – 1pm to 6pm Optional Visits to: East TN Historical Society Blount Mansion – oldest wood frame building this side of the Appalachian Mountains, James White Fort – Oldest European settlement and wood building this side of the Appalachian Mountains Pretentious Beer Co. & Woodruf Brewing Company TN Food and Festivities at Calhoun's on the River 6 til 9	
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Thursday 23 May		
Parallel Session Pinus		
8:30-9:10	WP 1.4 Microbial test methodology Conveners: Makoto Yoshida	
	On the use of miniaturized wood specimens in fungal decay experiments – mini-blocks versus EN 113 test specimens C Brischke , G Alfredsen	24-11044
	Investigating moisture dynamics and fungal decay risk: integrating X-ray CT visualization and simulation benchmarks through a Fungal Control Unit J Van den Bulcke , J Van Acker, M Delbeke, A Blommaert, N Van Den Bossche, M Steeman, L De Ligne	24-11045
	Discussion and questions	
9:10-10:10	WP 4.1 Laboratory and field performance Conveners: Tripti Singh & Liang Liang	
	Evaluation of vacuum borate treated spruce or pine CLT in an above ground protected test in southern Mississippi M Mankowski , A Taylor, G Kirker	24-41001
	Field performance of preserved shakes and shingles R Stirling , S Kus	24-41000
	Outdoor Termite Resistance Performance of Zinc Borate (Borogard® ZB) Treated Parallel Strand Lumber (PSL) – 15 Years Field Test Results S Shi , E Laval , K Lung, F Ascherl, R Williams, W Li, X Li	24-40999
	Discussion and questions	
10:10-10:40	Coffee / Tea	
10:40-12:30	WP 4.1 Laboratory and field performance cont. Conveners: Tripti Singh & Liang Liang	
	Evaluation of the water exclusion ability and inherent bioactivity of heartwood against decay in Japanese and European wood species via above-ground exposure and water absorption tests T Osawa , R Noda, K Yamamoto	24-40998
	Shelling of flat and profiled western larch deck-boards exposed to natural weathering L H Leung, P D Evans	24-40997
	International joint field trial on the moisture performance of wood – Set up and first results C Brischke , et al (33 co-authors)	24-40996
	Discussion and questions	
12:30-13:30	Lunch	

Parallel Session Quercus		
8:30-9:10	WP 2.5 Wood protection by design & new protection concepts Convener: Jae Woo	
	The potential of Wacapou (<i>Vouacapoua americana</i>) extracts to develop new biobased protective solutions for white woods E Kieny, K Candelier , L Milhe, Y Estevez, C Sophie, R Lehnebach, J Damay, D Florez, E Hoël, M-F Thevenon, J Bossu	24-20724
	Elevated Pressure Hybrid Wood Modification: Synergistic effects on durability performance P Klaas, D Jones	24-20725
	Discussion and questions	
9:10-10:10	WP 3.1 Thermal modification Conveners: Dennis Jones & Kévin Candelier	
	EMC as a quality control parameter for thermally modified wood P Klaas , J T Lauridsen	24-20720
	Natural Weathering of Modified Pine and Eucalyptus Woods by Surface Charring E E Soyturk, E N Kavakli, S N Kartal , C M Ibanez	24-30801
	A novel treatment for increasing UV stability of wood based on citric acid and urea S Jué, A Scharf, C-F Lin, R Moutou Pitti, D Sandberg, D Jones	24-30811
	Discussion and questions	
10:10-10:40	Coffee / Tea	
10:40-12:30	WP 4.3. Wood-based composites Convener: Phil Evans	
	Evaluation of mass timber materials for military and commercial trailer decking G Kirker , A Senalik, X Wang, K Ohno, R Arango, M Mankowski, X Xie, J Eskola, N Kamprath, S Karwaczynski, M Weaver	24-41009
	Performance of Douglas-fir cross laminated timber (CLT) subjected to elevated humidity in a ground proximity field test for 6 years M E Mankowski , J J Morrell, T G Shelton, G T Kirker	24-41010
	Properties of thermal modified wood of <i>Pinus pinaster</i> , <i>Pinus radiata</i> and <i>Pinus sylvestris</i> from Galicia, Spain D Lorenzo , J Benito, J Arancon, J Crespo	24-30800
	Discussion and questions	
12:30-13:30	Lunch	

	Scientific Plenary Session – Discussion Forum Chair: Miha Humar	
	Protection of mass timber Is building with mass timber without chemicals possible? B. Lesar Protection of mass timber in the US G. Presley Wood modification and mass timber – opportunities and challenges D Jones	
	Discussion and questions	
15:00-15:30	Coffee / Tea	
15:30-16:30	Final Plenary Session President: Rod Stirling Vice-President: Miha Humar Secretary-General: Mats Westin	
	<ul style="list-style-type: none"> 5. Approval of the Annual Report 2023 and Auditor’s report (IRG/WP 60532) 6. Granting discharge for the Executive Council and Secretary-General from the administration and accountancy for 2023 7. Approval of membership fees for 2025 8. Approval of the budgets for 2024 (forecast May 2024) and 2025 9. Election of new officers 10. Appointment of auditors 11. Future venues 12. Any other business 	
18:00-24:00	CONFERENCE BANQUET Liriodendron tulipifera Ball Room	