FINAL PUBLISHABLE SUMMARY REPORT

The EC project FORBIOPLAST grant agreement no. 212239, selected by EC as a star project, started on the 1st July 2008. The research activity in FORBIOPLAST have been focused on the use of by-products from wood industry as raw materials for the production of composites with biodegradable and recycled polymers as well as for the production of hard and soft polyurethane foams by innovative sustainable synthetic processes with reduced energy consumption. The materials produced in the project are devoted to applications in automotive interior parts and in the packaging and agriculture fields.

The consortium coordinated by Prof. A Lazzeri of the University of Pisa had a very positive interaction among the members as attested by the regular reaching of the scheduled deadlines. The researchers: University of Pisa (UNIPI-Italy), University of Budapest (LPRT-Hungary), the Latvian State Institute of Wood Chemistry (IWC-Latvia), University of Almeria (UAL) and Fundacion CARTIF (CARTIF) (Spain), University of Bucharest (UASVM-Romania), Organic Waste Systems (OWS-Belgium-SME), Norconserv-Nofima A.S. (NORC-Norway-SME) constantly cooperated with the producer: PEMU Plastic Processing Co. (PEMU-Hungary-IND), RODAX (RODAX-SME) and Incerplast (INCP-SME) (Romania), Ritols Ltd. (RIT-Latvia-SME), and with the end users FIAT Research Centre (CRF-Italy-IND), Neochimiki (NEOC-IND) and Cosmetic (COS-SME) (Greece) with the inputs of Wiedeman (WIED-Germany-SME) a market expert in the exploitation of environmentally friendly materials.

The FORBIOPLAST website is on line with the following address: http://www.forbioplast.eu. The logo of the project is visible on the Project website and aims to outline the innovation in the valorisation of forest resources perceived in the project. The website is divided into a public area for all the users and into a restricted area for beneficiaries and selected members of the Industrial Advisory Board. The public area reports a presentation of the project, abstract, objectives, and the contact details of beneficiaries as well as the news letter and the publishable news about the meetings and images of the prototypes produced.

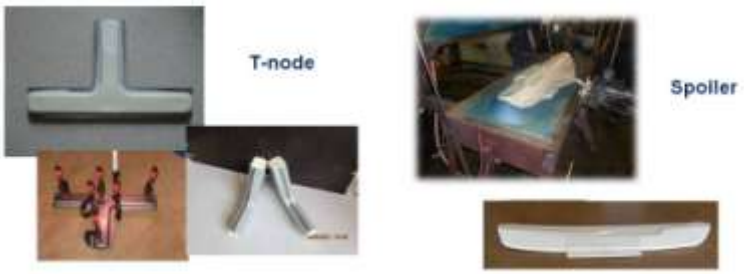
The cooperation of researchers with industries has lead to the production of prototypes of soft and rigid foam produced by lignin and wood by-products, eventually containing wood fibres. Hard polyurethane foams were used to produce a T-node (40x40 cm) part and a spoiler (1.4 m) for automotive applications. Soft polyurethane foams produced by lignin were proposed for applications in packaging, insulation and both as support for the growth of ligninolytic micro organism.

The most promising recipes selected by researchers based on recycled polypropylene and wood fibres were used to produce the granules, by industries, shipped to the industrial partner that performed injection moulding trials and produced prototypes of a car seat. They were produced items for agriculture and packaging applications with formulations based on biodegradable polymeric matrices and wood fibres. Materials were also prepared with wood fibres pre-treated by the addition of waxes and with wood fibres modified by enzymes. Tomato yarns were tested in trials set in green houses and in open fields. Some of the prototypes prepared fulfilled the requirements of the cultivar cycle. These tomato yarns can be collected with the organic remaining of the tomato harvest and sent to a compost plant. Tests were also organised to the transplanting pots and in packaging for the trays, and egg containers.

Some slow release fertilizers were prepared as sticks based on starch and wood fibres enriched with Nitrogen-Phosphorus-Potassium (NPK) components.
The materials produced for packaging applications were tested for properties relevant to packaging (sealing ability, permeation to gas and water, toxicity etc).The end users producers of cosmetics products and of chemicals performed tests on the containers produced for packaging on their products.
International patents were applied for the production of polyurethane and their use as substrate for growth of ligninolytic microorganism, as well as for the production of co-polymers and blends based on polylactic acid. Industrial partners and RTD are carrying on the exploitation of FORBIOPLAST products in particular for fertilizer sticks, tomato yarns and pots, biodegradable materials for packaging and composites with recycled polypropylene and wood fibres for automotive applications.

FORBIOPLAST logo.

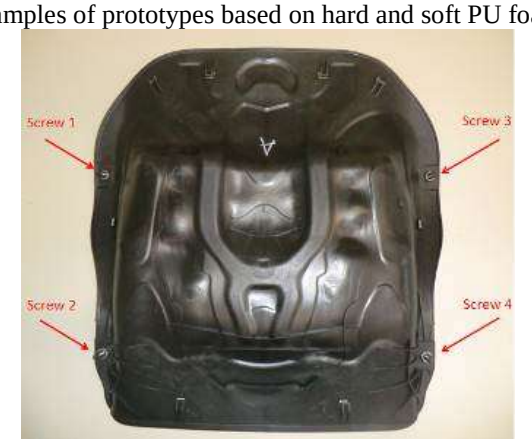
BiPoCo logo



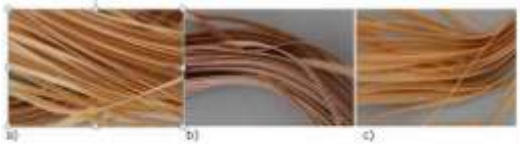
Rigid Polyurethanes by IWC, PEMU and CRF with 25% Renewable Materials

Soft Polyurethanes foams by UNIPI with lignin content 6-13%, total content of renewable material over 40%

Examples of prototypes based on hard and soft PU foams

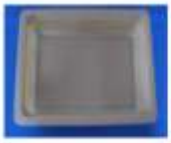


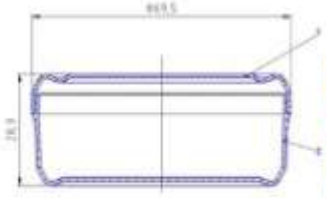
Car seat



Tomato yarn and pots of INCP produced with formulations by UNIPI and PEMU

Balcony flower pot and food trays produced by PEMU – Sealing of the tray by RODAX





Cosmetic container for COS produced by INCP

a)

b)

c)

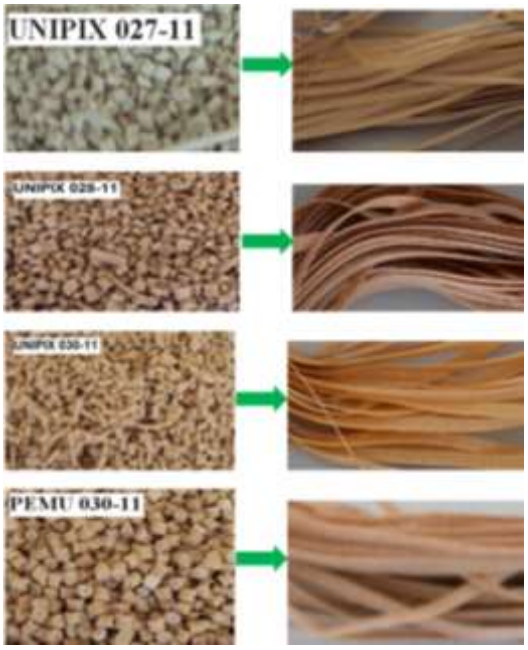
d)

e)

Laboratory production of T-node by IWC and RIT for CRF: (a) – experimental mould under IR-heater, (b – e) – process optimization.

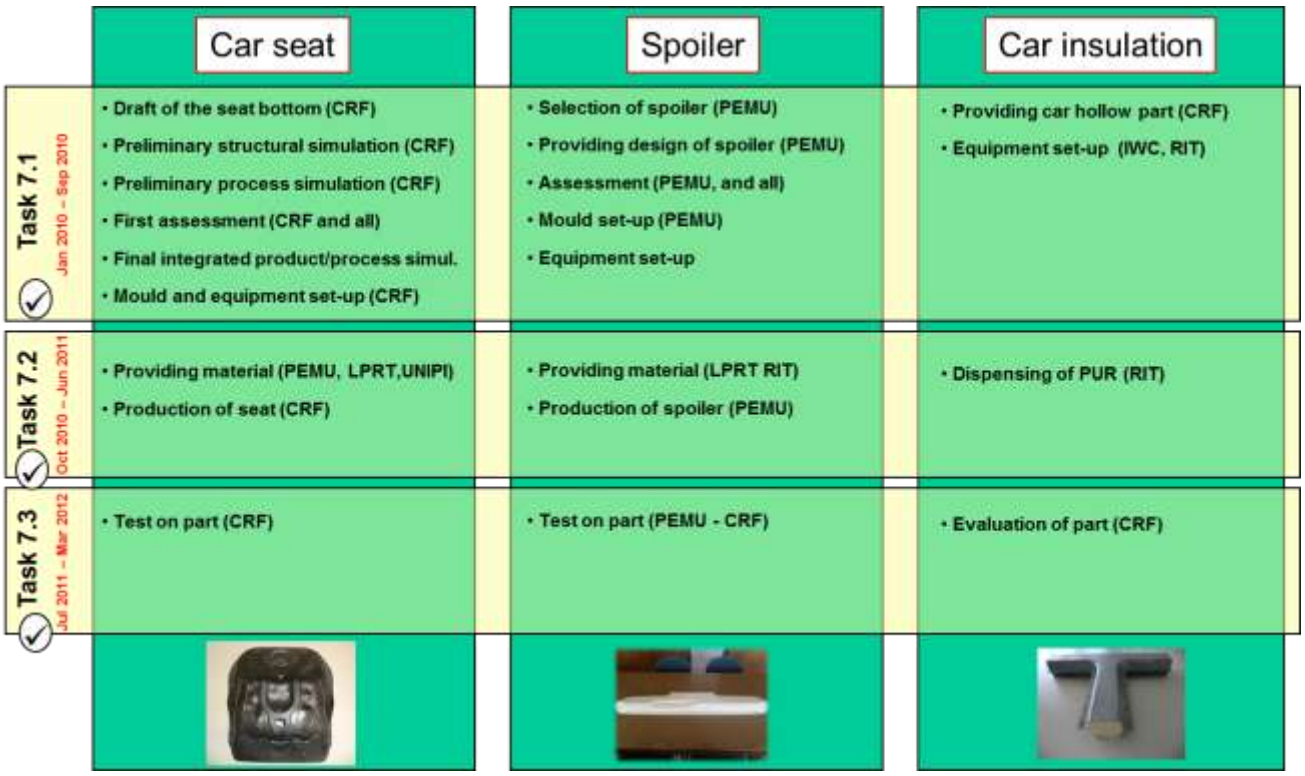
Dry granulation and strand die methods at PEMU

Side feeder at PEMU



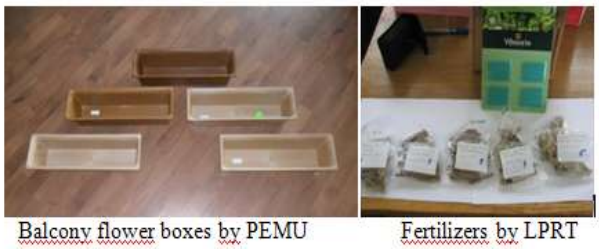
Tomato yarns processed by extrusion

Biodegradable pots by formulations
027-11; 028-11 and 032-11



Tomato yam by INCP

Pots by INCP



Balcony flower boxes by PEMU

Fertilizers by LPRT

Prototypes for packaging applications

Egg container by PEMU Food tray by PEMU

Chemical containers by INCP Cosmetic containers by INCP

Fish boxes by RIT and IWC
Prototypes for packaging applications

Tomato yarn tested by UAL

Biodegradable pots and yarns tested by UASMV

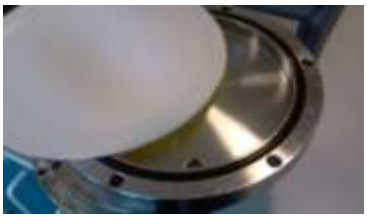
Encapsulated fertilizers tested by USAVM

Packaging Top sealing (NORC)

. Sealing tests (RODAX)

Sealing strength test (NORC)

Sensorial analysis (NORC)



Migration assays (NORC)

Gas permeability (NORC)

Fish packs

Food trays chilling

Meat packs

Microbiological analysis

IR patterns (UASVM)

Storage test (UASVM)

Visual inspection (USAMV)

FORBIOPLAST web site: www.forbioplast.eu

FORBIOPLAST logo.

INNOVATION CONVENTION BRUXELLES

5-6th December 2011

tepat, Eiropā

Jo vairāk grozies, jo vairāk atlec

Latvija izmanto tikai pusi no ES iespējām zinātnes attīstībai

INA STRAZDIŅA

BRISELE, SPECIĀLI "LA"

Eiropas Komisija (EK) šonedēļ izsludināja pēdējo un līdz šim lielāko virkni uzaicinājumu iesniegt priekšlikumus pētniecības projektu atbalstam tā sauktajā Septītajā pamatprogrammā. Kopumā 8,1 miljardu eiro jeb aptuveni piecus miljardus latu piešķirs tādu projektu un ideju atbalstam, ar ko paredzēts nostiprināt Eiropas konkurētspēju un pievērsties cilvēku veselības un vides aizsardzības jautājumiem, kā arī jaunu iespēju meklēšanai un risināt arvien sarežģītākus uzdevumus saistībā ar urbanizāciju un atkritumu apsaimniekošanu.

Īpašu uzmanību veltīs mazajiem un vidējiem uzņēmumiem, kuriem paredzēts finansējums 1,2 miljardu eiro apmērā.

Prestižākais – tālu

Latvija patlaban no visām Eiropas Savienības (ES) dalībvalstīm zinātnei paredzē-

PUBLICITATES FOTO

Projekta "Forbioplast" komandas dalība inovāciju konventā 2011. gada decembrī Briselē. Putupolsuretāna iegūšanas eksperimentu veic LVKĶI asistents Miķelis Kirpļuks, eksperimentu vēro (no kreisās) "Forbioplast" projekta

■ ĪSUMĀ

Daudz citu valstu pilsoņu

No Latvijā dzīvojošajiem iedzīvotājiem 17% ir citu valstu pilsoņi, kas ir trešais lielākais īpatsvars starp Eiropas Savienības (ES) valstīm, liecina "Eurostat" dati. 0,4% no Latvijā 2011. gadā dzīvojošajiem ārvalstniekiem bija citu ES dalībvalstu pilsoņi, bet pārējie 16,6% ir ES neietilpstošo valstu pilsoņi. "Eurostat" norāda – Latvijā un Igaunijā lielais ES neietilpstošo iedzīvotāju skaits saistīts ar iebraucējiem no bijušajām PSRS republikām, kuriem piešķirts nepilsoņa statuss. Savukārt Lietuvā ārvalstu pilsoņi veido 1% no populācijas, kas ir trešais mazākais īpatsvars starp ES valstīm. Vismazākais citu valstu pilsoņu īpatsvars pērn reģistrēts Polijā – 0,1%, bet visielākais Luksemburgā – 43,1%.

Instrukcijas tikai igauniski

Igaunijas valdība vakar nolaidīgai oponicionārās Sociāldemokrātiskās partijas ierosinājumu aptiekās pār-

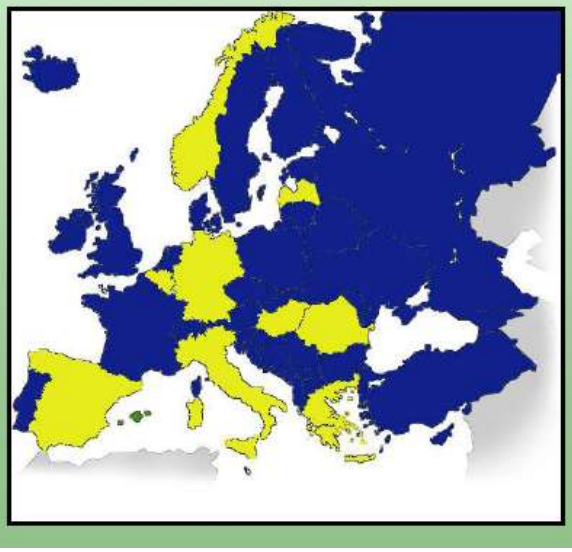
Siófok, Lake Balaton, Hungary from 27.-31.05.2012.
Hotel Azur
Bi.Po.Co Bio-based Polymers and Composites of FORBIOPLAST

The conference was also related to the other FP7 projects Woody and Biostruct.

PLAST 2012, Milano, Italy, May 2012

Participants in FORBIOPLAST

The FORBIOPLAST consortium is composed of 16 partners. All the research activity is carried out in strict cooperation among research centres, small-medium enterprises and industrial partners in order to develop valuable products.



Researchers

- University of Pisa (Italy): coordinator, nanotechnology, material processing
- University of Budapest (Hungary): fibres modification
- Latvian State Institute of Wood Chemistry (Latvia): PU expert
- University of Almería (Spain): biovalorisation, biodegradation
- Fundacion CARTIF (Spain): forest material expert
- University of Agronomic Sciences and Veterinary Medicine, Bucharest (Romania): agriculture, toxicity
- Organic Waste Systems (Belgium): composting, LCA
- Norconserv-Nofima A.S. (Norway): packaging tests

Producers

- PEMŰ Plastic Processing Co. (Hungary): car components, packaging
- RODAX (Romania): equipment
- Ritols Ltd. (Latvia): PU foams
- Incerplast (Romania): packaging

End users

- FIAT Research Center (Italy): vehicle prototypes, LCA on car components
- Neochimiki L.V. Lavrentiadis S.A. (Greece): users and tests on packaging
- Cosmetic (Greece): users and tests on packaging

Market expert

- Wiedmann GmbH. (Germany)

Industrial Advisory Board

forchem

JOENSUUN TIEDEPUISTO

Kemijski inštitut
Ljubljana
Slovenija

Novamont

The Department of Wood Science & Forest Products at Virginia Tech

INTEMA
CONICET
UNMDP

SOLVAY

КАПЕ
CRES

TOR VERGATA

EUROMASTER

LA SOLE

PECS

FEMTO
Engineering srl

STORAENSO

BIOMER
biodegradable polymers

CITMA
FUNDACION CENTRO TECNOLÓGICO DE LA MADERA Y EL MUEBLE DE ANDALUCÍA

Representatives of IND, SMEs as well as industry associations in the area of utilizations of forest raw resources or by-products of forest connected industry for the production of eco-compatible foams and composites suitable for applications in the packaging, agriculture and automotive sectors.

Help defining research challenges from industrial point of view .To recommend Short-, Medium- and Long term priorities to relevant WPs, providing feedbacks on FORBIOPLAST research activities and suggest possible links to public and private financing.

FORBIOPLAST PRODUCTS

Soft Polyurethane

Rigid Polyurethane

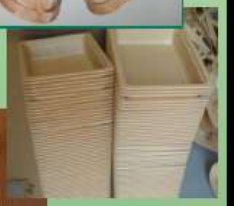
T-node

Tomato yarns

Pots

Fertiliser Sticks

Car seat



Spoiler

Packaging

International Conference

Baltic Polymer Symposium 2009

22-25 September 2009. Ventspils, Latvia

AWARD

in recognition of the best poster presented

U.Stirna, U.Cabulis, M.Kirpluks

"Influence of resin acid content in tall oil esters on thermal characteristics and flammability of polyurethane foams"

Prof. M.Kalnins
Chairman of Scientific Committee

Dr..J.Zicans
Chairman of Organising Committee