

NEWSLETTER

5TH ISSUE NOVEMBER 2023



LIGNICOAT

SUSTAINABLE COATINGS BASED ON LIGNIN RESINS AND BIO-ADDITIVES
WITH IMPROVED FIRE, CORROSION AND BIOLOGICAL RESISTANCE

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Join us on:

@LIGNICOAT



This project has received funding from the Bio-based Industries Joint Undertaking (JU) under the European Union's Horizon 2020 research and innovation programme under grant agreement No 101023342. The JU receives support from the European Union's Horizon 2020 research and innovation programme and the Bio-based Industries Consortium.



Bio-based Industries
Consortium



Horizon 2020
European Union Funding
for Research & Innovation



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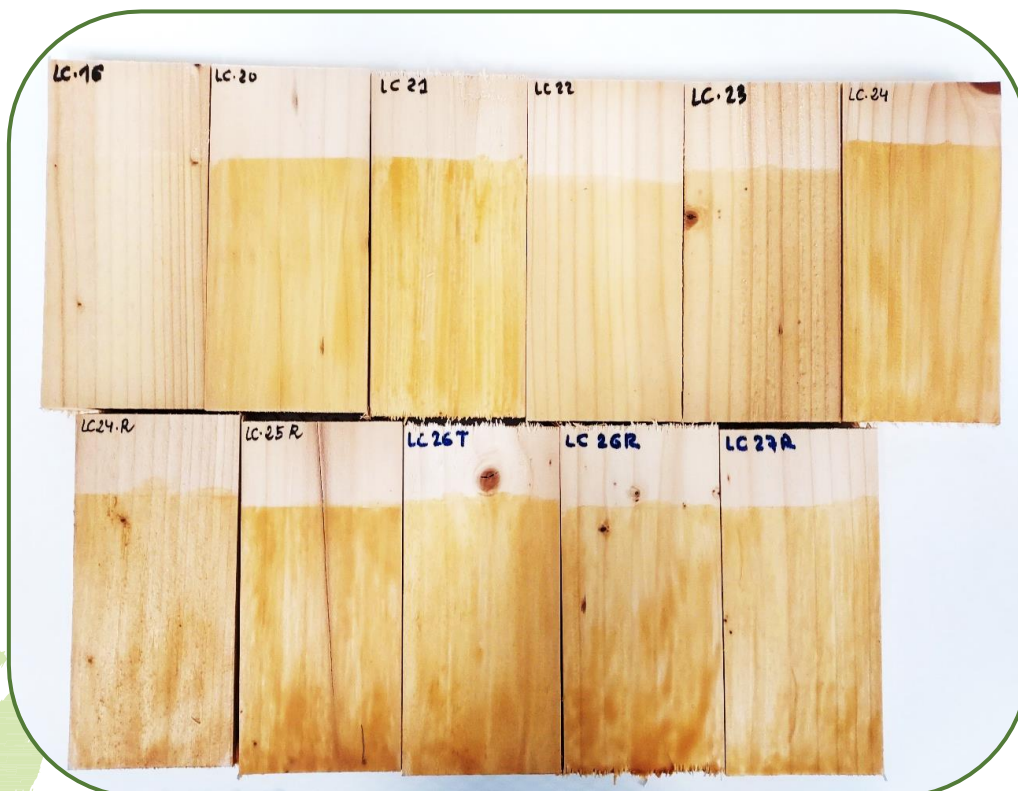


1. WELCOME

Welcome to the 5th Edition of the LIGNICOAT newsletter!

As we enter **month 30** of our 42-month journey, we are excited to share the latest developments from the LIGNICOAT project. Coatings are integral to our lives, but their environmental impact and volatile organic compound (VOC) emissions have raised concerns. LIGNICOAT is pioneering sustainable solutions by harnessing lignin, a by-product of lignocellulosic biomass to produce bio-based coatings for the wood, metal, furniture, automotive, flooring, machinery, and paint industries. In this edition, you will find highlights from the last months, including the **project progress**, some **research highlights**, **news**, **attended** and **upcoming events**.

We hope this newsletter will keep you informed and engaged with the LIGNICOAT project and the wider bio-based and coating community.



Different LIGNICOAT biocoating formulations applied to pine wood.



2. PROJECT UPDATE

CURRENT PROGRESS

70%



14 PARTNERS



42 MONTHS



8 COUNTRIES



8 WORK PACKAGES



EUR ~5 MILLION

TIMELINE

Milestone 4: Production of at least one resin of each type that fulfill the requirements

January 2023



PUD resin
from lignin polyols



Alkyd resin
from lignin polyacids



Epoxy resin
from glycidylated depolymerized lignin



[Download our press release to know more.](#)

Mid-term Review Meeting
February 2023

M24 Project Meeting in Espoo, Finland
6th – 7th June 2023



The Consortium gathered at VTT premises and visited the pilot plants.



Milestone 5: One candidate of biocapsules, bioadditives and enzymes with potential to reach antiviral and VOC degradation targets
October 2023

M30 Project Meeting in Nice, France
22nd – 23rd November 2023

M36 Project Meeting
May/June 2024



2. PROJECT UPDATE

Submitted Deliverables

In the implementation journey of the LIGNICOAT project, we have submitted several significant deliverables.

Here are some of the key achievements the project has attained during the last months:

Number	Title	Lead Beneficiary	Nature
D2.1	100g (M20) and 500g (M29) of lignin based APUD – PUD for task 4.1	ECOAT	Demonstrator
D2.2	300-500 g of alkyd resin (M20).15kg of alkyd resin (M29)	BARPIMO	Demonstrator
D2.4	1 kg of bioisocyanate for task 2.1	VENCOREX	Demonstrator
D3.1	Development of bioadditives (encapsulated or emulsified) with antimicrobial and antiviral properties and determination of its effectiveness.	FORESA	Report
D3.3	Antimicrobial effectiveness of natural bioadditives and active compounds bioencapsulated after being incorporated in the formulations.	ITACYL	Report
D3.5	Enzyme preparation with demonstrated robust activity against coating-derived VOCs	NORCE	Report
D5.2	Preliminary report of Economic LCC of coating solutions	ARDITEC	Report
D5.4	Final Report Health and Safety study	ARDITEC	Report
D6.9	KPI and Impact questionnaire v3 (2023)	AXIA	Report

Deliverables submitted in the last months

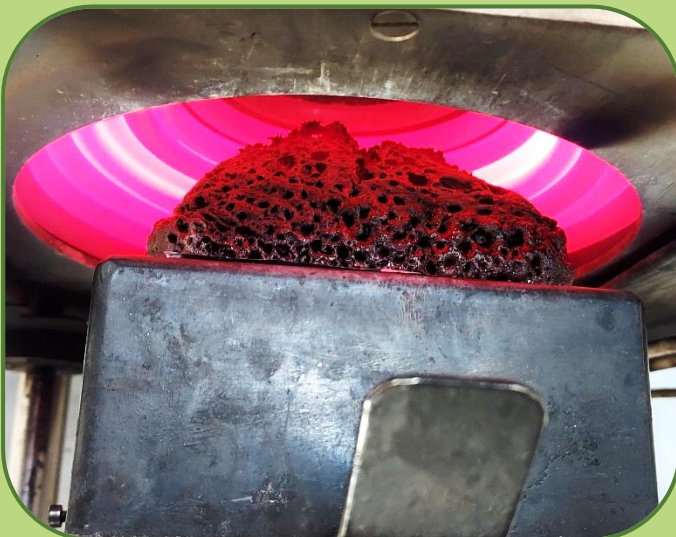


LIGNICOAT

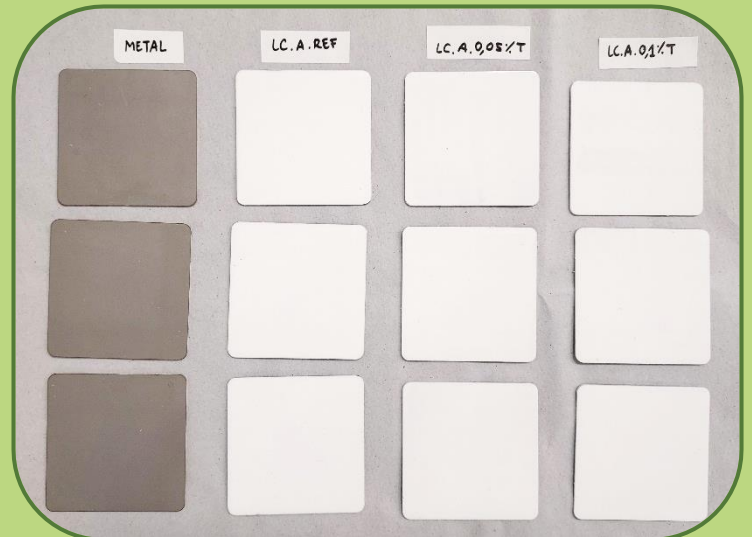
3. WORK PROGRESS & RESEARCH HIGHLIGHTS

CONSORTIUM PROGRESS

TECNALIA is making significant progress in the LIGNICOAT project. They have formulated new **bio-PU retardants** for wood using resins from ECOAT. These formulations have been tested for fire performance. Additionally, TECNALIA has developed an **antimicrobial alkyd paint** with thymol, which is being evaluated for its effectiveness against bacteria by ITACYL.



Cone calorimeter test of bio-PU fire retardant coating.



Antimicrobial paint with current alkyd and thymol bioadditive.



VITO is advancing on two fronts. First, they have produced **depolymerized lignin at kg scale** from organosolv and hydrolysis lignin. This lignin has been sent to Westlake for further processing (lignin epoxidation) to create lignin-based epoxy resins. Additionally, VITO is **optimizing depolymerized lignin production** processes using a continuous lab system.

BARPIMO Coatings successfully produced a substantial **5 kg batch of bio-alkyd resin**, utilizing lignin as a key component. This bio-based resin has been specifically formulated for application on metal surfaces, demonstrating performance in enhancing corrosion resistance.





3. WORK PROGRESS & RESEARCH HIGHLIGHTS

CONSORTIUM PROGRESS

VTT, the Technical Research Centre of Finland, has been recently engaged in a collaborative effort with ARDITEC Association. Their primary focus has been conducting a **comprehensive techno-economic assessment** for producing lignin polyacids. This assessment involves evaluating the feasibility and cost-effectiveness of solvent fractionation techniques in production. The insights gained from this assessment will contribute to a deeper understanding of the economic aspects of lignin polyacid production within the scope of the LIGNICOAT project.



VTT



AEP Polymers has been collaborating with TECNALIA to prepare a **scientific paper** focused on **lignin-polyols**.

FORESA Technologies has been conducting **new trials involving formaldehyde enzymes** and is awaiting the results of these experiments. Additionally, they have been analysing the **antibacterial and antiviral properties of melamine boards** prepared using a sugar bio-resin and a bio-additive (thymol).



FORESA
TECHNOLOGIES



ARDITEC Association has been working on **sustainability assessments** within the project. They have focused on **environmental and economic evaluations**, with initial results already submitted. They presented preliminary findings at BIOKET Canada (see News section for details) and are working on an article about lignin-based polyols. They have also begun a social impact assessment and started evaluating the sustainability of end-products (i.e., coatings).



3. WORK PROGRESS & RESEARCH HIGHLIGHTS

CONSORTIUM PROGRESS

VENCOREX's recent focus has primarily been on **preparing for the industrial pilot** set for 2024. Their main activities have centred around report writing and compiling essential data on kinetics, equilibrium constants, and physico-chemical parameters. This groundwork is instrumental in shaping the path forward for the project.



AXIA Innovation has recently submitted the deliverable **D6.9 Key Performance Indicator (KPI) & Impact Questionnaire**. This report assesses ongoing and finished Bio-Based Industries Joint Undertaking (BBI-JU) projects' contributions to specific KPIs and expected impacts by 2023. Additionally, AXIA has been maintaining its communication channels active and establishing connections for clustering activities with related projects. They have also **prioritised key exploitable results (KERs)** aligned with partner intentions and is working on the competition analysis as part of the exploitation strategy of the project..

ITACYL recently **submitted a paper** on the fractionation of high-value compounds from hops using an optimized sequential extraction procedure. Additionally, they are actively evaluating the antimicrobial performance of an **alkyd formulation containing thymol**.



IRIS Coatings is actively engaged in the development of bio-coatings aimed at enhancing **fire protection for wood surfaces**. Their work aligns with the project's goals of advancing sustainable and effective coating solutions.

WESTLAKE Epoxy has received depolymerized lignin from VITO and is currently focused on **formulating lignin-based epoxy resins**.





3. WORK PROGRESS & RESEARCH HIGHLIGHTS

CONSORTIUM PROGRESS

NORCE has been **upscaling enzyme production in a 6-liter fermenter**, followed by enzyme purification. These data will contribute to ARDITEC's Life Cycle Assessment (LCA). Enzymes have also been characterized and delivered to FORESA Technologies for testing. Moreover, NORCE is currently establishing the **methodology for antiviral tests**, which involves working with cell lines and attenuated viral strains.



ECOAT has successfully **delivered bio-PUD and bio-PUD-NCO resins** to TECNALIA, contributing to ongoing project tasks. They are currently focused on producing 100 g of bio-PUD (polyurethane dispersion) using lignin polyols and bioisocyanates, as well as 500 g of bio-APUD based on lignin polyacids.



PU (left) and Bio-PU (right) coatings application on oak wood.

Different LIGNICOAT PU biocoating formulations on particle board.





4. NEWS

M24 Consortium Meeting in Espoo, Finland

On 6-7 June, the LIGNICOAT consortium gathered for its fifth project meeting at month 24 (M24). VTT, the Technical Research Centre of Finland, in Espoo, Finland, hosted this gathering. The event allowed consortium members to assess project progress, share insights, and strategize for future advancements.



Half the first day saw the Consortium participating in a pilot plants tour of VTT and continued with the meeting agenda. The second day began with an Advisory Board meeting led by TECNALIA and Work Package - WP leaders, gathering valuable input and advice from field experts guiding future strategic directions and decisions. The discussion then continued with presentations on the remaining project work packages.

LIGNICOAT will showcase samples at the CBE JU Stakeholder Forum 2023

**CBE JU
Stakeholder
Forum 2023**

6-7 December Brussels
#CBESF23



Circular
Bio-based
Europe
Joint Undertaking

LIGNICOAT will participate in the upcoming Circular Bio-based Europe Joint Undertaking Stakeholder Forum 2023. This event, organized by the CBE JU, is scheduled from December 6th to 7th, 2023, in Brussels, Belgium, and will bring together leaders and experts from the global industry.

During the CBE JU Stakeholder Forum 2023, LIGNICOAT will introduce its innovative wood coating based on lignin, a natural polymer derived from wood.

To secure your attendance, please visit www.cbe.europa.eu



4. NEWS

Upcoming M30 Consortium Meeting in Nice

The next LIGNICOAT project meeting is set to take place in Nice, France, on November 22-23, 2023. Our partner, ARDITEC Association, will host the Consortium.

During the two-day meeting, Consortium members will delve into a comprehensive evaluation of the achievements of the project's work plan, deliverables, and milestones. This critical assessment aims to gauge the progress and effectiveness of the project, ensuring it remains on track to meet its objectives.



<https://www.pexels.com/photo/aerial-view-of-the-promenade-des-anglais-in-nice-france-667722/>



Bio-based Industries Consortium 2023 Trend Report



Download the BIC 2023
Trend Report



The 2023 BIC Trend Report, emerging from four workshops hosted by BIC from April to June, provides practical insights and policy guidance for a sustainable, circular bioeconomy, aligning with projects like LIGNICOAT and ensuring Europe's continued bio-based industry leadership.

The report offers recommendations, such as promoting sustainable bio-based products, reducing fossil fuel dependence, and accelerating innovation entry into the market. Download the 2023 BIC report [here](#).



4. NEWS

Sister projects' event in Brussels

Bio-based Innovations for Industrial Applications

24 April 2024, 09:00 – 17:00 CET



**BIP Meeting Center,
Rue Royale 2-4, B-1000 Brussels**
Free Registration • In-person Event



These projects receive funding from the Bio-based Industries Joint Undertaking (JU) under the European Union's Horizon 2020 research and innovation programme under grant agreement No 887398 and No 101022370. JU receives support from the European Union's Horizon 2020 research and innovation programme and the Bio-based Industries Consortium.

The LIGNICOAT project will participate in an upcoming event organized by sister projects CHAMPION and PERFECOAT. This gathering will showcase the latest advancements in bio-based solutions across various applications.

The event, hosted by the BBI JU projects CHAMPION and PERFECOAT, is a comprehensive exploration of innovative bio-based materials. It will feature engaging presentations, a dynamic poster exhibition, and ample networking opportunities. Renowned speakers will share insights and perspectives, including researchers at the forefront of bio-based material development and representatives from industry and the European Commission.

For more details and registration, please click [here](#).



5. EVENTS

ATTENDED EVENTS



ARDITEC Association at the BIOKET 2023

25 May 2023, Montreal (Canada)

Léo Staccioli (Project engineer, ARDITEC) delivered a presentation titled **“Assessment of the Life Cycle of Lignin-Based Polyols and Polyacids for Coatings Applications”** on May 25 at the BIOKET Conference held in Montreal, Canada. This presentation was part of session 9, focusing on “Key Enabling Technologies (KETs) for Producing Biobased Materials.”



During this session, which centred on lignin valorisation, the LIGNICOAT project garnered significant interest from the audience. The presentation highlighted the substantial potential of lignin-based polyols and polyacids in coating applications, emphasizing their positive environmental impact and sustainability.

VITO at the Plant Based Summit 2023

14 June 2023, Lille (France)



With a presentation titled **“Lignin and Lignin Depolymerization: Enabling Bio-based Materials with Aromatic Components,”** on 14 June, Karolien Vanbroekhoven (Research manager, VITO) presented LIGNICOAT’s development of bio-based product at the Plant Based Summit (PBS) 2023 in Lille, France.

The PBS is widely recognized as an international gathering for the bioeconomy sector, bringing together key stakeholders and end-users to shape a more environmentally friendly and sustainable economy.



5. EVENTS

ATTENDED EVENTS



IRIS Coatings Chairing a Conference

19 September 2023, Milan (Italy)

On September 19th, our partner Claudio Pagella (CEO, IRIS Coatings) served as the chairperson and delivered the opening speech about the LIGNICOAT project at a national conference held in Milan, Italy. This one-day conference, organized jointly by the Octima Organization and the European Coatings Magazine, was specifically centred around the coatings and paints industry.



The conference placed significant emphasis on regulatory compliance, sustainability, and advancements within the field, with a particular focus on environmentally friendly and bio-based solutions. Download the presentation [here](#).

LIGNICOAT Meets REDONDO

27 September 2023, Munich (Germany)



On September 27, AXIA Innovation engaged in discussions with Professor Dimitrios Bikiaris, from Aristotle University of Thessaloniki (AUTH), the Coordinator of the Horizon Europe [REDONDO](#) project during the M12 meeting hosted at AXIA's premises in Munich, Germany, to understand the key advancements and seek potential synergies.

LIGNICOAT and REDONDO are aligned in their mission to develop and promote sustainable materials. LIGNICOAT is dedicated to developing environmentally friendly lignin-based coatings, while REDONDO focuses on enabling the recyclability of cross-linked polyethylene



5. EVENTS

UPCOMING EVENTS

Event	Date	Place	Link
10 th Biorizon Annual Event on Bio-Aromatics	29-30 November 2023	Rotterdam, The Netherlands & Online	Biorizon event
CBE JU Stakeholder Forum	6-7 December 2023	Brussels, Belgium	CBESF23
Bio-based Innovations for Industrial Applications	24 April 2024	Brussels, Belgium	Sister projects' event
Polymers 2024	28-31 May 2024	Athens, Greece	Polymers 2024
Biobased Coatings Europe 2024	5-6 June 2024	Valencia, Spain	Biobased Coatings Europe 2024
International Conference on Renewable Resources & Biorefineries	5-7 June 2024	Brussels, Belgium	RRB 2024
Renewable Materials Conference 2024	11-13 June 2024	Cologne, Germany	Renewable Materials 2024
The Fundamental Science and Cutting-Edge Engineering of Lignin	14-19 July 2024	Easton, MA, United States	Lignin Gordon Research Conference
17 th European Workshop on Lignocellulosic and Pulp	26-30 August 2024	Turku, Finland	EWLP 2024
Nordic Wood Biorefinery Conference 2024	15-17 October 2024	Örnsköldsvik, Sweden	NWBC 2024
European Summit of Industrial Biotechnologies 2024	11-14 November 2024	Graz, Austria	esib 2024



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6. CONTACT INFO

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THE LIGNICOAT TEAM



Our Team is composed of a multidisciplinary consortium that constitutes an excellently balanced team in terms of knowledge, expertise and experience with a total of 14 partners from 8 countries across Europe. The consortium is counting on the participation of 9 industrial partners for ensuring the exploitation of the outcomes of the technological challenges of LIGNICOAT.



Join us on:



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Horizon 2020
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