Fibre to fibre recycling of textiles
HAVEP

Company: HAVEP

Product or service: Workwear - design, production and distribution

Pilot: Recycled cotton

Key facts:

- Production and sale of textile for workwear made with fibres from recycled textile. Two materials were developed:
  - Fenix: cotton/polyester fabric:
    - 10% recycled post-consumer cotton/ 65% recycled polyester / 25% cotton
    - 10% recycled post-consumer cotton/ 35% recycled polyester / 55% cotton
  - Jeans: 100% cotton of which 66% recycled cotton from cutting waste from industry
- First steps towards chemically recycled cotton where trousers are made of 100% post-consumer recycled cotton

Results:

The recycling of raw materials in this pilot achieved positive environmental impact. An indication of this impact in the period 2017-2018 is:

- Water savings: 13,903 m3
- Energy savings: 33,371 kWh
- CO2 reduction: 3.2 tonnes

- During the pilot and estimated 3.2 tonnes of discarded textiles both post en pre-consumer were saved from incineration.

Key lessons:

- It takes time to find the right partners in the supply chain and to get a good collaboration between them
- Reflect on the next use application of a garment from scratch in the design process
- The search for the proper fibre mix in the yarn and the fabric of

Overview of the company

Intro

Havep is a Dutch family-owned company active in workwear and protective wear since 1865. Most of its customers operate within industries such as construction, (petro) chemicals, transportation and logistics. Havep also offers services based on a strong stock collection as well as project services for custom-made solutions (e.g. the Royal Dutch Touring Club).

Mission and vision

HAVEP has a strong sustainable vision: it wants to achieve a positive impact, for its products, the company, the environment and for people. In terms of production, the ambition is to make 90% of production circular by 2025. A roadmap was established together with various specialists in order to achieve this objective. It contains actions on raw materials, detox of used chemicals, designs for recycling, picking up and recycling customer materials, and so on.

Cooperation with suppliers and other stakeholders

HAVEP was an integrated company until 2002, but yarns and fabrics are purchased nowadays.

Tailoring mainly occurs in Macedonia and Tunisia, for the most part in workshops that manufacture 100% for HAVEP. HAVEP has already implemented Living Wages in its own workshop, steps have been taken in this direction for the other workshops.

Within the context of its sustainability policy, HAVEP is also seeking options to use waste, such as cutting waste as a filling for punch bags, or old clothing for processing into sports bags.

At the level of the company and the environment, HAVEP heats with pellets from its own forest through sustainable forestry. They are also used to heat the adjacent care home.

"This ECAP pilot helped us to make the change we want to achieve"
Vinsent Jansen, product manager of Havep

Why ECAP?

ECAP – the European Clothing Action Plan is a project part funded by the EU LIFE programme. The project aims to achieve waste prevention, reduction of water and energy use as well as lowering CO2 emission in the chain. ECAP implements the F2F pilots to support businesses in their pursuit of circular textile and their efforts to reduce virgin raw materials. The pilots are intended to develop knowledge and an understanding of the use of recycled materials in new clothing. ECAP came at precisely the right time for HAVEP. Efforts were already geared towards sustainability and the development towards more circular entrepreneurship. The central issues are the reuse of textile and a reduction in the use of virgin raw materials. ECAP was used as a driver in this process.

Recycling of post-consumer workwear

The HAVEP pilot was initially focused on the market launch of clothing for the healthcare industry with recycled content. The healthcare industry is a new market for HAVEP. However, this proved too ambitious to achieve during the pilot period. This is why the focus was shifted to the development of a fabric that can also be used for light-duty activities within workwear. In addition, a sustainable pair of jeans was developed with 66% post-consumer recycled cotton and major steps were taken in the pilot towards chemical recycling and producing fabric with 100% PCS cotton, led by the Saxion University of Applied Sciences.

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What we did

At the launch, HAVEP wanted to gear the pilot towards the development of yarns and fabric with recycled content for the healthcare industry. This was a new sector for the company. Thus, HAVEP continued to build on a pilot collection with circular products. There was a demand for these products in the healthcare industry, but they were difficult to procure. It ultimately proved too ambitious to achieve within the duration of the ECAP pilot, and the developed fabric was used for products for sectors where HAVEP has already secured a position. The first order for a product with this fabric is being produced now: aprons for staff at the cleaning company deployed by the Dutch central government. In addition, a version with recycled content was developed for products from the company´s standard collection.

The pilot was launched by the end of 2016 and was completed by the end of 2018. The following activities were performed:

Engaging supply chain partners

A first meeting with potential project partners was organised in October 2016. In this meeting, hosted by HAVEP, the companies expressed their interest in the project. The products must be placed on the market at a competitive price. Therefore, all partners will present an open calculation stating their actual costs and the usual profit margin. It was agreed that the industrial partners in the consortium will do the piloting tests at their own risk and expense. If the project is a success, there will be agreements between those partners and HAVEP to cooperate for at least a fixed period in which the companies can achieve a return on their investment.

With the help of Remo, a yarn supplier was found in Spain. The supplier also takes care of the collection and fiberisation of discarded textile and works with a weaver from the same village. An existing supplier of Havep does the processing and production.

Development of yarn and fabric with recycled content

For this project, HAVEP carried out 3 projects:

*** Jeans**

Development of 3 types of jeans with 66% recycled cutting waste in the fabric to add to the stock collection

*** Fenix**

2 types of polyester/cotton fabric. The composition of the fabric includes cotton and PET, with 10% post-consumer cotton originating from post-consumer cotton and cutting waste.

*** Saxcell**

The chemical recycling of 100% cotton HAVEP overalls (post-consumer) into new fabric: HAVEP forms part of the consortium led by the Saxion University of Applied Sciences.

Development of a service model for a takeback system

In early 2017, we launched a takeback system that makes it logistically possible to take back clothing from customers. This way, we can achieve a higher volume of similar products. We would like to see this in a new high-quality raw material and perhaps in a new yarn. In terms of recycling, it is still difficult to reuse the entire item of clothing. For example, elastane in clothing, reflection bands, the use of coatings for logos and size labels that cause problems individually. It is important for us to know the origin of our products. Likewise, it is important to know where they will end up after use.

In addition, these systems should be designed in such a way that the flows can be properly monitored so that they can serve as usable new raw material flows.

Communication

For the benefit of communications about the environmental profits, there was a collaboration with REMOkey, who fitted the clothing items with a label featuring information on the origin of the material and the environmental profits achieved through recycling.

Communications occurred via a press release and a vlog at www.havepositiveimpact.eu. There was a great deal of response and interest from industry.

Tip:
Reflect upon Design. Circularity in textiles is more than recycling.

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Challenges

- To find the right partners in the total supply chain for the development of fabric
- High technical and functional demands imposed on workwear
- Finding a good and affordable mono-flow of discarded textile; cotton in this case
- Lack of knowledge of sustainability and the circular economy among customers

Results and impact

What did we achieve?

- In cooperation with Remo, a fabric supplier has been found in Spain. Discarded cotton sheets and cutting waste were used to this end
- Production of two types of fabric; polyester/cotton with 10% post-consumer recycled cotton and 65% recycled polyester
- A tender for the cleaning company of the Dutch central government was won by HAVEP. This contract includes 1,500 aprons for which this fabric will be used
- The second, slightly heavier type can be used in the customer-specific production of work shirts, trousers and jackets
- Work jeans with 66% recycled cotton from industrial waste are being produced and sold
- Because fiberisation, spinning and weaving occur at 1km2; a great environmental saving is achieved here
- Production of yarns and fabric of Saxcell has been delayed and has not yet been achieved upon completion of the pilot by the end of 2018.

Fabric composition	Product	Number	Weight kg RE content
Fabric fenix 1: 10% post-consumer re COT, 65% re PET and 25% virgin COT/ca 220 gr	Aprons Fenix 1	1,500	675
Fabric jeans: 66% rCOT industrial waste, 34% virgin COT	Worker jeans	2,595	1,712
Fabric fenix 2: 10% post-consumer re COT 35% re PET /55% virgin COT/ca 300 grams	Fenix 2	4,000 m	864
	Total		3,252

Indication of environmental savings per KG (source: REMO with the exception of the waste figure)

Total ECAP pilot		
Water	13,903	m3
CO2	3.2	tonnes
Energy	33,371	kWh
Waste	0.2 tonnes 3.0 tonnes	post-consumer textiles industrial textiles waste

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Next steps - long-term strategy of the company

HAVEP has taken the first steps in order to make its current range more sustainable, and the company will continue the search for sustainable and circular solutions for the most frequently used raw materials – cotton and polyester (generally blends thereof).

HAVEP intends to improve the design of the internal and external processes in order to be able to respond as early in the design phase. How can the design take into account recycling of materials after use? How does this fit in with the current logistics systems in order to reach a high volume of used materials? In order to achieve solutions, HAVEP seeks to collaborate with fabric and notions suppliers, parties involved in recycling/fiberisation, but perhaps also with innovative designers, in order to assess what is efficient and profitable throughout the chain.

We ultimately hope to optimise our production line in such a way that we can achieve our target for 2025, which is 90% circular production.

"Cooperation with other parties who share the same vision is a prerequisite to achieve really great results"

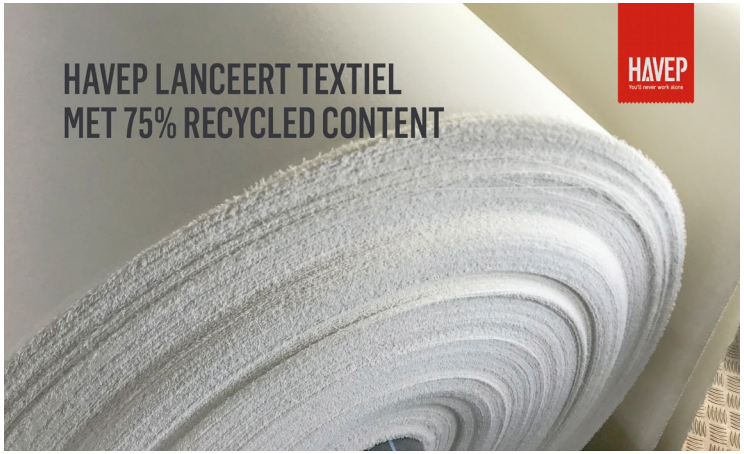
Els De Ridder marketing manager at HAVEP

Success factors

- Management is motivated towards sustainability
- There is a strategy and ambition for circular entrepreneurship
- Cooperation with Remo, with an extensive network of companies experienced in recycling
- The yarn supplier has technical knowledge, equipment and development capacity
- Short physical distances between the various companies which jointly form the production chain
- A choice to order the development of a fabric that we can integrate into a successful standard workwear package
- Creating focus in the efforts geared towards sustainability and the circular economy

Lessons learnt

- Post-consumer recycled content realised by mechanical recycling still has a negative influence on the quality (strength) of the fibres. So it is hard to use more than 10% post-consumer recycled cotton for workwear fabrics. Knits are easier
- Chemical recycling of cotton resulting in a viscose seems to achieve very good results, but it is hard to scale up the process from a pilot to an industrial scale
- The next use application should be determined as early as the design of the item
- It takes some time to find the right partners in the supply chain and to achieve a good collaboration between these partners; all partners need to have the same circular ambition
- The right fibre mix for circular products has yet to be found
- It is difficult to trace back the origin of the discarded material from the fiberisation company to the chain
- We need to make it easy for our customers to choose the sustainable option: no compromise on price and quality
- The government can play an important role by stimulating the procurement of circular products.



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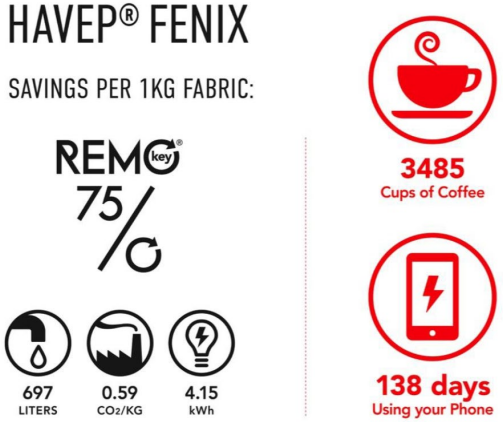
ECAP is €3.6 million EU LIFE funded project which aims to reduce clothing waste across Europe and embed a circular economy approach.

ECAP mission

Cutting the environmental impact of clothing across the supply chain. Generating value for business through collaboration, measuring and sharing best practice



Case studies were generated as a result of pilots carried out for ECAP by Rijkswaterstaat and the named organisations from 2016 to 2018.

Project supported by LIFE funding

Rijkswaterstaat
Ministry of Infrastructure and the Environment