

Fibre to fibre recycling of textiles

Tricorp



Company: Tricorp Workwear

Product or service: design, production and distribution of workwear

Pilot: saved by circular design

Key Facts:

- Development and production of three products: T-shirts, polo shirts and work trousers for the business market
- Composition of the yarn and fabric for the T-shirts and polo shirts: 10% post-consumer textiles (cotton), 40% industrial textile waste (cotton) and 50% PET
- The work trousers are made of fabric designed for recycling
- The pilot had the cooperation of Dutch Awareness and supply chain partners within the Dutch Circular Workwear Association
- Insight into the supply chain and its environmental impacts obtained through the application of the track and trace system
- Staff were trained to implement the circular working methods in 4 modules was implemented as they pilot ran.

Results:

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

Water savings:	6,740	m ³
Energy savings:	12,938	kWh
CO2 reduction:	3.1	tonnes
- During the pilot an estimated 1 tonne of discarded textiles both post and pre-consumer were saved from the waste mountain
- The results of this pilot and requests from the market have ensured that Tricorp is now focused on the development of circular products
- Cooperation in the supply chain was found to be crucial.

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Overview of the company

Intro

Tricorp was founded in 1998 under the name Rom88 and is located in Rijen, in the Netherlands. The company currently employs 50 staff and aims to provide professionals with workwear that ensures they get the most out of their working day. RFS in the logo stands for Representative, Functional, Clothing. This addition reflects the national and international ambition and the expansion of the collection with a Multi Standards Line, rain clothing and women's clothing. www.tricorp.com

Mission and vision

Tricorp positions itself as market leader in the business to business market. The role of market leader befits Tricorp where development and innovation are concerned. Socially responsible clothing production plays a central role here – it is both social, circular and environmentally friendly.

Cooperation with suppliers and other stakeholders

Tricorp constantly endeavours to ensure clothing production occurs in a socially responsible way and in accordance with the rules of fair trade. It does so by engaging in cooperation both internally and in the chain from supplier to colleague, from dealer to wearer and from the person wearing it to charity. Tricorp chooses a practical approach thinking in terms of solutions and challenges and especially learning by doing.

Chain cooperation

Tricorp is one of the chain partners in the Dutch Circular Workwear Association. This partnership was founded in 2017 together with Dutch Awearness (as Chain Director), Uniform Brands, Heigo, HAVEP and Wiltec. Within the 'The Dutch Circular Workwear Association', the partners join forces to stimulate the sale of sustainable professional wear. Thus, they achieve the objective of the circular economy – discarded clothing becomes new clothing – and they create sufficient volume to be able to recycle workwear. This enables them to take follow-up steps in the short term to create new materials, innovations and business models for the circular economy.

A cooperation existed with various partners from the Dutch Circular Workwear Association for the production of the different products. Dutch Awearness fulfils the role of Chain Director within the association.

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. For Tricorp, this came down to a fast start to the circular economy, so learning with the team they started working on the development of circular products immediately.

Recycling of post-consumer uniforms

The Tricorp pilot aimed to train all staff members to work according to circular principles and to develop three circular products. It mainly concerned T-shirts and polo shirts in which recycled 'post-consumer' textile materials were processed as well as the development of work trousers of which the material was designed for recycling.



Tip : Invite all those involved including the fabric manufacturer to the table and discuss each other's expectations.

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What we did

Together with partner Dutch Awareness, Tricorp used the pilot to train staff to aid and shape to the shift from a linear to a circular working method. Four modules were defined on the basis of experience Dutch Awareness had gained with the circular economy. The four modules are:

1. Insights into what the circular economy is and why it is required

What does Tricorp do in terms of circular workwear? What requires more attention? The module creates an internal base of support for the circular economy.

2. Design for reincarnation in the circular economy

What is circular design? The focus is mainly on the general principles of sustainability and the use of raw materials rather than on individual products. Remanufacturing and reuse are included.

3. Design, organisation and management of a circular supply chain

A new view of the supply chain, a network instead of a collection of separate businesses. In the circular economy, the supply chain work together as a whole in order to bring the flow of raw materials and products into the cycle.

4. Recycling and re-use

Three areas require attention: the take-back system, solutions for recycling various materials, and awareness and behavioural change among users.

The pilot was launched in early 2017 and was completed in early August 2018.



*“Developments proceed very rapidly.
You will quickly have an advantage once you start”.*

Willem Eimers, former project leader at ECAP pilot Tricorp

Selection of products

Polo shirts and T-shirts were selected as products for the processing of discarded textile materials. The work trousers were selected for the application of Infinity, a material made of polyesters which is designed in such a way that it is suitable for recycling. The production and specifications depend on customer requirements.

Engage supply chain partners

Tricorp has been working in cooperation with partner Dutch Awareness for some time and has been working as Chain Director in a network of companies that jointly have everything required to close the material chain. Mutual agreements were made with regard to the revenue flow in order to ensure that all parties benefit from the reuse and from products and materials. The service model for the collection and recycling or reuse is therefore included. Various partners from the network participated for the in the pilot, depending on the material and product requirements. It became evident during the pilot that the development process with existing suppliers proceeds more easily and quickly than with a new supplier.

Engage customers

Tricorp focused on tenders issued by the Dutch central government for products with recycled content. This was a conscious strategy because the central government seeks to buy workwear with recycled content in many cases. For the pilot, this meant that Tricorp could only manufacture the polo shirts and T-shirts with recycled content once it had won the tender. This was fortunately the case. The work trousers were included in the regular supply of Tricorp. A municipality ultimately became a customer for this product.

Development of yarn and fabric with recycled content

Together with Dutch Awareness, Tricorp has selected this project for the central government. They jointly started looking for suppliers of fabric that complied with requirements imposed by the government.

Communication

The CCSM system of Dutch Awareness is used for communication on the environmental profit. The Circular Content Management System (CCMS) is a circular track and trace system in which all partners in the supply chain are involved. Raw materials and products receive unique barcodes, so they can be followed through every stage of development, in order to make the raw materials available for reuse. It is a database with information about materials, and includes a life cycle analysis, a purchasing and inventory management tool and a track and trace system. More information can be found at www.circularchainsystem.com.

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Challenges

- Meeting quality requirements at an acceptable price
- Colour is an important issue. The colour has to be the same with each delivery. This is a challenge if you do not want to dye. Fabric with recycled content is made from various batches of recycled material. This produces colour differences when blending
- Requirements for pilling of workwear are at a high level. What is still acceptable?
- Guarantees and spreading of risk in the chain. What if quality loss occurs within the guarantee period?
- Preventing the release of microfibrils and hindering contribution to the plastic soup.

Results and impact

What did we achieve?

- Knowledge within the organisation has increased enormously
- For each of the pilot products the supply chain is working together
- More fabric than necessary was produced for the first order in order to guarantee the colour of the polo shirts. The client has co-invested in order to facilitate production
- "Cliff" has been developed for material from the take back system which cannot be used for new clothing yet. Cliff is a recyclable composite reinforced with fibres from discarded textile
- All elements of the company, including design, contribute to circular workwear
- The products are made of 30% of recycled fibres from postconsumer textiles
- Insight into the supply chain and its environmental impacts through the application of the track and trace system 'Circular Content Management System (CCMS)'.
www.dutchwearness.com/chainmanagement

Composition of fabric	product	number	Weight total recycled material in kg
10% cotton post consumer 40% cotton industrial waste 50% virgin PET	Polo shirt	10,000	900
10% cotton post consumer 40% cotton industrial waste 50% PET industrial waste	T-shirt	745	134
Total Weight			1034

Indication of the environmental savings (Source: REMO with the exception of the waste figure)

	Per kg polo	Per kg T-shirt		Total ECAP pilot
Water	3,485	3,485	litre	6,740 m3
CO2	1.58	1.65	kg	3.1 Tonnes
Energy	6.32	11.65	kWh	12,938 kWh
Waste	post-consumer textiles			193 kg
	industrial textiles waste			841 kg

Business case

- The material for the T-shirts and polo shirts was produced in Europe. This makes the cost price approximately 20% higher compared to China. This is a consideration that has to be included, especially at this stage of development of the circular economy. At a later stage, when developments in this area are advanced, more materials will be available in production countries such as China, and the cost price will decline.
- An infinity fabric of a good technical quality was selected for the work trousers, which gives the trousers a sustainable lifespan.

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Next steps - long-term strategy of the company

- Making manufacturers and end users aware of the necessity of sustainable clothing
- Ensuring new designs in the collection are made from recycled materials and are reusable to the greatest possible extent
- Searching for sustainable materials for the existing collection
- Actively continuing to search for better solutions
- Working together with as many parties as possible in order to ultimately deliver good solutions.

"The core notion is circular organisation. It is more than delivering a circular product".

Willem Eimers, former project leader at ECAP pilot Tricorp

Success factors

- Volume is important. An increase in customer demand helps enormously
- A good relationship with producers is required to achieve a reliable track and trace system
- Green public procurement, where recycled content is high on the agenda
- Long-term relationships and a permanent production site make development programmes easier and faster
- Technical expertise among government procurers
- A willingness to cooperate among those involved – for example customers, designers, producers – in order to jointly investigate requirements, options and solutions.

Lessons learnt

- Finding the right mix for yarn with a good price-quality ratio takes time. It is time-consuming rather than complicated due to endless testing
- The mix of post-consumer and industrially discarded textile offers the best outcome as far as quality and price are concerned
- The distinction between post- and pre-consumer is not clear for everyone – a workable shared definition would help
- Besides colour, pilling is the most important challenge. Blending with PET proved to be the solution for our products
- Chain organisation and a change in the working method are important elements of the circular economy. A chain director is required; also finding new suppliers
- The relationship with competitors has changed, this makes the work more enjoyable. This is an unexpected revenue-maximising effect
- The fact that we have to rapidly and effectively market the use of reusable materials to preserve nature and the environment for the next generations.



Tip
Recycled content means testing and more testing. Schedule enough time for this.

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Project supported by LIFE funding



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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

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



YOUR CONTRIBUTION TO A BETTER ENVIRONMENT

ENVIRONMENTAL SAVING	CO ₂ (KG)	ENERGY (KWh)	WATER (LITERS)	REFERENCE PRODUCT
Per 1 kg	1.58	6.32	3485	Cotton: 50% Polyester: 50%

PRODUCT HISTORY OF YOUR GARMENT

PRODUCT HISTORY	REMO-ID	BUYER	ITEM	REFERENCE / CODE
	RM1800031	DEFENSE	POLO	ARTICLE CODE
PRODUCTION STEP	PRODUCED BY	PRODUCTION DATE	QUALITY (% RECYCLED)	FIBRE COMPOSITION
Garment Produced	Qualified Supplier	01-01-2018	REMO-50	Cotton Recycled*: 40% Cotton Recycled*: 10% Polyester Virgin: 50%
Fabric: Woven/Knitted	Qualified Supplier	01-01-2018	REMO-50	Cotton Recycled*: 40% Cotton Recycled*: 10% Polyester Virgin: 50%
Yarn Spun	Qualified Supplier	01-01-2018	REMO-50	Cotton Recycled*: 40% Cotton Recycled*: 10% Polyester Virgin: 50%
Recycled Fibres ¹	Qualified Supplier	01-01-2018	REMO-100	Cotton Recycled: 100%
Recycled Fibres ²	Qualified Supplier	01-01-2018	REMO-100	Cotton Recycled: 100%

¹ Post-consumer ² Pre-consumer ³ Mix Post/Pre-consumer

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