

# Fibre to fibre recycling of textiles

## Schijvens



Rijkswaterstaat  
Ministry of Infrastructure and the  
Environment



**Company:** Schijvens Corporate Fashion BV

**Product or service:** Design, production and distribution of workwear

**Pilot:** Closing the loop of **uniforms**

### Key facts:

- Production and sale of T-shirts, polo shirts, blouses and other clothing made from fibres of recycled textiles
- The material of the workwear is cotton /polyester in a ratio of approximately 50/50 %
- Composition of the yarn and fabric: 30% post-consumer textiles (mixed PET & cotton), 20% industrial textile waste (cotton) and 50% PET (from bottles)
- The recycling of raw materials in this pilot achieved an indicative environmental benefit in the period 2017-2018 of:
  - Water savings: 38,617 m<sup>3</sup>
  - Energy savings: 94,743 kWh
  - CO<sub>2</sub> reduction: 19.8 tonnes
- In the period between 2017 and mid 2018, an estimated 11 tonnes of discarded waste were saved from the waste mountain
- Key findings:
  - Material from discarded workwear of clients is suitable for recycling
  - Chain cooperation is the key to success
  - Closing the material loop is commercially viable

Key facts

Overview

What we did

Results and  
impact

Case  
study



## Overview of the company

### Intro

Schijvens is a Dutch family business that has been involved in the design, production and distribution of workwear for 150 years. The company manufactures workwear for clients in retail, facility services, construction and transport & logistics, both in the Netherlands and abroad. Schijvens supplies various types of items, from polo shirts to dresses, from overalls to aprons, from work trousers to suits as well as accessories such as shoes, badges, belts and bags.

### Mission and vision

The mission of Schijvens is to produce sustainable workwear with material from discarded items of clothing which is worn with pride and a great deal of pleasure by employees of their clients. It is the ambition of Schijvens to be fully circular in its production by 2020.

### Cooperation with suppliers and other stakeholders

Schijvens is continually looking for improvements and is working actively on making the workwear more sustainable including the production process. The business does this together with its partners in the chain with whom long-term relationships are maintained. In order to stimulate this, an annual meeting is organised with all (international) production partners. It is the vision of Schijvens that cooperation is required to achieve its ambition for the circular economy.

To Schijvens, sustainability means there should be a focus on the environment and people. In 2017, 100% of the factories with which Schijvens cooperates were audited and Schijvens achieved a score that falls in the highest – leader - category of the Fair Wear Foundation!

## 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, a reduction in water and energy use and a reduction in CO2 emissions in the textile chain. ECAP uses fibre to fibre pilots to support businesses in their commitment to circular textiles and the reduction in the use of virgin materials. The pilots are intended to develop knowledge and insight into the use of recycled textile material in new clothing. For Schijvens, this came down to an acceleration and a reinforcement in its activities in terms of circular production.

### Recycling of post-consumer uniforms

The pilot by Schijvens aimed to produce sustainable workwear with 'post-consumer' recycled material for all staff members of three clients. This involved T-shirts, polo shirts and blouses with 100% recycled content, of which 30% post-consumer textile, 20% pre-consumer textile and 50% recycled post-consumer PET from bottles.

“Circular business, that means making business with and for your partners in the supply chain.”

Shirley Schijvens, managing director of Schijvens

Key facts

Overview

What we did

Results and impact



## What we did

Before ECAP started, Schijvens had already completed test runs with worn workwear. They showed that some fibres simply became too short to spin again. However, the fibres in discarded workwear overalls were reasonably suitable for recycling. In 2016, the supplier in Turkey introduced Schijvens to their network. Together they tested 20 samples of different workwear for recyclability. They were all recyclable except for one: a polar fleece sweater, which cannot be mechanically shredded, just melted.

The ECAP pilot was launched at the end of 2016 and was completed at the beginning of June 2018. The following activities were performed:

### Selection of products

Polo shirts, T-shirts and blouses were originally selected as items. However, other items were produced and sold during the pilot because demand increased considerably.

### Engage Supply chain partners

Prior to the pilot, Schijvens decided to base the development of the yarn and fabric with recycled content in Turkey. The company took over the sewing workshop in Mersin. The network of the company was used for the search for good partners for the development of yarns and fabric with recycled textile fibre content.

The business in Mersin also was the base for a feasibility study into the technical side of textile recycling, which was conducted by students.

### Development of yarn and fabric with recycled content

As a first step, Schijvens had pique jerseys made with post-consumer textile collected in Turkey. It concerned 3,000 meters in total. It was a first test to see if the quality was sufficient. This resulted in workwear for the first client. This was hostel chain Stayokay which purchased new shirts, polo shirts and sweat vests for its staff made from polyester and cotton with 100% recycled content, 50% recovered from mixed textiles and 50% PET bottles.

## The development of a service model for a takeback system

Schijvens offered its clients the service to collect discarded clothing and to recover it for recycling, complete with collection container and staff instructions. In addition, a logistics system was set up for processing and transports to Turkey. The clothing is sorted in the Netherlands and is subsequently mutilated to meet Turkey's import rules.

### Engaging clients

In the meantime, clients were sought who wanted to collect discarded clothing. Kruidvat, Etos and the Flemish Brico were the first, but in the meantime all clients of Schijvens wanted to participate.

### Communication

A partnership was set up with REMOkey for communication on the environmental impact. The company tagged the clothing items with a label with information on the origin of the material and on the environmental profit achieved through recycling. Publications were issued and the Schijvens website was updated with information on all circular products: [www.schijvens.nl](http://www.schijvens.nl)



Tip :  
Work  
together  
with your  
suppliers.  
They are  
your  
partners.

Key facts

Overview

What we did

Results and  
impact



## Challenges

- Business case on collection
- Quality of the fabric
- Design for recycling
- Restrictions on imports of discarded clothing and textiles
- Import tariffs on fibres and fabric
- Involvement of clients is important.

Schijvens can only manufacture circular workwear if clients want to purchase clothing with recycled content and moreover want to hand in their discarded clothing for recycling.

## Results and impact

- The supply chain development of recycled content in Turkey is in place
- The service for client return system has been developed
- A large proportion of clients purchase the take back service
- Seven fibre to fibre clients purchased workwear (including Hema)
- Staff of clients are happy with the new circular clothing
- All elements of the business including design contribute to circular workwear
- Developed products are made from 30% recycled fibres from post-consumer textiles.

Fabric consumption	product	number	Weight recycled kg
30% post-consumer textiles (mixed pet & cotton) 20% industrial textiles waste (cotton) 50% pet (from bottles)	Polo shirt	1,117	335
	T-shirt	29,171	8,751
	Blouse/ shirt	365	146
	Other	7,098	1,848
	Total	37,751	11,080

Indication of environmental savings (Source: REMO except for the waste figure)

	Per kg	Total ECAP pilot	
Water	3,485	38,617	m3
CO2	1.79	19,835	kg
Energy	8.55	94,743	kWh
Waste	0.3	3,324	kg post-consumer textiles
	0.2	2,216	kg industrial textiles waste
	0.5	5,540	kg waste bottles

## Business case

- Input of collected own material favourable for the cost price of recycled fibre
- Costs of the collection process, handling and transport are key in completing the business case
- Higher prices are acceptable if clients consider other economic values besides the cost price

Key facts

Overview

What we did

Results and impact



## Next steps - long-term strategy of the company

Schijvens has achieved the results far more quickly than expected. Also, clients are far more enthusiastic than expected.

In addition, Schijvens has had client approval for 50,000 additional items, so sales are expected to soon exceed 100,000 items a year, which is 20% of the total volume. The results are reassuring Schijvens will be able to achieve its ambition of being 100% circular by 2020.

“We definitely see circularity as our new business model”

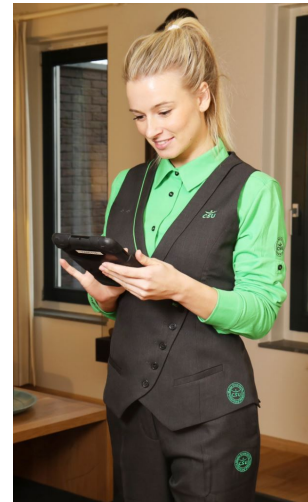
Shirley Schijvens, managing director of Schijvens

## Succes factors

- Management strongly motivated for sustainability
- Long-term vision and the strategy that is propagated
- Focus on staff training
- Suppliers are partners: annual strategic meeting
- Clients also want to join in the development
- A large retailer communicated positively to the general public about the new circular clothing and mentioned Schijvens

## Lessons learned

- Cooperation is key. The whole value circle should be involved to share risks and costs, to communicate and to innovate. All participants should be involved: from clients to logistics to sorting facility to yarn supplier, to weaver and knitter to garment supplier and brand
- The mix of recycled fibre of industrial waste and post-consumer textiles can reduce the risk of quality loss
- Start with the development of a yarn with recycled content which is applicable to manufacture various products
- Not all customers like the simplicity and minimal use of logos of the design for recycling
- Return logistics are expensive and there are not a lot of logistic companies that are able to handle returns
- Legislation is not yet ready for recycling. For example, the sorted clothes have to be mutilated before they can enter Turkey.



Tip:  
Just do it!

Key facts

Overview

What we did

Results and  
impact



Project supported by LIFE funding

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

### Disclaimer

While we have tried to make sure this case study is accurate, we cannot accept responsibility or be held legally responsible for any loss or damage arising out of or in connection with this information being inaccurate, incomplete or misleading. This material is copyrighted. You can copy it free of charge as long as the material is accurate and not used in a misleading context. You must identify the source of the material and acknowledge our copyright.

You must not use the material to endorse or suggest we have endorsed a commercial product or service. For more details please see our terms and conditions on our website at [ecap.eu.com](http://ecap.eu.com)

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



REMO<sup>®</sup>  
100/  
G



RM1800016  
ALBR201801-110

YOUR CONTRIBUTION  
TO A BETTER ENVIRONMENT

ENVIRONMENTAL  
SAVINGS PER 1 KG:

-  3485 LITERS
-  1.79 CO<sub>2</sub>/KG
-  8.55 kWh

REMOKEY.COM