

# Expert Input

## Circularity in Fashion

Status Quo & Opportunities  
to unlock business potential

**Ina Budde**

Co-founder & CEO  
circular.fashion

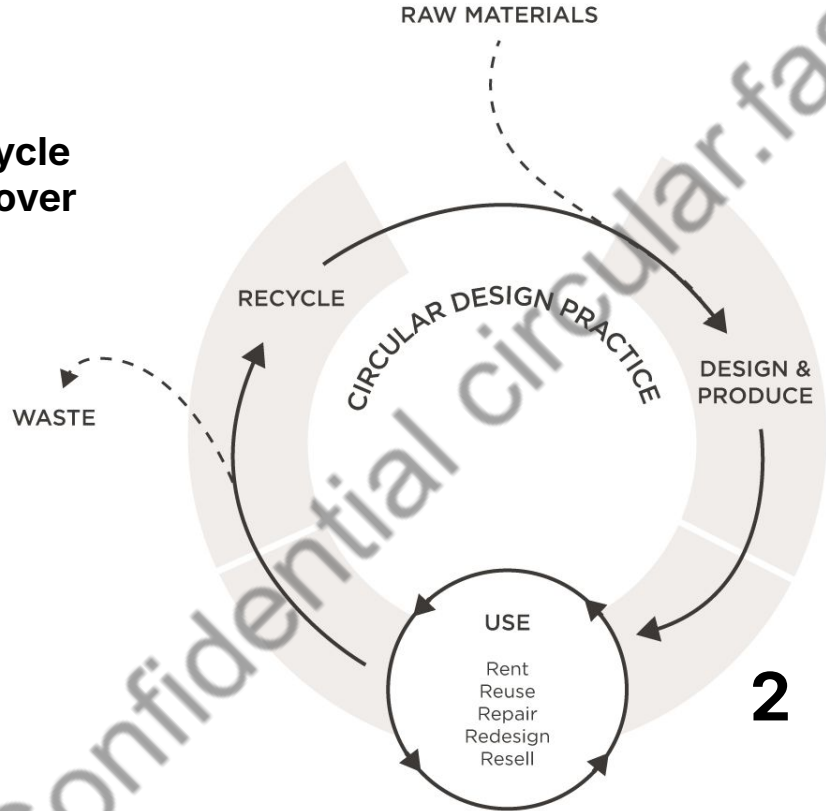




# Circular Economy | R' Strategies

**3** R8 Recycle  
R9 Recover

**1** R0 Refuse  
R1 Rethink  
R2 Reduce



R3 Reuse  
R4 Repair  
R5 Refurbish  
R6 Remanufacture  
R7 Repurpose

--- Ultimately phase out completely



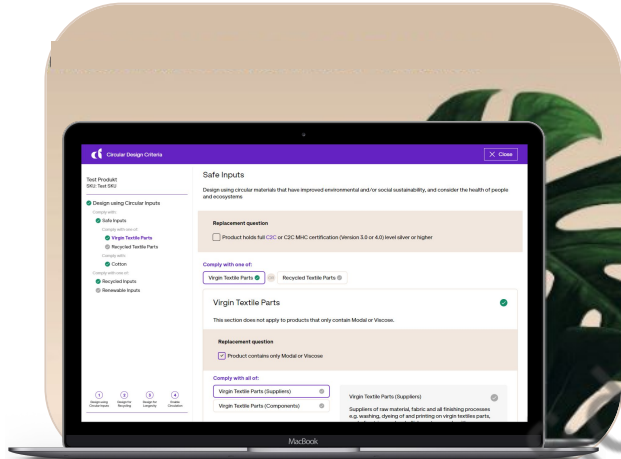


**circular.fashion**

Solutions along the product life cycle

**Design**

Circular Design Tools & Trainings



**Use**

circularity.ID Product passport



**Recycling**

Automated Sorting Solutions



# Get ready | Upcoming EU Regulation

EU Strategy for Sustainable and Circular Textiles | 03/2022

- 1 **Ecodesign and Green Claims**  
→ **Circular Design Criteria**
- 2 **Digital Product Passports**  
→ **circularity.ID®**
- 3 **Extended Producer Responsibility**  
→ **Automated sorting solutions**

*Exemplary engagements as part of our journey:*

**EU CSA Call CIRPASS – UBA PI4.0 – ISO TC 38 WG 35 DIN CE Roadmap**

→ **Today: Know-how & solutions to get ready**

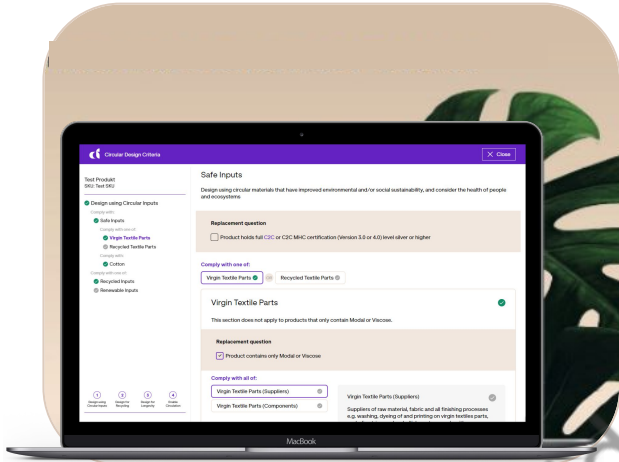




# Circular Economy | Solutions along the product life cycle

## Design

Circular Design Tools & Trainings



## Use

circularity.ID Product passport



## Recycling

Automated Sorting Solutions



→ Ecodesign and Green Claims

→ Mandatory Digital Product Passports

→ Extended Producer Responsibility  
→ Separate collection of textiles in EU



# Status quo of circularity

## Urgency in the fashion industry

سرکلرٹی کی موجودہ حالت  
فیشن انڈسٹری میں فوری ضرورت

Confidential Circular.fashion



# Current Linear System

Take → Make → Waste

موجودہ لکیری نظام  
لے لو → بناؤ → ضائع کر دو

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OVER  
**100 MILLION**  
**TONNES**  
TEXTILES  
PRODUCED  
2022



# 87% INCINERATED OR LANDFILLED

Worldwide



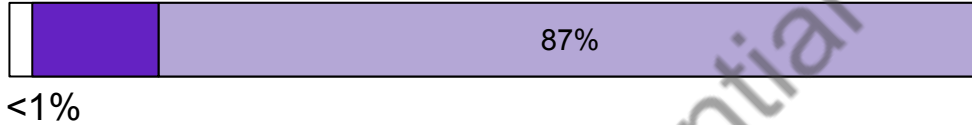
# <12% DOWNCYCLING

Creating e.g. non-wovens or filling material



# <1% FIBRE-TO-FIBRE RECYCLING

Regenerating fibres to virgin quality



Confidential circular fashion

# OVER 22 BILLION PAIRS OF FOOTWEAR PRODUCED YEARLY

Amount of footwear produced worldwide from 2015 to 2021

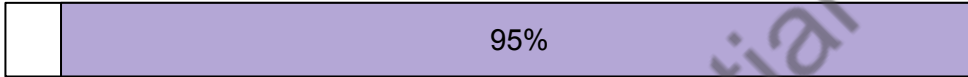
Statista, P. Smith, Oct 12, 2022



Confidential circular

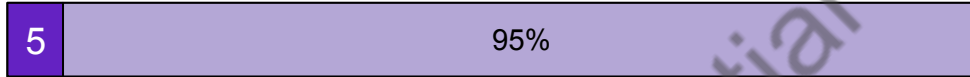
# 95% INCINERATED OR LANDFILLED

Worldwide



# 5% DOWNCYCLING

Sports surfaces, Insulation material



INESCOP <https://inescop.es/en/>





Increase valuable recycling  
creating the **resources** of the future  
through **circular design**

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## Solution

### **CIRCULAR ECONOMY**

**REDUCING CONSUMPTION  
& CREATING HEALTHY  
CIRCULAR TEXTILE LOOPS**

**→ MANUFACTURING  
LEVERAGE TO CREATE  
CIRCULAR PRODUCTS**

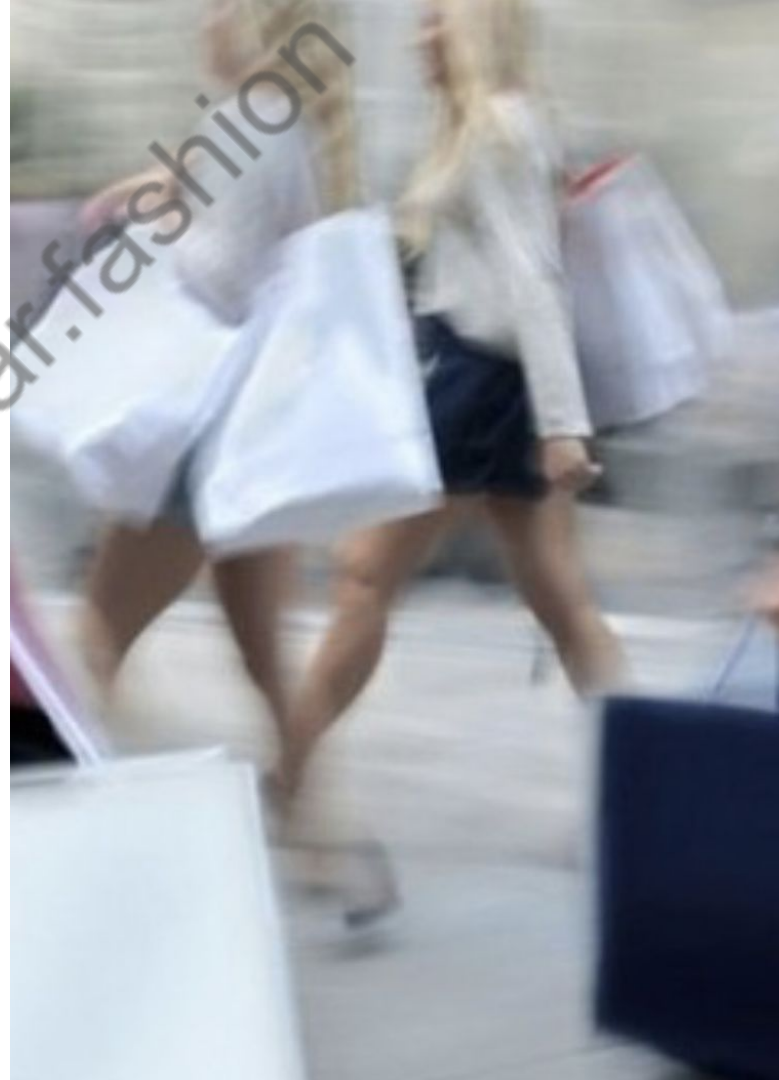




## Demand

**54% OF SURVEYED  
CUSTOMERS ANTICIPATE  
BUYING MORE CLOTHES  
WITH **RECYCLED**  
MATERIALS**

McKinsey & Company 2022





## Demand

EUROPEAN BRAND  
EXECUTIVES EXPECT  
**>30% OF THEIR  
PRODUCTS TO  
CONTAIN RECYCLED  
FIBRES BY 2025**

McKinsey & Company 2022

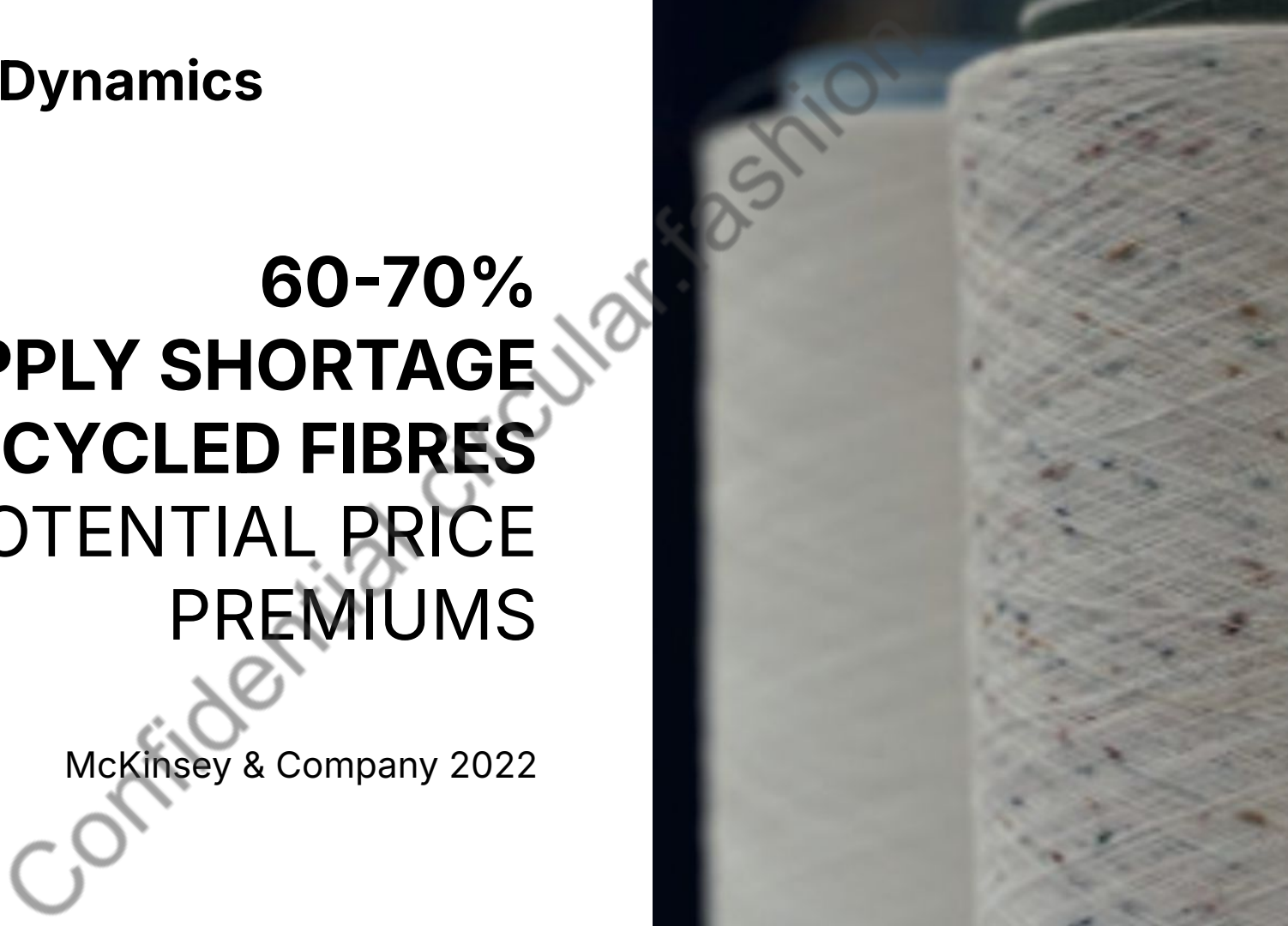




## Market Dynamics

**60-70%  
SUPPLY SHORTAGE  
OF RECYCLED FIBRES  
POTENTIAL PRICE  
PREMIUMS**

McKinsey & Company 2022



2017  
**12.5% OF THE GLOBAL  
FASHION MARKET**  
SIGNED THE 2020  
CIRCULAR FASHION  
SYSTEM COMMITMENT

BY GLOBAL FASHION AGENDA



# Ambitious Targets

## **C&A**

By 2028, extend the life of **7 out of 10** products in the way they are designed, produced and re-used

## **HUGO BOSS**

By 2030, **80%** of our products will be circular

## **H&M**

By **2025**, **all** our products to be designed for circularity.

Confidential circular



# Ambitious Targets

**BUT HOW TO**

**... GET THERE?**

**...MEASURE PROGRESS?**

**... COMMUNICATE  
SUCCESS?**

**C&A**

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Confidential/Circular



# 4 Steps to success

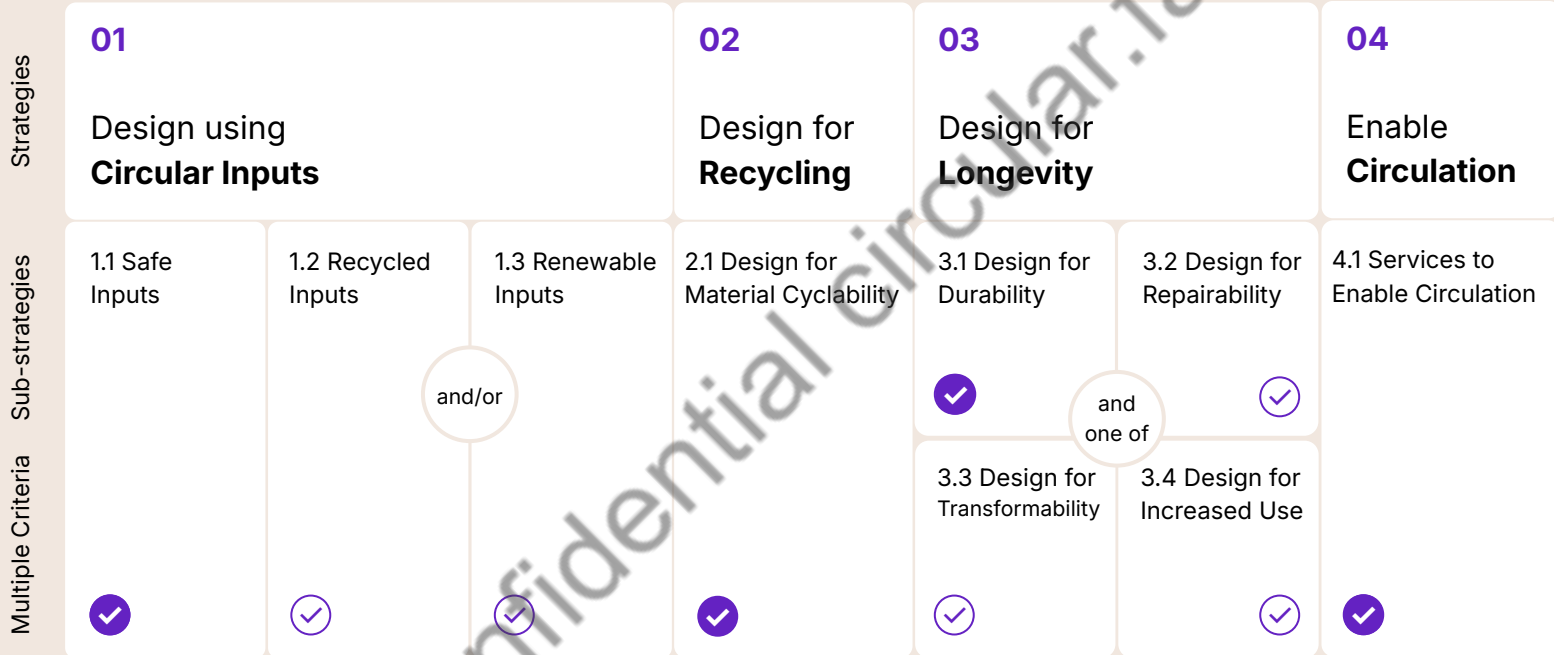
1. Circular Inputs
2. Design for Recycling
3. Design for Longevity
4. Enable Circulation

1. سرکلر ان پٹس
2. ری سائیکلنگ کے لئے ڈیزائن
3. طویل عمری کے لئے ڈیزائن
4. گردش کو ممکن بنائیں





# Circular Design Criteria | Framework



Mandatory



One of these options

# Circular Design | Trusted by frontrunning brands



**OTTO**

 **zalando**

**bonprix.**

**GANNI**



**HUGO BOSS**

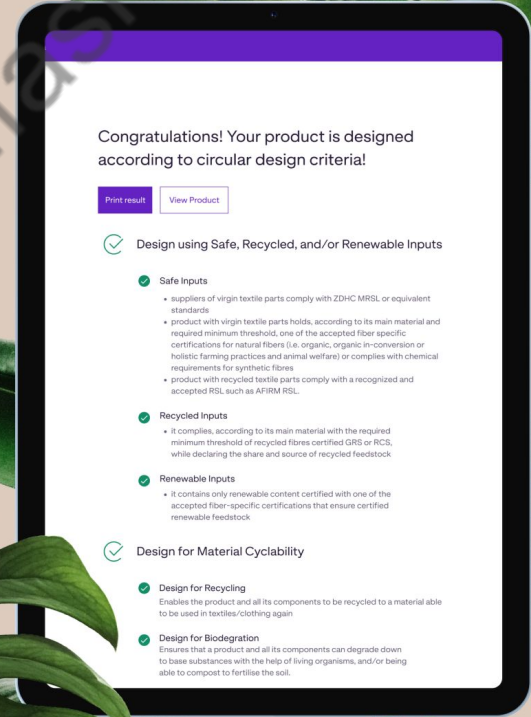
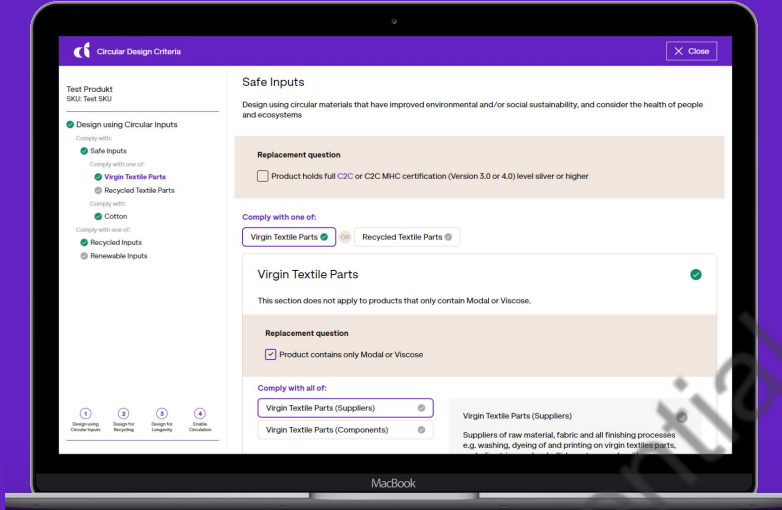
**Marc O'Polo**  
EST. IN STOCKHOLM

**HOLZWEILER**

 **INTERSPORT**



# Circular Design Criteria | Software





# 01

## **Circular Inputs**

using safe, recycled  
and/or renewable  
inputs





# Safe Inputs

Design using materials and processes that have **improved** environmental and/or social sustainability, and consider the health of people and ecosystems

Virgin fibres ZDHC MRSL

Recycled fibres AFIRM RSL

Fibre specific certificates





# Renewable Inputs

Design using materials that have been produced  
from a source that can be regenerated  
with maximum **10 year regeneration cycle**  
usually plant or animal biomass

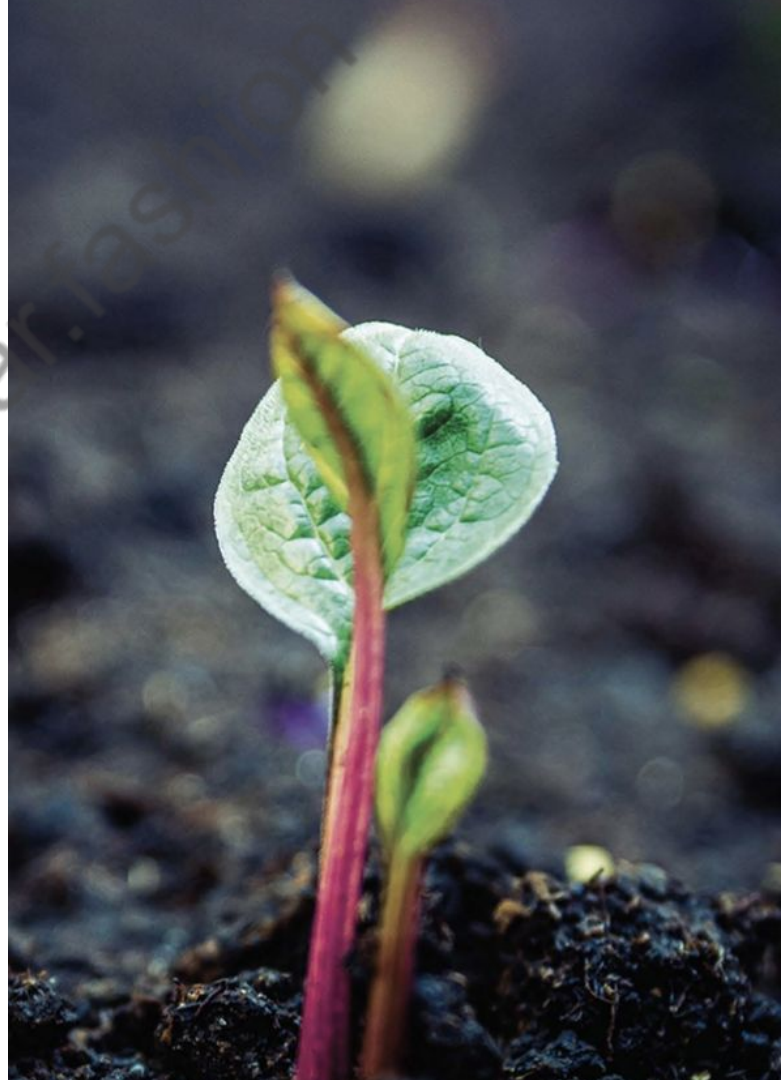
Renewable textiles 100% certified  
Excluding hard part & textile based trims

canopy

Using 95 - 100 % organic fibres:



Organic - In conversion  
certified by [textile's ref.]  
Licence no 12242





# Recycled Inputs

Design using materials that have been **recovered** from a either pre- or post-consumer waste stream and **processed** into recycled fibers

Fibre specific shares of 20-50% depends on what is technically feasible

Fibres GRS or RCS certified

Product RSL AFIRM



# ♻️ Recycling Source | Pre- & Post-Consumer Textiles

## Pre-consumer textiles

- Off-Cuts, leftover textiles etc.
- One type of textile including blends
- Often mixed, not collected separately



## Post-consumer textiles

- Worn and discarded finished products
- Mixed textiles and potentially contaminated



# Recycling Source | Pre- & Post-Consumer Textiles

## Pre-consumer textiles

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- One type of textile including blends
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## Post-consumer textiles

- Worn and discarded finished products
- Mixed textiles and potentially contaminated



There is  
**no waste**  
every resource is  
**value**



# **SOURCING rPET BOTTLES IS NOT THE SOLUTION**

Prioritize fiber-to-fiber recycling  
as PET bottles serve a better  
circularity-purpose within  
the beverage industry

EU Strategy &  
Dow Jones Sustainability Index





**Recycled**  
**≠**  
**Recyclable**





# 02

## Design for Recycling

Design for Material Cyclability

Enables the product and all its components to be recycled to a material able to be used in textiles/clothing again



# Recycling | Processes & Technologies

## Mechanical Recycling

Focussing on: CO, WV etc.



## Chemical Recycling

Focussing on: PES, CO, PA,



**Continuous update** of feedstock requirements of **circular.fashion's recycler network**

Always updated: **Circular Design Criteria – Software**

# Recycling | Technologies and Feedstock Requirements

**(Bio) Chemical Recycling**

- Chemical monomer i.e. depolymerisation
- Chemical polymer i.e. dissolving
- Enzymatic processing

**Outcome**

- Monomers
- Polymers



**Mechanical Recycling**

- Thermo-mechanical i.e. melting
- Shredding
- Adding virgin fibres

**Outcome**

- Pellets
- Fibres



Recyclable  
*Closed-loop*

**Mechanical Downcycling**

- Open-loop e.g. shredding

**Outcome**

- Non-wovens
- Filling material



Downcycling  
*Open-loop*

# Recycling | Based on our operational and innovative network

## (Bio) Chemical Recycling

- Chemical monomer i.e. depolymerisation
- Chemical polymer i.e. dissolving
- Enzymatic processing

## Outcome

- Monomers
- Polymers



## Mechanical Recycling

- Thermo-mechanical i.e. melting
- Shredding
- Adding virgin fibres

## Outcome

- Pellets
- Fibres



## Mechanical Downcycling

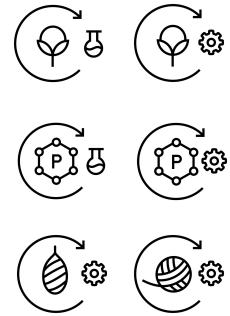
- Open-loop e.g. shredding

## Outcome

- Non-wovens
- Filling material

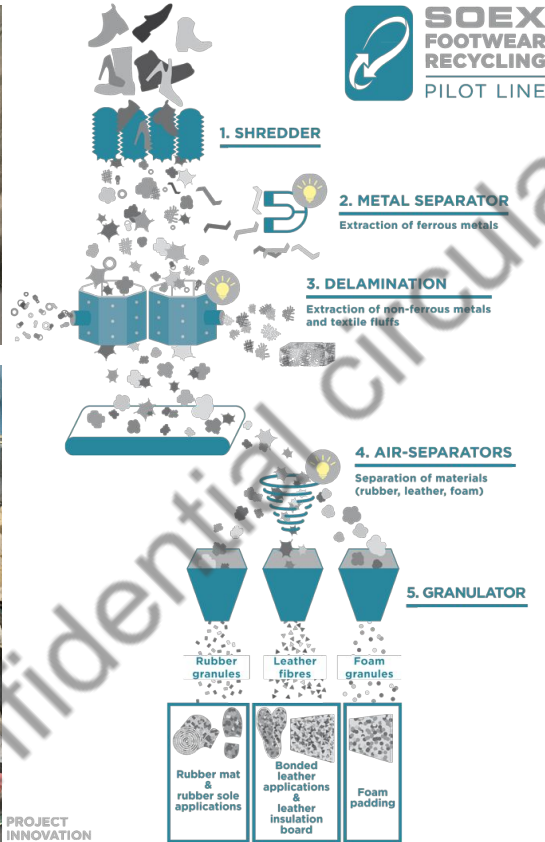


## Fibre Specific Requirements



Downcycling  
*Open-loop*

# Recycling | Footwear



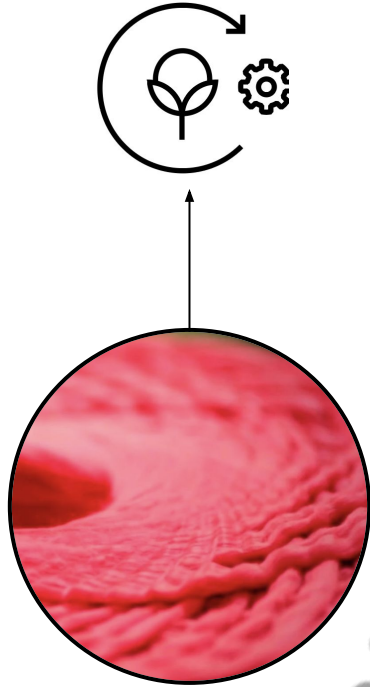
PROJECT INNOVATION

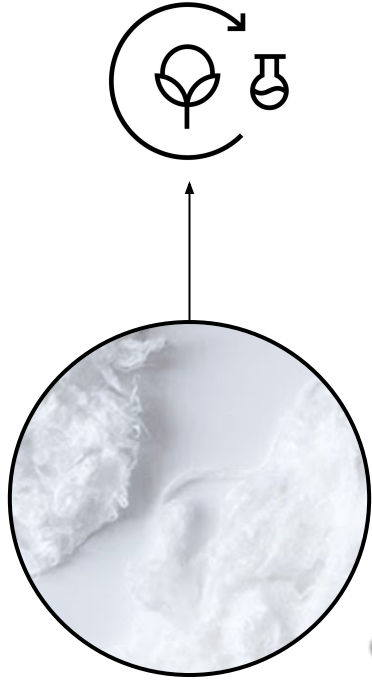


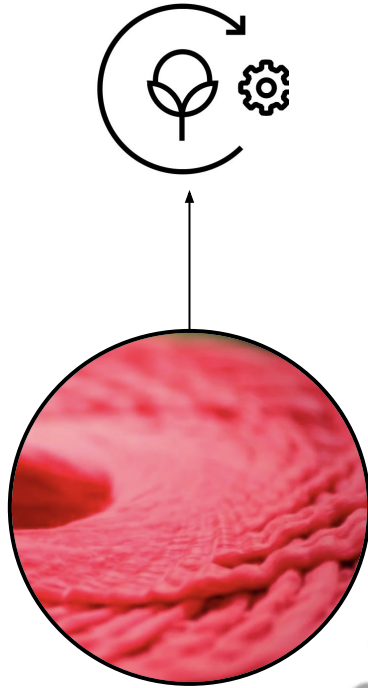
# Design for Recycling | Criteria Overview

- Fibre Specific Material Composition
  - Fibre specific share of main material and limited disruptors
- Surface Decoration
  - Limit size and type of prints and other embellishments
- Finishings
  - Complying to safe inputs and not covering fibre surface
- Trims & Fillings
  - Monomaterial, disassembly or standard detrimming
- **Technical, economical and sustainable factors**









### Selected Criteria

### Preferences

**Main material:**  $\geq 90\%$  cotton

**Colors:** Marketable colors as colors stick for mechanical recycling

**Blends:** Ideally mixed with Natural fibers, MMCF, Polyester (PET)

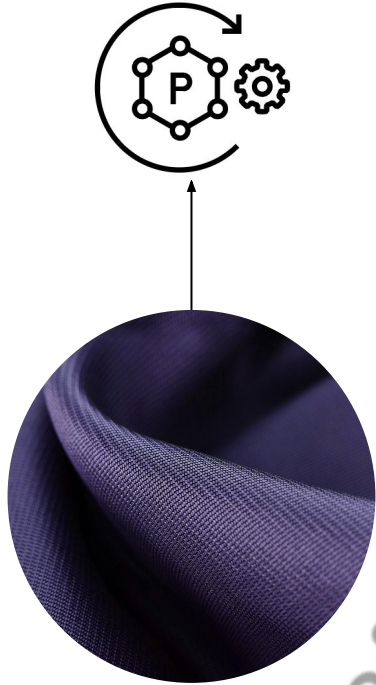
**Trims:** No trims make the process more efficient and reduce waste

**Elastane:** Limit to max 5%

**Prints:** Ideally no prints or print is limited in type and size

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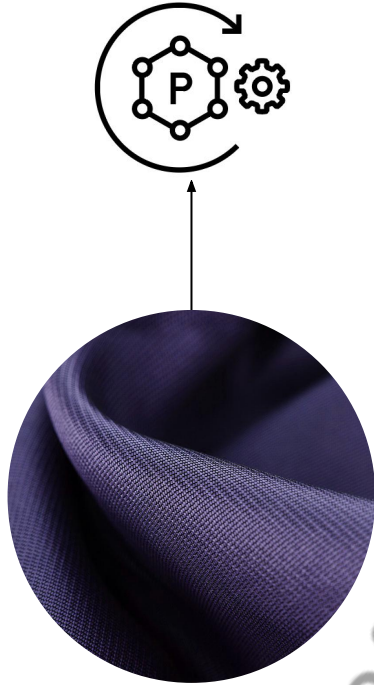
 **Polyester** | Mechanical  
*Operative*



 **Polyester** | Chemical  
*In development*



# Polyester



## Selected Criteria

**Main material:**  $\geq 80\%$  of polyester

**Blends:** Blended with no more than 10% fibres other than polyamide, natural fibres or MMCF

**Elastane:** Limit to max 5%

## Preferences

**Main material:** Ideally source post-consumer recycled textiles instead of recycled from PET bottles

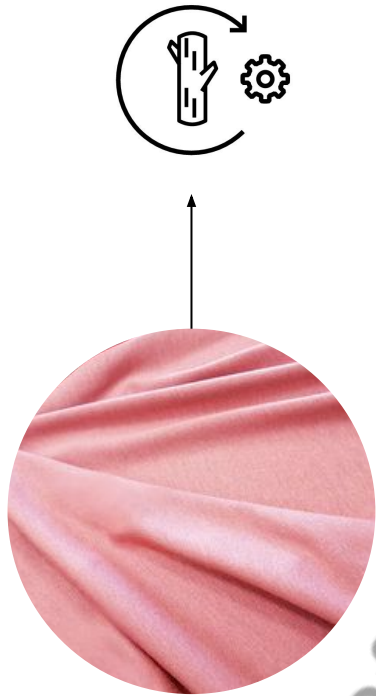
**Dyes & finishes:** Prefer specific yarn dye techniques

**Trims:** Metal parts must be removed before entering the recycling process

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**Wool** | Mechanical  
*Operative*

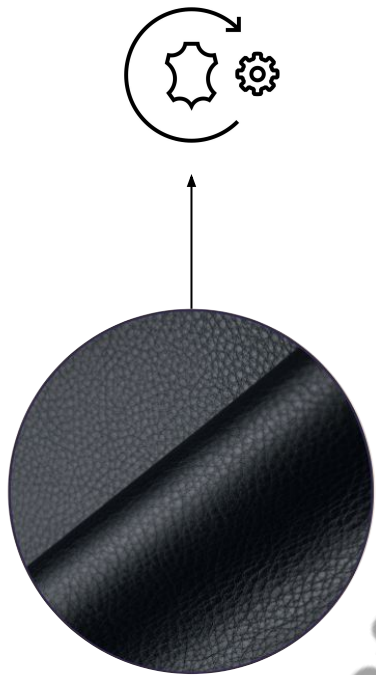




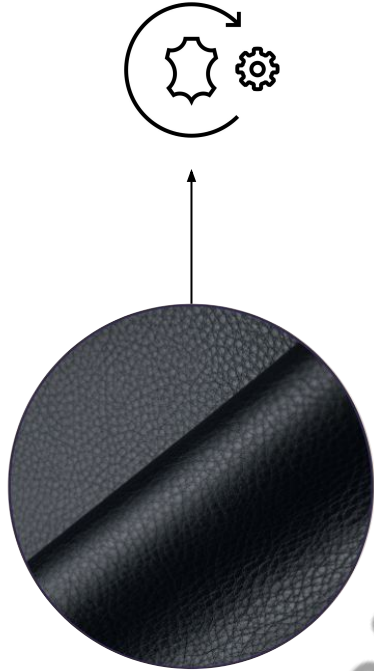
Confidential circular.fashion



# Leather



# Leather | Mechanical



---

## #1 Industrial waste

**Wet-blue:** Recycled into high quality bonded leather

---

**Synthetic-tanned:** Recycled into salpa

---

**Vegetable-tanned:** Recycled into salpa & fertilizers

---

## #2 Post-consumer waste

**Finished Goods:** Recycled into textile & sewing yarn

### Requirements:

**Tanning:** Chromium-tanning not recommended

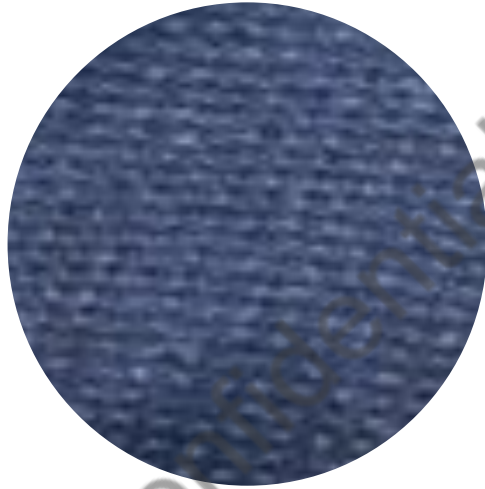
**Trims:** Have to be removed, no coatings

**Reinforcements:** Reduce or avoid bonded leather

---



**Recyclable Materials** → **Recyclable Design**



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# Mono-Cycle Design

- Products with **not more than 2 fibre types** and the required main fibre threshold on product weight e.g. **> 90% main fibre and <5% Elastane**
- Ideally incl. sewing thread, labels and replace trims for e.g. embroidered eyelets or rivets

**#Driving creativity and innovation:**  
surface embellishments, closure mechanisms

**#Cost & Value:** Not necessarily more expensive, wise material combinations, reduced complexity & trims



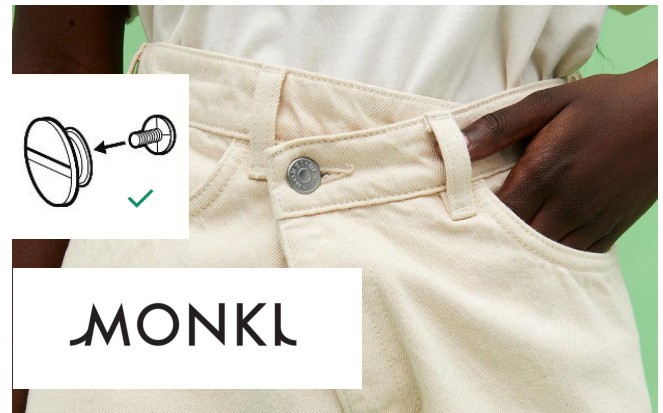


# Design for Disassembly

- For products containing components that are suited to **different cycles** designed to be **easily detached**, to enable recycling in their respective cycles
- Disassembly opens up possibilities for **multi-functional** use e.g. trans-seasonal modularity

**#Driving creativity and innovation:**  
Possibilities for multi-functional use & modularity

**#Cost & Value:** More value per garment through multifunctional use and re-use opportunities of elements





# 03

## Design for Longevity

Prolong the lifespan of the product by made to last in **function** and aesthetic, to update and modify for **changing needs** and desires





**50% INCREASE  
IN CLOTHING SALES**

**1/3 LESS  
UTILIZATION  
SINCE 2000**



# Design for Longevity | Criteria Overview

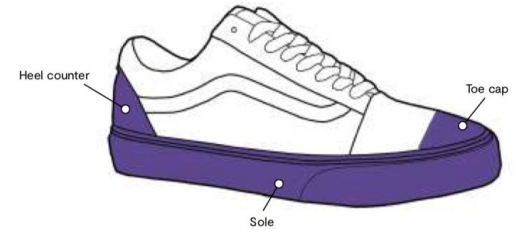
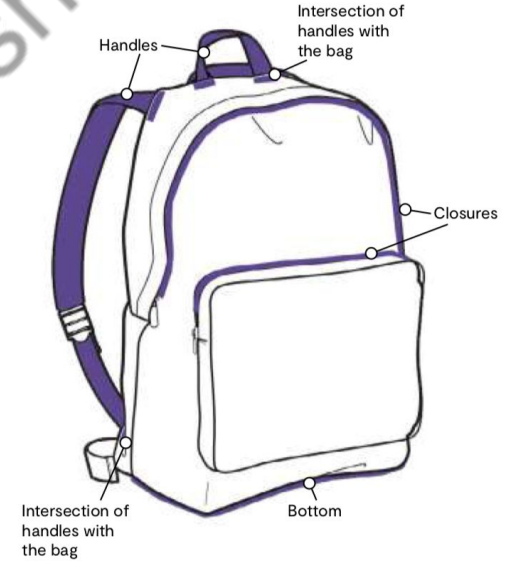
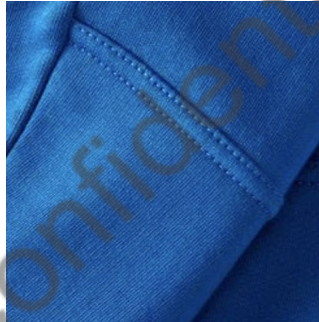
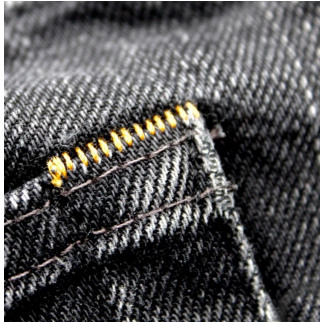
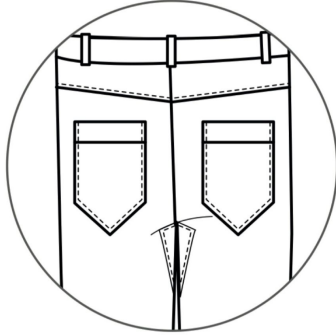
- Design for Durability
  - Reinforcements & Quality tests
- Design for Repairability
  - Exchangeable elements and seams easy to open
- Design for Transformability
  - Transformable in style, size and shape
- Design for Increased Use
  - Aesthetic durability & emotional connection

**Making longevity measurable per product type**



# Design for Longevity | Durability

## Strengthen Stress Points



# Design for Longevity | Repairability

Facilitate future repair and alteration with modularity, replaceable elements, seams easy to open etc.



Replaceable heel tab by VYN



Nudie Jeans Repair Kit Box





# 04

## Enable Circulation

Provide systems for products to engage the user to extend the life and connect to the **reverse supply chain** to enable closed-loop recycling

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**WASTE IS MATERIAL  
WITHOUT AN IDENTITY**

Thomas Rau

Confidential circular:fashion

# Digital Product Passports | Implementation of circularity.ID®

## 01 circularity data

```
2 <step>
3   <description>This circular t-shirt was
4   <city>Esposende</city>
5   <company_name>Brave Particle</company_n
6   <country>Portugal</country>
7   <oar></oar>
8   <postal>4740-010</postal>
9   <street>Avenida Comendador Francisco Al
10  <type>Production</type>
11 </step>
12 <assembly>
13   <name>T-shirt</name>
14   <material>
15     <name>Woven Care Label</name>
16     <description>A woven care label was s
17     <image>https://app.circular.fashion/
18     <colour>purple</colour>
```

## 02 product identifier



## 03 digital product site



## 04 circulation Intelligence

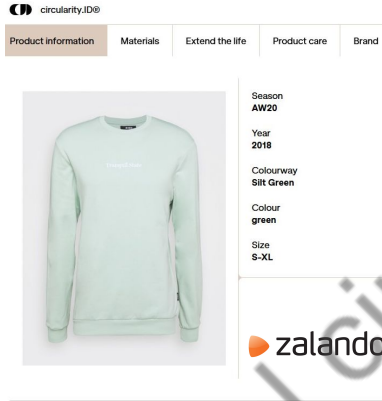
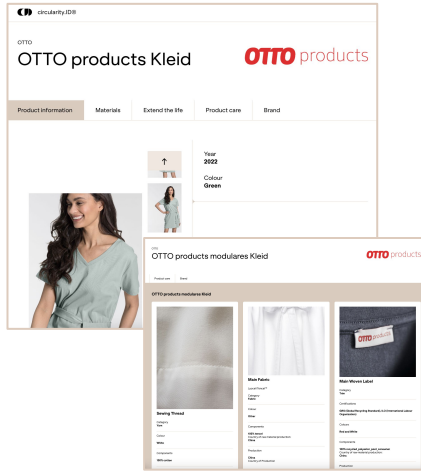


Product Platform



# Enable Circulation | Transparency

ARMEDANGELS



## About the product

This versatile and seasonless crewneck pullover is made with 100% organic cotton. It's cozy and soft on the inside while smooth on the outside. The fresh mint color is paired with a



Transparency & Traceability | Take Back | Care Guide

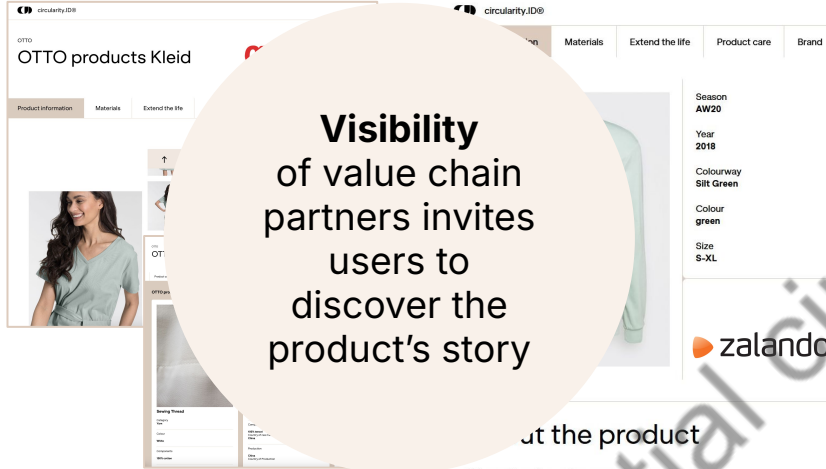
ARMEDANGELS

OTTO

zalando



# Enable Circulation | Transparency



Learn more about the product

This versatile and seasonless crewneck pullover is made with 100% organic cotton. It's cozy and soft on the inside while smooth on the outside. The fresh mint color is paired with a

Transparency & Traceability | Take Back | Care Guide

ARMEDANGELS

OTTO

zalando



# Enable Circulation | Intelligent Sorting

World's first ID based sorting solution  
circularity.ID product and material data

Recommerce

Fibre Recycling

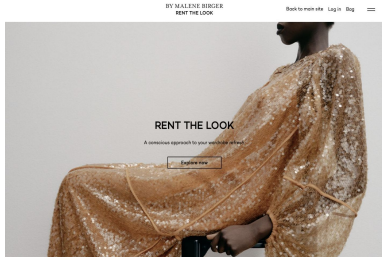
TEXAID



We establish **partnerships** between  
**manufacturers** ↔ **recyclers**  
to implement post-consumer recycled textiles



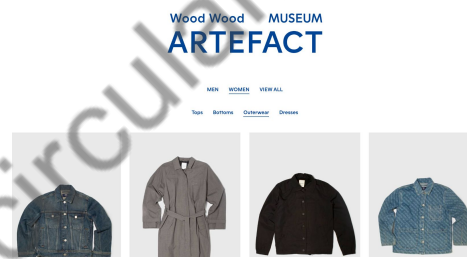
Short term rental



Rental subscription



Recommerce, Resale



Repair & Redesign



## New Manufacturing Business Opportunities

- **Long-lasting** & repairable products will unlock the **business cases** for new circular services
- Disruptive opportunity to **phase out fast fashion** and establish fully **new price dynamics**
- Discover **new manufacturing offerings** of repair services for your brand customers



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# 4 steps to success

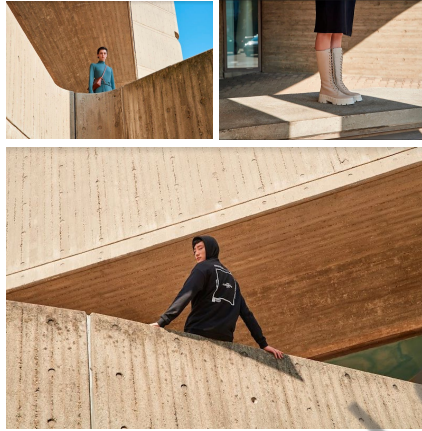
1. Circular Inputs
2. Design for Recycling
3. Design for Longevity
4. Enable Circulation

→ *Let's trial with your own products to  
**optimize for circularity!***





# circular.fashion | How our frontrunning partners are scaling up



## HUGO BOSS

### Our services:

- 2019 Circular Product Development
- 2018 Circular Design Workshops (100p+)
- 2021 Circular Online Trainings (200p+)
- 2021 Circular Retail Strategy Consulting
- 2022 Circular Design Criteria Definition

### Outcome:

- 2020 Plastic-free capsule collection
- 2022 Launch of Circular Product Policy
- 2022 Launch of Resale-Platform 'HUGO BOSS pre-loved'



### Our services

- 2018 Circular Design Workshops
- 2021 Online Trainings (with 200p+ each)
- 2020 Circular Product Checks, circularity.ID
- 2021 Digital Product Site, Take back system
- 2021 Circular Design Criteria Definition
- 2022 Training all private label teams

### Outcome

- 2020 Circular Capsule with 5 pieces
- 2021 Circular Collection with 50 pieces
- 2021 Launch of pre-owned category
- 2022 Launch of Circular Design Criteria



### Our services

- 2020 Circular Design Workshops
- 2020 Circular Product Checks
- 2021 circularity.ID Digital Product Site
- 2021 Take back for Recommerce & Recycling
- 2022 Circular Design Criteria Definition

### Outcome

- 2022 Circular Collection 1.0 with 14+ pieces
- 2022 Circular Design Criteria roll out

## ARMEDANGELS

### Use Case:

- 2019 Circular Design Workshops
- 2021 Circular Product Checks
- 2021 circularity.ID Digital Product Site
- Transparency, Take back for Recommerce and Recycling

### Outcome:

- 2021 Take back system for recycling
- 2022 Circular T with recycled content, integrated NFC chip for consumer experience and sorting interaction



**#Collaborate**  
**#Innovation Mindset**  
**#Going beyond**

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# Thank you

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Questions?

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