WOOD for HEALTH 1st International Newsletter

More wood in European health care buildings!



Visualization for a psychiatric clinic in Nuuk, Greenland Picture by White Arkitekter

Dear readers,

Wood calms us down, affects indoor air quality and sequesters carbon. To support the natural good properties of wood, new coatings that prevent the growth of microbes and improve cleanability of wooden surfaces are needed. The aim of the WOOD for HEALTH project is to promote the use of wood in healthcare buildings and to propose new European guidelines for that purpose. The project is led by University of Oulu from Northern Finland. The partners include three institutes from Latvia, Norway and Germany focused solely on wood research, two companies from Latvia and Germany manufacturing coatings and a Swedish architecture firm with acknowledged expertise in healthcare buildings.

The Project Consortium Agreement was signed by all partners 02.02.2022. Project Kick-off meeting was hold via Teams 28.02.2022. Project management (WP1) and Transnational dissemination (WP6) tasks started immediately when the project commenced. WP2 Wood surfaces in healthcare buildings – practical experience, and WP3 Synthesis and formulation of wood coating material were the first ones of research work packages to start activities. WP4 Antimicrobial, antiviral and hygienic properties of coatings and surfaces also commenced before the end of 2022.

It has been a pleasure to our consortium to notice interest the project has attracted in partner countries. Partners have been invited to introduce the project in seminars and professional magazines. For advocates of sustainable construction industry, raw material producers and constructors themselves there is indisputable interest to progress use of wood also in health care buildings and clearly identified challenges to be solved to facilitate use of wood in the premises and location requiring high hygiene levels. We hope that the consortium will be able to meet expectations.

Yours sincerely **Pekka Kilpeläinen** Project Manager of WOOD for HEALTH WOOD for HEALTH | 2023 | NEWSLETTER #1

Wood for Health

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Project management connects network together and represents & introduces it also to ForestValue Community

By Pekka Kilpeläinen (University of Oulu)

The WP1 coordinates work between partners and WPs. Monthly meetings are the main internal forum for discussion and interaction between partners. They have taken place regularly since March 2022 and are a good practice. Monthly meetings are complemented with WP meetings which can include 1 or more work packages and are called to meet by WP leaders. WP meetings discuss and agree execution of WP tasks more in details. In 2022, WP3 organised meetings attended by Latvian and German partners to agree about the work on wood coating materials and formulations. In March 2023, a larger meeting between WPs 3, 4 and 5 was organised to plan how to continue work after the results of antimicrobial assays for the first sample lots were available.



WOOD for HEALTH project's work packages

WP1 takes also care of contacts with ERA-Net ForestValue Coordination Office and delivers messages and information obtained from the Coordination Office to partners. The WOOD for HEALTH project was introduced to the ForestValue community in ForestValue Newsletter 10, and in the ERA-Net ForestValue Final Conference in September in Madrid. WP1 also monitors use of project resources, reaching Milestones and realization of budget. It maintains Sharepoint & Teams accounts for internal dissemination and sharing of documents. WP1 is led by the University of Oulu.

Wood surfaces in healthcare – practical experience

By Anna-Johanna Klasander (White Arkitekter)

WP2 secures the practical relevance of the project with building requirements developed from a real case, The Queen Silvia Children's Hospital in Gothenburg, to guide the research and development of new coatings and surface treatment of wood in healthcare buildings.

In this work package we gather international examples of good practice in the field. The material will be published as inspiration and reference in the European Guidelines together with examples of national legislation and policies for exposed wood in healthcare buildings.



Queen Silvia Children's Hospital in Gothenborg Picture by White Arkitekter

A first dummy of the forthcoming Guidelines is now available for input on the graphic design from the group.

Synthesis and formulation of wood coating material

By Claudia Schirp (Fraunhofer Institute for Wood Research)

WP 3 works on the development of new antimicrobial and antiviral coatings for wooden surfaces. It consists of two main approaches.

The first is the formulation of novel wood coating using biobased or natural antimicrobial compounds together with established binder systems. Different binder systems such as oil-based coatings (Latvian State Institute of Wood Chemistry and lecavnieks) and formulations on the basis of established acrylate and polyurethane dispersions (Fraunhofer WKI and AURO) are tested. Several candidates of antimicrobial and antiviral compounds are used in close communication with WP4.



Novel wood coating formulations Picture by Errj Sansonetti

The second part of WP 3 is concerned with the synthesis of completely new biobased binder systems with inherent antimicrobial and antiviral effects by incorporating fitting functional units directly into their chemical structure. Here work is focused on mainly biobased acrylate and polyurethane dispersions. The lab from Fraunhofer WKI is specialized in building these systems from their biobased base chemicals and aims to incorporate antimicrobial active building blocks directly into the structure of the polyacrylates and poly urethanes. These novel binders will be used as wood coatings and main properties will be tested regarding that applications WP5. Also WP4 will assess the achieved antimicrobial effect of the systems.

Improving antimicrobial, antiviral and hygienic properties of wooden surfaces by new coatings is key to enhanced use of wood in premises requiring high hygiene

By Pekka Kilpeläinen (University of Oulu)

The WP4 focuses on three high issues: It helps WP3 to find the most effective and stable composition of antimicrobial and antiviral coatings by laboratory assays of antimicrobial & -viral activity and then tests the most promising formulations on various wooden surfaces. WP4 also analyses how various surfaces collect microbes in real building environment and examines how effectively wooden surfaces can be cleaned from microbes, and whether developed coatings improve this cleanability.

Antimicrobial activity assays were started in November 2022 when partners from Germany and Latvia sent the first samples of binders and antimicrobial compounds to the University of Oulu. During 2022, Latvian State Institute of Wood Chemistry and Fraunhofer WKI sent 9 samples for analysis and Auro sent 5 samples. The analyses were carried out without major problems. Only reduced solubility of some samples under test conditions represented a slight issue, that was fixed by adapting solvents. In 2023 also antiviral activity of the most promising coating formulations will be assayed.

WP4 antimicrobial measures activities of compounds added to coatings, and of coating formulations. Studied compounds are either added on small paper disc placed on agar plate, into a well drilled to agar place or are cast evenly with melted agar on petri dish. Two first methods are quick screening methods, but also dependent how well substances diffuse into the agar. In these methods, the radius of inhibition zone formed around disk or well will be measured. Casting of samples with melted agar on a petri dish will be used to study the most efficient samples and determine the exact concentration required for growth inhibition by the compound. Coating formulations can be studied by casting then into agar and as a dried coating layer on a surface.

Assessing the coating performance

By Ulrich Hundhausen (Norwegian Institute of Wood Technology)

The objective of WP5 is to assess all technical properties of the coatings dependent on the requirement profiles defined in WP2. WP5 does however not include antimicrobial/-viral aspects as hygiene is central in the project and is therefore addressed in a specific work package (WP4). WP5 includes the characterization of important properties in health buildings related to surface protection and maintenance but also the analysis of the water vapor damp diffusion and the moisture buffer value of coated paneling and flooring according to the Nordtest procedure. The latter is used to model the moisture dynamics and the impact on energy consumption and enthalpy (RH and T) of indoor air for a simulated hospital ward room. In addition, preliminary life cycle analysis (LCA) and life cycle costing (LCC) for the new wood coatings are conducted.



Testing chemical resistance of coatings Picture by Ulrich Hundhausen

WP5 has started as planned in 2022. Based on results in the first workpackages, seven coating formulations were selected and are currently characterized in Task 5.1. The kick-off in Task 5.2 (hygrothermal modelling) and 5.3 (LCA and LCC) is scheduled for the end of 2023.

Spread the word

By Bruno Andersons (Latvian State Institute of Wood Chemistry)

We want to be seen and we are pleased that people have noticed us. The first-year dissemination activities of the project were devoted to the introduction of the context, purpose, objectives, and the necessity for such an interdisciplinary study, which can provide both health and environmental benefits. The interest in the project activities was high considering that 25 articles were published in public media, 7 messages about the project were posted social media accounts of different institutions, and 4 presentations/posters were presented in international conferences, seminars, and workshops. The project's website (www.woodforhealth.eu) was created at the beginning of the project, with a unique logo designed by White Arkitekter. In the first year, the website reached over 100 visitors from 12 countries.



Main page of the project's website

ForestValue Final Conference in Madrid Picture by Pekka Kilpeläinen

We observed that the dissemination activities are ensuring the communication of the project's results effectively and rapidly with a worldwide distribution. The use of different platforms (Facebook, LinkedIn, the project's website, scientific communication, general media, and social events) allows us to reach the scientific community, policymakers, the industrial community, higher education, and the public audience. In the project's social media accounts (LinkedIn and Facebook), a total of 20 posts were published about different activities including the results and outcomes from our main and working group meetings. LinkedIn has been very successful reaching 100 followers and over 2000 impressions. This newsletter, which you are reading now, summarizes all the project-related activities starting with management and ending with the dissemination of the project results. We believe that a newsletter is an efficient way to share the main information in one place and presenting it in a concise and reader-friendly way.

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Meeting consortium partners and introducing the project to scientific community

By Pekka Kilpeläinen (University of Oulu)



The WOOD for HEALTH project meeting in Göttingen. Picture by Bruno Andersons

WOOD for HEALTH Consortium met the first time face-to-face in Göttingen in 18th Annual Meeting of the Northern European Network for Wood Science and Engineering (WSE 2022) 21-22 September 2022, Goettingen, Germany. The project poster was presented there, and the consortium had a project meeting where the strategy how to select the first compounds for antimicrobial activity assays was decided. At the end of September, the project was presented in the ForestValue Final Conference to researchers of other projects of the program program administrators. and The to presentation given by Dr. Pekka Kilpeläinen can still be found on YouTube here.

Miscellaneous news

A section about the project was included in the R&D magazine by White Research Lab



Visit of the Kainuu Central Hospital in Finland



Finnish project was invited to participate and give a presentation in Eastern Finland seminar of Wood construction

WOOD for HEALTH project is featured in the ForestValue newsletter #10



Finnish project was invited by the funding body (Ministry of Environment) to visit the largest Finnish hospital, University Hospital of Helsinki, and to tell about benefits of wood construction to the property management of the hospital

Stay tuned for future activities

By Bruno Andersons (Latvian State Institute of Wood Chemistry)

By regularly sharing our findings and progress, we are planning to continue to be active on the project's website and social media accounts. In 2023, you can expect two scientific papers submitted in SCOPUS-indexed journals about the developed coatings. In addition, you will have the chance to meet us in person and hear a presentation about our results at conferences and seminars. The first in 2023 is the 9th Norwegian Conference of Wood Architecture on April 17. The activities will not stop here as we plan to participate in social events, which are more addressed to the general public such as Shadow Day and Researchers' Night. Will there be an upcoming newsletter?! Yes, we will work on publishing our WOOD for HEALTH 2nd International Newsletter about our second-year activities, so follow us on our social media accounts for the latest updates.

Meet the consortium

The consortium is composed of seven partners including a university, three research institutes specialized in different areas of wood research, an architect company, and two coating manufacturers. They bring into the project a high level of expertise in architecture, wood construction technology, wood and coating chemistry, health effects of natural compounds, microbiology, environmental and economic product assessment as well as scientific dissemination and industrial implementation. This is further added and complemented by knowledge and expertise of a number of collaborators from industry and academia, and by interacting with and drawing experiences from real life construction projects.



Partners from academia

University of Oulu (OULU) with its 13 000 students and over 3000 employees is the main university in Northern Finland. Unit of Measurement Technology (MITY) is focused on applied research with notable success: in 2013-19 MITY had the third highest number of Invention Disclosures in UOULU, second only to complete Faculties of Information Technology & Electrical Engineering, and Technology. Biocenter Oulu Virus Core Facility was established in 2006, and offers services both inside of the university and to external customers and collaborators.

Fraunhofer Institute for Wood Research (WKI) is Europe's largest application-oriented research organization. The department of Binder and Coatings at Fraunhofer Institute for Wood Research, WKI, covers the entire value chain for the development of wood coatings. Starting from the modification of monomers and polymer synthesis of resins for coatings and adhesives, the formulation of paint mixtures all the way to application techniques and testing and evaluation of finished products. For more than 10 years the research projects focus on the synthesis of resins based on renewables as an alternative to petrochemical raw materials. Next to biobased materials the focus is on additional properties like fire retardancy or antimicrobial properties.

The Norwegian Institute of Wood Technology (NTI) is the R&D Center of the Norwegian wood industry with approximately 130 member companies. Established in 1949, NTI has many years of experience in planning, conducting, and implementing national and international research projects that are essential for the Norwegian wood industry. Besides R&D, NTI's major activities are in the field of contract testing, technical consultancy, certification, and standardization work along the entire value-chain.

The Latvian State Institute of Wood Chemistry (LSIWC), founded in 1946, is a State R&D institute providing research and testing in the field of wood science, wood and polymer chemistry, biotechnology. The main priorities of the multidisciplinary scientific activities are: wood and wood materials with upgraded properties for construction: protection, modification, renovation, maintenance; a biorefinery approach for producing chemicals and products from wood, its components and waste and other types of biomass; obtaining of green chemistry products and green polymers from wood and plant biomass and its processing residues. LSIWC has a long-term experience in the study of wood degradation and protection with the aim to prolong the service life of wood and wood-based materials including development of coating compositions for retaining the wood surface's decorative and physical properties. Beside the technological developments, LSIWC is seriously engaged in the study of wood degradation mechanisms.

AURO WITTE Decavnieks

Auro Pflanzenchemie AG (AURO) is a consistent pioneer in the field of ecological natural paints, wood care and cleaning products. Their paints, varnishes, varnishes, oils, waxes, cleaning and care products made from natural materials are powerful and unique in their combination of quality and ecological orientation. The company was founded in 1983 as a GmbH, in 1998 it was converted into a stock corporation. AURO AG currently employs 45 people, 6 of whom work in research and development. The basic material of modern chemistry essentially consists of the non-renewable raw material crude oil. The material resources of future chemistry are abundantly available in our biosphere: the plants. The AURO company has been building on this raw material concept of the future since 1983.

White Arkitekter (WHITE) is one of Scandinavia's leading architectural practices. They are an employee-owned architecture collective of over 700 employees, with presence in Sweden, Norway, UK, Germany, East Africa and Canada. Their head office is in Gothenburg, Sweden. They work with architecture, urban design, landscape architecture and interior design with a sharp focus on sustainability. Today, about 25 per cent of White's revenue comes from assignments in the healthcare sector and about 190 employees work in healthcare sector assignments. Their own research organization, White Research Lab, enables employees to do practice-based research, development and innovation both in-house and in collaboration with partners in academia, business, authorities, NGOs and others. Wood and Healthcare are two central fields of development within WRL.

Iecavnieks & Co, Ltd (Iecavnieks) is one of the largest cold-pressed oil producers in the Baltics. The brand "Paint Eco" combines natural products for wood surface coating, which includes centuries of knowledge of natural dyes. With reference to ancient linseed oil paint recipes, modern boiled linseed oil product lines were created. The manufacturer's product range includes floor oil, paints, stains, waxes based on vegetable oils as well as boiled linseed oil. The manufacturer offers environmentally and human health friendly products - the Latvian Asthma and Aerology Association has recognized the company's products as suitable for use in rooms where people with allergies or asthma are staying.

We acknowledge the support

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ForestValue

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Follow the project and contact us

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More information in www.woodforhealth.eu

For the latest news and progress follow us on LinkedIn and Facebook.

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