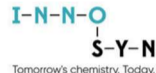


## PROJECT [ROBUSTOO]

PARTNERS:



COUNTRY:



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**DESCRIPTION/OBJECTIVE:** FCBA valorizes enzymatically modified hardwood lignin as a precursor in the bonding of wood-based panels adhesion and in 3D printing by liquid deposition modeling.

## RESULTS & CHALLENGES

Increase in the percentage of modified hardwood lignin from 70% to 100% as a replacement for phenol + total substitution of formaldehyde with non-toxic and bio-based aldehydes

→ **Sustainable resins** serving European sovereignty, environmental protection and human health:

- Solution based on petroleum-free chemicals offering an alternative to SVHCs and formaldehyde
- Bonding wood with wood: offers a bio-based solution to wood panel manufacturers for end-products composed of 98% wood.



±500 kt of PF resin are produced annually for bonding wood panels

→ **Diversify products from pulp mills:** lignin is currently used as an energy source. Identifying efficient and cost-effective applications is a key issue to enabling hardwood cooking mills to diversify and generate additional profits.

**Key challenges remaining:**

- Resin reactivity: reduced temperature and curing time of 100% bio-based adhesives, resulting in improved compatibility with industrial processes
- Boost mechanical properties of bio-based polymers in additive 3D printing
- Deeper understanding of mechanisms: inherent complexity of lignin and corresponding polymers are only partially understood.

## INTERESTING LINKS

Website ROBUSTOO  
<https://www.robustoo.eu/index.html>

LinkedIn ROBUSTOO  
<https://www.linkedin.com/company/robustoo/about/>

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