

Finished projects



Filatures du Parc

Obtaining a recycled fibre of the same quality as a primary fibre, and less costly

Filatures du Parc, which have for years been able to produce a high-quality recycled fibre based on knit fabrics, set themselves the goal of achieving this with woven textiles. After a whole array of tests, the mission has been accomplished!

↓ INTERVIEW WITH FABRICE LODETTI, MANAGER

Have you succeeded in completing your project?

Yes, we've finally obtained the result we were hoping for, it's really satisfying! The yarn that we've obtained is high-quality and marketable.

What was the procedure you used?

On each occasion, we chose the more difficult method, according to the principle that "if you can do something complicated, you can do something simple", in order to make sure that the end results would be the best possible. So we chose coats that were mostly made of wool, in black. We conducted some 43 tests: 23 in the lab and 20 on a commercial scale. In each production stage for a yarn, we had it woven and tested the characteristics of the resulting fabric. And we are very proud to have finally obtained very recently an abrasion score of 3-4 out of 5, which is a very high standard. We have taken twenty-one months in all to achieve this, by regularly taking the machines we use for production out of service in order to conduct the tests. We have processed 7000 kilos of coats supplied by Le Relais and SRCE!



What will be the next stages in development?

We now want to approach the firms who contribute to Eco TLC to offer them our recycled yarn. We have high hopes that they will be interested in a yarn that is such high-quality, recycled and less expensive!



PROJECT AT A GLANCE

Goal: transform used woven material made out of wooly fibers into new yarns of the same quality



Time frame: 18 months – ended April 2014

Total funding from Eco TLC: 100 000 €

Type of TLC covered: essentially woven winter clothing made of wool or other mixed fibers

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Joint local authority for the districts of Pays de Colombey and Sud Toulousain (Meurthe-et-Moselle)

Recytex: a Textiplax line of products for furniture, building and leisure

Creation of a composite material blending fibres sourced from final textile waste: the target established by the joint local authority has today been achieved. All that remains is to develop the product.

↓ INTERVIEW WITH EDOUARD PETITDEMANGE, HEAD OF BUSINESS DEVELOPMENT

What stage has your project reached?

We have recently, in early March 2014, achieved our goal, which was to create a composite solid material that combined fibres sourced from final textile waste. This phase was completed thanks to crucial support from Eco TLC. The result combines polyester or epoxy



Team (L to R): Frédéric Leclerc (head of social development), Jean-Pierre Arfeuil (vice-president) and Edouard Petitdemange (head of business development)

“ We are not losing sight of the ultimate objective, which is to promote employment, and in particular entry into the workforce, in our region. ”

resins with 20% of blended textile fibres from sorted end-waste. The material has the advantage of being very resistant while affording an opportunity to recycle textiles.

What can this material be used for?

We have identified three fast-growing niche markets for this innovation: street furniture, the building and public works sector and leisure activities. We envisage starting off with commercialisation of semi-finished products, in



Monobloc sunlounger

the form of sheets. We have already completed a prototype of the “bain de soleil” monobloc sunlounger, which we hope to develop. And we continue to research outlets for these sheets.

What are the next phases?

In collaboration with Cetelor and the School of Mining (Ecole des Mines), our next phase in development will involve resolving the issue of product durability. We hope to combine final waste from textile fibres with bio-based resins so that the product is as eco-friendly as possible. In the long run, the idea is to create a public/private cooperative in order to develop the product. We are not losing sight of the ultimate objective, which is to promote employment, and in particular entry into the workforce, in our region.

PROJECT AT A GLANCE

Goal: create a new plastic using textile as an inert fill

Time frame: 14 months – ended June 2014

Total funding from Eco TLC: 43 550 €

Type of TLC covered: all textile end waste

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Trucs Trouvailles

Recycling rubber soles: mission accomplished

In conjunction with her partner Paraboote, Sylvie Dameron has developed a recycling process for rubber soles. This represents a victory for this innovator, who cannot tolerate the idea of wasting raw materials.

↓ INTERVIEW WITH SYLVIE DAMERON

It was following a meeting with Richard Pontvert at the Pollutec exhibition that I had the opportunity to talk to people from the Paraboote company. They contacted me again some years later about a project for recycling rubber soles.

In February 2012, thanks in particular to the support from Eco TLC, I started the research stage in the laboratory.

Successful tests

The tests were conducted in several phases. Apart from some difficulties in ascertaining the composition of some types of soles and in finding a machine that was suitable for producing granular material and mixing it

with the raw material, the project went very well overall and my client is very satisfied with the technical qualities of the end product. The final stage, which we concluded recently, involves recycling end-of-life soles made of rubber and thermoplastic rubber, which come from the sorting centres of “Le Relais”. The soles were sorted, then crushed and the finished product samples were completed in April. The contract is coming to an end and we have achieved our objectives.

Furthermore, we hope to find one or more partners for a contract to develop items from granular material made from end-of-life shoes. This would involve manufacturers who produce large runs of one article and/or take up substantial tonnage. And there is no lack of projects for us, since we also hope to find a partner for a leather recycling contract!



PROJECT AT A GLANCE

Trucs-Trouvailles

Goal: recycle rubber soles into a new product

Time frame: 13 months – ended June 2014

Total funding from Eco TLC: 34 980 €

Type of TLC covered: non-reusable shoes soles made of rubber

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New projects

→ MAPEA



Summary of the project

Making use of old clothes made of cotton and cotton/polyester fabrics as reinforcing fillers in the formulation of innovative plastic materials.

NAME AND DETAILS OF MAIN CONTACT PERSON:

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Presentation of sponsored company

MAPEA, company set up in 2003, specialising in the formulation of plastic materials and compounding technologies. MAPEA provides services and research for businesses in the plastics processing sector, either with an eye to creating a new plastics product or in order to improve productivity in moulding these materials. At the same time, MAPEA develops its own plastics materials, which include a range with recycled products.

Goals of the project

- Cut costs for materials in plastics processing
- Diversify sources for raw materials, as well as reduce the concentration of petroleum-based components
- Increase the level of recycled materials in plastic articles, in particular for the automotive and engineering industries

Types of clothing, household linens and shoes processed:

end-of-life clothing in cotton/polyester in any proportion; and end-of-life cotton/polyester textiles (excl. flat linens)

Duration: 18 months; start 1st April 2014

Amount of subsidy from Eco TLC: 116 000 €

Partners:

- Armor Lux: textile supplies and knowledge of the sources
- Plastigray: moulding, end user of new materials
- Several sub-contractors throughout the project: Textel, Carbonetex, PEP, Yamana
- Funding Inov'R, under the Techtera label



Message to the companies contributing to your project:

This project will allow MAPEA as a company to develop as a result of establishing a production unit for industrial plastics materials made from recycled products. Within 3-5 years, it ought to employ 20-25 staff. THANK YOU for your support!



→ Concrete made from old clothes

Summary of the project

Implementation of the concept to deliver a product for marketing on an industrial scale that is simultaneously visually attractive, eco-friendly and effective: market research, full-scale trials, research regarding design and laboratory tests.

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Message to the companies contributing to your project:

Thank you for enabling us to realise this project and to demonstrate that recycling can be a source of beauty. By the time development has finished, we hope to end up with range of quality products, marketed towards individual consumers and professionals.

Goals of the project

The project's objective is to create a new range of acoustic, visually appealing products, made entirely of recycled textiles. Béton de Chiffon (rag concrete) has its origins in reflections about design and textile recycling, which highlighted the aesthetic potential for a recycled fibre that is all too often concealed. The textile fibres are smoothed out, taking on the mineral look of concrete while retaining the pliability of textiles.

Types of clothing, household linens and shoes processed: used clothing and household linens

Duration: 20 months (end projected for December 2015)

Amount of subsidies from Eco TLC: 49 290 €

Partner: Le Relais - the industry partner for the project

Presentation of sponsored company

The Prémices collective is a young company that was founded by four interior and graphic designers, who share a common interest: recovering, recycling and reusing existing materials. Currently the company is attached to the business incubator at the Paris Ateliers at the French National School for Advanced Studies in Design.



Ongoing projects:

Where are they at?

The beneficiaries share their experience and the progress in their research.

AIR, consultants for responsible innovation



Recycling leather and rubber shoes

The AIR agency and its partners have succeeded in creating a method for recycling that makes it possible to separate rubber from leather in used shoes. After successful laboratory tests, industrial-scale tests are in progress and expectations are high!

↓ INTERVIEW WITH BENJAMIN MARIAS, MANAGER

Why are you trying to separate leather and rubber in used shoes?

Our partner SOEX, a provider of collecting and sorting operations, wants to find markets for recycling shoes, and both leather and rubber are materials with relatively high added value. So we thought it would be interesting to explore this avenue, with the intention of producing a powder from recycled leather and a powder from recycled rubber, which could be used to manufacture new products. Our short-term goal is to process a ton of shoes a day using this process.



this way be sold? What are the mechanical and chemical properties of these powders? What are the environmental benefits of these recycled materials over the entire life cycle? The answers to these questions are what will guide our future developments.

What are the next stages?

While waiting for this information, we have set up a network of end users in order to develop recycled materials (rubber and leather), which meet the requirements of the market: in furnishings, luggage, shoes etc. We hope to be able to sell them our recycled powders at the same price as they pay for virgin materials. They do in fact have genuine expectations regarding the ability to use recycled materials.



What are the outlets for leather and rubber powder?

When combined with non-recycled rubber, rubber powder can be used to re-manufacture soles or any types of rubber articles.

When it comes to leather powder, it can be blended with organically sourced resins in order to create practical upholstery for furniture, for example. It is then referred to as bonded leather.

What progress did the project make?

Excellent! It was launched in June 2013 and kept us a busy for about a year. We, the AIR agency, are affiliated with SOEX and with the English professor Mike Lee, who developed the separation procedure. The machine that we designed first crushes the leather and rubber shoes and removes any hard metal spots. However, the real innovation is in the separation procedure for the materials, initially using centrifugal force and then pulsation. We are proud of having succeeded in designing a machine that will run on a laboratory scale, and we are now keen to obtain the results from the industrial-scale tests!

What do you expect from the next tests?

This large-scale development will allow us to answer several questions: for example, what is the real cost of the machine? At what price can powders obtained in

PROJECT AT A GLANCE

Goal: develop an industrial grinding and separation process to find added value recycling outlet

Time frame:
14 months

Total funding from Eco TLC: 86 000 €

Type of TLC covered:
non-reusable shoes

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Bleaching textiles without water

As a specialist in dyeing textiles without water but with CO₂, Feyecon has succeeded in using the same technique to strip the colour from textiles. A procedure that is likely to interest many players in the industry.

↓ **INTERVIEW WITH AUDREY NGOMSIK FANSELOW, HEAD OF RESEARCH AND DEVELOPMENT**

What was the method you used?

We use CO₂, a “waste” gas, to dye clothing and also to dry fruit, and for numerous other applications in the food, pharmaceuticals and textile industries. As the textile sector uses considerable quantities of water for dyeing, our procedure will allow this resource to be saved by substituting CO₂. So we have reversed the process in order to remove the colour, and we have succeeded.



Polyester fabric before (green) and after (white) waterless bleaching process

How did you get to that stage?

We work with some major international labels for sports shoes, for whom we dye the textiles. They are aware of the issues around recycling and we were therefore looking at ways of using our CO₂ procedure for recycled textiles. We then established that many markets, in particular plastics processing, require white or monochrome fibres. We then decided that, if it was possible to colour textiles using



From left to right: Jorge Barriatua (Chemical engineer in training), Dr Audrey Common (Scientific manager), Guillermo Ramas (R&D engineer), Lara Gonzales (R&D engineer), Dr Audrey Ngomsik-Fanselow (Project Manager)

CO₂, it should be possible to bleach them using the same technique. The application documents were sent to Eco TLC in late 2012, and we then launched the project in May 2013.

What were the different phases in the project?

We are very familiar with polyester, as we have dyed it very often, and we know that there are substantial sources, so we started out with this material. We proceeded by conducting different tests on a small scale: bleaching different types and colours of waste

EcoTextile, waste collection / Framimex, sorting of waste

Viacover: insulation made of concrete and recycled textiles

In order to find an outlet for sorted end-waste, Framimex/ EcoTextile are attempting to combine it with concrete in order to create exterior sound insulation. It is a very promising project.

↓ **INTERVIEW WITH MEHDI ZERROUG, MANAGER**

What procedure do you follow?

Framimex/EcoTextile, providers of collecting and sorting operations, want to recover, recycle and reuse final textile waste, which, for want of a market, are currently incinerated. Incineration is expensive and neither is it appropriate. We therefore hope to find a channel for this potential source, which will allow providers of sorting

operations and the entire branch to achieve savings. In 2010, we launched a research project with the aim of learning to what extent it was possible to mix textiles with concrete in order to produce insulation.

What progress did you make with this project?

First we requested funding from BPI France (which was then called Oséo), thanks to which we were able to proceed with the tests together with CERIB, the specialist concrete research centre. At the end of two years, the mix was deemed to be durable, robust and practical, in other words: viable. We therefore filed the patents and conducted a feasibility study, which led us to the second phase of development, where we are today. We are supported by Eco TLC in this project and also by ADEME.

What is the goal of this phase in the project that is supported by Eco TLC?

The studies we have conducted so far targeted several applications, all concentrating on insulation, both acoustic and thermal. We are gradually submitting the results as the tests progress. We are testing several compositions with different, required properties, varying types of concrete blends (with varying qualities and compositions) and of textiles (different fabrics, with larger and smaller pieces of textiles). Then we will be testing the technical

PROJECT AT A GLANCE

- Goal:** finalise a type of sound insulation out of light concrete
- Time frame:** 12 months (already 3 years of R&D undergone)
- Total funding from Eco TLC:** 53 500 €
- Type of TLC covered:** all textile end waste
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textiles to see if it was possible to strip the colour in every case, improving the parameters for bleaching, then re-dyeing, analysing the technical quality of the fibre once it had been bleached and re-dyed, attempting to obtain a uniform colour for different textiles. Then we tried to find out who would be interested in our results. The idea was to offer white textiles for plastics processing, but we realised that our procedure might interest the entire sector, since it concerned a pre-treatment stage in recycling. Obtaining a uniform colour for textiles could, for example, make it possible to eliminate the need to sort by colour.

What will the next stages be?

We will proceed with larger-scale tests, carrying out more in-depth quality analyses, optimising costs, and conducting environmental analyses in order to confirm the economic merit of the project. The environmental advantage of our method is obvious, as several companies have already joined us.

PROJECT AT A GLANCE

Goal: create a un-dye process for polyester fabric based

Time frame: 25 months

Total funding from Eco TLC: 188 600 €

Type of TLC covered: polyester fabrics

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Valagro, Poitou-Charentes Eco-industrial Park, Eco-Ethanol, Valoris

Recovery of blended textile fibres: a promising project on the way to becoming reality

In 2013 they succeeded in finalising development of a method for recovering, recycling and reusing end-of-life textile blends. Valagro and the Poitou-Charentes Eco-industrial Park, in conjunction with Éco-Éthanol and Valoris, are now moving up a gear: preparing to market the product.

INTERVIEW WITH CÉDRIC DEVER, ↓ SCIENTIFIC DIRECTOR AT VALAGRO

What is the goal of your project?

End-of-life textile blends are difficult to recycle and are often destined for incineration or landfill. Due to the wide variety of fibres, they constitute a raw material, the mechanical properties of which are not of great interest to industry, unless it is possible to separate the different

blended constituents. This is what we succeeded in doing in 2013: with a succession of chemical and enzymatic reactions, we managed to separate the different chemical components in a batch of blended textiles: cotton, wool, polyester, polyamide. It is thanks to support from Eco TLC that it has been possible to perfect this waste

recovery procedure for blended textile waste, and it is again thanks to their support that the pilot tests for commercialisation have now been conducted.



What stage have you reached now?

Once the initial work had started in 2009, we patented this procedure called "Multitex" back in December 2012. In 2013, we registered interest from manufacturers, both with respect to using the procedure and its operation. In 2014, we have therefore arrived at a new phase, which involves publicising the project. And, first and foremost, we are consolidating our results by moving on to pilot testing. We validate the procedure on the basis of hundreds of kilos of textiles, which allows us to establish all the key figures for industrial scale production and marketing of a procedure like this. What are the energy costs? What price will be charged for the finished product? Just the questions that interested manufacturers are asking us. We are all waiting impatiently for confirmation of the economic viability of →

PROJECT AT A GLANCE

Goal: design a chemical process to separate synthetic and natural fibers

Time frame: 15 months

Total funding from Eco TLC: 113 000 €

Type of TLC covered: mixed fabrics

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qualities, their resistance to compression, to freezing/thawing, to rain, to Karcher cleaning, to cleaning agents, etc. Several test tubes have therefore been selected after passing the tests for freezing/thawing and compression. We are following the established protocol!

What is the future for this product?

We have decided on a name for it, Viacover, but is still premature to make announcements about the ultimate viability, production costs, etc. The tests are still in progress. We should know more by the end of 2014.





this procedure. We have received signs of interest on the part of the chemicals industry in particular. Where the latter is concerned, our resource does in fact represent the potential for disposing of raw materials from recycling, thus offering a neutral carbon footprint, rather than petrochemical components. With the availability of textile waste, this raw material is also secure in terms of procurement. It remains to be seen at exactly what price these recycled raw materials will be ... the answer is due at the end of 2014!

FROM page 1: are calling for it. So major chains, like the Decathlon brand, are unwilling to wait to label the environmental footprint of their products until labelling has become mandatory.

Labelling recycled fibres

With Eco TLC, the goal is collect information about the environmental footprint of a number of recycled fibres. If it is demonstrated that recycling results in a benefit for the environment, this will be reflected on the shop label for the textile, which, in turn, will guide consumers in their purchases and offer an additional benefit to producers who are moving towards an eco-design approach and use of recycled fibres.



Establishing 'sorting according to material composition' and developing it

RDC Environnement, centre for environmental expertise

→ Interview with Isabelle Descos, engineer

The industry's goals are to double collections and to establish sorting according to material composition, in order to provide new avenues for textile recycling between now and 2019. Eco TLC called on RDC Environnement to assist it in the collaborative design of a solution for "materials composition sorting".



Benoît Liégey, Head of Sustainable Evaluation Department at RDC Environment

What is the role of RDC Environnement?

A firm of consultants based in Belgium, RDC Environnement supported Eco TLC in 2013 in its re-approval procedure (2014-2019) by acting as moderator for working parties presenting a review of the environmental organisation's actions to stakeholders in the industry and establishing future objectives with them. The ambitious goal of the new agreement to double the volumes collected, sorted and recovered, in comparison with figures at the end of the previous agreement (2013), calls for improving capacities for sorting, recovery, reuse and recycling. New funding is planned for operators of a specific type of sorting that is needed for recycling operations; this is called components sorting.

Why and how to increase materials composition sorting?

Components sorting aims to gain access to new outlets in order to recycle more materials. This involves a pre-recycling procedure that will allow clothing, household linens and shoes to become more suitable for recycling. Following a first sort according to the destination of the recycling products (e.g. wiping cloths,

garnetting etc.), the components sort consists of taking the clothing, household linens and shoes, which cannot be reused, in order to identify them more closely according to constituent and sorting them by separating them or preparing them so they can be recycled as new products or new raw materials. In the first instance, we will need to define components sorting: at what point does a used textile article become a usable raw material? For example, is cutting up fabric to produce cloth pieces a stage in preparation or is it recycling? Once we have agreed on this definition, it will be possible to generate projects. It is first necessary to identify the needs of innovators and users of secondary materials so that we can define the basis for specifications for sorting/recycling companies.

We will then proceed with experiments, which will take between six months and a year, to establish the exact technical elements with the aim of defining new sorting categories that correspond with the specifications. It is essential to work in collaboration, in particular with sorting operators, so that the recently standardised categories will allow all parties

to have to sort from similar sources at an acceptable cost, with appropriate funding if necessary.

What are your expectations from the next working parties?

We are hoping for substantial participation, and we are enthusiastic about the ideas and projects that will emerge from these discussions. We are sure that sorting operators will be proactive as they have every interest in increasing the opportunities for outlets to take up the textiles that they sort. We are also hoping to get users of recycled materials involved in particular, including those outside the textiles sector (e.g. automotive), who are not necessarily aware of the potential of recycled materials and regard them sometimes as constraints. The challenge for these working parties is to pool their knowledge, and this is a real difficulty given the confidentiality of some projects. We encourage anyone who is interested to join us. It will be possible to get on board once we have got going, but those who are involved from the outset will have a head start!

