



Innovative Advanced Wood-Based Composite Materials and Components



The research leading to these results received funding from the European Community's Seventh Framework Programme (FP7 2007-2013) under grant agreement No 210037 (WOODY)



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General Information about the Project

- ❑ **Full title:** Innovative Advanced Wood-Based Composite Materials and Components
- ❑ **Acronym:** WOODY
- ❑ **Funding scheme:** Large-scale integrating project
- ❑ **FP7 – Theme NMP**
- ❑ **Call identifier:** FP7-NMP-2007-LARGE-1
- ❑ **Research area:** NMP-2007-4.0-1 Advanced Wood-Based Composites and their Production
- ❑ **Number of partners :** 18
- ❑ **Funding:** €5.1 million, budget: €7.15 million





Partners in the Project

Beneficiary No	Partner name	Abbreviation	Country
1	Centro di Progettazione, Design & Tecnologie dei Materiali (Coordinator)	CETMA	IT
2	APC Composit AB	APC	SV
3	Danmarks Tekniske Universitet	DTU	DK
4	Valtion Teknillinen Tutkimuskeskus	VTT	FI
5	Centexbel	CENTEX	BE
6	TransFurans Chemicals	TFC	BE
7	Marbo Italia S.p.A.	MARBO	IT
8	Luleå Tekniska Universitet	LTU	SV
9	D'Appolonia S.p.A.	DAPP	IT
10	Antnony, Patrick e Murta – Exportação LDA	APM	PT
11	Volvo Lastvagnar Aktiebolag	VOLVO	SV
12	Lindbäcks Bygg AB	LIND	SV
13	Swerea SICOMP AB	SIC	SV
15	eXtreme Materials S.r.l.	EXTREME	IT
16	The Hebrew University of Jerusalem	HUJ	IL
17	Gianazza Angelo S.p.A.	GIAN	IT
18	FAPES S.p.A.	FAPES	IT
19	European Plastics Converters	EuCIA	BE





Partners in the Project



Skandinaviens nordligaste tekniska universitet
– Forskning & utbildning i världsklass



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Objectives

- Development and promotion of **composite structures from renewable materials** – wood-derived cellulose nano-fibres and resins obtained from natural raw resources
- Development of an **innovative process covering the entire value chain of composites**: fibre, matrix and core derived from natural resources materials
- Application of innovative materials, treated and developed in an eco-sustainable manner and designed according to an innovative concept, in the sectors of **transportation** and **construction**, with additional potential applications and in the furniture, music instrument and toy industries



Main Innovations

- Development of **innovative core systems**, composed of **bioderived polymers (PLA, natural starch)** expanded under chemical and physical stimuli, suitable for being industrially implemented into the production of composites
- Development of a system of natural resins as **matrix** for the laminar composites, based on **furan materials**, suitable for being processed under standard conditions for composites production (resin infiltration, RTM, vacuum infusion ...)



Main Innovations

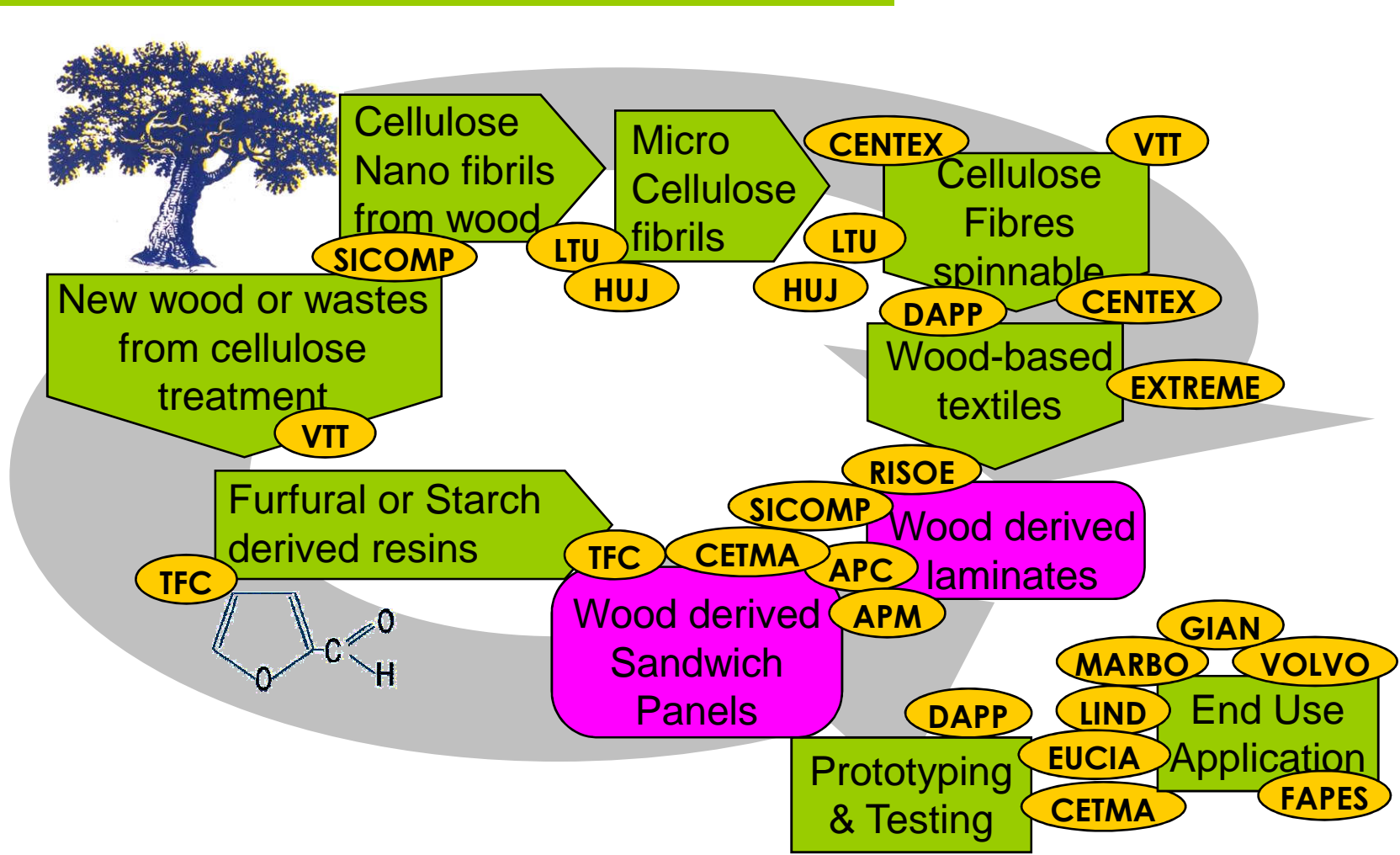
- Development of an **enzymatic and thermal-chemo-mechanical treatment** for the extraction process of high-quality, sustainable **cellulose nano-whiskers**. The implementation of **CBD enzymes** is regarded as a key issue for the maximization of performances
- **Composite design tools** enabling a newer and optimal exploitation of the properties of the materials, developed by utilising the potential of panels and hybrid structures
- Development of **additives** for operation in the composites formulation process



Value Chain

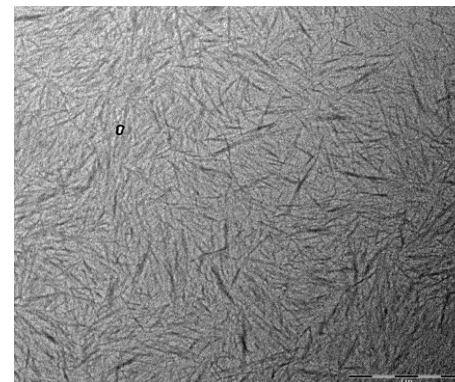
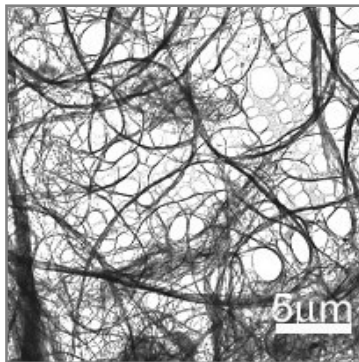


Value Chain & Partnership



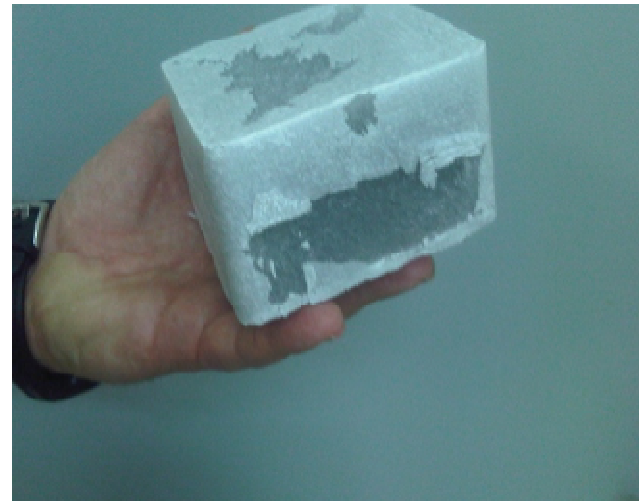
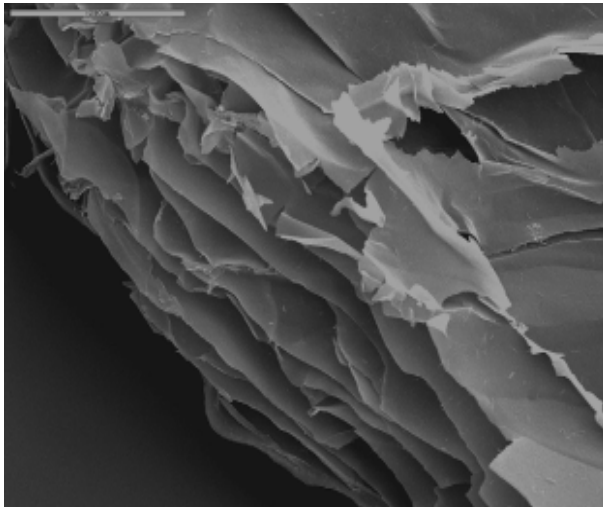
Main Results

- Results so far achieved (project has passed the 24 Month milestone) enable to foresee a good potential for implementation and industrialization of the results
- Nanofibres are developed in accordance to nanofibrillation and nano-whisker processing



Main Results

- Whiskers are processed into aerogels having a high void ratio and extreme performances when treated with furan resin: potential applications as core materials
- Specific applications already sought



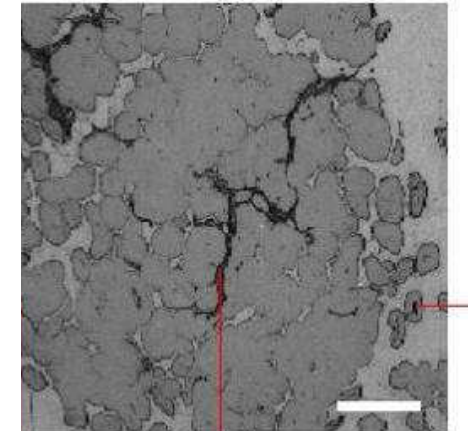
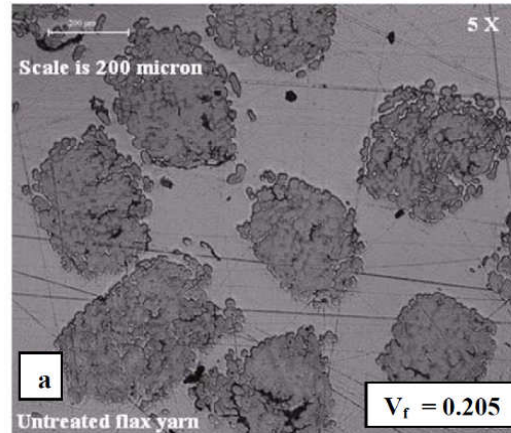
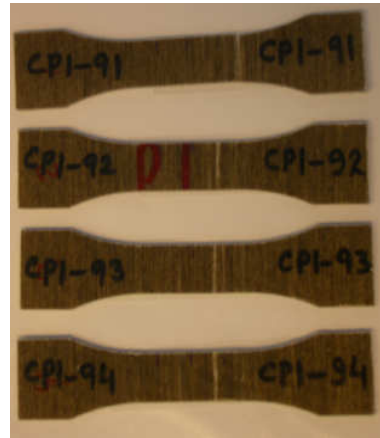
Main Results

- Natural based textile materials developed and applied as reinforcement for composites: the mechanical performances are combined with good appearance and inalterability, both with natural and synthetic resins
- Mirror finish and good geometrical properties ensured to evaluate also extreme mechanical performances



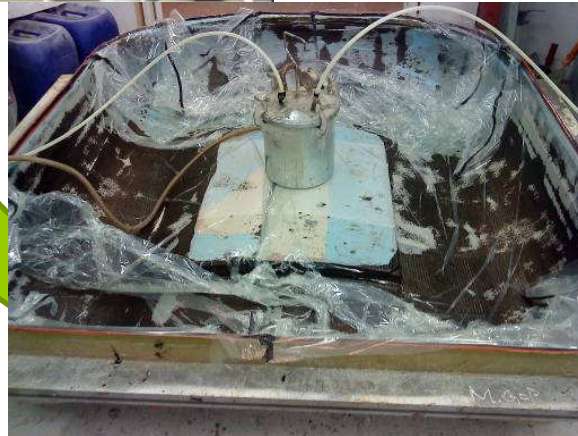
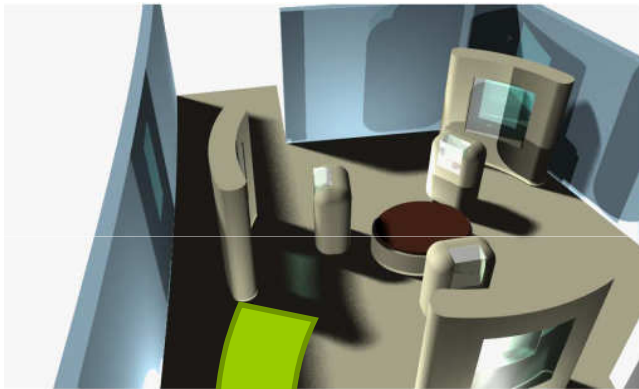
Main Results

- Mechanical performances are evaluated on standard specimens derived from composites, showing tensile modulus 34 GPa and tensile strength 290 MPa, with fibre volume content of 54%



Main Results

- Ideas for demonstrating the results of the project are already running into prototypes



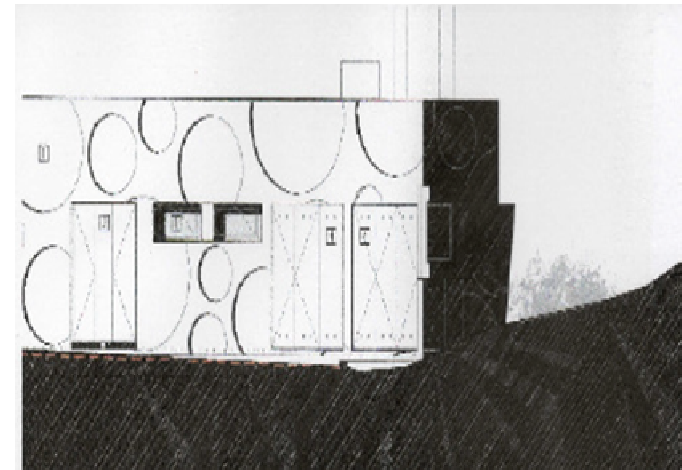
Main Results

- Five show expositors are developed and installed at the Historical naval museum of Stockholm
- “Shipping&Shopping” exhibition is expected to last for the next 10 years



Main Results

- Other ideas for demonstrating the results of the project are being investigated together with designers and architects
- Bio-panels for external decoration are being designed





Contacts

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Thanks for your attention

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