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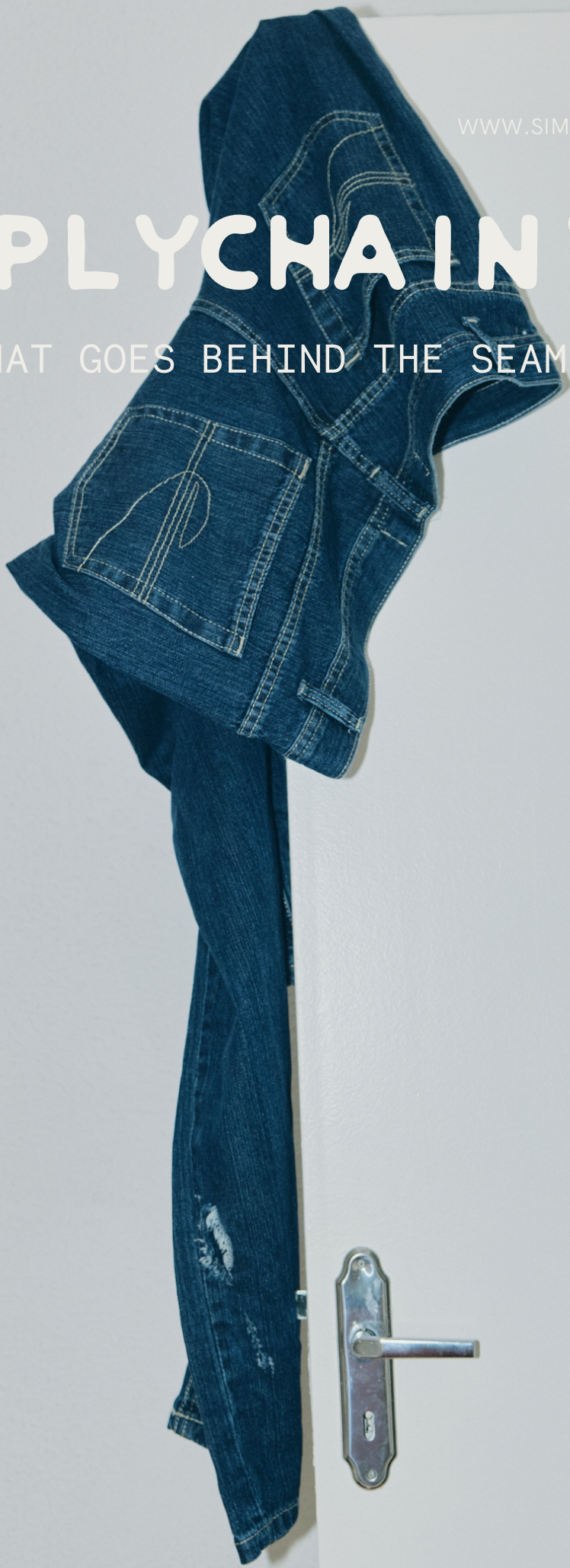
SUPPLY CHAIN 101

WHAT GOES BEHIND THE SEAMS



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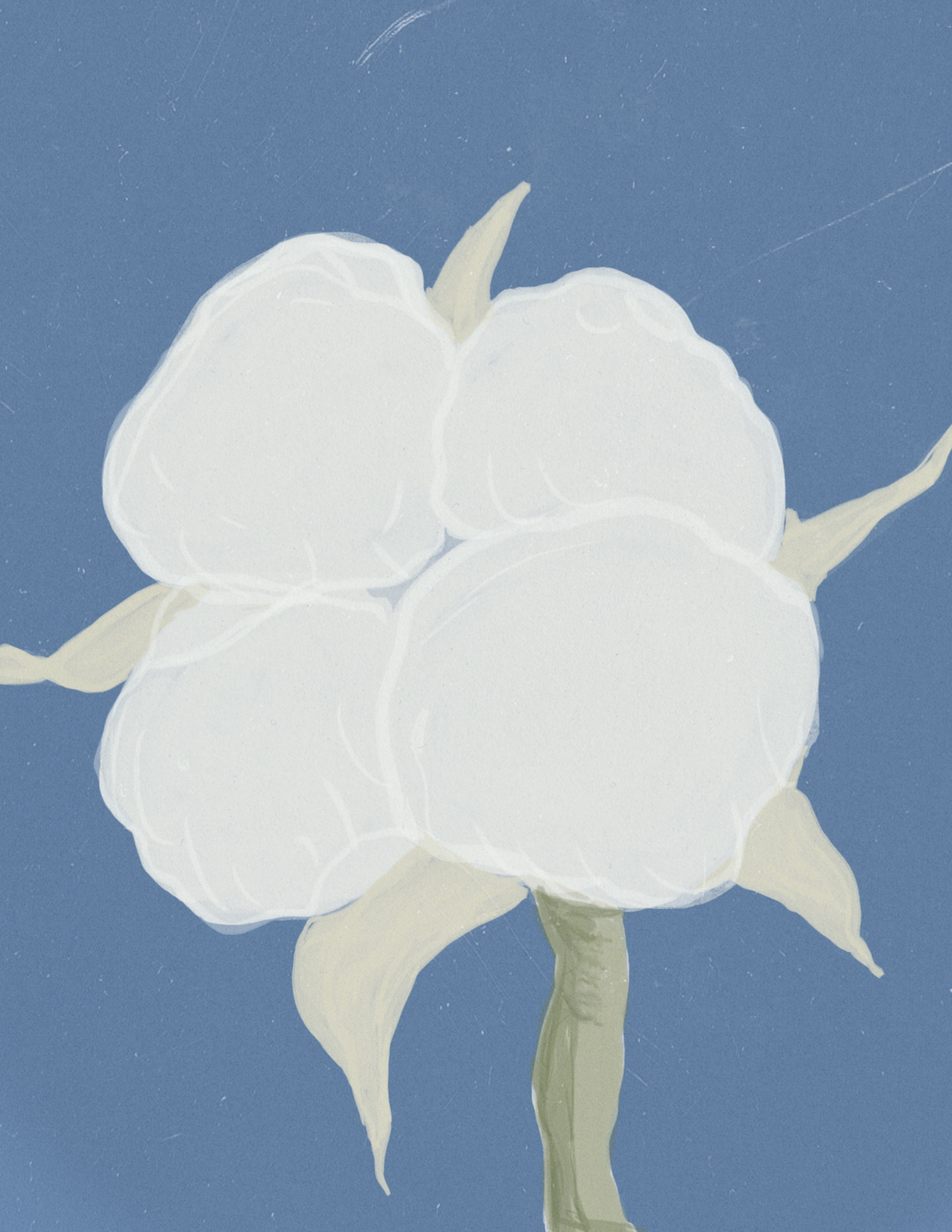


STEP 1

raw materials

It all begins in the fields. Denim, primarily made from cotton, is a crop that requires specific conditions such as a long frost-free period, ample heat and sunshine, and fertile sandy soil. And since it’s not a food crop, there are fewer regulations on the chemicals used during farming. Let's work together to make sure the cotton in our clothes is grown ethically and responsibly.

WHAT & HOW

It is pretty clear that the sustainability of cotton production is directly linked to the amount of water and chemicals used in the farming process. But here are some numbers for you.

There is a range of data on cotton usage of pesticides: it covers 2.4-3% of the world's cultivated land, yet it accounts for 16-24% of the global insecticide use (source 1, source 2). Regardless of the exact value, we can agree that the use of chemicals is high.

Cotton has been the primary fibre used in denim since its inception, but as we learn more about its impact on the planet, mills and manufacturers are looking for alternatives to reduce denim's reliance on cotton. However, it's important to note that with proper management, cotton production does not have to be detrimental to the environment!

Cotton has become very industrialized and is mostly grown in monoculture (an area where only a single type of crop is produced) with heavy pesticide use. However, according to idh around 99% of the world's cotton farmers across 70 countries are smallholder farmers, who produce 75% of the 25 million metric tons of global cotton production annually. Smallholders are farmers, mostly living in developing countries, that do not own large areas of land (often less than 2 hectares), rely on crop production for their livelihoods, and are very dependent on yields.

Another major issue in cotton farming is the state of soil health. Intensive farming can severely degrade soil quality, leading to a decrease in fertility, water absorption and an increase in runoff. Despite the global area devoted to cotton cultivation remaining constant for the past 70 years, cotton production has depleted and degraded the soil in many areas. This has led to the expansion of cotton farming into new areas and the destruction of habitats.

At the end of the 19th Century, denim was only made of cotton, and was thick and durable. But, things then changed in 1958 with the invention of Spandex, a stretchy version of polyester, allowing jeans to expand and retract back to their original shape. The issue with all materials similar to spandex (lycra and elastane to name two) is that they are made of a synthetic polymer called polyurethane. Like all plastic-based materials, it is not renewable, as it comes from fossil fuels, and has a high environmental impact in terms of raw material extraction, and chemicals used in processing.

Now denim is mostly made of a combination of cotton with:

+ Polyester for durability
+ Spandex / Elastane / Lycra for stretch
+ Viscose / Rayon for softness
+ Thermopolymers for specific thermal properties

With issues such as cotton's heavy pesticide use, soil degradation, and the negative impact of synthetic fibers on the environment, it can be confusing to know which fibers to choose. One solution is to opt for reclaimed materials, which are made from waste or by-products of other processes. Another option is to choose recycled fibers that are free of microplastics, and fibers sourced from renewable sources or regenerative farming methods. Additionally, look for fibers that have the potential to be recycled, this way you can ensure that they will not become a waste after you are done using them.

BEST PRACTICES

+ **Regenerative Farming for Climate Positive Fibers** that restore soil health. There are many methods for building resilient soils and we have our dedicated farmers to thank for that. Some methods include incorporating animals for grazing and natural fertilizers, building bio-diverse fields by planting trees, cover crops to conserve soil, rotating crops, boosting soil fertility with fungal compost, and methods for no-till cotton without any of the nasty chemicals! Growing this cotton literally reverses the negative impacts of traditional cotton growing and protects biodiversity!

+ **Regenerative Organic Certified™** is a revolutionary new certification that ensures that farms and products meet the highest standards in the world for soil health, animal welfare, and farmworker fairness.

+ **Good Earth Cotton** is carbon positive cotton, meaning growing the cotton actually removes carbon from the air, and it is also 100% traceable with Fibertrace technology. To learn more click here.

+ **Organic cotton** is grown with NO PESTICIDES and non-GMO seeds, but is very hard to scale for mass quantities. But, currently only 1% of the world's cotton that is grown is organic cotton and with the influx of organic cotton products out there... something doesn't add up! Be sure to check for a certificate. For an in depth look at organic cotton click here.

+ **FAIRTRADE cotton** means that all farmers are guaranteed a living wage for what they grow and sell, and Fair Trade also helps them to reduce their impact on the environment by reducing the use of chemicals and adapting to climate change patterns.

+ **BCI Cotton** stands for BETTER COTTON INITIATIVE. This program gives smaller farms guidelines on how to grow and harvest their crops in an environmentally friendly way through:

    + Using just the right amount of fertilisers
    + Using just the right amount of water for irrigation
    + Manage the planting such that water does not pool" around the roots.
    + Control the use of pesticides

+ **REFIBRA™** is a revolutionary fibre made from cellulose rich waste (aka post consumer textiles) and Lenzing's renowned Tencel fibre. It combines the best of two worlds to create one of the most ecological wood-based fabrics on the planet. In short, REFIBRA is the product of recycling cotton waste fabrics into virgin textile.

+ **Hemp** is known for its ability to capture carbon from the air and can also decontaminate polluted soils. Hemp is a wonderful fibre! It can be blended with cotton, to have a durable and strong 100% organic fabric. We hope that one day hemp can become the substitute to polyester to give strength to cotton jeans and allow us to increase the amount of recycled cotton they can contain. To explore how hemp is cottonized for denim, click here.

+ **Recycled Cotton** is the holy grail of fibres! I would love to see a world where its possible to have 100% recycled and recyclable jeans in a closed loop system. When using recycled material, you can avoid all the sourcing and processing steps required to make virgin material from scratch, so the impact is drastically reduced as you can imagine! But, of course it depends on the waste product you start with, whether you have to wash it and dye it again, and what processing steps are required. When recycled mechanically, it has a lower processing impact and requires less specific technology than chemically recycled cotton, but this reduces the length of the fibre, which is a measure for its strength. So, it is currently only possible to include 40% recycled cotton in a new fabric.

But! Never forget about the human impact. More on that over at Cotton Diaries.

+ **Recycled Cellulosic Fibers** like Re:Newcell's Circulose and Infinited Fibre's Infinna are two examples of successfully scaling chemically recycled cotton, a wildly exciting development for circulating textile waste! They are able to turn used cotton and viscose into new biodegradable pulp, from which new fibers are extruded, and can continue to be recycled over and over, creating a truly circular economy.

+ **COREVA™** is an innovative technology developed and patented by Candiani Denim that uses a plant-based yarn obtained from natural rubber to replace synthetic, petrol-based yarns. Made from organic cotton wrapped around a natural rubber core, the result is a yarn that is completely plastic-free and biodegradable. By replacing conventional synthetic and petrol-based elastomers with a new, custom-engineered component, Candiani has created an innovative stretch denim fabric – without compromising the elasticity, physical qualities, and durability of jeans.

+ **Natural Stretch**. One natural denim stretch solution we have seen from Naveena Denim is creating high stretch fabrics made from 100% cotton. How have they done this? The Mecha-Stretch concept is a mechanical stretch concept designed for 100% cotton woven fabrics. It truly has an elastic behavior thanks to a specialized weaving technique.

+ **Tencel** is a cellulosic fibre coming from tree bark. It is a "greener" fibre than cotton or many other common textile fibres as It is grown in a sustainable manner - no pesticides are required to grow the trees, and most of the time they are rain fed. Trees are grown and processed at a rate that allows them to recover, and are FSC certified. An organic solvent is used to dissolve the wood chips into a solution. The chemical used to dissolve these chips is very expensive so it is recycled after the process is complete.

+ **Biomimicry** has been of very high interest to me, so much so, that I wrote a whole article on it here!

Want to focus on the social impact of cotton? There are incredible farmer cooperatives and initiatives out there!

Seed2Shirt is a vertically-integrated apparel manufacturer that works from the ground up — literally — for a transparent, diverse, and ethical supply chain created specifically to bring value back to the African diaspora communities they source from, via their Farmer Enrichment Program. This Program began with organic cotton farmers of Burkina Faso, who, in their transition to organic agriculture, were facing issues of soil nutrient depletion, less abundant yields, and less profit. Today, Seed2Shirt works with 8,400 organic cotton farmers (58% of which are women!) in 5-year partnership models, and with Black-owned production companies throughout the US — ensuring consideration of people and land throughout the *entire* process.

Want to get connected directly at the farmer level?
Cotton Diaries and The Sourcery will help you do it :)

Want to focus on the social impact of cotton?
There are incredible farmer cooperatives and initiatives out there!

CERTIFICATIONS

RSB

C2C

FAIRTRADE

GRS

GOTS

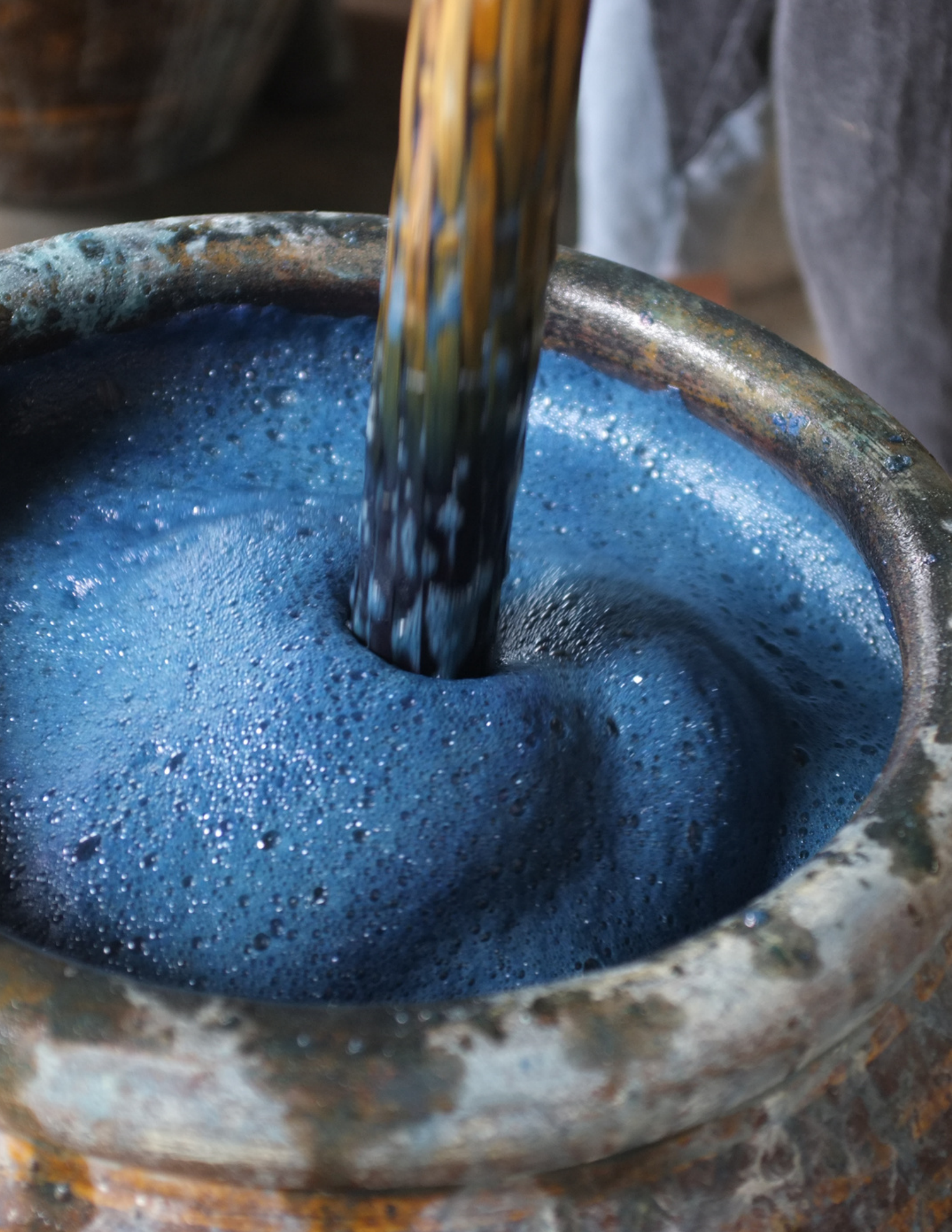
REGEN ORGANIC (ROC)

RCS

OCS

CLIMATE BENEFICIAL

BCI



STEP 2

fabric production

A NOTE ON MILLS' ELECTRICITY:

Fabric production is the step in the life cycle of a garment that has the highest impact. According to Life Cycle Assessment experts Ecochain, almost 10% of the impact of the apparel industry occurs by producing the fabric, which is made in fabric mills. These are extremely large factories with gigantic machinery which often runs 24 hours, which is why the sustainability of spinning and weaving is very connected to the type of energy that is used.

WHAT & HOW

CLEAN ENERGY

Renewable energy sources are the best option. Hydro and wind power require large scale installation, which must be made available to mills by energy companies or governments. Manufacturers have started installing solar panels on their roofs, that fit very well in the countries that produce most of the world's denim: India, Egypt, Pakistan, Turkey. You can find a great comparison of different energy sources here, and our article on Solutions for Fossil Free Energy in Fashion.

INDIGO

In theory, this is just one dye, but the outcome is much more than that: it can be pale, dark, bleached etc. This is possible because it's not a perfect dye, given its values for color fastness and bleaching resistance that bring its imperfections.

In denim, we have two main types of dyes: indigo and sulfur. However, indigo and sulfur have troubles sticking to the fibers on their own. Indigo requires multiple applications to develop the color, about 6 - 8 dips on top of exposing it to oxygen and stabilizing it before dipping it again.

Indigo can be either natural or man-made, but the molecule is the same, and it has to be solubilized with sodium hydroxide (caustic soda) and reduced with sodium hydrosulfite (hydro), regardless of whether it was sourced from the Indigofera tinctoria plant or from aniline and other chemicals. "Aniline free", which you might see in sustainability communication from brands, refers to detectable amounts of residual aniline that can be found in the indigo dye paste, however the indigo dye is still made from aniline.

Although there isn't a difference in the way it is applied, the production of indigo is very different. Making synthetic indigo is a complicated chemical process with high health and safety risks, which should be done in extremely careful facilities. The chemicals are derived from petroleum, and we all know the destructive effects that the extraction of it has on the planet.

Chemicals are one of the main components of our clothes, but have gotten a terrible rap over the years. When chemicals are used properly and safely, they can have some benefits. However, heavy use of chemicals causes massive freshwater and ocean pollution, as well as soil degradation, which poses a great threat to global food security and biodiversity.

Unfortunately, natural indigo takes more time and land to produce, and it cannot meet global demand.

There is a great online webinar by the Transformers Foundation: "THE TRUTH ABOUT INDIGO" - The Truth Series: Season 2 Ep.4. which covers the technical side of indigo and answers a lot of the questions you might have on it. The experts tell us that if you look back to ancient times, Samurais used it to heal their wounds, as a flame retardant, for its healing properties, and its odor prevention, making it much more than just a color.

SPINNING

Fibers are cleaned of any impurities like sticks and leaves, this means separating the cotton lint (the white fluff, a mass of unicellular hairs that grow attached to the cotton seed). The fibers are then spun into yarns that are woven into fabrics, and this is where you would also add other fibers such as Tencel, Refibra, or bio stretch.

A lot of cotton can get lost during this stage, but most mills have vacuum-like machines that will suck up all the lost cotton during the process and recycle it back into their feedstock. Cotton is like gold, it cannot be wasted!

Ring Spun vs. Open End Spinning:
+ Ring-spun yarn is made by twisting the cotton strands to make a very fine, strong, soft rope of cotton fibers. Ring-spun yarn is more durable than open end yarn and generally more expensive.
+ Open-end spinning, on the other hand, is a system of spinning where the yarn is twisted by rotating at the hap or break in the flow (the fibers wrap around the yarn vs spinning one long piece of yarn).

DYEING

Most denim fabric, even the ones that are used for your vintage looking light wash pairs, are dyed dark, and then reduced in color, which creates our desired final result. This means that chemicals are used at the dyeing stage and then later on again (jump to 'washing' here).

First, the yarn has to be treated with caustic soda and a wetting agent to remove natural oils in the cotton and impurities that cause inconsistencies in the dyeing. Rinsing is crucial for the dye to permeate the yarn. Then the yarns are dipped into several baths of indigo in a continuous rope dye range. The vat is the indigo bath. If you wanted to add sulfur to compliment the indigo with a cast of black, you would do so before dipping the yarns in indigo during cleaning or after indigo dyeing to achieve different looks. After the dye is applied, the yarns are washed to remove any residual indigo. Indigo and sulfur dyes are not colourfast, so they can be easily removed in the laundry, but more on that later.

WEAVING

To most denim enthusiasts, the difference between a woven and a knit fabric is very clear, and they will also know that denim tends to be a twill woven fabric. But this is not an exclusive club: we want to include everyone! So, what's a woven VS knit?

A knit fabric is made up of a single yarn, looped continuously to produce a braided look. A woven fabric is generally produced on a loom and made with many threads that will be placed at two specific angles. The two angles will then define your warp and weft directions. Denim is a woven fabric, made of a dyed warp and a bleached or undyed weft. This is why when you turn your jeans inside out, they are a different color!

To set our yarn up for weaving, we need to coat it to ease the friction that occurs during weaving known as a sizing formula. Then we take our dyed yarns for our warp and our undyed natural yarns for the weft!

BEST PRACTICES

INDIGO PRODUCTION & DYEING

Today, most indigo is produced in China in powder form, which requires caustic and hydrosulfite to be applied, otherwise it will not stick to the cotton. Only a small percentage of the world's denim mills use "pre-reduced " indigo, which requires little water, and eliminates the wastewater and sludge that powdered indigo creates. It also shields workers from toxic powder exposure and reduces the amount of waste salt by 70 percent.

There is something in between natural indigo and synthetic indigo that might solve our problems both in the manufacture of the dye and in the dyeing process! That is bio-based synthetic indigo (therefore not coming from the indigofera plant, but made in factories from other natural sources).

Research is constantly being done on new options for dyeing, such as working on the natural color of the cotton, a lesson from the past, and on printing, a potentially disruptive technology that could help us avoid waste.

Digital printing of denim can be beneficial because it reduces the amount of water, chemicals and energy required to create a denim looking fabric. However, a study undertaken by the Society for Imaging Science and Technology has concluded that the technology is not yet at the stage to give the same texture and line quality. The brand Our Legacy is selling digitally printed jeans that are inspired by vintage designs, photographed and digitally manipulated, then printed on new pairs. We are looking forward to the future development of this technology.

Some manufacturing facilities have on-site water recycling facilities, so water for dyeing denim can be reused over and over again. This process saves millions of liters of water with no change to production output, while helping us avoid depleting our resources!

Hot Tip: When choosing factories, be sure to check out their Effluent Treatment Plant! More advice on this from Salli Deighton here.

For more indigo alternatives, head to "Dyeing to Know About Sustainable Dyes? Sorry I had To.".

1

Stony Creek Colors, however, has been making strides in producing natural indigo for denim mills, specifically with their 100% BioPreffered indigo product. A 100% BioPreferredTM score, certified by the United States Department of Agriculture (USDA), indicates that after being subject to radiocarbon dating, the product is proven not to contain any synthetic adulterants. The natural dye used in the project has the same performance capabilities of synthetic indigo but is derived from Indigofera suffruticosa plants, grown in partnership with US-farmers in Tennessee and Florida and cultivated through Stony Creek Colors' in-house seed genetics and agronomy program and proprietary extraction processes.

2

San Francisco biotech firm Huue believes that the answer to synthetic indigo is Genetically Engineered Bacteria to mirror the way the Japanese indigo plant, Polygonum Tinctorium, makes and holds its color. Tinctorium uses E. coli to produce indican, the chemical precursor to indigo, in large bioreactors. The microbial fermentation process can save 100 tonnes of petroleum and 10 tonnes of toxic chemicals per tonne of product. Pili's process differs a little using microbes working at room temperature to create color! !

3

Foam Dyeing is a water-free process that eliminates the waste created from the traditional dyeing processes. Foam is obtained from an aqueous solution and then spread on a fabric. Pretty neat if you ask me. The foam is made from a watery solution, which includes a foaming agent and a carrier for the dye stuff. The indigo dye is then transferred to yarns in an oxygen-deprived environment sealed by a nitrogen hood. This is a revolutionary process that has been in development for nearly a decade.

4

The latest development on the market is called Blue Infinity by Crescent Bahuman, however, this technology isn't actually indigo and as we have just learned, indigo is inherently a problem. Learn more about this revolutionary, resource friendly blue dye here.

5

Research is constantly being done on new options for dyeing, such as working on the natural color of the cotton, a lesson from the past, and on printing, a potentially disruptive technology that could help us avoid waste.

WEAVING

Vertically integrated facilities will generally blend their pre-consumer and post-industrial waste into their products at this stage too and like we learned in the raw materials stage, we want to continue to increase the amount of recycled fibers in our clothes :) But let's keep them microplastic free.

Laser friendly fabrics are fabrics that are designed to be lasered in the washing process. This means that the fabric does not get damaged by the laser, and that the color responds perfectly to the laser beam, reducing waste in production, and higher durability.

Look for energy efficient facilities that are creative with their resources such as using natural lighting for your factory or using renewable energy.

WHAT CAN YOU DO ABOUT IT?

+ Look for natural indigo labels, however, less than 1% of indigo produced today is from plant based indigo.

+ Look for brands using efficient dyeing methods and aniline free dyes.

+ Buy brands that are disposing of waste in a humane manner such as turning old sludge into bricks that can be used for homes or using water filtration systems that allow them to recycle the water.

To learn more about the indigo problem, read my #DiligentDenim Blog post, “The Indigo Problem”.

TRACEABILITY

WHAT & WHY

This is a good place to stop and talk about these two hot topics that many often find confusing. Many companies have a limited view of the network of business partners within their supply chain, and do not get the full story behind their products.

Most know their immediate suppliers, which are the factories that do the cutting, sewing and washing, but information about their suppliers is lost. Therefore, all of the cotton farmers, mills, accessory suppliers, miners of the metals, oil refineries that produce plastic based materials, etc., are lost too. Basically all that has been explained until now is out of reach for most brands, and without this knowledge, it is extremely difficult for them to make a real impact through their environmental and social policies.

Traceability is the concept of looking at the supply chain and being able to accurately map all suppliers from the raw material extraction stage to its end use. It requires the collaboration of all industry partners, the deployment of common approaches and reliable technical solutions that are fit for different environments. The practice of subcontracting, which we have analyzed in depth with Kim Wan Der Weerd, certainly plays a key role in traceability. Read more about it here!

Transparency means explaining clearly to consumers what impact the production of their garments have, which can range from disclosing production locations, CO2 values, certifications, progress towards targets, issues with accidents and human rights, etc. This allows consumers to make informed purchasing decisions, and help research entities and NGOs establish where the industry is at.

Both transparency and traceability are now a priority for the garment industry to manage supply chains more effectively, however transparency and traceability individually are not enough. This information must be used to generate real change.

BEST PRACTICES

We have physical tracers and blockchain traceability, and we have some companies who are combining the two. Physical marking allows for information on the supply chain to be written in the garment, and it can be done through chemical/physical marking. Blockchain traceability require inputting information into the blockchain, which might sound a little riskier already (ie. who's to say someone isn't entering the wrong information!?).

Several of these solutions apply QR codes to clothing labels so that customers can learn about the provenance of their garments. These include the Lyfcycle (mobile app and web traceability platform), or brand initiatives, such as by Residus. They can include information on fibres, certifications, processes, location of production, and visibility on several aspects of the supply chain. QR codes are also useful tools for informing consumers for best practice in garment after care and end-of-life.

+ FIBRETRACE® embeds luminescent pigments on the fibre, right at the raw source or spinning mill. The pigment bonds and is indestructible throughout the entire textile processing cycle. The pigments can be read and tracked at every stage of the supply chain through the use of a handheld FIBRETRACE® hardware device which scans and reads the brand's individual signature created in the luminescent pigment. Each audit is recorded on the blockchain, and currently the technology is applicable today to cotton, responsible viscose and recycled polyester.

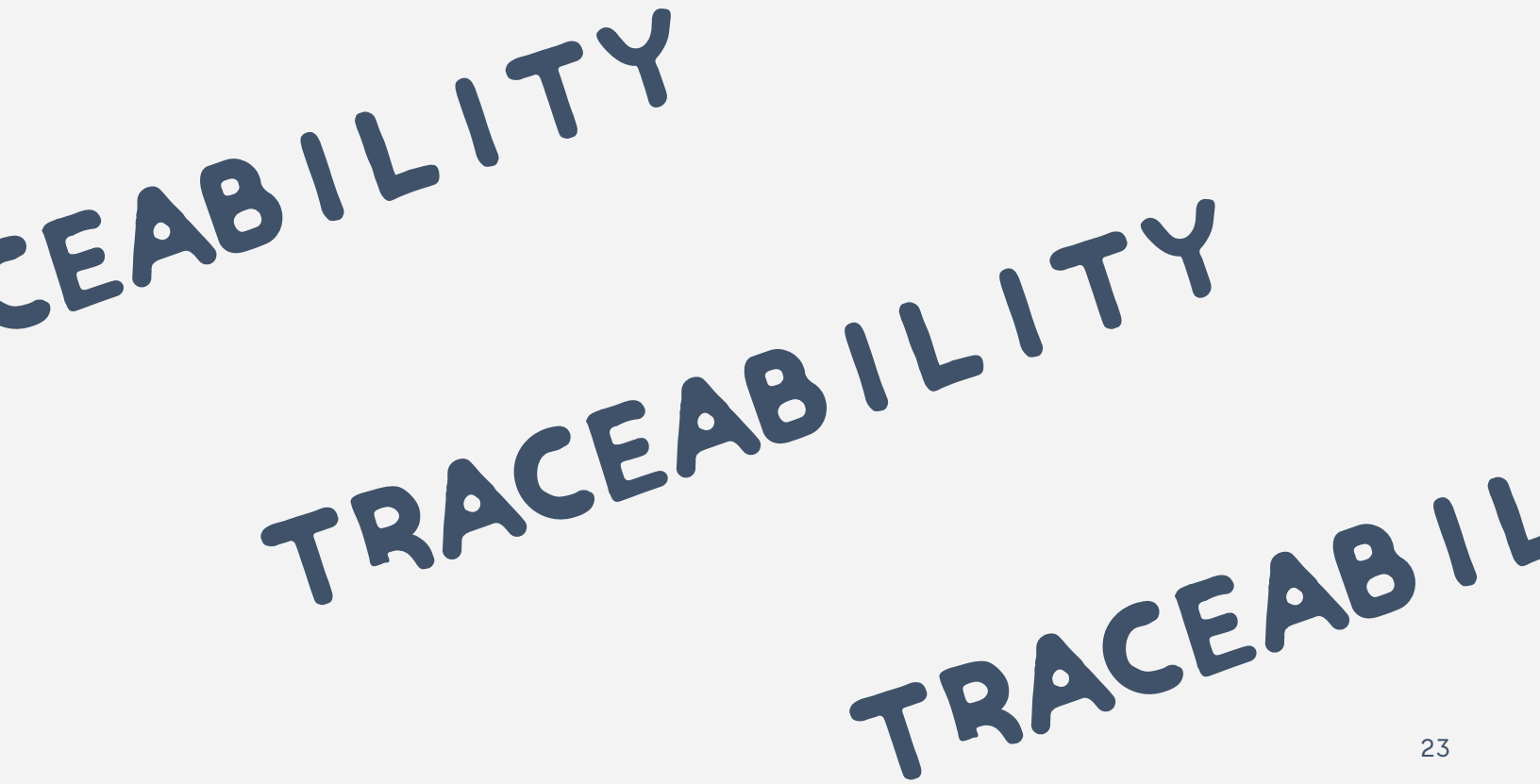
+ Haelixa is another company combining physical tracers with blockchain technology. The markers are applied to the raw material or to semi-finished products at any production step, which creates a unique identity. At any point, the product can be submitted to a quick test to unravel its history and ultimately verify its integrity. The non-destructive test can be done with both the finished and the intermediate product.

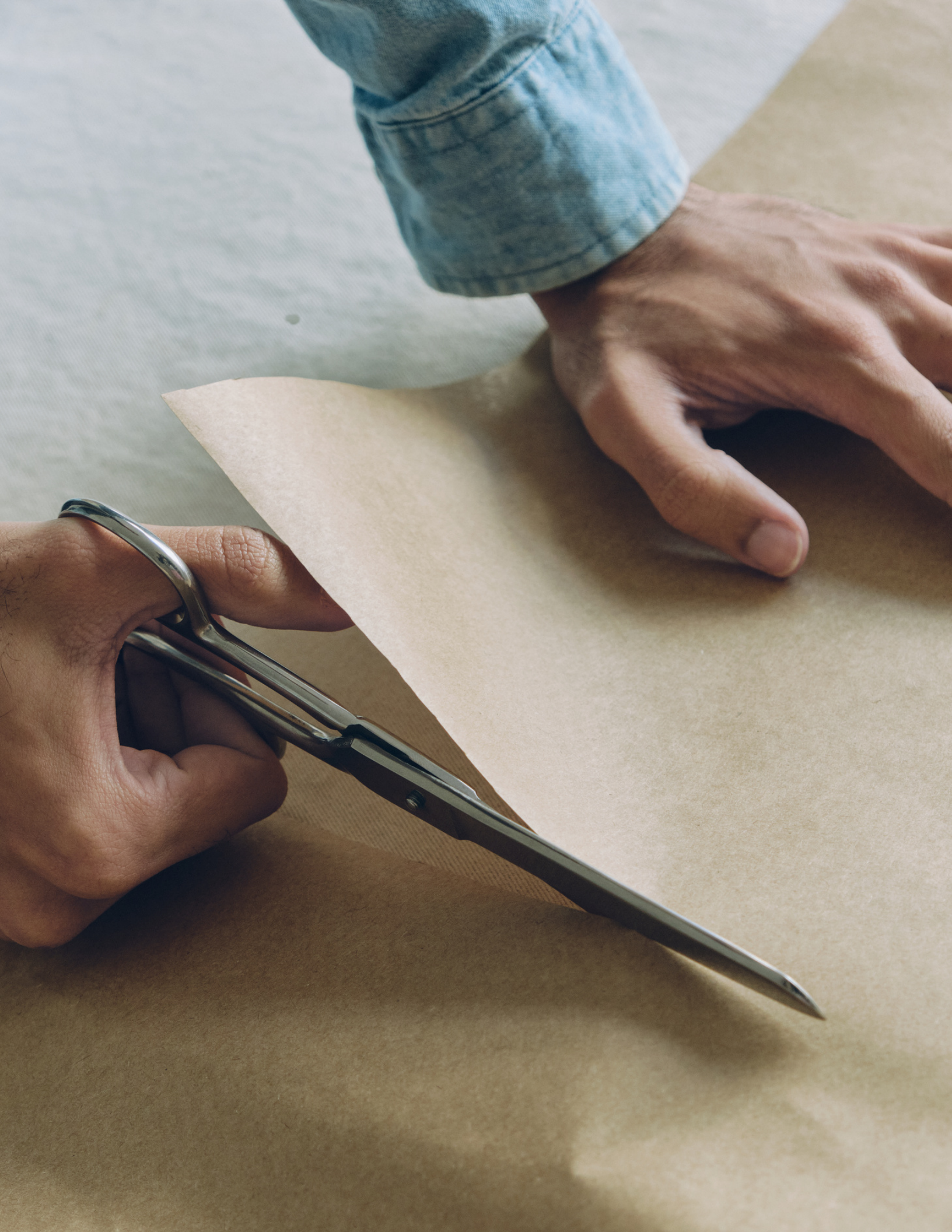
+ The TextileGenesis™ platform is an outcome of intensive "grass-root" discussions with the entire apparel supply chain; its technology combines blockchain with GS1 (a global traceability standard) for the apparel industry. Its platform allows digitization and traceability of any textile asset such as fiber, yarn, fabric, or garment through Fibercoins™ (blockchain based digital-tokens, likened to fingerprints). Fibercoins stay intact no matter how many times the material is reused or recycled, and the information is stored using blockchain, which can't be altered or tampered with.

+ Oritain works across the fashion, food and pharmaceutical industries, and it has managed to map out the majority of the world's cotton. Its mission is to help companies verify their sourcing claims with an 'origin fingerprint'. Unlike any other traceability program, Oritain doesn't need to add or rely on any tracers, which allows you to test a product at any stage of the manufacturing process without any change to production! Click here to view the conversation between Ani, Cone Denim and Oritain, and to read how the science used was originally used for murder investigations and is admissible in the court of law.

+vApplied DNA Sciences' CertainT® platform tags, tests and tracks raw materials such as cotton and lyocell through each stage of production. Materials are tagged with a unique molecular tag and products can later be tested using a portable device at the yarn, greige or finished product level.

+ EON, another major company focusing on traceability using QR codes, was founded in 2015 with the mission to power industry's transition to a circular system of commerce. EON established the CircularID™ Initiative in 2018, to develop a protocol that would unlock the communication and connectivity for this network. Through the initiative, EON led the development of the Circular Product Data Protocol - the global language for connected products. Today, EON works with global brands and retail's across the fashion industry to provide Digital ID technology and implementation.





STEP 3

sample/cut /sew

Fabrics are shipped from mills to manufacturers, who are in charge of turning rolls into finished garments. The first step is to cut the rolls into parts that will compose the jeans.

WHAT & HOW

SAMPLING

Sampling is a process of making a product prototype prior to starting bulk production, and is a key part of the design and pre-production process, as it provides an essential opportunity to analyse what works before putting the design into production. Before deciding on the final shade, fabric, and fit, factories can make dozens of samples for one item that then goes into production. $6 to 8 billion is spent on sampling in the fashion industry every year. These samples often are not sold, and their environmental impact should not be overlooked.

CUTTING

Automated cutting allows for a machine with an automated moving blade to cut rolls into parts of garments, for better worker safety, since the traditional cutting method required for employees to handle cutters manually. Furthermore, the cut pieces are repeated perfectly to reduce waste.

Cutting waste is one of the least talked of issues in fashion: tiny pieces of fabric are either incinterated or thrown to landfill. You can read more about the upcycling of fabric waste in 'End of Life'.

There is also a big problem of minimum order quantities that is not well known. Fabric is considered a high volume low price product, therefore manufacturers who have to run extremely big machines and use vast amounts of chemicals in their production set a minimum order quantity. Garment manufacturers however receive an order from brands, who do not take responsibility over the order quantity from the mill, so they end up with unused fabric that they have to store or dispose of.

SEWING

Sewing factories are employers of hundreds of thousands of people, all using variations of simple sewing machines. This is why the sustainability of this step is mostly social: material is transformed mechanically only.

Since the Rana Plaza disaster in 2013 when more than 1000 people died in an accident in Bangladesh, because of the very poor working conditions, the world has started paying more attention to fashion workers' rights.

In the current set-up of the fashion industry, brands have extremely big supply chains, which makes it near impossible to know exactly what is going on in every factory. Systems of audits and certifications have been set up to ensure that factory employees receive a fair wage and work in a safe and healthy environment.

The difference between a living wage and a minimum wage is that the former allows a worker's family to have enough to pay for varied and nutritious food, afford water, housing that meets certain standards, education including that to achieve a better position, health care, transportation, clothing and some discretionary earnings, including savings for unexpected events, such as the death of a family member (..or a pandemic).

Code of conducts are written by brands to ensure that their suppliers meet certain standards. Many of the processes can be dangerous to people's health because of big machinery and chemicals, which is why it is very important to protect them.

There is a lot more than just receiving a living wage. Unions allow workers to ask for what they need, this could be insurance, support for their children's education, better facilities in the factories, social security, and transport. There are companies that don't allow for their employees to start a union and ask for rights, which shows that they do not value the wellbeing of their employees.

The concept of Diversity and Inclusion is also very important, and it looks at including in the workforce those who are discriminated against. Companies that hire thousands of people should ensure that they welcome women, people with disabilities, people from ethnic minorities and LGBTQ+.

SUSTAINABILITY GOES FURTHER THAN JUST WITHIN THE FACTORY. A COMPANY THAT HIRES A LARGE PROPORTION OF A COMMUNITY SHOULD SUPPORT IT THROUGH CSR PROJECTS THAT CAN ALSO BENEFIT THE COMPANY ITSELF IN THE LONGER TERM.

BEST PRACTICES

SAMPLING

3D sampling allows brands to create a virtual fit model of their product, and has become an innovative tool to minimise the harmful effects of the sampling stage. Companies like Clo 3D, Taas, Optitex and Marvelous Designer provide digital sampling services, and it is impressive to see how they can recreate different fabrics, patterns, and lighting on the digital clothes.

CUTTING

CAD design is a program used for placing patterns and connecting with cutters. Experts would use their knowledge to reduce the fabric waste by maximizing the fabric used with clever pattern placements.

Cutting waste highly depends on the design, size range, and fabric details, and the percentage of cutting waste can vary from 0 up to 20%. Although being used more widely in Fashion classes than in practice in industrial settings, Zero Waste Pattern Cutting means that the pattern pieces fit together so that no fabric is wasted during the cutting phase. This also allows to reduce the amounts of cuts that are required.

Intellocut is a fabric planning optimization software designed to help apparel and textile businesses save fabric in roll form in order to boost topline. It distributes patterns along the rolls to maximise fabric utilisation and reduce offcuts. Think of this as a puzzle solved by software!

WHAT CAN YOU DO ABOUT IT?

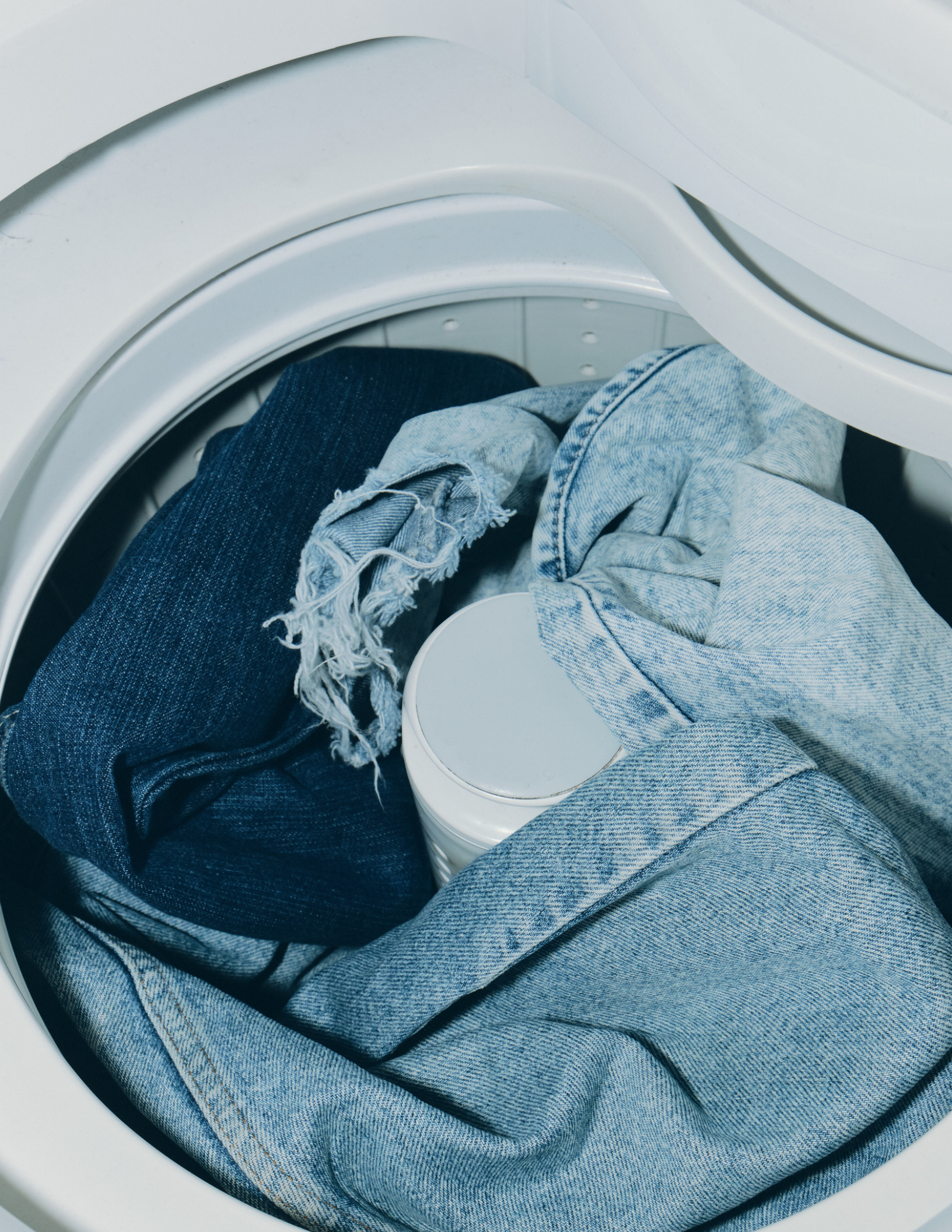
It is still too rare for brands to publish a full list of their suppliers. You should prioritise the brands that do, and then do your research into them. Some brands have started actively calculating living wages, and starting to ensure that they are paid, an example is Nudie Jeans, that is transparent in showing that it has not yet reached even 50% of the workers in its supply chain. The main limitation is traceability: most brands have no idea where their clothes are actually made. The model of fast fashion doesn't allow brands to develop long term partnerships with its suppliers, and having an impact on garment workers.

Organisations such as the *Fair Wear Foundation, Fair Trade, ILO (International Labour Organisation), Better Work, B Corp* and many more give recognition to factories that meet high standards.

Fashion Checker is a campaign by the Clean Clothes Campaign (CCC), funded by the European Union. It has developed a website where it provides access to data about brands, their transparency, and work on living wages. Since 1989, CCC has worked to ensure that the fundamental rights of workers are respected.

Social enterprises are businesses that put the interests of people and planet ahead of shareholder gain, and are driven by a social and/or environmental mission. Social enterprises commit to reinvesting most profits into achieving its objectives. This is a fundamental difference between social enterprises and traditional businesses, which are accountable to shareholders and as such are primarily driven by these interests. It is possible to source from social enterprises, therefore having a positive impact on people through purchasing, either business to business (B2B) or Business to Consumer (B2C).

Rekut is an example of a social enterprise in the denim industry, which we wrote about here.



STEP 4

wash

You might think that factories are washing your jeans because they want them to be nice and clean when you buy them in the shop, but that is not the case. There is so much going on in the laundry of a finishing factory: changing the feel, the colour, the texture, the properties and the look of garments.

WHAT & HOW

After your jeans are cut & sewn, they're "finished" where coatings are added or dye is removed for different looks. This is where we have seen a great deal of work in creating more sustainable options that use fewer resources and require less time. Ozone gas and lasers have been instrumental in removing indigo to create vintage washes and whiskering that was generally produced using harsh chemicals like Potassium Permanganate (PP SPray) and manual scraping.

Wastewater has been a major issue with processing denim. After denim has gone through the washing process, toxic sludge is left and disposed of in unethical and unsustainable ways.

They say in China you can tell the next trendy colour by looking at what colour the rivers are 😟

Effluent Treatment Plants are just as important in the washing process as in dyeing of the indigo. They use chemicals, bacteria, filters that need to be changed, and a lot of electricity, the best practice is definitely to avoid polluting the water, and when necessary then cleaning it.

What exactly is removed from the water?

Sludge is a combination of very small particles of cotton, particles of stones used in the wash, and chemicals. Do you have a dryer at home that requires you cleaning the filter at every usage? On an industrial scale that is the equivalent of sludge. The types of sludge of course depend on what initially goes in the water that is cleaned in the ETP: what fibres, chemicals and stones are used, and this will define the ways in which it can be disposed of.

After the garments are washed they also need to be dried. You can imagine that machines that can dry up to 100 jeans at a time need a lot of heat and power, meaning that they consume steam and electricity in vast amounts. Why don't they hang the jeans like they do in Italian towns? Some factories have started installing conveyor belts that allow the jeans to be dry up to 85%, and then go in dryers for a very short time to become softer.

WHAT CAN YOU DO ABOUT IT?

+ Look for denim that uses water recycling plants at the production facilities, and sustainable disposal of sludge.
+ Look for denim that uses more eco-friendly and water efficient processes like laser and ozone.
+ If a brand says it's saving 90% less water than "traditional denim," ask them how and what number they are comparing it to!
+ Buy vintage or secondhand!!!

BEST PRACTICES

Support the ones that are disposing of waste in a humane manner such as turning old sludge into bricks that can be used for homes or using water filtration systems that allow them to recycle the water. There have been new developments where this sludge has been turned into fertilizer too!

Lasers can be used to create whiskering, distressing, holes, special designs and more. A computer program dictates the intensity and pattern, taking only a few seconds to complete the design. Check out my experience using one here! Lasers are extremely suitable for decolouring clothing, especially indigo on cotton, and create worn-out effects like whiskers or patterns, and abrasions to create rips and customized designs. This was originally done with sandblasting (literally blasting the jeans down with sand to wear them down). Lasers are able to do this with a minimum amount of energy. Chemicals, such as potassium permanganate, water and heat through steam are not necessary in this process. Therefore the footprint of laser technique is much lower, and no heavy manual work is needed.

Ozone Gas can be used in the washing process and requires up to 60 percent less water and less chemicals compared to the traditional method of using bleach denim. Ozone decomposes indigo and other dyes with its high oxidation potential, therefore it is a good replacement for sodium hypochlorite (bleach). No water or steam is required, it easily turns into oxygen or dissolves in pure water and is therefore not harmful to the environment. . This results in a water reduction, time reduction, fewer chemicals and less energy.

Less Water / No Water is always the goal, but new developments have shown us the possibility of using no fresh water at all! With Bio Membrane Reactor technology, domestic wastewater that is drawn from the surrounding communities is treated, as well as a new pipeline that will draw wastewater from the local municipal line. Not to mention without the use of any chemicals.

No More Pumice Stones! Instead there are companies making fake stones that provide beautiful results, but there are also natural enzymes that can create the same looks and lastly, there are mesh looking grills put into washers to achieve the look with NO STONES! Research is also being done into stones that don't break down in the washing machine. Seriously tons of stones are shipped around the world, used once to give a nice feel to jeans, and then are discharged as sand and contamination to water? Yes.

Reducing microplastic pollution by integrating Xfiltra into washing machines to prevent 78% of microfibres from going down the drain.

Companies like Sea Change are discovering ways to filter wastewater, remove the contaminants, and release the clean water back into the atmosphere or recycle it back into their facilities for use.

CERTIFICATIONS

ZDHC was started in 2011, mostly as a response to the Greenpeace DeTox campaign. Part of the initial work established a Joint Roadmap to lead the apparel and footwear industry towards zero discharge of hazardous chemicals. ZDHC now is also a certification and classification of chemicals into tiers. All Bluesign and Organic certified chemicals are level 3 ZDHC (the highest level of sustainability).

You should look out for these certifications:

WRAP

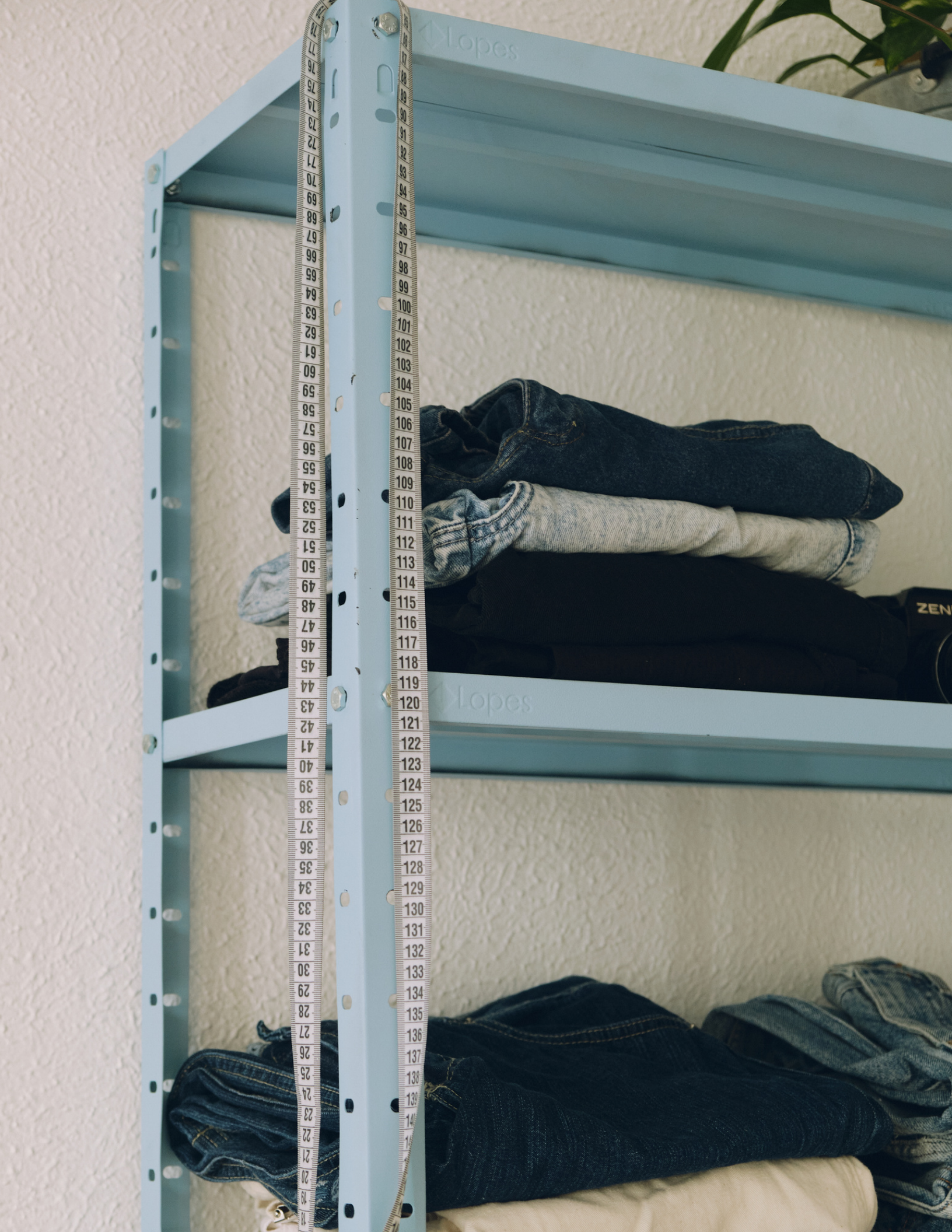
BLUESIGN

GOTS

FAIRTRADE

ISO14001

OEKO TEX



STEP 5

packaging & shipping

Tags, Label, Hangers, Hang Tags, Polybags, cartons, all contribute to the waste that comes from this industry. So much plastic is still used for packaging.

WHAT & HOW

PACKAGING

Polybags are the ubiquitous packaging of the fashion industry – something that unites brands small and large, from sportswear to luxury, to fast fashion retailers. This is the clear plastic bag which covers every garment from manufacturing to retail stores or consumer homes. Hundreds of billions of polybags are estimated to be produced for the fashion industry every year. Brands should consider not only the materials used but consider the wider system used with the packaging – for example, how will it be collected and recovered at all points where waste is generated?

Bioplastics are also a new hot topic. Bioplastics are plastic materials produced from renewable biomass sources, such as vegetable fats and oils, corn starch, straw, woodchips, sawdust, recycled food waste, etc. They can be great if they are also biodegradable, meaning that they can be composted. However if there is no system for composting, the effort is useless, the packaging could end up together with normal plastics and be an issue for the recycling process. It can be confusing to understand that some plastics can be biobased but not compostable, therefore we suggest that you check out a useful diagram made by Ecoage in their article explaining this group of materials.

Recycling could be increased thanks to government subsidies, legislation, oil price rise, design for recyclability (narrower range of polymers, no coloured plastics), advances in recycling technology and in sorting (optical recognition etc.). Collaboration and cooperation comes back as being the key to achieve a circular economy.

SHIPPING

Your pair of jeans might have travelled more than most people in the world. Cotton could be grown in India, then spun, woven and dyed in Italy, turned into a garment in Vietnam and sold in a shop in the US. It is very rare for one country to have a fully integrated production of garments, so how do we reduce the transportation's carbon impact?

One thing is undebatable: flights should not be used for clothes. They do not expire like fresh goods, and should not use the transport method with the highest carbon emissions. The issue comes from this system of having new collections coming out too fast, and a split up supply chain, which means that there could be delays at the end, and a pressure to get clothes into shops on time.

What other methods are available? Cargo ships have an exponentially bigger volume than trucks, but they also can transport a lot more volume, which means that the usage of diesel for a cargo ship is divided in between many more items. Shipping the same goods to the Netherlands can have a bigger carbon impact by truck from France than shipping them by ocean freight from South America.

WHAT CAN YOU DO ABOUT IT?

PACKAGING

Best practice for packaging is to ask: is this really needed? There are so many tags, boxes and bags that the consumer will never use. Brands should encourage consumers to put their new purchase directly in their bag, without adding unnecessary weight to it.

Ideally, brands would have strong, isolating, and moisture proof reusable containers that fit the requirements across their supply chains, share with suppliers, and use over and over again. If the logistics of sales require for something to become ownership of the consumer, then it should be compostable, and made from renewable sources.

FSC is a certification that we have already mentioned in the description of Tencel, and the same thing that is certified in the growing of trees (at rate that allows them to recover) is valid for all paper based materials for packaging. Look for brands that use 100% FSC certified paper and carton for their tags, boxes and bags.

Recycling is also a delicate topic, it does come third in the rule “reduce, reuse, recycle”. However, it can be a good solution for certain types of packaging, but if there is a system of recycling but the polybag is not recyclable then it becomes useless. Most countries have started requiring recycling information to be written on the packaging, so try to look for recyclable materials. Here you can find recycling symbols explained.

Mushroom® Packaging is a great example of a low impact packaging, it is made with hemp hurds and mycelium (which you know how much we love). It is a high-performing packaging solution, cost-competitive, thermally insulating, and water-resistant. It can be composted in a natural environment (differently than most bioplastics) in 45 days. It is also certified 100% Biobased and Cradle to Cradle Gold.

Seaman paper has launched a line of transparent paper bags designed to replace single-use plastic poly bags. Try to look for them!

Look for compostable bioplastics and make sure you dispose of them in the correct bin!

SHIPPING

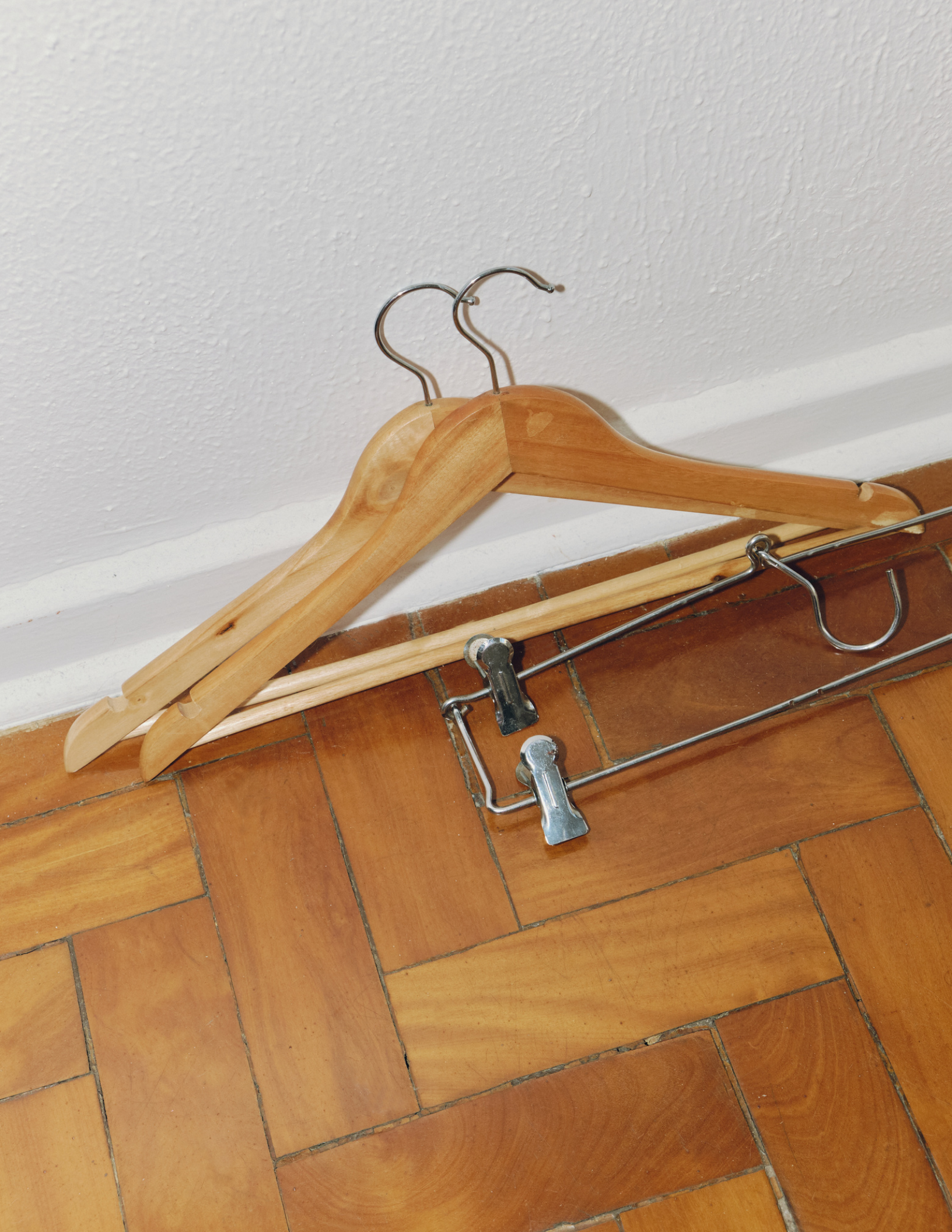
Get informed on your favourite brand’s yearly impact report and check if they explain what transportation methods they use. Ocean freight is preferred when possible. If they launch new collections every two weeks and offer express shipping there is a chance they use air transport.

Offsetting is very debated in the sustainability world. By definition a carbon offset is a reduction in emissions of carbon dioxide or other greenhouse gases made in order to compensate for emissions made elsewhere. This reduction can be in the form of planting trees, investing in renewable energy, avoiding deforestation etc. The way it is calculated is by analysing what emissions would occur in the absence of a project. The issue is that there are projects that sell carbon credits for trees or land that would not have been destroyed anyways, or for renewable energy that was going to be invested in anyways.

Do you want to calculate your own emissions and offset them? The project Ecosphere Plus which combines carbon offsetting with the improvement of livelihood in endangered areas, and has a carbon calculator for deliveries, flights, businesses etc.

Of course it would be best to reduce emissions completely, but when it is not possible it is better to offset emissions than to not do anything about it.

Your brand can use a carbon neutral shipping method. There are plenty of options, including from UPS.



STEP 6

use & care

It is no doubt that fashion is one of the most wasteful industries and denim was always under attack for being one of the worst offenders. We know a significant amount of greenhouse gas emissions are linked to the manufacturing of garments and unfortunately, garments are being worn **40% less** than the previous generation. This leads us to the real problem - overproduction/overconsumption.

We produce way more than we need, so much so that some of what is produced (estimated at 30%) is never actually worn, and goes straight to the landfill. Some brands will partner with different organizations to donate their unsold goods, but if an estimated 150 BILLION garments are produced a year, 30% (**45 billion garments**) is WAY too high a number, so we need to be buying less, choosing well, and making it last, while the industry continues to minimize waste and maximize resources.

Read more on "Waste Solutions for the Denim Industry" written by Simply Suzette here!

HOW TO BUY BETTER

PURCHASING QUESTIONS

Before you buy, I challenge you to ask yourself the four questions:

1. Do I really need this?
2. What is it made out of and where was it made?
3. Is there a repair service?
4. What will I do when I am done with it? Upcycle, restyle, or resale?

At Simply Suzette we we spend our time looking for solutions, which naturally led us to adding more questions and searching for more answers:

1. Is it designed for durability? (see the End of Life section)
2. Is this something that I can style in different ways and wear often?
3. Have I looked for a vintage/second-hand alternative?
4. Does it have a clear care label, including tips to wash it in a sustainable way?
5. Am I prepared to keep loving this item even if it slightly changes in colour or feel?
6. If it ever gets damaged in the future, could it look cool with repair stitches, patches, or embroidery? (we are thinking of our favourite upcycling brands)

BE CURIOUS

In a world where big companies can cover their actions with more publicity stunts, it is important to ask questions and dig deeper. **Knowledge is power!** The more you know about a company, the more you can make educated purchases.

buy less, choose well, make it last

DO SOMETHING

We can change our mindsets and ask the questions, but doing something about it is the hardest part. Sustainability is a journey that looks very different for everyone. It can start with taking your old clothes to a donation center, or saving up to buy a good quality pair of jeans that will last you years instead of your $20.00 pair that barely lasted one season. For Ani, owner and founder of Simply Suzette, it started with buying her first pair of sustainable jeans and grew from there.

GARMENT CARE

On top of the issues that come with garments not being used at all, the Use/Care phase plays a very significant role in the life cycle impact of clothes, and has even been estimated to be the stage with the highest impact together with raw material extraction. Laundry alone accounts for approximately 30% of the carbon footprint of clothing. During this phase, large amounts of water, energy and chemicals are used in washing, tumble drying and ironing, and there is the issue of microplastics shed into the environment. It also is the longest phase of the garment, as these actions can be repeated hundreds of times, further degrading the garment and turning it into waste. It really is a critical stage, where our habits can make a big difference. Additionally, impact varies for different products and depends upon factors such as consumer behaviour, geographical zone in which the product is used, and even the weather conditions in that zone. Let's look at each one of these issues in detail...

Similarly as in the Finishing phase described earlier, (where jeans are washed to get desired effects) washing, drying and ironing jeans at home requires large amounts of water, energy (mechanical and thermal), and chemicals.

Additionally, all this stress reduces the lifespan of clothes, as fibers degrade or shrink, colours fade, and clothes end up not being usable anymore.

The impact of your wash highly depends on the energy mix of your supplier (whether your electricity was made from impactful sources such as coal, or through renewable energy, like hydro), and the temperature that your tap water starts from, which is why we mentioned the geographical area. According to the UK Energy Saving Trust, choosing to wash at 30 degrees rather than at higher temperatures uses around 40% less energy, and reduces the degradation of clothes. According to WRAP, extending the average life of clothes by just three months of active use per item would lead to a 5 to 10% reduction in each of the carbon, water and waste footprints.

Many of you have probably read terrifying headlines detailing the amount of plastics that we eat on average every year due to microplastics having entered the food chain, and being found in water, vegetables, milk, etc. Remember us mentioning microplastics earlier? What is the difference?

Microplastics are plastic pieces less than five millimeters in length (mostly formed when plastic waste material that has been discarded in nature breaks down), and microfibers are a subcategory of microplastics that are fibrous in shape (mostly formed in the washing of textiles that contain plastics, such as polyester and nylon). According to researchers at the International Union for Conservation of Nature (IUCN), plastic particles washed off from products such as synthetic clothes & textiles contribute to 35% of primary microplastics polluting our oceans. That is a LOT!

How does this happen? During each wash, the fibres undergo a large amount of stress due to the force of the water, the temperature, and the chemicals that are applied through soaps, softeners etc. This causes tiny pieces to break, so small they're not visible to the human eye, and end up in the water.

There is no need to panic, and yes you should still continue washing your clothes, however there are several things that you can do:

1. Firstly, washing garments less often is the most effective way to reduce the environmental impact. By washing your jeans every 10x instead of every 2x, you can drastically reduce energy use, climate change impact, and water intake!
2. Spot-clean your clothes - often a small stain means that we wash 3kg of fabric - this seems unnecessary right? Just use a damp cloth. It also means you can rewear your jeans much faster than having to wait for when you find the time to do a full wash.
3. Make sure you check the fabric care label to make sure that you're washing your clothes on the right setting, to ensure that they will not get damaged through the washing cycle. Keep in mind that the number for the temperature is the maximum temperature that the garment can withstand - and not the advised temperature for the wash.
4. Reduce washing temperature. Higher temperatures encourage the loss of dye and fade black and bright clothes by opening up the fibres. Unless your jeans are truly filthy, cleaning denim at a cooler temperature (30 degrees C or lower), and as little as possible, will help them last longer and look better. Does your older family member believe that you only really clean your clothes with very hot water? You can explain to them that detergents (such as Ariel and Persil) have evolved significantly in the last decades, and for clothes not including baby clothing, towels and bedding, they can effectively kill bacteria and remove stains.
5. Always wash at full load.
6. Only use a small amount of detergent on a delicate cycle. Find a list of good detergents here!
7. Turn your jeans inside out, this will protect the most visible part of your favourite pair.
8. Try to avoid drying and ironing as much as possible. Generating heat requires vast amounts of energy. Hanging your clothes can be a pleasant and mindful activity, which can also reduce your electricity bill. Give clothes a shake and smooth them out before you hang them up, so that they don't dry and set with creases.
9. Try to purchase eco-friendly fibres, such as 100% cotton jeans, that will not release any microfibers when washed
10. Consider using a filtering bag or ball that traps microfibres during washing.

Find garment care products reccommended by Simply Suzette here!

WHAT TO LOOK OUT FOR?

Good news! 100% cotton jeans are still produced by most brands. Look out for them, and remember that there is a lot more than just the fabric to inform yourself on.

GINETEX, the International Association for Textile Care Labelling, has developed an internationally applicable logo for sustainable care. Consumers are given information to help them reduce the environmental impact of caring for textile. Look out for Clever Care on your labels. Apparel companies such as G-Star Raw and Stella Mc Cartney are adopting the clevercare.info logo on their care labels.

Want to reduce microfibers getting in our precious water? The Guppyfriend laundry bag, which is also supported by Patagonia, and the Cora Ball, which does not require you to put your clothes in a bag during washing, are the two best known options to reduce microfibers in your wash. Another option is Gulp, a device that traps fibres by connecting between the outflow pipe and the drain. Lint LUV-R and Planet Care are filters that can be retrofitted to machines, although these filters are less effective than the named options. Find the listed products here.

Self cleaning surfaces? Seriously? Well - don't get too excited yet - there is not a garment available yet that can be bought and used for a lifetime without ever seeing a wash. But, of course nature being amazing, it has developed self-cleaning surfaces, that are a class of materials with the inherent ability to remove any debris or bacteria from their surfaces in a variety of ways. The self-cleaning functionality of these surfaces are commonly inspired by natural phenomena observed in lotus leaves, gecko feet, and water striders to name a few. Research is being done into ways to use this in garments, so stay tuned, because we might hear some surprises soon.

CERTIFICATIONS

FAIRWEAR

FSC

FAIRTRADE

B CORP

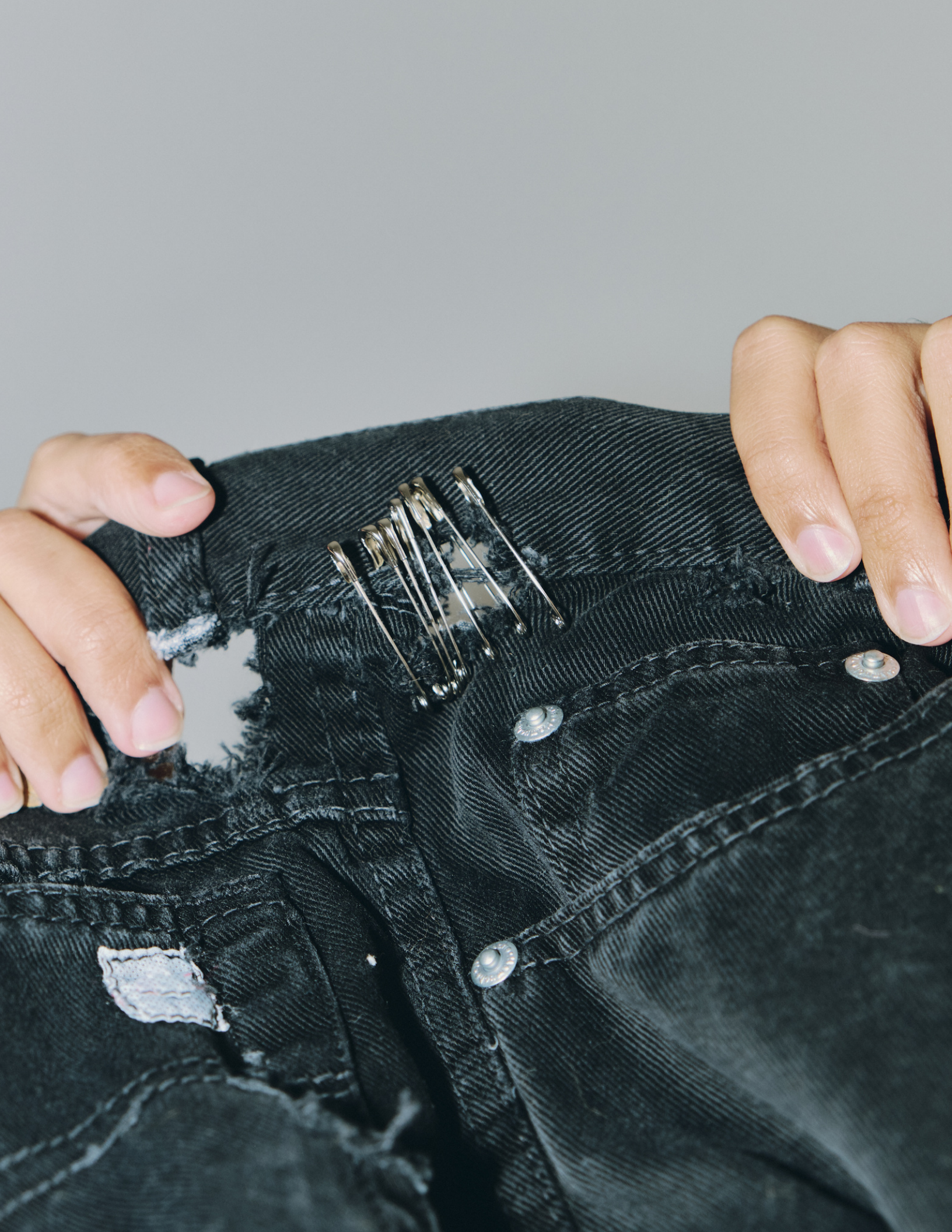
GOOD ON YOU

ECOCERT

CRADLE2CRADLE

CLIMATE BENEFICIAL

Bonus Tip: If you're shopping online, look for digital sizing solutions like body scans to get your perfect fit and avoid the GHG emissions of shipping & returns!



STEP

end of life

Not to be dramatic, but the total quantity of fashion waste is estimated to reach 148 million tons in 2030.

Sadly the majority of clothing waste is incinerated or ends up in landfills. The latter is not a good solution: natural fibres take hundreds of years to decompose and release greenhouse gases into the atmosphere, and synthetic materials are not designed to decompose at all and may release toxic substances. We clearly need better solutions for the end of the life of garments.

BEST PRACTICES

DURABILITY AND NEW BUSINESS MODELS

What if there was no need to end the life of a pair of jeans at all? The concept of durability looks at eliminating waste by making items that last much longer, which can be achieved by using resistant materials, not applying processes that destroy the fibres, and reducing the amount of times a garment has to be washed.

How does one measure this? The Jeans Redesign project is an initiative by the Ellen McArthur foundation, the world's leading research centre for Circular Economy, and it suggests measuring jeans durability through the number of washes a pair of jeans can go through without being damaged.

What if I get bored of a style, or my denim piece doesn't fit me anymore? Depop, ThredUp, Vinted, Ebay, second hand stores, and many more models are great solutions to allow people to exchange clothes. These systems need strong garments that can be shipped around the world, exchanged, worn, washed, and resold, which ties back to the concept of durability.

DESIGN FOR CIRCULARITY

Circularity is a concept which completely eliminates the concept of waste, both in terms of materials and value. Basically the end of life of a pair of jeans is the beginning of something else.

We have a huge respect for denim designers who are doing all they can to design the best jeans they possibly can because like we've heard before, 80% of the impact of a garment comes from the design stage! But, not all designers have the knowledge to produce circular jeans.

But how are circular jeans actually different? As stated by the Jeans Redesign.

+ All should have metal rivets in the jeans removed entirely or reduced to a minimum - as they are hard for recyclers to remove, large parts of the upper fabric of jeans are usually cut off and subsequently landfilled or incinerated (Lil tip: look to historic pocket designs and their use of clever bartacks)
+ All must have recyclable materials which can be kept in use once a product and its components can no longer be reused or repaired
+ All must be identifiable and traceable
+ No hazardous chemicals should be used in the manufacture of the jeans as they can cause allergic reactions and respiratory diseases etc. in the garment workers and consumers

When designing for longevity, durability, and reparability, the aim is to extend the use of a garment. On the other hand, when designing for disassembly, recyclability, or biodegradability, the aim is to ensure that products and materials return to the system and can be regenerated through a biological or technical cycle. But in order to cycle products successfully, we need to know EVERYthing that went into making it. Traceable supply chains and materials make this much easier to do so.

RECYCLING INTO NEW YARN AND FABRIC

The best solution is to keep jeans being used as jeans. Ideally forever. Brands like Atelier and Repair have taken fashionable repairs to the next level, however sometimes there is no hope for your clothes to be used any further, they could be too torn or stained. That is when recycling comes into place. It conserves natural resources, saves energy, and reduces the need for landfill space. What are the options?

+ Mechanical recycling of cotton means that fibres are extracted and spun again, without using any water. The issue is that the length of the fibres becomes much shorter, therefore of lower quality and strength, so they have to be combined either with virgin cotton or with polyester.

+ Chemical recycling of cotton is the newest area of research, examples of companies doing this are Renewcell and Infinited Fibre. Pulp is extracted using chemical processes, and this material is used to make new textiles such as Viscose. The limitation here is that the chemical process only works on fabrics that have minimum 98% cotton content.

RECYCLING INTO NON-FABRIC

Surely there must be a solution to the problem of fabric waste. Is there no other industry that would be happy to collaborate? The construction industry is always looking for large volumes of cheap materials right? Downcycling is a concept which describes how a material loses its value through a recycling process, and is repurposed as a lower quality item. This is often the case for textile waste reused in construction, mostly as an insulating material to fill walls. Textile waste is also used to fill mattresses and make rugs, however they are considered low quality items.

(Slightly off topic) Have you ever heard of Precious Plastics? It is a wonderful initiative which is present in lots of countries around the world, based on open source information on how to recycle plastic through shredding, heating, pressing or moulding. What if the same was done for fabric waste?

What if we used fabric waste instead of other materials that have a high impact? Check out two amazing projects that turn fabric waste into tiles and furniture:

+ Fab-Brick
+ Stelapop

WHAT CAN YOU DO ABOUT IT?

Let's ditch our take - make - waste model and move towards a circular one where we design out waste and pollution, keep products and materials in use for as long as possible, and regenerate the natural world. For the fashion industry, this means rethinking and redesigning clothing so that old clothes can be used to make new, textiles are made with safe and renewable materials, and garments are worn more.

Think about this:

If it ends with you, how can it be circular?

CERTIFICATIONS

+ C2C Gold
+ Jeans Redesign member
+ 98+ % cotton content on content labels

#SUPPLYCHAIN101

www.simplysuzette.com/supply-chain-101