



R&D for value innovation

CTP is a key international player in the development of new materials and sustainable processes for the **cellulose, wood pulp, paper/cardboard** and **packaging** value chain.



Driving the circular bioeconomy



FIBRES AND PLANT CHEMISTRY

- Mechanical, chemical, unbleached and bleached pulps
- Natural Molecules



FIBRES TREATMENT

- Mixing / Refining
- MicroFibrillated Cellulose
- Extrusion



STRUCTURING OF MATERIALS

- Fractionation / Stratification
- 2D Materials (papers-boards) and 3D Materials (moulded cellulose / foams)

BIOBASED MATERIALS



TECHNICAL AND DESIGN



SENSORS

- Optics / Mechatronics
- Data Processing

CONFORMITY ASSESSMENT



PRODUCT PERFORMANCE

- Fitness for purpose
- Runnability
- Flushability



FOUR LABORATORIES

- Physical Testing
- Chemical, sensory and microbiological analysis



FOOD CONTACT

- Inertia
- Declaration of compliance
- Good Manufacturing Practice



PROCESSING CAPABILITY

- Alternative packaging solutions
- Bonding and sealing
- Forming



SUSTAINABLE INDUSTRY

- Water use / Effluent
- Energy efficiency
- Decarbonisation



PLANT OF THE FUTURE

- Efficient processes
- Digital models
- Simulation and monitoring



CIRCULAR BIOECONOMY

- Eco-design
- Recycling / Deinking
- By-product recovery

ECO-EFFICIENT PROCESSES

FUNCTIONAL PRODUCTS



SURFACE TREATMENT

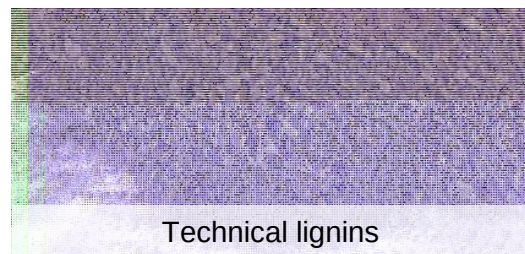
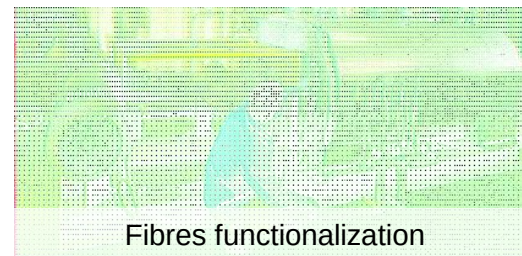
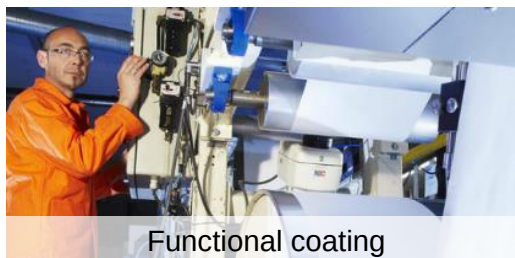
- Coating
- Chromatogeny®
- Wet Lamination



PRINTING PROCESSES

- Graphic
- Functional & Interactive
- Printed Electronics

Pilot-scale equipment that makes a difference



Sustainable wood- & plant-based materials

BIO-BASED MATERIALS AND PROCESSES

PROVIDES

"PROcesses for Value added
fibres by Innovative Deep
Eutectic Solvents"

2015-2018

H2020-BBI-JTI

*Create a sustainable,
economically feasible pulping
technology for wood and agro-
based lignocellulose raw
materials using deep eutectic
solvents, for lignin,
hemicellulose, and cellulose
fractionation at low temperatures
and atmospheric pressure.*



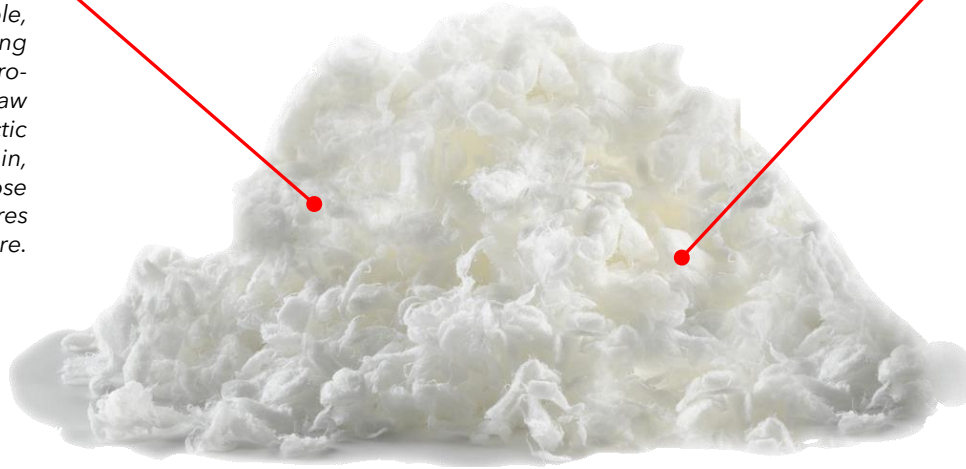
WOODZYMES

"Extremozymes for wood
based building blocks: From
pulp mill to board and
insulation products"

2018-2021

H2020-BBI-JTI

*Develop enzymes for wood
processing, tolerant to extreme
pH and temperature, to
selectively valorize underutilized
lignin and hemicellulose
fractions, providing high-quality
bio-equivalents of petroleum-
based chemical building blocks.*



Sustainable micro- & nano-engineered bio-materials

BIO-BASED MATERIALS AND PROCESSES



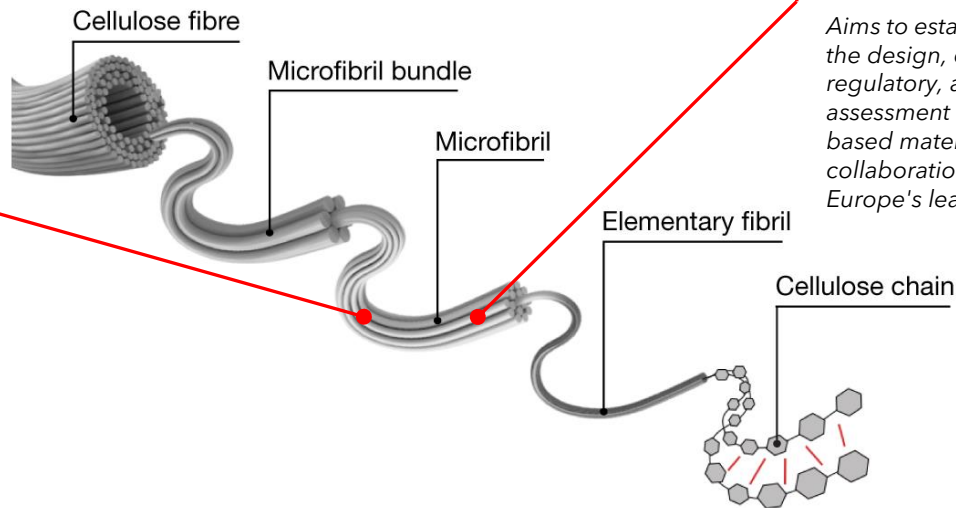
SUNPAP

"Scale-up nanoparticles in modern papermaking"

2009-2012

H2020-NMP

The goal was to deploy M/NFC in various papermaking applications, focusing on high-performance goods, ecologically friendly production processes, and high-value fiber-based products with unique features, such as graphics papers and packaging boards.



BIONANOPOLYS

"Open innovation test bed for developing safe nano-enabled bio-composites for multifunctional and new advanced applications"

2021-2024

H2020-NMBP-TO-IND

Aims to establish an open test bed for the design, development, testing, regulatory, and environmental assessment of nano-enabled bio-based materials, fostering collaboration and innovation to secure Europe's lead in this growing field.



Sustainable manufacturing bio-based industry

RESOURCE-EFFICIENT PROCESSES



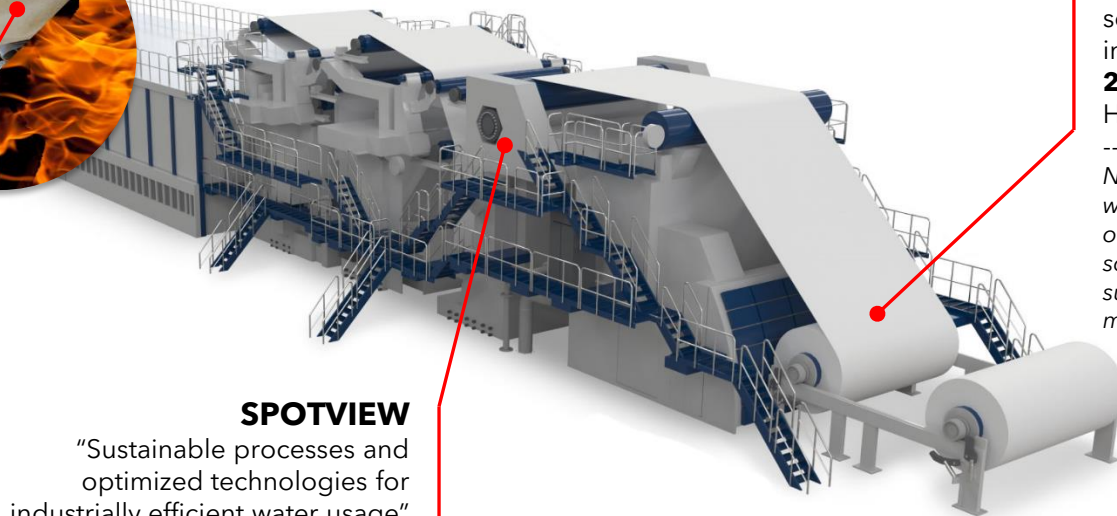
SORT IT

"Recovered paper sorting with innovative technologies"

2008-2011

FP7-ENV

Efficient and cost-effective sorting of paper and cardboard: NIR spectrometry, image processing & sorting robots.



SPOTVIEW

"Sustainable processes and optimized technologies for industrially efficient water usage"

2016-2020

Coordinator

H2020-BBI-JTI

Innovative, efficient, and sustainable technologies to optimise the use of natural resources, particularly water.



Horizon 2020

CORNERSTONE

"Combined technologies for water, energy and solute recovery from industrial process streams"

2023-2027

HORIZON-CL4

New technologies using waste heat can recover 90% of wastewater energy and solutes, enhancing sustainable industrial water management in Europe.



Sustainable flexible & rigid fibre-based packaging

BIO-BASED MATERIALS AND PROCESSES

SHERPACK

"Innovative structured polysaccharides based materials for recyclable and biodegradable flexible packaging"

2017-2020

Coordinator
H2020-BBI-JTI

Recyclable, biodegradable and renewable paper-based material with increased rigidity to replace flexible plastic and aluminium packaging.



FORMCELL

"Flexible tool making process for wet moulding of cellulose"

2016-2018

H2020-EUROSTARS

Flexible, economical and fast process for manufacturing tooling assemblies for industrial wet cellulose molding.



CELLUWIZ

"Process developments for a recyclable and compostable all-cellulose multilayer material for packaging"

2019-2022

Coordinator
H2020-BBI-JTI

Production of renewable, recyclable and biodegradable all-cellulose packaging to replace multi-material and multi-layer plastics.



Sustainable electronics

PRINTED ELECTRONICS ON PAPER

A3PLE

"Autonomous Printed
Paper products for
functional Labels and
Electronics"

2011-2015

Coordinator
FP7-NMP

Sustainable, low-cost, large-
area, hybrid organic and
inorganic printing
technologies for the
manufacture of autonomous
paper-based products.



MARS-EV

"Materials for Ageing Resistant
Li-Ion High Energy Storage for
the Electric Vehicle"

2013-2017

FP7-NMP

*Industrial prototype assembly of
sustainable and safe electrolytes
materials for high energy electrode.*



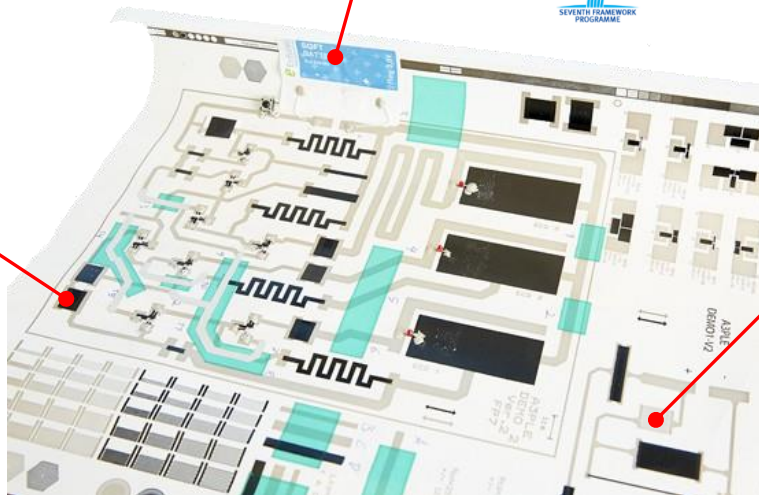
GREENANOFILMS

"Development and
application of ultra-high
resolution nano-organized
films by self-assembly of
plant-based materials for
next generation opto- and
bio-electronics"

2014-2017

FP7-NMP

*Cellulose nanocrystals and
nanofibres for ultra-high
resolution nanostructured
organic photovoltaics,
nanolithography and
biosensors.*





AWP2026

SELECTED TOPICS OF INTEREST FOR CTP



Research & Innovation Action (RIA)

- **HORIZON-CL6-2026-01-CIRCBIO-07**
Advancing the European bio-based innovation enabled by biotechnology and biomanufacturing concepts
- **HORIZON-CL6-2026-01-CIRCBIO-08**
Supporting pre-normative research for standardization of the bio-based products

Innovation Action (IA)

- **HORIZON-CL6-2026-01-CIRCBIO-02**
Advancing recycling technologies for mixed post-consumer textiles waste from blended products

Advancing recycling technologies for mixed post-consumer textiles waste from blended products

Proposals should:

- address textile consumer products made of fibre blends (e.g. polycotton, or other blends of multiple materials in combination such as bio-based and non-biobased);
- develop and advance novel and marketable solutions for post-consumer textile waste (apparel and home textiles) to enable its effective end-of-life collection, sorting and recycling (fibre-to-fibre), possibly including biotech solutions;
- develop innovative techniques for effectively disassembling complex products, separating multi-material layers and fibre blends and removal of non-textile components, coatings or contaminants to facilitate efficient recycling processes;
- assess the recyclability limits of textiles by determining the number of recycling cycles a fibre can undergo. When further fibre-to-fibre recycling is no longer viable, alternative applications should be explored to extend the material's value. Solutions should address recycling of blended products from both natural fibres (e.g., cotton) and synthetic polymers, ensuring optimal resource efficiency and minimizing waste throughout the textile lifecycle;
- characterize post-consumer textile waste in order to define appropriate management practices in particular if the technology is developed within an industrial and urban symbiosis;
- advance recycling technologies that remove persistent chemicals (e.g. PFAS) from post-consumer textile waste that may harm human health and the environment.

• CTP's technical capabilities & scientific expertise

- Alternative application when recyclability limits are reached: using small fibres to produce paper, molded cellulose or Microfibrillated cellulose (MFC)
- 2 industrial companies are already interested (an equipment manufacturer and a paper producer)
 - ✓ Paper and MFC production at lab and pilot scale and characterization
 - ✓ Expertise in separating, cleaning, bleaching ... "fibres" if needed
- Cellulosic textile fiber obtained by a patented process of dissolution/regeneration of cellulose, less polluting and less energy-intensive (at room temperature) than the viscose process
- Mechanical disassembling steps/ equipment through the manufacturer

Advancing the European bio-based innovation enabled by biotechnology and biomanufacturing concepts

Proposals should address the following activities:

- identify, select and develop further promising selected key technologies underpinning the bio-based innovation/industry, in particular R&D on synthetic/molecular biology, gene editing, metabolic engineering, microbiome[1], and/or biofoundry approaches, covering all applications aiming at clean growth and environmental solutions. Advancing towards validation at a pilot-scale is encouraged, to enable future exploitation. The applications in health biotechnology, as well as the biofuel/bioenergy area are excluded, to avoid overlaps with Horizon Europe Clusters 1 and 5, respectively;
- ensure the integration of digital technologies (e.g. AI/Machine Learning, bioinformatics);
- advance the convergence of biotech and life sciences developed under the first point with Nature-based Solutions, e.g. for environmental applications, carbon sequestration[2], biodiversity protection/enhancement, aligned with (bio-)circular economy principles (e.g. cascading biomass use), ensuring the environmental fate and sustainability is considered quantitatively at the earliest stage and ensuring safety to human health and environment is addressed and guaranteed;
- develop recommendations for policy makers and industrial actors, taking into account the available scientifically sound assessment of risks and benefits of the developed solutions.

- **CTP's technical capabilities & scientific expertise**

- End-user on this type of project, as we are looking for:
 - ✓ Need for new enzymes able to weaken cellulose without impacting Dp (Cellulose Degree of polymerization) in order to produce MFC (microfibrillated cellulose) to bring excellent and permanent grease properties to paper packaging all along the entire life cycle.
 - ✓ Need for enzymes to decontaminate sludge/discharge from papermaking processes in order to remove substances of concern (mineral oils, phthalates, bisphenols, PFAS, or PE/PP microplastic)

For both points CTP own pilotes at right TRL and expertise to test the enzyme efficiency



Research & Innovation Action (RIA)

- **CBE-2026-RIA-01** Addressing separation and purification challenges in biorefineries
- **CBE-2026-RIA-02** SSbd bio-based polymers from alternative sources
- **CBE-2026-RIA-03** Develop breakthrough and sustainable bio-based textile fibres

Innovation Action (IA)

- **CBE-2026-IA-01** Biotech routes for valorisation of residual biomass
- **CBE-2026-IA-03** Bio-based chemicals and/or materials from woody residues
- **CBE-2026-IA-05** Films and coatings for circular packaging

Flagship

- **CBE-2026-IAFlag-01** Boosting biorefinery competitiveness through biotech



Differentiating technologies & industrial applications

- Use of energy efficient and solvent-free extraction of bio-based products by twin screws technology in biorefineries (lab (1 to 2 kg /h dry) and pilot scale (5 to 20 kg/h dry))



Differentiating technologies & industrial applications

- WP leader as end-user in paper making industry :
 - ✓ Test the suitability of obtained bio-based polymers in circular-by-design final applications such as packaging for example: Coating / spray / printing of these polymers on paper (lab and pilot scale)
 - ✓ Application of super hydrophobic bio-based surface treatment (chromatogeny) to apply in combination with these polymers
 - ✓ Test the suitability of obtained bio-based polymers in bulk (to bring wet strength...)
 - ✓ Characterization of barrier properties (oxygen, grease, water, water vapor), mechanical properties
 - ✓ Taking into account regulations for packaging recycling (PPWR) and suitability for food contact
 - ✓ Testing of suitability for converting and sealing (glue, ultrasonic welding)
 - ✓ Capabilities for flexible and rigid packaging (pouch/sachet, trays), laboratory scale or semi-industrial pilots
 - ✓ Recycling in pulp and paper sector
 - ✓ Proof of concept production



Differentiating technologies & industrial applications

- Cellulosic textile fiber obtained by a patented process of dissolution/regeneration of cellulose, less polluting and less energy-intensive (at room temperature) than the viscose process

Technical capabilities & scientific expertise

- Production of dissolved cellulose pulp (100g to 2 kg/h)



Differentiating technologies & industrial applications

- Use of energy efficient and solvent-free extraction of bio-based products by twin screws technology in biorefineries (lab (1 to 2 kg /h dry) and pilot scale (5 to 20 kg/h dry))

Technical capabilities & scientific expertise

- Biomass treatment and pre-treatment processes for the extraction of compounds of interest
- End-user to test of developed bio-based chemicals as additives in suitable paper making applications : molded cellulose, MFC production, injection products...



Differentiating technologies & industrial applications

- Biomass treatment processes for the extraction of compounds of interest
- Valorization of unexploited lignocellulosic forest biomass (hedges, coppices, knots, bark) for the production of bio-sourced additives such as MFC or dissolved cellulose
- Valorisation in molded cellulose, injection
- Extraction of high value-added compounds (turpentine, soap, fatty acids, resin acid, polyphenols, etc.) by different solvent-free extraction techniques (e.g. twin screw) preserving the values/properties of the fibers for papermaking

Technical capabilities & scientific expertise

- Depending on the unexploited forest biomass, different scenarios can be considered:
- < 100 tons/day: decentralized mini-mill concept for the versatile production of pulp, for example to the production of molded cellulose packaging or tissue paper (local production, decarbonization, drying energy savings)
- > 100 tons/day: integrated plants for the economic production of bleached pulp and production of MFC
- Characterization of biomass (lignin content, resin content, etc.) by NIR and chemical analyses (fiber morphologies)
- Ongoing partnerships with leading industrialists in the forestry sector
- Capabilities for laboratory scale tests or semi-industrial pilots (cooking, bleaching, twin-screw extruder...)



Differentiating technologies & industrial applications

- Implementation of bio-based coatings for molded cellulose packaging using multi-layer technology (hyper-refined pulps and microfibrillated cellulose). Provides barrier properties, improve mechanical strength and reduce weight ($>50\text{g/m}^2$), control surface finish and dust release.
- Chromatogeny treatment that provides hydrophobicity (CBE CELLUWIZ project - Food contact approved by BFRXXXVI in 08/2024)

Technical capabilities & scientific expertise

- Application of new bio-based coatings to packaging papers using all coating and printing technologies (blade, spray, size press, printing, etc.).
- Printability expertise : assessment and recommendation for main industrial printing processes (offset, flexo, gravure, inkjet and screen) using several specific pilot presses and trials in industrial conditions
- Needs for new bio-based coatings for sealing the sheet structure and porosity, for high-performance barriers (water, vapor, gas, contaminants), and for bonding (hot-melt, cold-set, ultrasonic).

We would be happy to discuss potential collaboration...



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Successful transfers from R&D to industry

CTP collaborates closely with more than **800 industrial** partners in **Pulp & Paper** and **related industries** printing, packaging, converting, end-users, suppliers, equipment manufacturers, food and drugs, luxury, textile, building

