

Circular Design Guidebook

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Foreword



Welcome to the ASOS Circular Design Guidebook.

Circular design gets to the heart of what fashion is all about: creating products that are loved and treasured for a long time by multiple owners, made through fantastic design and innovative production methods. Most crucially, it's about designing and creating products in a new way that moves the fashion industry away from the linear 'take-make-dispose' model of old, and towards a new model, where our fashion circulates through a system that doesn't just minimise its impact on the planet but, in the best cases, actively repairs or protects it.

Achieving this will be no small feat. Much innovation has taken place within circular design over recent years and cutting-edge solutions, methods and techniques are rapidly evolving. With such a pace of change, the fashion industry has yet to define a set of agreed circular design systems against which all of us can create and manufacture fashion.

The work to define those agreed systems is thankfully underway, through industry-wide collaboration and expert-led initiatives such as Textiles 2030, overseen by WRAP and backed by the UK government. Through Textiles 2030, organisations including ASOS are coming together to agree and define industry-wide good practice design principles for circularity as part of a wider roadmap on circular textiles.

This work is only possible because of the spirit in which brands are approaching circular design: as a pre-competitive, collaborative space where we can work together to reduce and transform the impact of fashion on the planet.

It is in that spirit that ASOS is publishing this circular design guidebook, which has been adapted from an internal guidebook rolled out by ASOS to its commercial teams in 2020 and 2021. In publishing it, we hope to contribute to the conversation taking place within the industry and offer our own perspective on how circular design can be applied in practice.

Part of a collaboration started in 2018, the guidebook is co-authored with the Centre for Sustainable Fashion. It has been created to support designers, brands and industry colleagues in designing and creating circular fashion. We also hope to support fashion students and young creatives just starting on their journey in the industry by offering access to the latest best practice taking place within commercial organisations.

It has been designed as an interactive reference tool that enables interested readers – regardless of their level of technical expertise – to learn more about circular design, how it fits into sustainability efforts, and how it can be applied in practice.

Continued...

We do not have all the answers and we are continuing to learn and evolve our own approach to circular design as innovation continues at pace. As a result, rather than offering rigid guidelines to each of our nine circular design strategies, we instead pose questions that are informed by our experience and which we hope will inspire others to create and define their own approaches.

The guidebook includes five chapters: circular design at ASOS; an overview of the circular economy and how it relates to sustainability; nine strategies to put circular design into practice; materials and their suitability for circular products; and an introduction to textile recycling and 'the power of the inner circle'. Readers are not required to read the guidebook cover-to-cover – instead, feel free to skip to the most relevant sections using the table of contents on page V.

The prize offered by effective and impactful circular design is enormous. Getting it right is critical to the future of the fashion industry and achieving the sustainability we all want to see. So much so that, in the recent launch of our 2030 programme for Fashion with Integrity, ASOS defined 'Be More Circular' as one of our two key goals to minimise our impact on the planet, alongside our ambitious Be Net Zero goal. These sit alongside our two key goals to deliver positive benefits for people: Be Transparent and Be Diverse. Under Be More

Circular, we are committed to doing much more to make our products more sustainable, and to scaling up our use of circular design strategies across our business. The publication of this guidebook is the latest step on that journey and will be followed by a dedicated circular strategy launched before the end of 2023, where we'll be setting out our next steps in greater detail.

Crucially, we're not doing any of this work alone. Collaborating with our partners, from the Ellen MacArthur Foundation to Centre for Sustainable Fashion to our peer brands through Textiles 2030, is key to bringing circular design to life. That spirit of collaboration will continue to prove vital for the entire industry as we head on this journey together.



Simon Platts

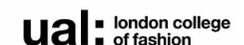
Responsible Sourcing Director, ASOS

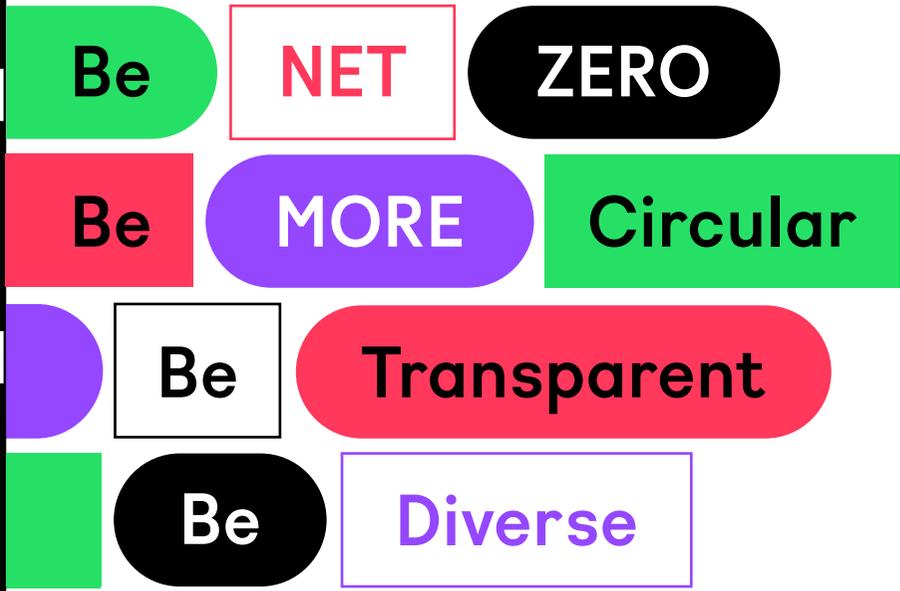
Centre for Sustainable Fashion

Centre for Sustainable Fashion is a research centre based at London College of Fashion, University of the Arts London, that:

- Provokes, challenges and questions the fashion status quo in order to create internationally acclaimed research in the sustainability space.
- Helps government, businesses and public arenas to set their sustainability agendas.
- Pioneers world-relevant curricula to help the industry players to put sustainability into action.

Learn more about the Centre's work by visiting www.sustainable-fashion.com





Contents

01 **1. Circular Design at ASOS**

04 **2. Intro to the Circular Economy**

11 **3. The Circular Strategies**

14 **3.1 Innovative Materials**

20 **3.2 Recycled Materials**

26 **3.3 Minimised Waste**

31 **3.4 Zero Waste**

45 **3.5 Remanufacture/Upcycling**

51 **3.6 Durability**

58 **3.7 Versatility**

63 **3.8 Mono-materiality**

69 **3.9 Disassembly**

74 **4. Sourcing Materials for Circular Design**

92 **5.1 Waste & Textile Recycling**

98 **5.2 Textile Recycling Technologies**

105 **i. Final Thoughts**

1

Circular Design at ASOS

Circular Design at ASOS

ASOS started its circular design journey in 2018, when it first partnered with Centre for Sustainable Fashion (CSF) to create and launch a pilot educational programme for ASOS designers on circular design. As part of that initial pilot, 15 members of ASOS' design team progressed through a series of half-day workshops, discussions and drop-in sessions to explore concepts, case studies, and practical applications of circular design with researchers and designers from the CSF team.

The results of that pilot were used to refine and improve the educational programme, which was then rolled out across all of ASOS' design team. At the same time, work began on the development of ASOS' first circular design range. This capsule collection was designed to showcase circular design and demonstrate how ASOS could create circular products that were commercial and appealed to its customers.

The ASOS Design Circular Collection launched in September 2020, by which time 100% of ASOS designers had completed the circular design educational programme. The collection comprised 29 styles, with fashion-forward and trend-led pieces featuring oversized styling and 90s' prints, in everything from micro prints to original blue denim, and bumbags. The collection also included colour-drenched tailoring, oversized cardigans and tees, mix and match stripes, and square neck volume dresses, all in the season's key colours – brown, lilac and neutrals.

Each product included a QR code on its garment tag, which customers could scan to visit a dedicated circular design page on ASOS.com and learn more about the circular design strategies used to create the range.

The ASOS Circular Design Collection was a commercial success, selling 8,000 units in the first 6 weeks and resonating with ASOS customers: ASOS' social posts on the collection received 756,000 views and reached 3.3m customers. It was also a technical success, allowing ASOS to bring circular design to life in a real-world product collection and take several key lessons from that process.

Those lessons were folded into the wider programme of work developed by ASOS and CSF and subsequently rolled out to wider commercial teams within ASOS between June and August 2021. Alongside its education programme, ASOS also worked with CSF to design and launch a guidebook on circular design strategies, to be used by teams as an interactive reference tool to support product development. That guidebook was then adapted into this version for external audiences.

Continuing to expand education across the commercial team is a key step given the importance placed on the circular economy in ASOS' Fashion with Integrity 2030 programme (available to read at www.asosplc.com), launched in September 2021. *Be More Circular* is one of four key 2030 goals included in Fashion with Integrity and will be achieved by scaling ASOS' use of circular design strategies across its business.

ASOS' circular design journey continues as the business evolves its approach to take account of the latest thinking and best practice. Its designers are currently developing future circular design collections for release over the coming seasons, with more detail coming soon.



Fashion with Integrity: Be More Circular

1.

100% of own-brand products made from recycled or more sustainable materials by 2030, with pathways in place for prioritising high-impact materials, i.e. our existing commitment to sourcing 100% more sustainable cotton by 2025.

2.

By 2023, we'll publish a public-facing circularity strategy to allow us to embed circular design strategies by 2030.

3.

100% of own-brand packaging made from certified sustainable or recycled materials and be widely recyclable by 2025.

4.

Facilitate programmes for recycling and reuse in key markets by 2030.

Critical friends & partners



Read ASOS' full Fashion with Integrity - www.asosplc.com

2

Introduction to the Circular Economy

Introduction to the Circular Economy

“A circular economy is an alternative to a traditional linear economy - take, make, use, dispose - in which we eliminate waste and pollution, we keep products and materials in use and we regenerate our natural systems.”

- Ellen MacArthur Foundation

Against the backdrop of the climate emergency, it has never been more important for the fashion industry to think about the way we develop and make products, the impact this has on the planet, and how we can change for the better.

The circular economy is a key tool to bring about positive change. But to understand its importance in making fashion more sustainable, we must start with the relationship between fashion and the environment, and the issues that this relationship can create.

In this chapter we'll define sustainability and how it relates to the circular economy. We'll explore the three principles of the circular economy as defined by the Ellen MacArthur Foundation. And we'll explain how this translates into meaningful action for the fashion industry.



Defining Sustainability

“The only constant is change, but the direction of change depends on what we think is valuable.”

– Professor Dilys Williams, Centre for Sustainable Fashion

‘Sustainability’ has been used to talk about environmental awareness for over 30 years. It was defined by the UN in 1987 as “meeting the needs of the present without compromising the ability of future generations to meet their own needs.”¹ Put another way, sustainability ensures that two things, human rights and planetary boundaries, are respected.

Centre for Sustainable Fashion, which co-authors this guide, further defined the term “sustainable” in the context of fashion as “harnessing resources ethically and responsibly without destroying social and ecological balance.”² Sustainability is therefore a way of thinking about the resources (both human and environmental) that are needed to sustain the fashion industry; making sure those resources are sourced, managed and used ethically and responsibly; and being aware of the social and environmental impacts of using these resources.

For ASOS, sustainability isn’t just about avoiding or minimising negative impacts, although this is always a good place to start. Instead, it’s about moving from an extractive system that removes resources without putting them back, to a regenerative system where fashion actively repairs and help to restore our planet.



The Circular Economy and Sustainability

Sustainability brings together many diverse perspectives and approaches. Circularity is one of the approaches that can help us to make a sustainable future a reality. As the Ellen MacArthur Foundation states, “the circular economy is a systems solution framework that empowers people to address global challenges, including climate change, biodiversity loss, waste, and pollution. It is a bigger idea than addressing the symptoms of today’s wasteful and polluting economy. It represents an opportunity to fundamentally redesign our economic model to benefit society, businesses, and the environment.”

WHAT IS THE CIRCULAR ECONOMY AND WHY DO WE NEED IT?

The circular economy aims to ensure our industry doesn’t use more resources than the earth actually has. In other words, circular fashion must exist within planetary boundaries. Circularity doesn’t explicitly focus on human equality, though it does indirectly through phasing out hazardous chemicals and increasing transparency through 3rd party sustainability standards certifications. (ASOS also has a dedicated ethical trade programme, which you can find out more by visiting [asosplc.com](https://www.asosplc.com).)

The circular economy aims to close the loop on materials. In a circular economy, products and the materials they’re made from are kept in use and they never become waste. What we’d normally throw out gets turned into new products. This has important implications for the environment. Not only does this mean ‘doing less bad’ (less pollution, less landfill, less oil, less cotton growing, fewer chemicals) – it shifts our approach to ‘doing more good’ – helping to restore the environment through fashion. It also unlocks new creative potential, so we have the opportunity to explore new approaches to design and product development.

A circular economy is broken down into three main principles:³

1. ELIMINATE WASTE AND POLLUTION
2. CIRCULATE PRODUCTS AND MATERIALS
3. REGENERATE NATURE

In practice, this means eliminating any waste and pollution created by fashion products; keeping fashion pieces in active use for as long as possible; and helping to ensure fashion contributes to the restoration and regeneration of our planet and its ecosystems.

¹ United Nations Brundtland Commission (1987). <https://sustainabledevelopment.un.org/topics>
² Williams, D. and Stevenson, N. (2008). Volume 1.0 Centre for Sustainable Fashion: A Snapshot Analysis. Centre for Sustainable Fashion. UAL.

³ Ellen MacArthur Foundation, A New Textiles Economy: Redesigning fashion’s future (2017)

The Circular Economy Principles

ELIMINATE WASTE & POLLUTION

According to the Ellen MacArthur Foundation, roughly 35% of materials end up as waste during the design and manufacturing stage: before a garment or product reaches the consumer.¹

Waste can be created at almost every stage of the fashion supply chain, from producing fibres to dealing with damaged product at the end of its life. The manufacture of materials themselves can create pollution – for example, the fossil fuels used to make virgin polyester must first be extracted from the earth, generating greenhouse gases and contributing to climate change;² and 20% of industrial water pollution globally is attributable to the dyeing and treatment of textiles.³ It's also estimated that during production about 15% of every fashion garment ends up as offcut waste.⁴ Waste can also be created when clothes are disposed of – up to 87% is estimated to end up in landfill or incineration,⁵ in part due to a lack of textile collection and recycling infrastructure – which is why it's important for brands to support and help customers to donate or pass on clothing they no longer want or need.

The principle 'eliminate waste and pollution' aims to eradicate waste of any kind, including pollution and harmful chemicals. This can be done, for example, by addressing microfibre pollution, using only the materials needed, using only safe chemicals, and using manufacturing processes that reduce water, energy, land and/or chemical use. A key part of this principle is to ensure that all products are made with safe and recycled or renewable inputs, with non-renewable resources (like virgin polyester or conventional [non-sustainable] cotton) phased out.

¹ Ellen MacArthur Foundation (2013) Towards the Circular Vol. 1: Economic and business rationale for an accelerated transition. Ellen MacArthur Foundation
² Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Fossil fuels. Condé Nast.
³ Kant, R., Textile dyeing industry: An environmental hazard, Natural Science, Vol. 4, 1 (2012), p.23
⁴ Rissanen, T., & McQuillan, H. (2016). Zero Waste Design. New York: Routledge.
⁵ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.

CIRCULATE PRODUCTS AND MATERIALS

"Extending the life of clothes by just nine extra months of active use would reduce carbon, water and waste footprints by around 20-30%."⁶

As a society, we're consuming fashion at a faster rate than ever before. When fashion products are manufactured and discarded more quickly, it increases waste and increases demand for the resources needed to make new ones.

In the UK alone, WRAP estimates that £140 million worth of clothing goes to landfill each year.⁷ Less than half of all used clothes are collected for reuse or recycling when no longer in use, and only 1% of them are recycled into new clothes.⁸

The principle 'circulate products and materials' helps to preserve the value of materials, labour and resources by ensuring they are worn more often, are passed between wearers, and are re-made into new products at the end of their useful life.

The Ellen MacArthur Foundation calls this concept 'the power of the inner circle', with the **USE** loop making the most out of everything that goes into our clothes. The next loops are **SHARING** (like rental and swapping); **PROLONGING** (through repair and customisation); **REUSING** (through re-styling), **REMAKING** (creating new products out of existing materials), and **RECYCLING** (transforming discarded products into new materials).

Examples of these loops include extending the lifespan of products by using durable materials or providing clear labelling to show consumers how to care, clean, store and repair their much-loved item. Another approach is to add value to a product by introducing versatile designs, so more than one wearer can enjoy the piece or it can be worn in different ways. Another is to engage and inspire customers with new ways to wear and care for their items. In Chapter 3, we'll discuss the actions that you brands, retailers and designers can take to influence this change and ultimately help wearers to enjoy their clothes for longer.

⁶ WRAP (2016). Extending Clothing Life Protocol. WRAP.
⁷ WRAP (2012). Valuing our clothes: the evidence base. WRAP. Pg. 2.
⁸ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation. Pg. 20.

REGENERATE NATURE

A 2016 study estimated that approximately 60% of fashion's materials currently come from finite resources.⁹

Currently, fashion manufacturing tends to have a one-way, extractive relationship with nature, where resources are taken from our natural environment but can't be safely returned to it. In contrast, the principle 'regenerate nature' is about actively repairing our environment, changing this relationship to one that is restorative.

To achieve this, the industry must first work to decouple production from the one-way consumption of finite resources. It can do this by switching to renewable inputs (like cotton, wool and other plant- or animal-based materials) that are grown using regenerative agriculture and without the use of harmful pesticides; and by turning waste into new materials and closing the loop on fashion. These changes ensure that fashion can help to rebuild soil health, improve water quality, restore biodiversity and even mitigate the effects of climate change through capturing carbon.¹⁰

⁹ Bruce, N., Hartline, N., Karba, S., Ruff, B., Sonar, S., Holden, P. (2016) Microfiber pollution and the apparel industry. University of California Santa Barbara, Bren School of Environmental Science & Management, Final Report. Pg. 3.
¹⁰ Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Regenerative agriculture. Condé Nast.

THE BIOLOGICAL CYCLE

In the biological cycle, natural materials that are free of any toxic substances break down, returning safely to the soil through natural decomposers like enzymes, bacteria, fungi and worms.¹ Bio-based materials return to our ecosystem in the form of biological ingredients or 'nutrients'. It's important to note that different materials need different conditions to biodegrade (for example based on temperature, moisture, oxygen, and pH level). While a biodegradable fabric can decompose, it often needs a specific compost environment to do so, and industrial composting infrastructure hasn't reached the point where it's scalable, which poses a challenge for this type of material.²

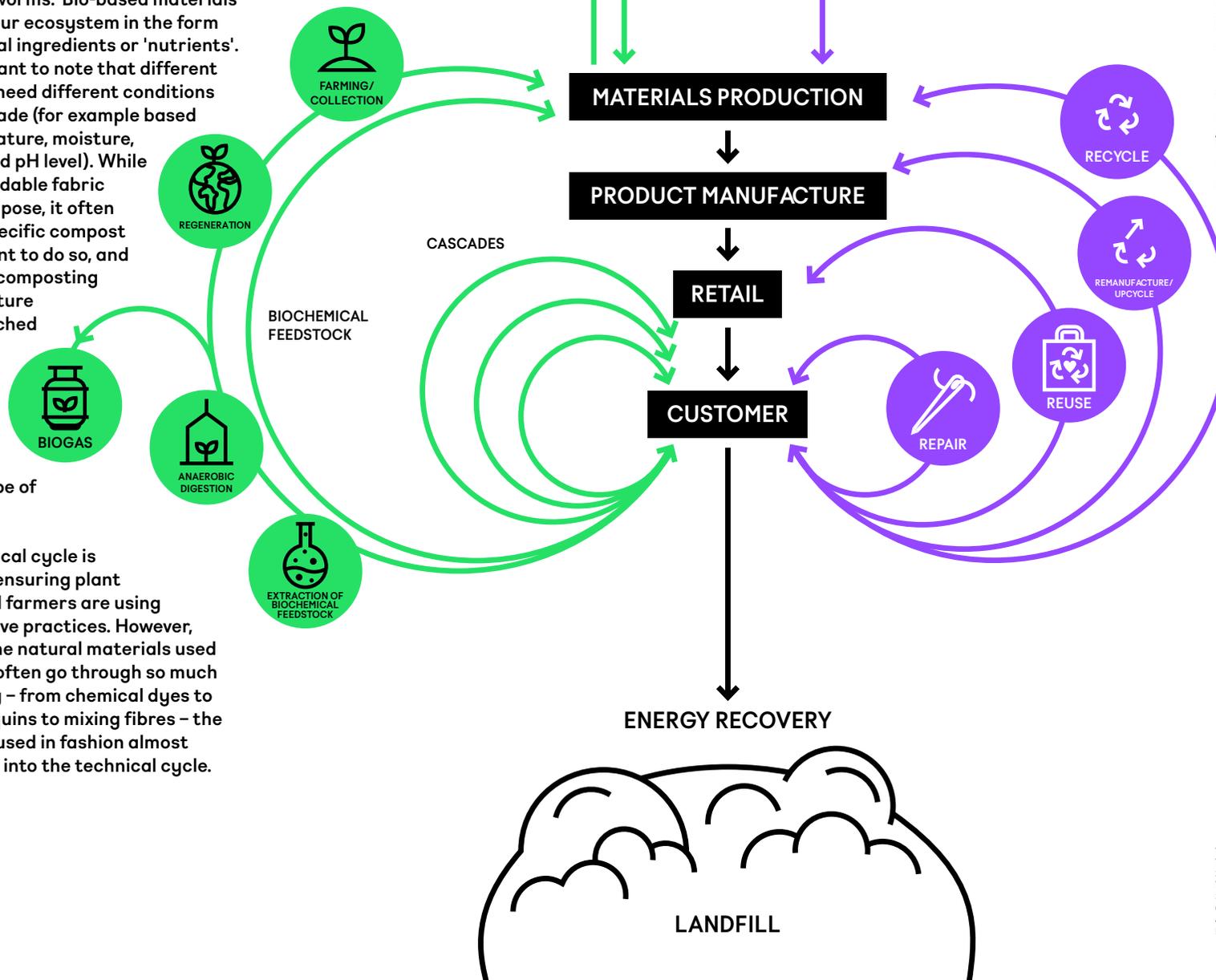
The biological cycle is useful for ensuring plant and animal farmers are using regenerative practices. However, because the natural materials used in fashion often go through so much processing – from chemical dyes to adding sequins to mixing fibres – the materials used in fashion almost always fall into the technical cycle.

RENEWABLES

FINITE MATERIALS

THE TECHNICAL CYCLE

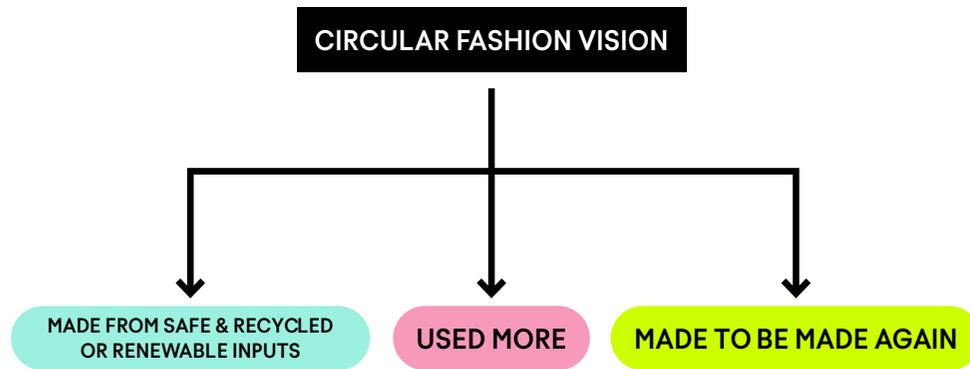
In the technical cycle, materials are recovered and made into products and new materials through four technical processes: repair, reusing (like rental or resale), remanufacturing (like upcycling), and recycling⁴ (see Chapter 5 for more info). This encourages new ways to use products, materials and other resources again and again. Much like the biological cycle, the technical cycle relies on fashion wearers to do their part, like putting items on resale platforms or dropping off old clothes at a textile recycling facility.



1 Blackburn, R. S. (2005). Biodegradable and sustainable fibres. Cambridge: Woodhead Publishing.
 2 Blackburn, R. S. (2005). Biodegradable and sustainable fibres. Cambridge: Woodhead Publishing.
 3 Drawing is based on Braungart & McDonough, Cradle to Cradle (C2C)
 4 Ellen MacArthur Foundation (2019). Circular Economy Systems Diagram. Ellen MacArthur Foundation.

What does this mean for fashion?

So, how do the three circular economy principles (eliminate waste and pollution, circulate products and materials, and regenerate nature) translate into priorities for the fashion industry? The Ellen MacArthur Foundation – the organisation behind the circular principles – has further developed them into a vision of a circular economy for fashion.



Products are:

MADE FROM SAFE AND RECYCLED OR RENEWABLE INPUTS

“In a circular economy, substances that are hazardous to health or the environment are designed out to allow safe material circulation and ensure that no pollutants are released into the environment.”¹

USED MORE

“In a circular economy, products and materials are kept in use at their highest value at all times. Reuse is the preferred option wherever relevant.”²

MADE TO BE MADE AGAIN

“From the outset, products are designed and manufactured so that they can be reused, remade, recycled, and - where relevant, and after maximum use and cycling - safely composted.”³

Interested in learning more? Check out their full vision at emf.thirdlight.com/link/nbwff6ugh01m-y15u3p/@/preview/1?o.

1 Ellen MacArthur Foundation (2020). Vision of a circular economy for fashion. Ellen MacArthur Foundation. Pg. 9.
2 Ellen MacArthur Foundation (2020). Vision of a circular economy for fashion. Ellen MacArthur Foundation. Pg. 6.
3 Ellen MacArthur Foundation (2020). Vision of a circular economy for fashion. Ellen MacArthur Foundation. Pg. 7

What does this mean for products?

Products that are circular by design have an incredibly important role to play in fulfilling this vision. The way we create and make products can help the fashion industry to achieve these pillars, by enabling products to travel through the loops of use, sharing, prolonging, reuse, remaking and recycling one after the other. Of course, it's not just the designers who are responsible for a circular product. Everyone in the development process has an important role to play, from raw materials farming, to textile development, to patternmaking, to manufacturing.

The overarching goals of circular design at ASOS are to keep a product in use for as long as possible, and then once it's no longer usable, to ensure its materials can be reused and made into new products. This means that products are designed in a way that will enable them to be worn and loved for many years; and/or enable their materials to be recycled, remanufactured or otherwise kept in the fashion economy.

We'll explore this in more detail in Chapter 3.



Circular Business Models

Circular products aren't the only way to bring circularity to life. A circular economy needs systems and infrastructures in place to ensure that products can fulfil their potential to eradicate waste, stay in use and close the loop. It also needs circular business models that move beyond making new clothes from virgin materials, in turn reducing the industry's reliance on extracting new natural resources to create revenue.

Circular business models provide several strategies to achieve this. For example, brands can offer services to help to extend the life of fashion products, to help ensure that they are used more and that they never become waste. Circular business models can include:

- Rental services
- Sharing or peer-to-peer rental services
- Repair or restoration services
- Resale or re-commerce businesses

Many of these models (particularly rental, repair and resale) enable products to stay at their highest value – the original product is maintained without major changes being needed. The environmental impacts of these services come from logistics (like shipping and cleaning), rather than the extraction or farming of new materials. For example, an ASOS programme launched with DPD in 2021, DPD ReLOVE, enables ASOS customers to donate their unwanted pieces to charity, ready for sale on the second-hand market. To minimise the impact of logistics, products can be donated at the point of delivery, saving additional trips.

Secondly, they can help to enable a closer connection to wearers. For example, many brands offer incentives such as gift vouchers for returning clothes and customised or co-designed products aim to develop an emotional connection between wearers and their products.

Thirdly, they provide opportunities for new production models. For example, North Face refurbish damaged and defective pieces. These models help to keep materials in use in the circular economy.

Finally, they're not only resourceful and enable us to circulate existing materials – they also offer opportunities for revenue through existing products. Many businesses are now looking to circular business models as a way to diversify their income or to generate charity funds.

 In order for a product to be fully circular, it must be linked to circular business models that ensure it will be used more and made again – so that it successfully passes through the loops of use, sharing, prolonging, reusing, remaking and recycling. A fully circular product must be integrated into a circular system, moving through circular business models to keep the product in use at its highest value. Otherwise, we are only focusing on the start of the product life cycle through circular design. This is a good first step, but it isn't the full solution.

The Circular Design Strategies

3

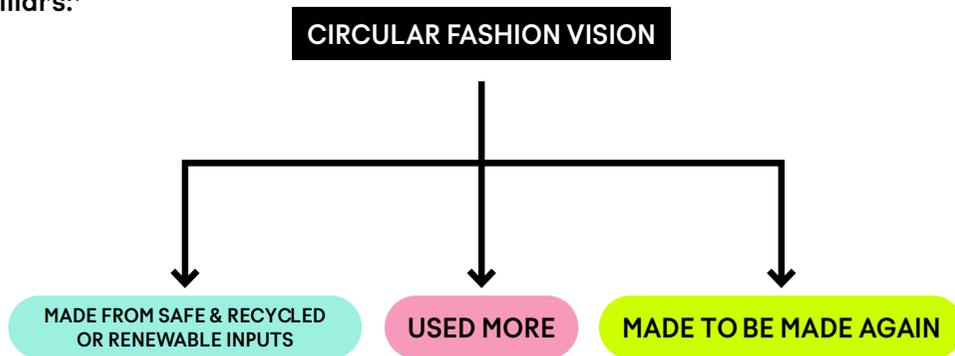
The Circular Design Strategies

INTRO TO THE CIRCULAR DESIGN STRATEGIES

This chapter aims to support designers, brands and creatives on their journeys to transform the way we as an industry create fashion. At ASOS, we want to share what we know and what we've learned so far, so we can help others on their journey to embrace circular design systems in fashion.

Context: the circular economy

The circular economy is a new way of thinking, designing, making and using. As we covered in Chapter 2, the circular fashion vision is based on three pillars:¹



Design sits at the heart of the circular economy. It enables the development and manufacture of products that fulfil the pillars of the circular fashion vision by creating products that easily move through the circular fashion industry.

There is currently no industry standard or certification for circular design, but our approach at ASOS is closely aligned with the Ellen MacArthur Foundation 'Vision of a circular economy for fashion' (2020)².

To do this at ASOS, we've developed a set of nine circular design strategies to guide us when creating circular products. These have been developed over a three-year process in collaboration with Centre for Sustainable Fashion (CSF), which co-authors this report.

This process commenced in 2018, when CSF developed a circular training curriculum in collaboration with ASOS. This included piloting studio-based workshops with ASOS designers, testing how the circular design strategies could be applied to our product categories and resulting in exploratory pieces including a zero-waste skirt and 100% recycled puffer.

In 2019, this training was rolled out to 100% of designers as part of our Global Fashion Agenda (GFA) circular commitment. In 2020, we launched our first circular collection, a 29-piece capsule of trend-led styles that put the strategies into practice. And in 2021, we updated our curriculum and design strategies based on our learnings from the collection and developed a circular design guidebook for internal use by our employees – which has now been adapted into this guidebook for our colleagues in the industry.

Our nine strategies are ASOS' interpretation of circular design, based on our real-world experiences of product development from the circular collection. Each one helps to build towards the circular economy vision and supports the transition from a linear to circular system.

The strategies give our teams guidance on how to design with both the circular economy and product lifecycle in mind, from designing to manufacturing to use to end of use. They support all three key phases of a product's lifecycle: from initial product development, to extending the active life of a product in use, and finally to ensuring the product is able to stay in the technical cycle (see Chapter 2) after it's recycled.

Crucially, this approach encourages our teams to embrace holistic design: thinking across the entire life of the product and its intended use when making design decisions, rather than focusing on relatively more simple switches like lower-impact fibres or processes. Within this design framework, designers are empowered to be flexible and use their own expertise to apply the strategies that best suit their products.



Circular design is an iterative process, and while we're pleased with our progress to date, we at ASOS have yet to reach our full ambitions in this space. We will continue to test and learn, so we can refine our design strategies as they evolve. And we need to move beyond design, too. We need to collaborate with the whole fashion supply chain, from mills and laundries to factories to recycling and garment collection facilities. We are also committed to collaborating with our industry peers through our memberships with the Ellen MacArthur Foundation, WRAP's Textiles 2030, the Textiles Exchange & Sustainable Apparel Coalition, as we progress in our Be More Circular goal as part of Fashion with Integrity. Read more about that at www.asosplc.com.

¹ Ellen MacArthur Foundation (2020). Vision of a circular economy for fashion. Ellen MacArthur Foundation.
² Ellen MacArthur Foundation (2020). Vision of a circular economy for fashion. Ellen MacArthur Foundation.

The Circular Design Strategies

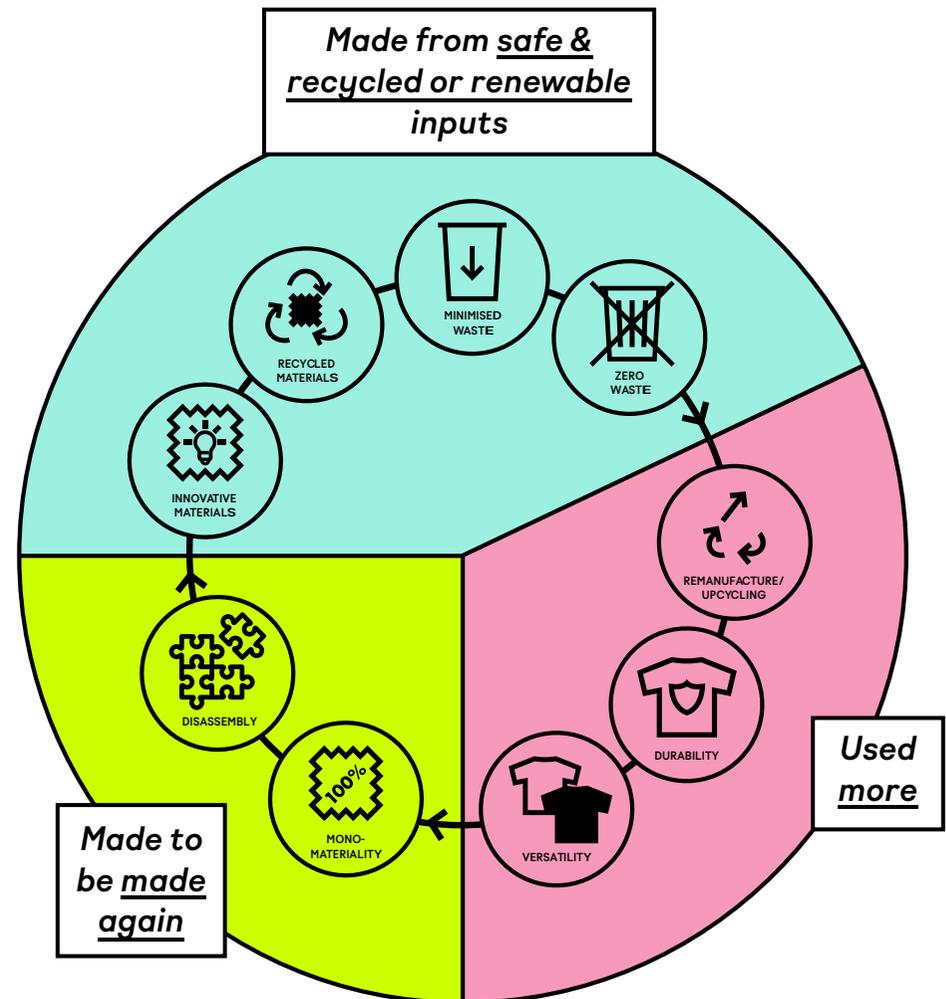
The nine circular design strategies are the way ASOS embeds the circular fashion vision into products. Each strategy fits into one of the three points of the circular fashion vision: Made from safe and recycled or renewable materials, Used more, Made to be made again.

Under our approach to circular design, a circular product must be made from safe and recycled or renewable materials, plus it must be designed to meet either the 'Used More' or 'Made to be Made Again' points, through appropriate circular design strategies.

This is because sometimes these points can conflict with each other – a super-durable product designed for durability or performance might not be able to be recycled; or a product designed for recyclability that can be easily disassembled ready for recycling might not be very durable.

Meeting both durability and recyclability at the same time would be the gold standard, but because of these trade-offs, we ask our designers to consider how the product will be used by the wearer and use this to determine which principle makes the most sense for that specific product. We call this holistic design: thinking about the full life cycle and intended use of a product during its design, to make sure we're making the right circular design decisions.

In the rest of this chapter, we'll share an overview of each of our nine circular design strategies. We'll introduce a series of questions that designers and brands can use to set their own standards and approach, and which have helped steer our own approach to circular design at ASOS. We're still developing our work in this space, so we'll be reviewing and revising our approach to align with best practice as circular design continues to evolve.



Innovative Materials

3.1

Innovative Materials

WHAT IS THE CIRCULAR DESIGN STRATEGY AND HOW DOES IT WORK?

This strategy goes beyond switching fibres for more sustainable input. Instead, it uses innovative approaches to produce recycled and renewable materials. Innovation can focus on many different points in the supply chain – for example growing renewable fibres using regenerative practices; processing with safe chemistry; textile production techniques; and recycling using new techniques or new material streams – which is why this strategy will continue to evolve.

Recycled fibres are also included in this strategy. This is because some of the technologies and materials are not as widely available as more traditional techniques like mechanical fibre recycling (see Chapter 5 for more info).

Incorporating innovative materials into designs might be more challenging in some cases, because not all innovations will be available at scale. Because of the emergent nature of the strategy, not all the options may have a certification. Designers will need to do some research to ensure that the materials they are interested in are sourced from a reputable brand or supplier with a verifiable circular production system, verifiable scientific evidence or an assessment.

Some materials designers might want to explore include:

MADE FROM WASTE

- Agraloop™ BioFibre™ by Circular Systems, made from food and medicine crop leftovers

PROMOTING NEW RECYCLING TECHNOLOGIES

- LENZING™ Refibra™ technology upcycles cotton scraps into a cotton pulp and transforms this into virgin quality Tencel™ Lyocell fibres to make fabrics and garments
- Infinited Fiber Company's Infinna™, a chemically regenerated textile fibre made from cellulose-rich waste including textiles and cardboard



Because this strategy focuses on innovation, it's a fast-moving area with a lot of changes and new launches happening regularly. Many innovative materials are not yet available at scale. As the circular economy becomes more of a priority for the fashion industry, innovative options should become more widely available. Until then, we're focusing on supporting materials that promote new recycling technologies, are made from waste, and are made using alternative recycled materials.

- Texloop™ RCOT™ by Circular Systems, high-quality recycled cotton made from pre-consumer textile waste

PROMOTING INNOVATIVE RECYCLED MATERIALS

- Parley for the Oceans is a global organisation collaborating with brands to tackle marine plastic waste through worldwide initiatives and projects. Some of the plastic debris collected by their global network is processed and upcycled to create Parley Ocean Plastic® – a range of premium fabrics, yarns and materials which have featured in products ranging from jackets by Helmut Lang and dresses by Iris Van Herpen to trainers with adidas and even credit cards from American Express.

- REPREVE® is transforming discarded bottles into new recycled fibres. The fibre process can embed properties like wicking, adaptive warming and cooling and water repellence to create a reliable and durable fabric quality. So far Unifi – which makes REPREVE® – has recycled over 25 billion plastic bottles into new fabrics.

- ECONYL® is regenerated nylon made from made from both pre- and post-consumer waste including textile scraps and fishing nets.

Regenerative fibres are another emerging area in this space. These are materials that are grown using regenerative agriculture farming practices and without the use of hazardous chemicals. While it's currently difficult to find material suppliers for these, the Ellen MacArthur Foundation has profiled a number of brands that are working with farmers to achieve regenerative outcomes. See page 64 of their 2021 paper, The Nature Imperative¹, for more information.

¹ Ellen MacArthur Foundation (2021). The Nature Imperative: How the circular economy tackles biodiversity loss.

Head to our materials glossary in Chapter 4 to understand more about the terms used in this strategy.

Innovative Materials - Designer Considerations:

Can you use a material that makes use of a new recycling technology?

Can you use a material that is made from recycled materials from another industry, plastic pollution, or a by-product from within the fashion industry? Is your material diverting waste that would otherwise go to landfill?

Is the material you want to use currently at scale across the fashion industry? Can you explore its use on a small scale or with a pilot project? Can you collaborate directly with the producer to support scaling the material?

Can you use a material that makes use of an innovative recycled input?

Where else on the supply chain could you look to use innovative processes? For example, at a sourcing level, could you use regenerative agriculture practices?

Examples

See the following for claims by other brands in relation to innovative materials:



ECONYL®
REGENERATIVE NYLON

ECONYL® is a textile yarn produced by Aquafil and made from both pre- and post-consumer waste including textile scraps and fishing nets. Thanks to the innovative technology employed for its manufacturing, it can be recycled to original quality standards.¹ ECONYL® nylon is widely used across the fashion industry.

Our ASOS DESIGN range features swimwear with 78% premium ECONYL® recycled nylon content, using materials that would otherwise be wasted – plus it saves on natural resources too. And it looks great, so winning all around.

CIRCULAR DESIGN STRATEGIES:

INNOVATIVE MATERIALS

1 EcoNyl (n.d.). The Process.



INFINNA™

Infinna™ is a biodegradable textile fibre that can be made from a range of cellulose-rich waste streams such as discarded textiles, cardboard and even rice straw. Infinited Fiber Company uses chemical recycling methods (see Chapter 5 for more details) to create Infinna™, a material with a look and feel that's similar to cotton – providing a great circular alternative to conventional options that can be used for everything from denim to jerseywear. Already endorsed by H&M Group, Patagonia and Wrangler,² the fibre also boasts natural anti-microbial properties and a better dye uptake than cotton or viscose.

CIRCULAR DESIGN STRATEGIES:

INNOVATIVE MATERIALS

2. Infinited Fiber (2020). Top Global Fashion Brands Say "Yes!" to Infinited Fiber Company's Textile Recycling Technology.

Examples

See the following for claims by other brands in relation to innovative materials:



Texloop is a recycling platform that implements “Lightest Touch” processing to preserve fibre quality for the next generation of recycled materials. Their flagship product, RCOT Primo recycled cotton, is high-quality recycled cotton that is Global Recycling Standard certified with up to 50% recycled cotton composition and blended with GOTS-certified³ organic cotton fibre, Better Cotton Initiative cotton, TENCEL™ Lyocell, and other Canopy-approved safe man-made cellulosics.

Texloop RCOT Primo has been used by H&M, Converse, Arket, Girlfriend Collective, and Madewell.

CIRCULAR DESIGN STRATEGIES:

INNOVATIVE MATERIALS
MINIMISED WASTE

³ Global Organic Textiles Standard

TEXLOOP RCOT BY CIRCULAR SYSTEMS



Promoting eco-innovative upcycled materials.

Parley for the Oceans is a global organization collaborating with brands to tackle marine plastic waste through worldwide initiatives and projects. Some of the plastic debris collected by their global network is processed and upcycled to create Parley Ocean Plastic® – a range of premium fabrics, yarns and materials which have featured in products ranging from jackets by Helmut Lang and dresses by Iris Van Herpen to trainers with adidas and even credit cards from American Express.

CIRCULAR DESIGN STRATEGIES:

INNOVATIVE MATERIALS
MINIMISED WASTE

PARLEY

Examples

See the following for claims by other brands in relation to innovative materials:



In 2017 TENCEL™ Lyocell fiber with REFIBRA™ technology was the first cellulose fibre featuring recycled material on a commercial scale. The fibre is produced in the closed loop lyocell production process and contains up to 30% of upcycled cotton waste.

A special manufacturing process enables fibre identification in the final product, even after long textile processing and conversion steps. In September 2021 certified carbon neutral TENCEL™x REFIBRA™ fibres were launched into the market showcasing the commitment to build a truly sustainable textile industry, not only through the reduction of carbon footprint, but also via increased circularity through the REFIBRA™ technology.

CIRCULAR DESIGN STRATEGIES:

INNOVATIVE MATERIALS

3.2

Recycled Materials

Recycled Materials

WHAT IS THE CIRCULAR DESIGN STRATEGY AND HOW DOES IT WORK?

This circular design strategy is comparatively simple: using recycled materials instead of virgin options. This has a dual benefit: it gives material waste a new life, while helping to reduce environmental impacts compared to landfilling and incineration of old materials that could otherwise be recycled.¹

Using recycled materials also increases demand for these options, such as our recycled outdoor styles which are popular with our ASOS customers. Increasing demand is important, as currently there's insufficient supply of recycled materials in the market, which can make this strategy a challenge.

As more customers purchase products made with recycled fibres, and more brands and manufacturers demand products made with recycled materials from suppliers, supply should grow to match demand – helping us all move in the same direction.

There are two terms you'll hear when you're buying recycled products:

POST-CONSUMER WASTE: waste generated after a product has reached its user.² This includes waste from households, businesses or commercial facilities, e.g. discarded plastic bottles or discarded clothes.³

PRE-CONSUMER WASTE: waste generated before a product reaches the user, usually from manufacturing or processing, e.g. fabric offcuts from the factory floor.⁴

The best way for a designer or a brand to start working with recycled materials is by incorporating them into designs. Generally, the following fibres are more commonly available as recycled materials, although this will depend on location and source.

- Recycled cotton
- Recycled polyester
- Recycled polyamide (nylon)
- Recycled cellulose-based fabrics (e.g. viscose, lyocell)
- Recycled leather
- Recycled wool

Some recycling techniques, for example mechanical fibre recycling (see Chapter 5 for more details), can weaken the fibre. This can make using 100% recycled content a challenge, depending on the kind of fibre, material and product, so lower percentages may be required depending on end-use.



i *Recycled materials and recyclable materials are different. The former is what this strategy is all about. We'll cover the latter in the Mono-materiality and Disassembly strategies, and in more detail in Chapter 5.*

¹ G. Sandin, G.M. Peters. Environmental impact of textile reuse and recycling – A review. J. Clean. Prod., 184 (2018), pp. 353-365, 10.1016/j.jclepro.2018.02.266

² Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Post-consumer waste. Condé Nast.

³ ISO 14021:2016. Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling). <https://www.iso.org/obp/ui/#iso:std:iso:14021:ed-2:v1:en>

⁴ Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Pre-consumer waste. Condé Nast.

Recycled Materials - Designer Considerations:

Is the material from pre- or post-consumer waste sources? Generally within circular design, post-consumer textile waste should be preferred as this helps close the consumer loop and pre-consumer waste should be minimised. However, pre-consumer waste can have a role in enhancing the strength of a recycled fibre blend. Decisions should therefore be made based on the intended use of a garment.

Can you switch to trims made from recycled materials?

Do you know which recycling process has been used to create the recycled fabric?

Can you switch any of your virgin materials for recycled fibres? What recycled alternatives are available to you?

What percentage of recycled content can you use? How will it affect the quality and lifespan of your finished product?

Is there an assurance that no hazardous chemicals have been used in the recycling process? Do your material producers have a facility water programme in place to manage effluent and reduce water use, or a programme in place to embrace circular systems or achieve ZDHC ambitions?

Is the material certified by an industry-accepted sustainability standard?¹

How will using recycled materials impact the value of your product (in environmental, financial or even cultural terms)? Will it make your product more appealing to the end users and so help in extending the life of that product?

Can your material choice be recycled again? (See the Mono-materiality strategy for more guidance on this point).

¹As a starting point, check out ASOS' list of certification partners.

Examples

See the following for claims by other brands in relation to recycled materials:



ASOS DESIGN - UNISEX SUIT

From our 2020 ASOS Design Circular collection. Not only are the suit blazer and trousers unisex for versatile use, all components are made from recycled materials – including the shell and lining fabrics which were both 100% recycled polyester, and the interlining, threads, shoulder pads, sleeve head roll and buttons, which all contained partially recycled content. The suit has also been made with minimised construction techniques, by reducing the amount of material inside the jacket to make recycling easier and less complicated. The internal components are each made from a single fibre and tacked together rather than fused, so they can be easily taken apart to enable recycling.

CIRCULAR DESIGN STRATEGIES:

RECYCLED MATERIALS
MINIMISED WASTE
VERSATILITY
DISASSEMBLY



H&M JEANS REDESIGN

A denim menswear collection based on the Ellen MacArthur Foundation Jeans Redesign guidelines, which specify minimum requirements for jeans across the three circular foundations (made from safe and recycled or renewable inputs; used more; made to be made again).

The capsule – including jeans, jackets, an overshirt, bucket hat and tote – is made from a mix of organic cotton and up to 35% post-consumer recycled cotton, plus minimised waste processes to reduce water and energy consumption. The H&M designers switched from polyester to Lenzing TENCEL™ Lyocell threads, increasing the percentage of cellulose in the finished product and ensuring the recyclability of the pieces in line with the Jeans Redesign guidelines.

CIRCULAR DESIGN STRATEGIES:

RECYCLED MATERIALS
MINIMISED WASTE
DURABILITY
MONO-MATERIALITY

Examples

See the following for claims by other brands in relation to recycled materials:



TOMMY HILFIGER RECYCLED DENIM

Recycled cotton content in recycled denim is often limited to smaller percentages, as the cotton can be damaged during the recycling process and needs to be blended with virgin fibres. Tommy Hilfiger has overcome this challenge with a new mechanical recycling technique developed by the PVH Innovation Centre, which has enabled them to create 100% recycled denim. The collection also features recycled threads, more sustainable trims, and lower-impact finishing techniques.

CIRCULAR DESIGN STRATEGIES:

RECYCLED MATERIALS
MONO-MATERIALITY



MARKS & SPENCER RECYCLED SWIMWEAR

With its 137-year history, British retailer Marks & Spencer is renowned for its sustainability credentials. In 2019 the brand released a kids' swimwear range using fabric made from recycled PET, helping reduce the millions of tons of plastic waste generated each year. The chlorine-resistant swimwear collection was not only kind to the environment, items in the range also provided 50+ UPF (ultraviolet protection factor) validated by the British Skin Foundation.

CIRCULAR DESIGN STRATEGIES:

RECYCLED MATERIALS
DURABILITY

Examples

See the following for claims by other brands in relation to recycled materials:



Nike Air is one of Nike's boldest and long-standing embodiments of sustainable innovation. Visible Air cushioning has evolved radically in the past three decades since the Air Max 1. All Nike Air soles designed since 2008 contain at least 50% recycled materials and are made with 100% renewable energy since 2019. Over 95% of the waste material from manufacturing is diverted from landfills. And 99% of recoverable water used in their innovative dyeing process is recycled.

CIRCULAR DESIGN STRATEGIES:

RECYCLED MATERIALS

3.3

Minimised Waste

Minimised Waste

WHAT IS THE CIRCULAR DESIGN STRATEGY AND HOW DOES IT WORK?

This strategy focuses on reducing the resources needed to make products. It addresses waste by aiming to increase efficiency in material use and in processes, and by ensuring that only the necessary volume of fabrics, trims and components is used.

There are a range of techniques that can be applied under this strategy. Examples include manufacturing techniques that create pieces with the exact amount of yarn needed, such as fully-fashioned or whole knits; or laser denim distressing, that cuts out the need for water or chemicals. Other techniques address lay planning (how pattern pieces are placed on fabric for cutting), such as finding efficiencies in how individual garments are cut or by combining two styles onto one lay plan.

Minimised processes on the other hand (also known as lower-impact processes) reduce the natural resources (water, chemicals, energy, land etc.) needed and the pollution that can be created by washing, finishing or dyeing items. Combined with a commitment to the Zero Discharge of Hazardous Chemicals¹ Roadmap to Zero Programme, these processes will help reduce the pollution created by washing, finishing and dyeing.

To start working with minimised waste materials, designers should think about which fabrics, materials, trims or components are essential for a product, and which can be reduced or removed. There may also be techniques (such as fully-fashioned or seamless knitting) that are appropriate for the product being designed.

To start working with minimised waste processes, designers should review the processes that are currently used to create their items. Some processes might be able to be switched to lower-impact alternatives, like some of the options below – or even omitted altogether.



It's worth noting the difference between minimised waste and zero waste. The zero waste strategy focuses purely on pattern cutting that eliminates all fabric offcuts. The minimised waste strategy looks at ways to reduce the resources needed to create products (such as water, chemicals, energy or materials). We'll cover zero waste in the next section.



1 The ZDHC Foundation (ZDHC) is an initiative committed to eliminating the discharge of harmful chemicals in the apparel and footwear value chain. ASOS is a Contributor to the ZDHC Foundation and has committed to their Roadmap to Zero Programme. This programme includes the implementation of sustainable chemical management practices, driving innovations, and best practices in the apparel, footwear, and leather industries to protect consumers, workers, and the environment. ASOS has adopted the ZDHC Manufacturing Restricted Substances List (ZDHC MRSL) to keep the harmful chemicals identified on this list out of its value chain.

Minimised Waste - Designer Considerations:

Materials		Processes			Chemicals, Water, Energy and Emissions		
<p>How could you make your lay plan more efficient? Can you hit at least 90% efficiency to minimise waste?</p>	<p>Can you ensure that all the materials you use are kept at their highest value? For example, can you incorporate offcuts into the product, or create a new product, rather than discard them?</p>	<p>Could you achieve the same look using a low-impact process, such as laser distressing?</p>	<p>Can you switch for safer or lower-impact dyes, for example natural dyes?</p>	<p>Could you choose low-impact printing methods for any graphics, patterns or colours?</p>	<p>Does the manufacturer or fibre producer have a programme to decrease their greenhouse gas emissions, reducing energy and using renewable energy?</p>	<p>Do your material producers have a facility water programme in place to manage effluent and reduce water use, or a programme in place to embrace circular systems or achieve ZHDHC ambitions?</p>	<p>Can you ensure that all the chemicals used in your product meet non-toxic certifications such as those provided by OEKO-TEX®?</p>
<p>How can you ensure your product only uses the materials it really needs? Are techniques like fully-fashioned or whole knitting, seamless knits, moulded or 3D printed components feasible for your design?</p>		<p>Can you use new technologies such as 3D design to reduce waste from the product development process (for example eliminating the need for physical samples)?</p>	<p>Can you eliminate or minimise any unnecessary processes? What do you really need for your design, and what's expendable?</p>	<p>Can you choose low-waste embellishments or finishes? For example, The Sustainable Sequin Company sequins are made from 20% recycled PET, reducing the use of fossil fuels and finding a new way to use plastic waste.</p>	<p>Can you ensure that all the chemicals used in your product comply with the current version of the ZDHC MRSL?</p>	<p>Does the manufacturer or fibre producer work with the Higg Facility Environmental Module developed by the Sustainable Apparel Coalition (SAC), so that they can share their environmental data from past years?</p>	

Examples

See the following for claims by other brands in relation to minimised waste:



ASOS HEART & DAGGER
JERSEYWEAR CAPSULE

This Heart & Dagger capsule minimises waste by distributing offcuts across five different styles, sharing fabrics in a creative mix-and-match. Developed by Marty Thone in ASOS' design team, the capsule required extensive collaboration and engagement with suppliers and factories to ensure that the concept was fully understood by all involved.

Looking ahead, Marty is keen to expand the idea and lessons learned across more ranges, so he can make even more of an impact on waste.

CIRCULAR DESIGN STRATEGIES:

MINIMISED WASTE



NIKE FLYKNIT

Nike Flyknit is precision-engineered down to every stitch, offering lightweight, breathable support with an average of 60% less waste than traditional footwear manufacturing.

Usually, shoe uppers are made from multiple materials that are cut and sewn together, and leftover materials go to waste. Nike Flyknit technology knits strong yet lightweight strands of yarn into a nearly seamless upper that provides maximum athletic performance while reducing waste. All core Flyknit yarns are made from recycled polyester.

CIRCULAR DESIGN STRATEGIES:

**RECYCLED MATERIALS
MINIMISED WASTE**

Examples

See the following for claims by other brands in relation to minimised waste:



EVERLANE X SAITEX DENIM

Everlane is a direct-to-consumer, US-based brand whose USP is based around sustainability and transparency. To produce denim pieces, it teamed up with Saitex, a manufacturer recognised for efforts in addressing environmental impacts of this material. The traditional process of making jeans requires a vast amount of water, but Saitex developed a closed loop system able to recycle and purify 98% of all water used in its production. On top of that, the factory is powered by renewable energy sources.

CIRCULAR DESIGN STRATEGIES:

MINIMISED WASTE



MARKS & SPENCER DENIM

All M&S jeans are made using 100% responsibly sourced cotton. In 2021, M&S launched its most sustainable denim range yet, using 80% less water in the finishing process and replacing standard dyes with cleaner and more resource-efficient alternatives that are kinder to people and the planet. You can find out more about what M&S are doing to make jeans more sustainably for the future by visiting -

www.corporate.marksandspencer.com/sustainability/our-products/clothing-and-home/fibres-and-fabrics/denim.

CIRCULAR DESIGN STRATEGIES:

MINIMISED WASTE

Zero Waste

3.4

Zero Waste

WHAT IS THE CIRCULAR DESIGN STRATEGY AND HOW DOES IT WORK?

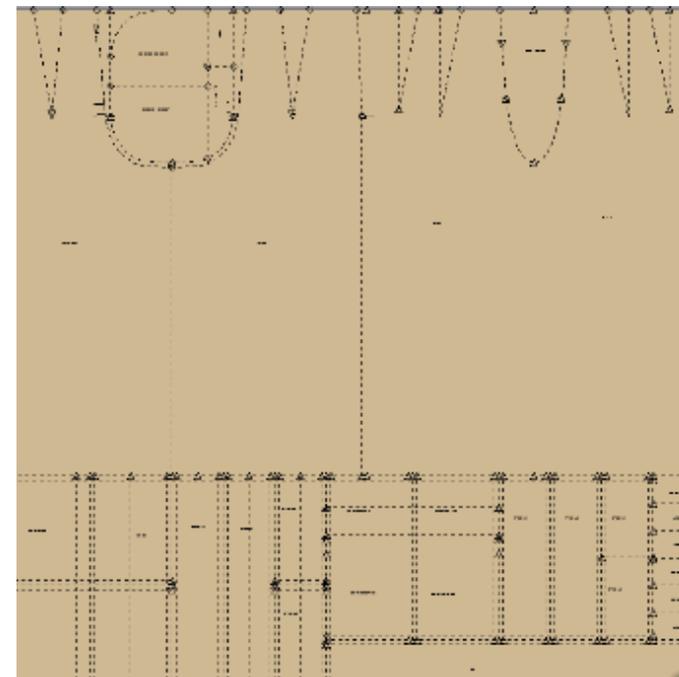
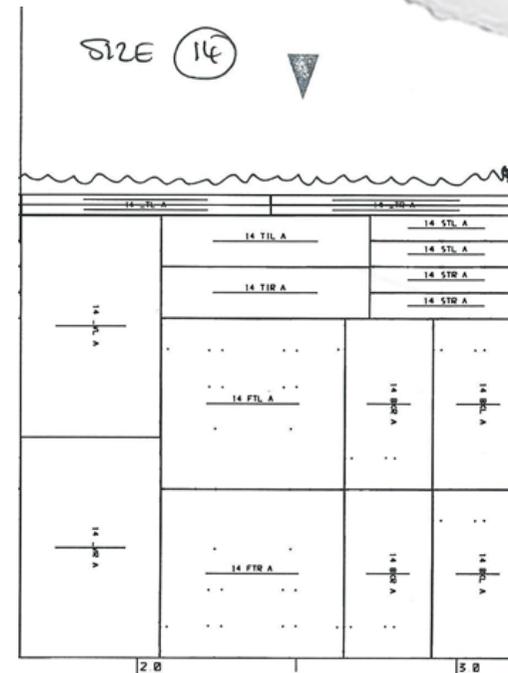
Right now, it's estimated that conventional production generates about 15% offcut waste for every single garment.¹ This is where zero waste comes in – it's a form of pattern development in which no fabric waste is created during cutting and sewing. All offcuts are incorporated into the final product.²

Top right: Square cut, bottom right: Tailored

Zero waste pattern cutting is a technical process that involves pattern development, fit, grading and size ratios. Zero waste patterns can be created most easily with square-cut pieces: the pattern is made up of rectangular or triangular pattern pieces. Some zero waste patterns use curved pieces instead to create a more form-fitting or tailored garment, with the pattern pieces nested into each other.

Zero waste design has been around for centuries³ (well-known examples include the traditional Japanese kimono) but it has not been widely explored by the mass market or large fashion brands.⁴ Many of the contemporary zero waste designers profiled in the seminal text *Zero Waste Fashion Design* (2016) are researchers, students, academics, and smaller brands, including Zandra Rhodes and Maja Stabel.⁵

The easiest way to start using zero waste is to select a product that's more adaptable to zero waste pattern cutting – for example, products with a boxy shape, products that use a lot of fullness, or products that are sewn together from fewer components and can be simplified into rectangular shapes more easily.



1 Rissanen, T., & McQuillan, H. (2016). *Zero Waste Fashion Design*. New York: Bloomsbury.

2 Ibid.

3 Ibid.

4 Ibid.

5 Ibid.

Zero Waste - Designer Considerations:

Designers may want to look at applying the following techniques:

Can you share fabrics across multiple garments, and/or distribute offcuts across a capsule of styles? This means that one style on its own won't be zero waste, but taken together, the full set will be.

Can you use fullness, gathers, pleats, darts or tucks to create shape, instead of panels or offcuts? This will reduce the need for multiple fabrics cuts for one garment.

Can you cut on crosswise grain to get pieces to fit together? How will this impact the garment fit?

Will adjusting seam or hem allowance help your zero waste pattern to work?

Are you manufacturing at scale? Can you order bulk fabrics only once the pattern and size ratio have been set? This ensures no fabric is wasted through over- or under-ordering.

Can you design for one-size-fits-most? This will help you to avoid grading issues. You can incorporate adjustable elements (like tie waists) to help create shape and adjust fit for different wearers.

Can you start the design process by considering the fabric first? Start with the width for a fabric you want to use, or look at similar fabrics with a different width if the pattern isn't working.

Are you manufacturing more than one size at a time? How will size ratios affect the lay plan? For example, a zero waste lay plan might require cutting a small and a large next to each other, and two mediums next to each other. You'd need to order a 1S:2M:1L ratio to ensure the lay plan works.

How many fabrics will be used in your design? Don't forget your linings and contrasting fabrics. For a truly zero waste pattern, all cut and sew components must be included.

Examples

See the following for claims by other brands in relation to zero waste:



ASOS DESIGN - SMOCK TOP & MAXI DRESS

A smock top and tiered maxi dress, both in 100% recyclable polyester and made from a base pattern of square pieces with gathers to create shape. The top is also a versatile piece – the ruching on the side can lengthen the piece to suit the wearer’s style.

CIRCULAR DESIGN STRATEGIES:

ZERO WASTE
VERSATILITY
MONO-MATERIALITY



ASOS DESIGN - ZERO WASTE SATIN MIDI SKIRT

The zero waste satin midi skirt is based on a full rectangle and uses panels, pleats and a tie-waist to create a flowing style. The project took a few months to develop in collaboration between our internal design teams and our supplier, with the pattern drafted in-house. Having clear intentions and understanding the end use of the product were key to the success of the project.

CIRCULAR DESIGN STRATEGIES:

ZERO WASTE

Examples

See the following for claims by other brands in relation to zero waste:



FARRAH FLOYD

Farrah Floyd is a ready-to-wear brand from Brussels, manufacturing and sourcing materials in Europe. Their pieces use zero waste pattern cutting matched with sustainably certified fabrics. A diverse range of garments is made by implementing creative draping and pleating techniques. These rectangle elements are fitted to fill all the width of the material in a way that doesn't leave any offcuts behind.

CIRCULAR DESIGN STRATEGIES:

ZERO WASTE

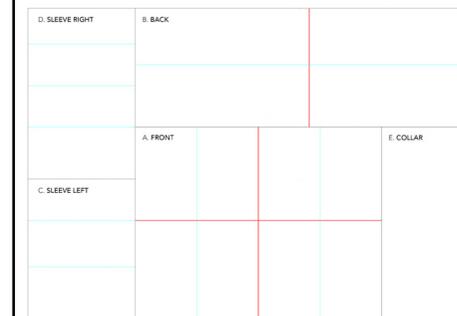
Photo credit | Mikomiko Studio



Jennifer Koh established her brand in 2017 after seeing the amount of silk waste created by the haute couture studio where she was interning at the time. After this experience, she decided to start her own label and develop her designs with zero waste pattern cutting in mind. The result is a collection of relaxed yet elegant silk eveningwear with sustainable process and manufacturing strategies at its core.

CIRCULAR DESIGN STRATEGIES:

ZERO WASTE



JENNIFER KOH

Examples

See the following for claims by other brands in relation to zero waste:



Holly McQuillan is a designer and educator specialised in researching and experimenting with the possibilities of the zero waste technique. She is co-author of 'Zero Waste Fashion Design' (2016) alongside designer, academic and pattern-cutting expert Timo Rissanen; and co-founder of Zero Waste Design Online. Holly McQuillan's early zero waste work developed zero waste methods to share with commercial designers and students to apply in their own context. Her more recent research explores the technical, systemic and aesthetic implications of making woven textiles and the 3D form simultaneously.

CIRCULAR DESIGN STRATEGIES:

ZERO WASTE

HOLLY McQUILLAN

The Zero Waste Pattern Cutting Guide

Creating and grading a pattern that will achieve 100% zero waste in the production lay plan is complex and requires adaptation of the design, fit and grading throughout the development process.

This guide has been put together to set out guidelines that support achieving a 100% zero waste garment from initial marker to production lay planning.

Each garment or product type will require unique adaptations.

Those adaptations will also impact other pattern pieces so this must be considered when making changes. The final fabric width may also change from the original pattern width, so this will need to be checked and the final pattern will need to be amended to ensure 100% fabric usage is achieved.



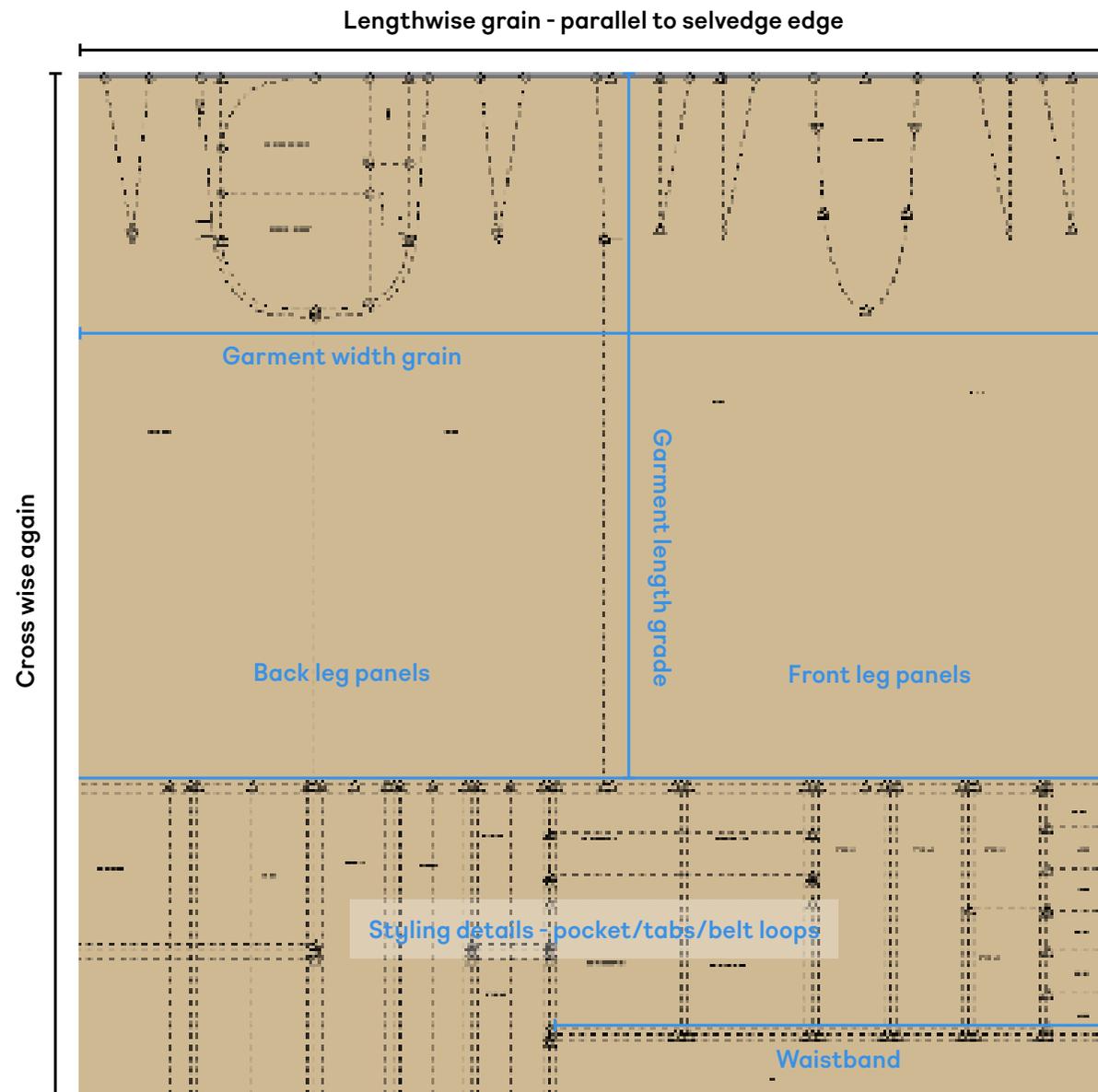
Initial Pattern Creation

The initial pattern creation and pattern piece placement is the key to achieving a zero waste pattern.

1. Ensure the full fabric width is used in the initial pattern marker.
2. Ensure the core size pattern marker creates a complete square or rectangle with no gaps.
3. Use square or rectangle pattern pieces, adding darts/gathers/pleats to achieve suppression/shaping. If creating a curve on a pattern piece utilise the curve to create another piece (i.e. back rise shaping can create pocket bag pieces, and front zip guard).

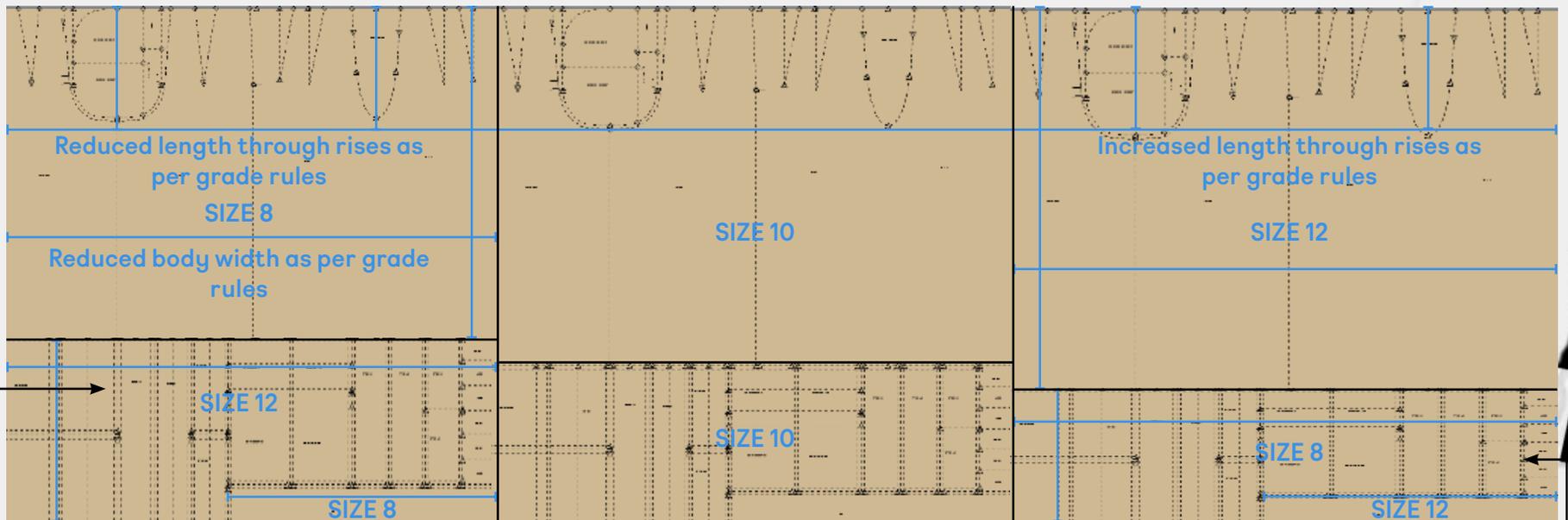
Ensure pattern pieces are placed with body width grades on the lengthwise fabric grain (i.e. waist/chest/hip), and length grades on the crosswise fabric grain (i.e. body length/sleeve length).





Grading - Example 1: WW Trouser

The body of the pattern should be graded first in the grid plan to achieve critical measurements. When grading zero waste you may need to flip the pattern grids for the design details, for example the size 8 grid will be filled using the size 8 body pattern pieces and the size 12 detail pattern pieces (pocket/trims). See example below of zero waste grading for a size 8,10,12 WW Trouser.



Reduced width x increase length on detail pieces - size 12 pattern pieces

Reduced width grade on w/band as per grade rules

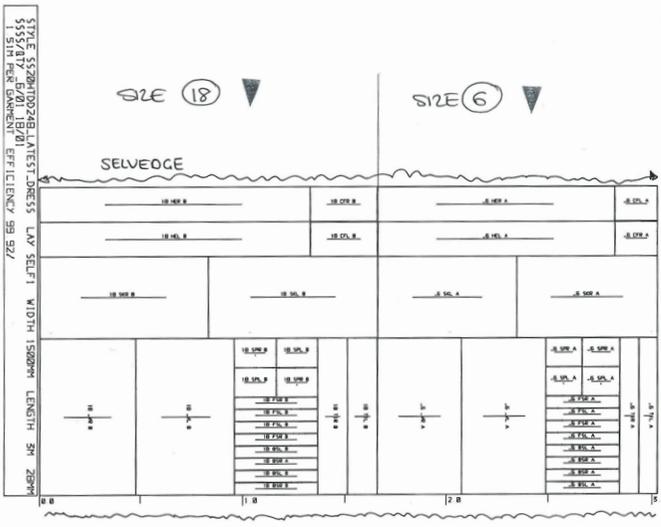
Increased width grade on w/band as per grade rules

Increased width x reduced length on detail pieces - size 8 pattern pieces



Grading - Example 3. WW Mini Dress

1. Body width grade again should always follow the lengthwise grain of the fabric and the length should follow the crosswise grain of the fabric.
2. If pattern pieces cannot be created with squares/rectangle pieces, the gaps in the pattern will need to be creatively utilised across the sizes. Sides gaps will also need to be filled with styling pieces (i.e. loops/tabs/pockets).



Remanufacture/ Upcycling

3.5

Remanufacture/Upcycling

WHAT IS THE CIRCULAR DESIGN STRATEGY AND HOW DOES IT WORK?

This strategy keeps materials in use by giving them a new lease of life as a new product. Remanufacture or upcycling (also known as 'repurpose') makes use of pre-consumer materials like offcuts, or post-consumer waste like second-hand garments or vintage fabrics. This design strategy aims to prevent textile waste from ending up in landfill, and helps to reduce the need for new fabrics.

This isn't a one-size-fits-all strategy. Designers will need an open mind and a creative approach to looking at waste materials, creating tomorrow's looks with yesterday's fabrics. Upcycled materials can be built into the design in a visible way (as a design feature) or in an invisible manner without any impact on the external look of the garment (for example hidden internal sections like pockets).¹ Transforming low-value waste into a desirable product is a truly creative circular challenge.



¹ Reverse Resources (2017). The Undiscovered Business Potential of Production Leftovers within Global Fashion Supply Chains: Creating a Digitally Enhanced Circular Economy. Reverse Resources.

Remanufacture/Upcycling - Designer Considerations:

How can you bring the story of creating new from old to life for the end user? How can you design the piece so its different lifecycles are highlighted, so its long-term value is understood by each of its wearers? Can you learn anything from the storytelling that already exists around vintage fashion?

Are you able to give new life to offcuts or supply chain waste? Can you use these materials in visible or invisible ways?

How could you deconstruct and reconstruct the garment? Can you splice existing pieces together?

How could you design the product to be used more through upcycling in the future?

Could you use an existing waste material from a different industry? Could you use upholstery or industrial textiles? What about unconventional materials like seatbelts?

Creating an emotional connection between a wearer and a garment is an important way of making sure that an item is treasured for a long time. Can you involve the wearer in the remanufacturing or upcycling process in any way, for example through personalisation?

Can you use techniques like cut and sew to patchwork the materials together into a new shape?

Could you use existing materials over choosing new materials? What liability, deadstock, second-hand or other discarded fabrics could you use?

How could you upcycle a garment to have a unique style? What can you do to make it one of a kind?

Can you restyle or refinish an existing product to extend its life cycle? Could you use overdyes, embellishments or prints to change the look of an existing garment?

Examples

See the following for claims by other brands in relation to remanufacture/upcycling:



ASOS DESIGN - UNISEX STRIPE SHIRT

Part of our 2020 circular collection, this versatile, unisex piece is made from two leftover striped fabrics sourced from our supply chain and upcycled into a new design. Not only did the product make use of existing materials, both fabrics are 100% more sustainable cotton,¹ ensuring the shirt is a recyclable mono-material. This product hits all three of the circular foundations: it's upcycled (made from safe and recycled or renewable inputs); unisex for versatile use (made to be used more); and recyclable (made to be made again).

CIRCULAR DESIGN STRATEGIES:

- REMANUFACTURE/UPCYCLING
- VERSATILITY
- MONO-MATERIALITY

¹ Defined by ASOS as containing organic or recycled cotton, cotton sourced through the Better Cotton Initiative, or a blend of these.



ASOS REPURPOSED RANGE

All the products in our recent Repurposed range are upcycled from materials that would otherwise be wasted, making sure it's still put to good use. It's not a perfect solution to address the waste created by fashion – including by us – but it's one way we can help reuse and upcycle fabrics so they can go on to be loved again.

CIRCULAR DESIGN STRATEGIES:

- REMANUFACTURE/UPCYCLING

Examples

See the following for claims by other brands in relation to remanufacture/upcycling:



ARKET UPCYCLED DOWN™ COLLECTION

The first ARKET Upcycled Down™ collection was introduced in 2018: a line of jackets, coats and accessories suited for the coldest days of autumn and winter. Since then, the collection has been renewed each season, updating styles, fits and other preferences after feedback from the ARKET community. The programme offers products made from pre-used material, using recycled down from supplier Re:Down, based in Hungary and France. The pre-used down and feathers are collected from discarded clothing, sleeping bags and bedding products, then washed and sterilised at high temperature in thermal water without the use of chemicals.

CIRCULAR DESIGN STRATEGIES:

REMANUFACTURE/UPCYCLING



ELVIS & KRESSE

UK-based Elvis & Kresse make accessories from an unusual source of industrial waste: London's damaged decommissioned fire-hose. In 2005 Elvis & Kresse began to rescue these hoses, transforming them into luxury accessories and donating 50% of the profits to the Fire Fighters Charity. Over the last 16 years the team has expanded their mission and now rescues and transforms more than 15 different materials that would otherwise languish in landfill.

CIRCULAR DESIGN STRATEGIES:

REMANUFACTURE/UPCYCLING

Examples

See the following for claims by other brands in relation to remanufacture/upcycling:



Eileen Fisher, founded in 1984, is a true pioneer of reselling at scale. Her Renew take back programme covers the end-to-end process from sorting to cleaning and redesigning. The company collects its own used garments and brings them back to life by cleaning and reselling or, if no longer possible, remanufacturing them into entirely new designs.

CIRCULAR DESIGN STRATEGIES:

REMANUFACTURE/UPCYCLING

3.6

Durability

Durability

WHAT IS THE CIRCULAR DESIGN STRATEGY AND HOW DOES IT WORK?

This strategy ensures products can be 'used more' by creating pieces that are designed to last for a long time. Enhancing the longevity of fashion is an amazing opportunity to strengthen our connection to our clothing. Durability relates to physical and practical attributes, but also to emotional ones – how a product is cherished and loved.

In terms of physical durability, this means the product is easy to care for, physically well-made and protected against colour changes.¹ Emotional durability focuses on long-term relationships between wearer and garment, enhanced through its design but also how the wearer interacts with it.² Both contribute to a fashion industry where products have an on-going, lasting value for the wearer(s).

To design for durability, select materials, finishes and construction methods that will allow the product to endure wear and care over a long period of time. Tenacity and elongation of yarns also play an important role in the durability of the fabric, enhancing longevity.



Durability - Designer Considerations:

Fabric and yarn choice

Construction and manufacturing techniques

Care and repair

Are you able to test samples before you select your fabric or yarn? How do they respond to rubbing, washing, pulling or snagging?

Could you choose yarns with strong tenacity and elongation? For example, longer staples will increase durability.

Could you choose fabrics with high tensile and tear strength?

Can you select stronger weaves, such as ripstop or twill weaves?

Can you identify which area of the garment is most likely to need reinforcement through a durable construction method? What wears out more quickly?

How can you reinforce these areas and stress points?

Can you go beyond existing care labels to better encourage customers to sort their washing, launder at lower temperatures (30°C or below), and avoid tumble-drying to help prolong the product's lifetime? Think about printing on products, QR codes, or including these messages in your marketing.

How can you support your customers in learning how to fix and repair clothes?¹

How can you communicate wear and care messaging to the wearer as part of the product story?

¹ For inspiration, check out ASOS' aftercare hacks blog at www.asos.com/responsible-fashion/planet/7-hacks-to-make-your-clothes-last/

Could you choose fabrics with a resistance to pilling?

Can you choose fabrics or yarns with high colourfastness?

If you're using synthetics, can you use more durable choices such as polyester or nylon? What sort of trade-offs will you need to consider between material choice, recyclability, recycled inputs or durability? How does the product's end-use inform your choices?

Can the use of linings, facings, gussets, yokes, taping or fusing help to strengthen the product?

Can you use stronger seam or construction types such as lapped, welt, bound or overlapped seams, cementing, bonding or gluing?

Can you provide or recommend repair services?

Are there finishes you could use which make caring for the garment easier?

Can the customer easily repair the garment themselves? How can you encourage them to do this?

Can you use stronger knit structures, such as cable or linen stitching?

If you're using natural fibres, can you use more durable choices such as cotton, wool or hemp?

If you're dyeing the material, how can you ensure the dye you select is colourfast?

Can you switch techniques that damage the fabric, like stone washing, for cosmetic alternatives (e.g. laser distressing)?

Can you use durable trims that won't break before the fabric wears out?

Can you provide or recommend repair services?

Can you provide spare buttons, threads or other trims so the user can fix the product themselves?

Can you advise customers to wash their products (especially outerwear and clothing that doesn't sit next to the body) less often?

Durability - Designer Considerations:

Functionality and performance

Meeting technical standards

Emotional longevity and user relationships³

Is your product performance focused (e.g. activewear)? Does it need a blended fibre to perform a function? Don't forget that blended materials are difficult to recycle with current technology, so make sure the benefits of the material (i.e. enhanced performance or durability) outweigh the drawbacks.

Products that meet the Ellen MacArthur Foundation's Jeans Redesign guidelines must withstand a minimum of 30 home laundries,¹ while WRAP's Clothing Longevity Protocol sets out different standards for different product categories (from 30 washes for knitwear and 62 for socks).²

How can your product meet this standard? Can you test for tensile strength, tear strength, dimensional stability, abrasion resistance, seam strength and colourfastness after these washes?

Could the product withstand the wear and tear needed to move through multiple users in a circular business model?

How can you co-create with the end user? How can they be involved in the design process or collaborate on the final piece to ensure it remains a valued and treasured item?

How can you encourage sharing the garment within the user's social circle?

How could you design a product to create an emotional connection to encourage the user to keep it for longer?

Can your user personalise their piece? Could they choose from different customisations to help them form a stronger emotional connection?

Could you incorporate design for versatility (see the next strategy) so that pieces can be easily switched or replaced depending on the needs of the user?

Are there finishes you can use that increase comfort?

What testing can you use to quantify the changes you've made to increase durability?

How could the materials and washes age gracefully over time? How can you communicate this wear process as a benefit to the user?

Examples

See the following for claims by other brands in relation to durability:



These circular denim jeans were designed to reduce the number of seams and pattern pieces, minimising cutting waste from the beginning. A key feature of the jeans is increased durability at the seams – instead of using traditional cut and sew techniques, the unique pattern created folds that were stitched down to look like seams, providing extra reinforcement. The pocket bags of the jeans include care advice for the customer and top tips on how to make their jeans last longer.

CIRCULAR DESIGN STRATEGIES:

- RECYCLED MATERIALS
- MINIMISED WASTE
- REMANUFACTURE/UPCYCLING
- DURABILITY
- MONO-MATERIALITY
- DISASSEMBLY



ASOS identified an opportunity to increase the product durability of blind felled hems on tailored trousers, i.e. falling after washing or wearing. We worked with WRAP to trial a bonding seal on both menswear and womenswear tailored trousers.

The thread manufacturer Coats was identified as a partner to work with on this pilot, as they produce a fusible low-melt thread that creates a reliable, secure hem called 'Hemseal'.

Lightweight garments performed better with the Coats Hemseal bonded hems, as the standard construction does not have a fell stitch to provide additional strength to the hem. It's important to use the correct amount of Coats Hemseal thread, and to bond it at the correct temperature, to ensure that the application does not feel scratchy or heavy.

CIRCULAR DESIGN STRATEGIES:

- DURABILITY

Examples

See the following for claims by other brands in relation to durability:



In collaboration with Fashion for Good and circular.fashion, Zalando has developed 'redeZIGN for Circularity', a capsule collection focusing on circular design. Each product features a unique circularity ID code woven into the label, which takes customers to a webpage with care instructions specific to their piece – helping to extend the life of the piece and minimise the environmental impact through its use. The page also details each product's materials, production facility, any certifications, and integrates a take-back scheme to resell second-hand products.

CIRCULAR DESIGN STRATEGIES:

DURABILITY

ZALANDO CIRCULAR COLLECTION



Designer Tom Cridland is known for his '30-year sweatshirt', a staple unisex piece made from loopback polycotton (ring spun to prevent pilling), reinforced seams and an anti-shrinkage silicone treatment. The brand has a clothing maintenance programme, which allows the customer to send the garment back, if damaged, to be brought to a 'good-as-new' state.

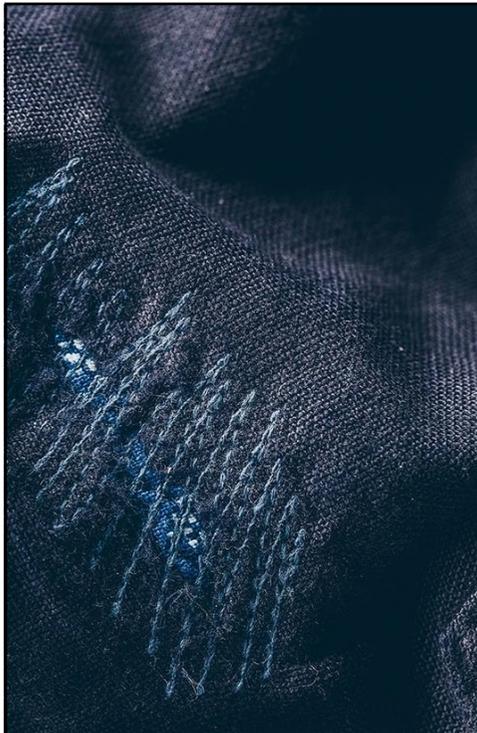
CIRCULAR DESIGN STRATEGIES:

DURABILITY
VERSATILITY

TOM CRIDLAND

Examples

See the following for claims by other brands in relation to durability:



TAYLOR STITCH

Taylor Stitch is a menswear brand with a big focus on repair. They run a Restitch take-back scheme, giving old clothes a new life through repair. Taylor Stitch boldly claims "We Want Your Old Sh*t." and they really do – they can fix it for you, or give it a second life through restoration and resale, which they believe is "better than new."

CIRCULAR DESIGN STRATEGIES:

DURABILITY



LEVI'S

Levi's, established way back in 1853, is known for high-quality denim products with a focus on durability. Recently the company opened Levi's® Tailor Shops to educate customers on denim care, help them personalise their garments and mend damaged pieces.

CIRCULAR DESIGN STRATEGIES:

DURABILITY
VERSATILITY

3.7

Versatility

Versatility

“Extending the life of clothes by an extra nine months of active use would reduce carbon, water, and waste footprints by around 20–30% each.”¹

- WRAP

WHAT IS THE CIRCULAR DESIGN STRATEGY AND HOW DOES IT WORK?

This strategy is about keeping products in use through versatility: designing products to have more than one function, or to be worn by more than one customer, or in different styles. Different shapes, components or features give the wearer options for styling, and they can adapt the piece based on changes in their moods, needs or trends. This also helps to make inclusive pieces that are more accessible for the next person to use it, like one-size-fits-most and unisex products that any gender and any shape can wear. The result is design that aims to increase use by reducing the number of products a person needs (through fulfilling multiple functions), and/or by increasing the number of people that can wear the piece over time.

Versatility is also a way to enhance the emotional durability of a product. Versatility enables a garment to be adapted across changes in a wearer’s shape, size, aesthetic, style or lifestyle, so they adjust it to fit their needs or creative inspiration at the time.² This means they can keep it for longer, helping to build a stronger connection to the piece.



Versatility - Designer Considerations:

To start using this strategy, think about the different end-uses, purposes and people the piece you're creating could serve – and then see if you can take this even further.

Can you develop a buildable product (for example, three-layered construction in an outdoor jacket, or a removable warmer)?

Can you switch out pieces or components (like straps or pockets) for different colours or patterns?

Can the item be reversible?

Can you button off or zip away components, like sleeves or hoods?

Which elements of your design could be exchangeable or replaceable?

What are the different events, seasons and/or environments it would look good in? How could the piece be adapted to suit these better?

Can you develop it for gender fluid wearers? Rather than just masculine-coded unisex (like menswear garments styled on women), can you create inclusive designs for any body type?

How could it smoothly integrate with changing silhouettes, trims/embellishments, and colour trends?

How could the product grow or change with the wearer?

How can you communicate the versatility of the piece with the wearer? Does it need instructions or styling directions?

How else can your product be adapted or changed to suit different wearers' needs? What other creative approaches can you take?

Examples

See the following for claims by other brands in relation to versatility:



ASOS DESIGN - REVERSIBLE PRINTED SHIRT

A two-in-one shirt featuring contrasting graphic prints on the inside and outside, allowing the wearer to style the piece according to their mood. The shirt is designed to be unisex for extra versatility. Made from 100% viscose fabrics, it could also be recycled at the end of its life.

CIRCULAR DESIGN STRATEGIES:

VERSATILITY

MONO-MATERIALITY



ASOS DESIGN - REVERSIBLE SLIP DRESS

A 90s-inspired slip dress designed to be worn in four ways, with two different colour choices and an adjustable length that can be modified to a mini or maxi. The dress is also designed for zero waste – the pattern makes use of simple square blocks with gathers to create shape and detail. Finally, it's made from 100% viscose, ensuring it is also able to be recycled.

CIRCULAR DESIGN STRATEGIES:

ZERO WASTE

VERSATILITY

MONO-MATERIALITY

Examples

See the following for claims by other brands in relation to versatility:



COLLUSION

COLLUSION is an inclusive brand created for everyone and we welcome everyone on our journey. We strive to be a destination where our demographic can feel safe to express themselves and be whoever they want to be. Our wardrobe is not constrained by gender as we push the idea of genderless dressing, diversity and individualism. Everything we create is animal free.

CIRCULAR DESIGN STRATEGIES:

VERSATILITY



MONKI CIRCULAR DESIGN DROP

Monki has developed a 'Wear, Love, Recycle' circular design capsule, featuring versatile products including a coat and jeans. The recycled polyester coat is reversible, giving customers the option to wear it with the quilted side facing out or in. The organic cotton jeans can be worn in two ways, with an asymmetric waist. The pieces are made from mono-materials so they are also able to be recycled.

CIRCULAR DESIGN STRATEGIES:

VERSATILITY

MONO-MATERIALITY

Mono-materiality

3.8

Mono-materiality

WHAT IS THE CIRCULAR DESIGN STRATEGY AND HOW DOES IT WORK?

The final two circular design strategies are all about closing the loop: designing products that are made to be made again. In simple terms, this strategy deals with 'end-of-life' in relation to circularity, answering the question: 'what are we going to do with this product when we're finished with it?'. These strategies focus on making it easier for products' materials to be given a new life through recycling.

As we covered in Chapter 2, designing for end-of-life is just one part of the puzzle. Best practice would be to combine these design strategies with programmes to put products back into the system, such as clothing take-back or recycling services. However, making sure products are designed with end-of-life in mind is a great place to start.

Mono-materiality closes the loop by making pieces easier to recycle. As we'll cover in Chapter 5, blended materials are a challenge for recycling – only some techniques such as mechanical fibre recycling can be used, which damages the fibres.¹ New technologies to recycle blends (such as polycotton) are still being scaled and are not widely available.² These issues can be avoided by using only a single material – a mono-material. A mono-material product, if made from a recyclable fibre, can go straight into recycling without the need to separate fibres or fabrics. (Head to Chapter 5 to learn more).

While simple in theory, this strategy can be difficult to put into practice. Mono-materiality includes everything that goes into the product, from linings, fillings, zips, buttons, and fusing. Additionally, if designing a more complex product – like hard accessories, shoes or outerwear – it can be tricky to find components and trims all made from the same kind of fibre.

Industry best practice defines mono-materiality as 98% of the total volume by weight³, which gives some leeway when it comes to things like care labels and threads. But everything else must be made from the same fibre.



¹ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.

² Ibid.

³ Ellen MacArthur Foundation (2021). The Jeans Redesign Guidelines. Ellen MacArthur Foundation.

Mono-materiality - Designer Considerations:

Can you use self-fabric for decorative components, ties or straps?

Can you take trims or components out of your design? Or switch them for versions that are more easily removed – for example sewing bar tacks or eyelets instead of using metal rivets or eyelets?

Could you change your current material choice? Is a mono-material a feasible option for the product you're designing?

How can you communicate the composition of the product to the user or recycler to enable recycling?

Does your current composition really need a blend in the fibre? Is it enhancing the garments function/performance, or can you remove the blend?

What are the trims and components in your product made from? Can you switch them so they are all made from the same fibre?

What will happen to your product at the end of its useful life? How could its materials be returned to the technical cycle?

Examples

See the following for claims by other brands in relation to mono-materiality:



ASOS DESIGN - CIRCULAR KNITWEAR

The 2020 ASOS Design Circular collection featured a series of knitwear pieces, including a cardigan, cable tank, bralette and beanie, designed with circularity in mind. Each product is made from 100% cotton or 100% polyester – easy-to-recycle fibres – and details like patterns and textures are knitted into the design itself, rather than adding on any extras made from other fibres. Many of the pieces are unisex and manufactured using minimised waste techniques such as fully-fashioned knits that only use as much yarn as is needed.

CIRCULAR DESIGN STRATEGIES:

MINIMISED WASTE
VERSATILITY
MONO-MATERIALITY



ASOS DESIGN - MONO-MATERIAL PUFFER

Developed in collaboration with the Design, Buying and Technical teams, the classic puffer jacket was re-made in 100% recycled polyester – from fabric to wadding to zips. Sourcing recycled trims that still met quality standards was a challenge in creating this garment and added time to the process.

CIRCULAR DESIGN STRATEGIES:

RECYCLED MATERIALS
MONO-MATERIALITY

Examples

See the following for claims by other brands in relation to mono-materiality:



C&A

In 2017, C&A introduced to the market its first series of Gold Level Cradle to Cradle Certified™ T-shirts, available from £7.00. Made from 100% organic cotton, the fabric is free of hazardous substances, which also supports safe recycling via their post-consumer takeback scheme. Since then, the company has added to its range of C2C products, proving that affordable circular fashion is not only possible but popular.

CIRCULAR DESIGN STRATEGIES:

- MINIMISED WASTE
- DURABILITY
- MONO-MATERIALITY



NAPAPIJRI "CIRCULAR SERIES"

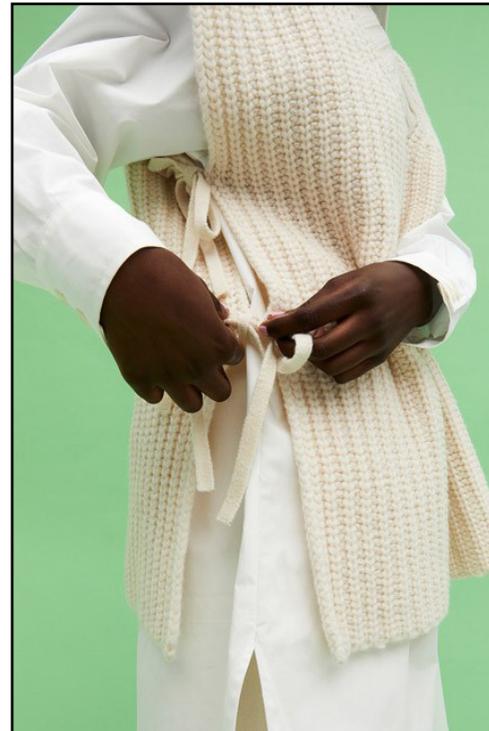
In 2019, Napapijri launched a fully recyclable jacket made from Nylon 6 and ECONYL®. The company has developed an online take-back scheme along with the product itself, so the jacket can be returned for recycling from two years after purchase. The brand also committed to reprocessing the collected garments into new products, enabled by the mono-material composition.

CIRCULAR DESIGN STRATEGIES:

- RECYCLED MATERIALS
- DURABILITY
- VERSATILITY
- MONO-MATERIALITY

Examples

See the following for claims by other brands in relation to mono-materiality:



MONKI CIRCULAR DESIGN DROP

Monki's 'Wear, Love, Recycle' circular design capsule features mono-material products including knitwear, jerseywear and a shirt. These products have been designed with only a single, recyclable fibre such as 100% organic cotton or 100% wool. All detailing uses the same material – the oversized wool vest features self-ties at the side, while the T-shirt uses rib trims that are also organic cotton.

CIRCULAR DESIGN STRATEGIES:

MONO-MATERIALITY

Disassembly

3.9

Chapter 3.9: Disassembly

WHAT IS THE CIRCULAR DESIGN STRATEGY AND HOW DOES IT WORK?

If it's not possible to get a product to 100% mono-materiality, this strategy offers another route to ensuring that materials are reused or recycled.

Disassembly focuses on making it easier to take products apart, remove components, and separate different materials ready for recycling or remanufacture. For example, a cotton shirt with sheer polyester sleeves can still be recycled if you can take the sleeves off quickly and easily for separate recycling processes.

To start designing for disassembly, first look at simplifying products by reducing their material complexity (the number of components, trims, or fibres used). This means not everything needs to be taken apart, only the pieces that are made of different materials, making it a lot easier for the person who needs to recycle the product once the customer is finished with it.



Disassembly - Designer Considerations:

Can the product can be disassembled by hand or with reasonable force (i.e. it doesn't require any complex, industrial or chemical processes?)

Can you reduce the number of trims you use, so not so many have to be removed?

Can you change your design to avoid glue, fusing or welding wherever possible, so elements can be separated easily?

Can you reduce the number of fibre types your product uses, so not every single piece needs to be separated?

What is the intended use of your product? Disassembly can sometimes reduce the durability of a product, so ensure you are making the right trade-offs, for example prioritising recyclability over longevity for products that use this strategy.

The Ellen MacArthur Foundation's Jeans Redesign Guidelines state that products "are designed and manufactured in such a way that allows all components that are added to the fabric to be disassembled for reuse or recycling."¹ Can you re-design your product to enable easy disassembly of any additional material that is added to the fabric?

Can you reduce the number of pattern pieces or components your product has, so not so many seams need to be taken apart?

Can you switch your metal trims for removable metalware on denim and accessories, like shank buttons that can unscrew?

Can you switch to trims that are easier to remove, like buttons instead of zips, or hooks-and-eyes that can be snipped off?

What will happen to the different materials in your product at the end of its life? Are they all able to be recycled or reused in some way?

¹ Ellen MacArthur Foundation (2021). The Jeans Redesign Guidelines. Ellen MacArthur Foundation. P10.

Examples

See the following for claims by other brands in relation to mono-materiality:



ASOS DESIGN - CIRCULAR DENIM

The 2020 circular collection featured multiple denim products – including jackets and jeans – that met our disassembly criteria. To ensure they can be easily recycled after use, the pieces are made with 100% cotton and feature removable button shanks.

The pieces are also made from recycled materials (at least 20% recycled content as verified by one of ASOS' certification partners); utilise minimised waste processes including low-water washes and laser distressing; are unisex for versatile use; and each piece has a removable care label with instructions to help wearers look after them.

CIRCULAR DESIGN STRATEGIES:

RECYCLED MATERIALS
MINIMISED WASTE
DURABILITY
VERSATILITY
DISASSEMBLY



ASOS DESIGN - CIRCULAR DENIM JEANS

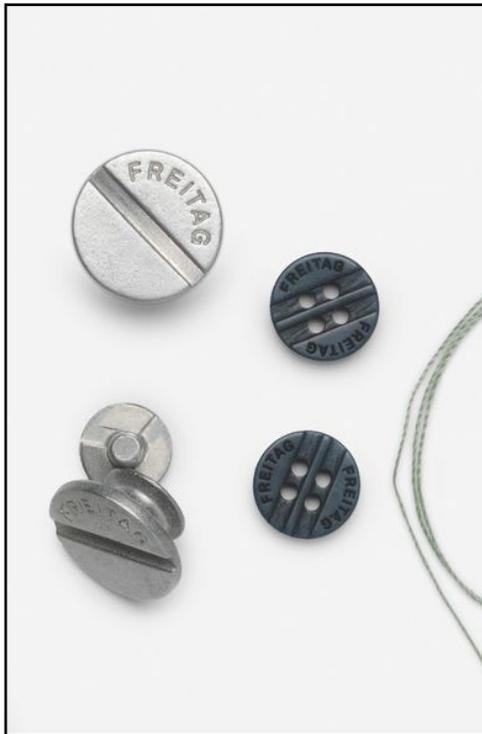
Part of ASOS' debut circular collection in 2020, these jeans were designed for recyclability and made from mono-materials (100% cotton) including recycled materials. Featuring a new fly construction which was specifically designed for easy disassembly, customers could find instructions on how to remove the fly and metal shanks from an illustration on the pocket bag. As an added bonus, the metal shanks and pocket bags were upcycled from deadstock.

CIRCULAR DESIGN STRATEGIES:

RECYCLED MATERIALS
MINIMISED WASTE
REMANUFACTURE/UPCYCLING
DURABILITY
MONO-MATERIALITY
DISASSEMBLY

Examples

See the following for claims by other brands in relation to mono-materiality:



In 2014, Swiss accessories brand FREITAG introduced metal buttons that could be unscrewed from their 100% biodegradable F-ABRIC garment easily to simplify the product recycling process but also to make their customers understand about the biological and technical cycle of circularity. For this reason, the button is not yet on the pants when you buy them. Instead, the customers will screw it on themselves.

CIRCULAR DESIGN STRATEGIES:

DISASSEMBLY

FREITAG F-ABRIC THE BUTTON



Fashion-technology company Unspun have launched a collection of jeans in line with the Ellen MacArthur Foundation Jeans Redesign guidelines. The collection features removable buttons and is sewn with smart stitch thread – it dissolves when heated, allowing for easier disassembly and recycling.

The capsule is further designed for circularity by manufacturing on-demand, customised pieces, reducing waste as pieces are only produced on a made-to-order basis; and by including a QR code on each product, enabling materials to be verified and tracked for recycling or resale.

CIRCULAR DESIGN STRATEGIES:

MINIMISED WASTE
DISASSEMBLY

UNSPUN GENESIS JEANS

Sourcing Materials for Circular Design

Sourcing Materials for Circular Design

WHAT IS THIS CIRCULAR DESIGN STRATEGY AND HOW DOES IT WORK?

As the Ellen MacArthur Foundation outlines in its vision of a circular economy for fashion,¹ all inputs (such as materials or chemicals) in the circular fashion economy must be safe and recycled or renewable.

SAFE: “In a circular economy, substances that are hazardous to health or the environment are designed out to allow safe material circulation and ensure that no pollutants are released into the environment.”²

RECYCLED: “Material that would have been disposed of as waste, but is instead reprocessed by means of a manufacturing process and made into a final product or into a component for incorporation into a product.”³ This means that circular products turn waste materials into something new.

RENEWABLE: “Material that is composed of biomass from a living source and that can be continually replenished.”⁴ This means that circular products are made from materials that can be grown again.

Everything a circular product is made from must be safe (free from hazardous substances), and made from a recycled feedstock or a renewable feedstock (from a living, sustainably grown or managed source, e.g. organic cotton).



Fibre types can be broken down into three simple categories: cellulosic (plant-based), protein (animal-based), and synthetic (oil-based).⁵

CELLULOSIC FIBRES: Fibres “obtained from plant-based material. This material can be either directly captured from plants, such as cotton, or treated chemically to extract and process cellulose”.⁶

PROTEIN FIBRES: “Fibres whose origin is protein. They traditionally come from an animal source through condensation of amino acids (e.g. wool, cashmere, silk)”.⁷

SYNTHETIC FIBRES: “Fibres made from polymers through chemical synthesis of raw materials such as petroleum (e.g. polyester, nylon)”.⁸

FEEDSTOCK: “Feedstock is anything used to produce a new product. This in particular includes raw materials (from either virgin, bio-based, or recycled sources) but can also include components from old products reused in a new product”.⁹

PRE-CONSUMER WASTE: waste generated before a product reaches the user, usually from manufacturing or processing, e.g. fabric offcuts from the factory floor.¹⁰

POST-CONSUMER WASTE: waste generated after a product has reached its user.¹¹ This includes waste from households, businesses or commercial facilities, e.g. discarded plastic bottles or discarded clothes.¹²

1 Ellen MacArthur Foundation (2020). Vision of a circular economy for fashion.

2 Ibid.

3 Ibid.

4 Ibid.

5 Rex, D., Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.

6 Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation. P. 120.

7 Circular.fashion. (2020). Circular.fashion dictionary.

8 Ibid.

9 Ellen MacArthur Foundation (2015). Circularity Indicators: An Approach to Measuring Circularity. Ellen MacArthur Foundation.

10 Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Pre-consumer waste. Condé Nast.

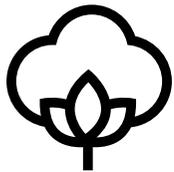
11 Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Post-consumer waste. Condé Nast.

12 ISO 14021:2016. Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling). <https://www.iso.org/obp/ui/#iso:std:iso:14021:ed-2:v1:en>

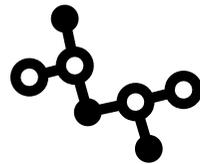
Safe & Recycled or Renewable Materials

Rather than just picking ‘the most sustainable’ fabric, it’s important to consider which materials are appropriate for the design and the product’s intended use and lifecycle. Designers should understand the environmental concerns of each material and then make an informed decision based on those factors. Material diversity – choosing a wide variety of materials – can help to reduce stress on ecosystems and reduce reliance on dominant fibres like cotton or polyester.¹

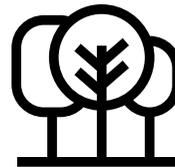
As well as looking at the fibres that go into a material, circular design also includes ensuring that products and materials are free from hazardous substances and chemicals, and that “production and use of products do not discharge hazardous substances into the environment”.² This means that only safe inputs (dyes or other process chemicals) can be used in the manufacture of the fabric or the garment itself, including during any recycling processes. For more on this, head to our section on the minimised waste circular design strategy on page 26.



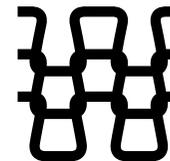
COTTON



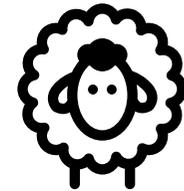
POLYESTER



MAN-MADE
CELLULOSIC FIBRES



NYLON



WOOL



GLASS
(ACCESSORIES, TRIMS)



PLASTICS
(ACCESSORIES, TRIMS)



METALS
(ACCESSORIES, TRIMS)



OTHER MATERIALS

Cotton

WHAT IS IT?

Cotton is an example of a cellulosic fibre as it's a natural fibre taken from the cotton plant. Cotton is often chosen for its physical properties, including its softness, which makes it a good choice for products that sit close to the skin. Cotton grows in bolls (protective cases) and must be harvested and combed (a process known as 'ginning') before being spun into a fibre.¹



CERTIFICATIONS

In its circular range, ASOS accepts more sustainable cotton certified to:

Virgin:

- Global Organic Textile Standard (GOTS)
The Global Organic Textile Standard (GOTS) is a world-renowned standard for clothes made with organically grown natural fibres. The GOTS seal of approval means that your product is made up of at least 70% organic content. Each stage of the supply chain is independently certified to make sure it meets the requirements of GOTS and was manufactured in an environmentally and socially responsible way.
- The Organic Content Standard (OCS)
The Organic Content Standard means your fashion find contains at least 95% certified organically grown material, and each stage of the supply chain is independently certified. FYI, this certification does not address the use of chemicals or any social or environmental claims in the processing of the fibres.
- Organic Content Standard Blended
If a piece you love was made with OCS Blended fibres, you can trust that it contains at least 50%- 95% organically grown material and that each stage of the supply chain is independently certified. But just so you know, this certification does not address the use of chemicals or any social or environmental claims in the processing of the fibres.

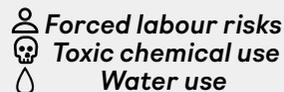
Recycled:

- The Recycled Claim Standards (RCS)
- The Recycled Claim Standard Blended
- Global Recycled Standard (GRS)

LEADING BY EXAMPLE

The Ellen MacArthur Foundation's report on biodiversity, *The Nature Imperative*⁹, profiles a number of brands who are working directly with farmers to grow cotton regeneratively.

WHAT IMPACTS DOES CONVENTIONAL COTTON HAVE?



Though it's a natural fibre, conventional cotton often comes with high environmental impacts. It typically requires vast amounts of water and land to grow,² especially to meet demand from the fashion industry (cotton is fashion's most-used fibre)³ – it's estimated that the average water use for a kilogram of cotton is 10,000 litres.⁴ Growing and processing cotton can involve the use of toxic chemicals, including pesticides, fertilisers and textile dyes.⁵ In addition to potentially damaging biodiversity, waterways and natural ecosystems, conventional cotton has a high risk for modern slavery including child labour.⁶

WHY CHOOSE SAFE AND RECYCLED OR RENEWABLE INPUTS?

'More sustainable' cotton needs less water, fewer chemicals, and can benefit farmers with higher yields and increased profits.⁷ Examples include:

- Renewable: Organic cotton is a regenerative alternative to conventionally grown cotton. It is grown without synthetic pesticides, artificial fertilisers or GMO seeds. Certification to organic farming standards cover the farming, organic processing standards (GOTS) certify the processing, based on use of certified organic fibre, covers all processing stages and include environmental and social criteria. Organic textiles are defined as from 'field to fashion'. Learn more of the details on our responsible blog.
- Renewable: Regenerative cotton is grown using regenerative agriculture farming practices. These practices ensure that soil health is protected, water quality and biodiversity are improved, and ecosystems are restored.⁸
- Recycled: Recycled cotton is made from fabric and fibre waste – it can be from post-consumer waste, pre-consumer waste, or a mix of both, with the preferred option being post-consumer.

1 Rex, D., (Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.
2 Fletcher, K. (2014). Sustainable Fashion & Textiles: Design Journeys. Abingdon: Routledge.
3 Rex, D., (Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.
4 Chapagain, A.K. et al. (2006). The water footprint of cotton consumption: An assessment of the impact of worldwide consumption of cotton products on the water resources in the cotton producing countries.
5 Fletcher, K. (2014). Sustainable Fashion & Textiles: Design Journeys. Abingdon: Routledge.
6 International Labour Organization (2017). Child Labour in Cotton – A briefing.
7 Rex, D., (Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.
8 Ellen MacArthur Foundation (2020). Vision of a circular economy for fashion.
9 Ellen MacArthur Foundation (2021). The Nature Imperative: How the circular economy tackles biodiversity loss. Pg. 64.

Polyester

WHAT IS IT?

Polyester is a synthetic fibre predominantly made from non-renewable fossil fuels, usually produced using petrochemicals which are reacted with alcohol, creating a string of polymers that are extruded into fibres.¹ Polyester is often chosen for its strength and its ability to hold dye colours easily.²

WHAT IMPACTS DOES CONVENTIONAL POLYESTER HAVE?

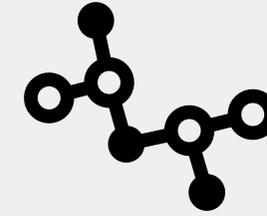
-  *High energy use*
-  *Resource depletion*
-  *Greenhouse gas emissions*
-  *Plastic pollution*

Conventional polyester is made from non-renewable petroleum, which means it contributes to resource depletion and is dependent on the fossil fuel industry. The process requires a high amount of energy – on average, one kilogram of polyester requires 109MJ³ – and emits greenhouse gases during production, contributing to climate change.⁴ A further concern is the shedding of plastic microfibres, which pollute natural ecosystems including soil and waterways.⁵

WHY CHOOSE SAFE AND RECYCLED OR RENEWABLE INPUTS?

There are a number of different alternatives to conventional polyester, including:

- **Recycled:** Recycled polyester uses up waste and reduces our need for virgin fibres, and (depending on the recycling technique used) can still have the same quality as a virgin fibre.⁶ It can be from post-consumer waste or pre-consumer waste, or a mix of both. Post-consumer textile waste is preferred, as under circular design, pre-consumer waste should be minimised.
- **Renewable:** Bio-based polyester fibres are made from natural sources such as vegetable oil or fermented corn starch. It's important to note these fibres are still emerging and may not be available at scale or are only available blended with virgin polyester.⁷



CERTIFICATIONS

ASOS accepts fabrics certified to:

- The Recycled Claim Standard (RCS)
- The Recycled Claim Standard Blended
- The Global Recycled Standard (GRS)

EXAMPLES

Parley for the Oceans is a global organisation collaborating with brands to tackle marine plastic waste through worldwide initiatives and projects. Some of the plastic debris collected by their global network is processed and upcycled to create Parley Ocean Plastic® – a range of premium fabrics, yarns and materials which have featured in products ranging from jackets by Helmut Lang and dresses by Iris Van Herpen to trainers with adidas and even credit cards from American Express.

REPREVE® is transforming discarded bottles into new recycled fibres. The fibre process can embed properties like wicking, adaptive warming and cooling and water-repellence to create a reliable and durable fabric quality. So far Unifi – which makes REPREVE® – has recycled over 25 billion plastic bottles into new fabrics.

1 Fletcher, K. (2014). Sustainable Fashion & Textiles: Design Journeys. Abingdon: Routledge.
2 Rex, D., (Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.
3 Laursen, S.E. and Hansen, J. (1997). Environmental Assessment of Textiles, Copenhagen: Danish Environmental Protection Agency. Pg. 84.
4 Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Polyester. Condé Nast.
5 Rex, D., (Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.
6 WRAP (2017). Valuing our clothes: The cost of UK fashion. WRAP.
7 Rex, D., (Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.

Man-made Cellulosic Fibres

WHAT ARE THEY?

Man-Made Cellulosic Fibres (MMCF), which are most commonly derived from wood, have the third-largest share in global fibre production after polyester and cotton. MMCFs include viscose, acetate, lyocell, modal, and cupro. As the name implies, they mostly use wood as feedstock. In order for MMCFs to offer a sustainable alternative, responsible sourcing practices and production processes must be safeguarded.

Viscose is by far the most prominent MMCF and is the third-most used fibre in the world. Viscose is a regenerated cellulosic fibre produced by chemically dissolving plants and plant waste, like wood pulp or cotton debris, to extract the cellulose and turn it into a solution that can be spun into a yarn. Viscose is also known as viscose rayon or rayon, and the process was invented in the mid-1880s – making it fashion’s first man-made fibre.¹

WHAT IMPACTS DOES CONVENTIONAL VISCOSE HAVE?



Toxic chemicals

Greenhouse gas emissions

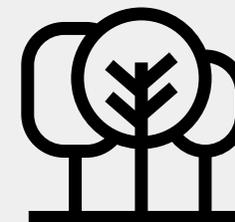
Deforestation and degradation risks

Conventional viscose, though derived from natural sources, requires significant water use and hazardous chemicals (including carbon disulphide, bleach and sulphuric acid), and the process emits greenhouse gases as well as chemical run-off that pollutes air and waterways.² Viscose production, relying on plant sources such as wood pulp, is also linked to deforestation and degradation risks, including that of ancient and endangered forests.³ Through its CanopyStyle initiative, the NGO Canopy Planet aims to protect ancient and endangered forests from ending up in the man-made cellulosic supply chain by working together with brands, MMCF mills and fibre producers.

WHY CHOOSE SAFE AND RECYCLED OR RENEWABLE INPUTS?

There are a number of different alternatives to conventional viscose, including:

- **Low-risk sourcing:** Viscose can be sourced from responsibly managed forests such as those certified by the Forest Stewardship Council (FSC)⁴ and the viscose producer ranked ‘green shirt’ in Canopy’s Hot Button Report.
- **Low-impact chemical use:** Lyocell is produced in a near closed-loop cycle where the chemicals and/or water are safely reused for each new batch.⁵ The benefit of the lyocell process is to derive the cellulose from pulp without relying on the chemically complex viscose process.
- **Next generation and recycled:** Viscose can also be made from cellulosic waste, from sources including fabric offcuts and food or agricultural industry waste. Check out the ‘Innovative Materials’ strategy in Chapter 3 to learn more.



RESPONSIBLE SOURCES

Preferred fibres & fabrics are from brands which source from forests certified by the Forest Stewardship Council as responsibly managed, and from “Next Generation” fibres as well as those that use production methods that require less water and energy and fewer chemicals, such as Lenzing ECOVERO™ and Birla Livacoco.

EXAMPLES

Austrian manufacturer Lenzing™ uses eco-friendly production methods that require less water, less energy-responsible fibre sources (Canopy Hot Button ‘green shirt’ rated MMCF) and fewer chemicals:

- Lenzing TENCEL™ Lyocell: is a biodegradable fibre made with highly resource-efficient closed-loop technology. Comes from various sustainably managed tree species, e.g. spruce, pine, birch, beech and eucalyptus.
- Lenzing TENCEL™ Modal: softer than cotton and ideal for close to skin products like nightwear and lingerie. Comes from mainly beech wood from Austria and neighbouring countries.
- Lenzing ECOVERO™: Compared to conventional viscose fibres, the production generates up to 50 per cent lower carbon emissions and water impact.

¹ Centre for Sustainable Fashion and Condé Nast. (2020). The Sustainable Fashion Glossary: Viscose. Condé Nast.

² Laursen, S.E. and Hansen, J. (1997). Environmental Assessment of Textiles, Copenhagen: Danish Environmental Protection Agency, p84.

³ Centre for Sustainable Fashion and Condé Nast. (2020). The Sustainable Fashion Glossary: Viscose. Condé Nast.

⁴ Ibid.

⁵ Centre for Sustainable Fashion and Condé Nast. (2020). The Sustainable Fashion Glossary: Lyocell. Condé Nast.

Nylon

WHAT IS IT?

Nylon (also known as polyamide) is a synthetic fibre usually made from petrochemical feedstock.¹ It's the second-most produced synthetic fibre after polyester,² and is similarly chosen for physical properties including strength for products such as outerwear, swimwear and accessories.

WHAT IMPACTS DOES CONVENTIONAL NYLON HAVE?

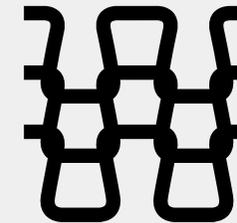
- ⚡ *High energy use*
- 🌍 *Resource depletion*
- ☁️ *Greenhouse gas emissions*
- 🗑️ *Plastic pollution*

As with polyester, conventional nylon is made from non-renewable petroleum, so its extraction contributes to resource depletion and relies on the oil industry. Its production also uses a significant amount of energy – one kilogram of nylon requires 150MJ³ (compared to 109MJ per 1kg of polyester) – and emits nitrous oxide, a greenhouse gas, during the process.⁴ Nylon is also a source of microfibre pollution.⁵

WHY CHOOSE SAFE AND RECYCLED OR RENEWABLE INPUTS?

Alternatives to conventional nylon include:

- **Renewable:** Bio-based nylons are made from renewable feedstocks such as vegetable oil.
- **Recycled:** Recent recycling innovations have made it possible to make high-quality nylon yarn out of post-consumer waste like carpets or ocean plastic.⁶ Note that post-consumer waste is the preferred option.



CERTIFICATIONS

ASOS accepts nylon fabrics certified to:

- The Recycled Claim Standard (RCS)
- The Recycled Claim Standard Blended
- The Global Recycled Standard (GRS)

EXAMPLES

ECONYL®

ECONYL® is a textile yarn produced by Aquafil, and made from both pre- and post-consumer waste including textile scraps and fishing nets. Thanks to the innovative technology employed for its manufacturing, it can be recycled to original quality standards.⁷

¹ Fletcher, K. (2014). *Sustainable Fashion & Textiles: Design Journeys*. Abingdon: Routledge.

² Rex, D., (Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.

³ Allwood, J.M., Laursen, S.E., Malvido de Rodriguez, C. and Bocken, N.M.P. (2006). *Well Dressed?*, Cambridge: University of Cambridge Institute of Manufacturing, p45.

⁴ Fletcher, K. (2014). *Sustainable Fashion & Textiles: Design Journeys*. Abingdon: Routledge.

⁵ Rex, D., (Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.

⁶ WRAP (n.d.). Introduction to recycled nylon.

⁷ EcoNyl (n.d.). The Process.

WHAT IS IT?

Wool is an animal fibre created by shearing sheep and spinning the collected wool into a yarn. It's a natural high-performance fibre: it is strong, odour- and water-resistant, and provides insulation,¹ and is often chosen for knitwear and outerwear for these physical properties. Because wool is sourced from animals, it's an example of a protein fibre.

WHAT IMPACTS DOES CONVENTIONAL WOOL HAVE?



High land use
High chemical use
Greenhouse gas emissions
Animal welfare risks

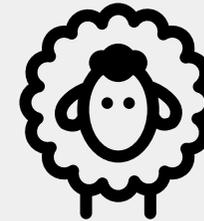
Conventional wool requires large amounts of land for sheep farming. Pesticides are often used to protect sheep from parasites and the animals themselves produce methane, a potent greenhouse gas.² Once the wool has been shorn, hazardous chemicals and significant amounts of water are used to clean and process the fibre.³

Wool is also linked to animal welfare risks. Animals may be subject to poor living conditions, injuries during shearing, and mulesing, a physically painful practice that involves removing flesh from the area around the tail.⁴

WHY CHOOSE SAFE AND RECYCLED OR RENEWABLE INPUTS?

Alternatives to conventional wool include:

- **Renewable:** wool certified with the Responsible Wool Standard ensures that more sustainable farming practices have been used to ensure soil health, that biodiversity and animal welfare are protected, and hazardous chemicals are reduced.⁵
- **Renewable:** organic wool is sourced from sheep farmed using organic practices, such as organic feed and no use of pesticides or other hazardous chemicals.⁶
- **Renewable:** Regenerative wool is grown using regenerative agriculture farming practices. These practices ensure that soil health is protected, water quality and biodiversity is improved, and ecosystems are restored.⁷
- **Recycled:** Because wool fibres are longer relative to other fibres, it's more easily able to be mechanically recycled.⁸ Mechanically recycled fibres use less energy than virgin equivalents and can save dye chemicals and water if the wool is sorted by colour before recycling.⁹



CERTIFICATIONS

ASOS accepts wool fabrics certified to:

- The Recycled Claim Standard (RCS)
- The Recycled Claim Standard Blended
- The Global Recycled Standard (GRS)
- The Responsible Wool Standard (RWS)

EXAMPLES

The Responsible Wool Standard (RWS)

The Responsible Wool Standard is a standard to certify that wool is sourced from farms with a more sustainable approach to land management, and who practise respect for animal welfare.

The Ellen MacArthur Foundation's report on biodiversity, *The Nature Imperative*,¹⁰ profiles a number of brands working directly with farmers to grow wool regeneratively.

1 Centre for Sustainable Fashion and Condé Nast. (2020). *The Sustainable Fashion Glossary: Wool*. Condé Nast.
2 Ellen MacArthur Foundation (2017). *A New Textiles Economy: Redesigning fashion's future*. Ellen MacArthur Foundation.
3 Fletcher, K. (2014). *Sustainable Fashion & Textiles: Design Journeys*. Abingdon: Routledge.
4 Centre for Sustainable Fashion and Condé Nast. (2020). *The Sustainable Fashion Glossary: Wool*. Condé Nast.
5 Textile Exchange (n.d.). *Responsible Wool Standards (RWS)*.
6 Fletcher, K. (2014). *Sustainable Fashion & Textiles: Design Journeys*. Abingdon: Routledge.

7 Ellen MacArthur Foundation (2020). *Vision of a circular economy for fashion*.
8 Ellen MacArthur Foundation (2017). *A New Textiles Economy: Redesigning fashion's future*. Ellen MacArthur Foundation.
9 Fletcher, K. (2014). *Sustainable Fashion & Textiles: Design Journeys*. Abingdon: Routledge.
10 Ellen MacArthur Foundation (2021). *The Nature Imperative: How the circular economy tackles biodiversity loss*. Pg. 64.

Plastics (accessories, trims)

WHAT ARE THEY?

Plastics are synthetic materials, the majority of which are made from fossil-based organic polymers derived from petrochemicals. The most common plastics include polyethylene (PE), polypropylene (PP), polystyrene (PS), polyvinylchloride (PVC), polyethylene terephthalate (PET), polyester (PES), polyamide (PA) and acrylic (PC).¹ Non-clothing plastics are usually picked for properties including durability, stain resistance, and easy care.

WHAT IMPACTS DO CONVENTIONAL PLASTICS HAVE?

-  Resource depletion
-  Hazardous chemical use
-  Greenhouse gas emissions
-  Plastic pollution

Most plastics are made from non-renewable petroleum, which depletes natural resources and contributes to climate change through greenhouse gas emissions.² The production of plastics can also require hazardous chemicals such as solvents and antistatic treatments.³ The plastic may not be recyclable (for example acrylic or PU – see Other Materials) and plastics often end up incinerated, in landfill, or accumulated in the natural environment,⁴ breaking down into microplastics over time.⁵

WHY CHOOSE SAFE AND RECYCLED OR RENEWABLE INPUTS?

Alternatives to conventional plastics include:

- **Recycled:** the plastics recycled at the highest volumes are HDPE (High Density Polyethylene) and PETE or PET (Polyethylene Terephthalate).⁶ PET bottles are a commonly recycled feedstock for polyester materials.⁷ Recycled polyester can be from post-consumer waste, pre-consumer waste, or a mix of both, with the preferred option being post-consumer textile waste.
- **Renewable:** Bio-based plastics are derived from renewable feedstocks, including cellulose, vegetable fats and sugars, which helps to reduce reliance on fossil fuels.⁸

¹ Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Plastics.

² Ibid.

³ Ibid.

⁴ Geyer, R. (2017). Production, use, and fate of all plastics ever made. *Science Advances*, 3 (7).

⁵ Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Plastics.

⁶ Ellen MacArthur Foundation (2016). *The New Plastics Economy: Rethinking the future of plastics*.

⁷ Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Recycling.

⁸ Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Plastics.



CERTIFICATIONS

ASOS accepts plastics certified to:

- The Recycled Claim Standard (RCS)
- The Recycled Claim Standard Blended
- The Global Recycled Standard (GRS)

EXAMPLES

Our ASOS Design recycled sunglasses are made using post-consumer plastics from different industries. The frames are made from recycled plastics such as light switches, phone cases and tableware. The recycled lenses are made from post-consumer waste from cars and train lamp covers.



Metals (accessories, trims)

WHAT ARE THEY?

Metals are widely used in the fashion industry, for example in zips, embellishments and jewellery. These include steel, zinc, and alloys such as brass or sterling silver. To avoid depletion of finite resources and the challenges associated with the extraction of primary raw materials (e.g. impacts of mining, traceability), brands and designers should maximise the use of recycled metals.

WHAT IMPACTS DO CONVENTIONAL METALS HAVE?

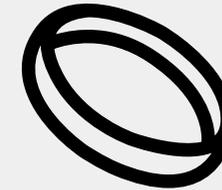
-  Resource depletion
-  Greenhouse gas emissions
-  High energy use

Primary (virgin) metal production is responsible for approximately 7-8% of the world's total global energy use, contributing to significant greenhouse gas emissions.¹ If not properly managed, mining of these metals can cause significant damage to local environments, including pollution of groundwater, biodiversity loss, and land degradation.²

WHY CHOOSE SAFE AND RECYCLED OR RENEWABLE INPUTS?

- Recycled: in theory, metals can be recycled indefinitely – which means that rather than relying on mining virgin materials, metals can instead be used over and over again, saving on energy, water and minimising environmental degradation.³

1 United Nations Environment Programme (2013). Environmental risks and challenges of anthropogenic metals flows and cycles - Summary
2 Ibid.
3 United Nations Environment Programme (2011). Recycling rates of metals: a status report.



CERTIFICATIONS

ASOS accepts recycled metals certified to:

- The Recycled Claim Standard (RCS)
- The Recycled Claim Standard Blended
- The Global Recycled Standard (GRS)

EXAMPLES

Our ASOS design recycled jewellery is made using post-consumer metals from different industries. The castings are made from recycled zinc from the accessories & clothing industry such as handbag hardware & charms, clothing decoration and jewellery components. The recycled steel and brass are scraps and offcuts from the sheet metals industry.



Glass (accessories, trims)

WHAT IS IT?

Glass is a material formed by cooling molten substances (usually containing a high percentage of silica) quickly enough to prevent visible crystallisation.¹ Glass is often found on garments and accessories in many decorative forms, and incorporated into embroidery and jewellery, for example as beading.²

WHAT IMPACTS DOES CONVENTIONAL GLASS HAVE?

- ⚡ *High energy use*
- 🔄 *Greenhouse gas emissions*

Primary (virgin) glass is produced using extremely high temperatures to melt the base substances, requiring significant energy. The process generates greenhouse gas emissions such as nitrous oxide and carbon dioxide, which contribute to climate change.³

WHY CHOOSE SAFE AND RECYCLED OR RENEWABLE INPUTS?

- Recycled: Glass can go through the reclaimed process an indefinite number of times, and glass recycling is widely available. Recycled glass – known as ‘cullet’ – can be made from both pre-consumer waste (such as process residues) and post-consumer waste (such as discarded bottles or other glass products),⁴ but post-consumer waste is the preferred option as it closes the consumer-to-industry loop.



CERTIFICATIONS

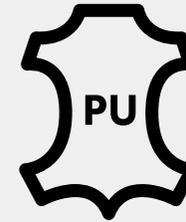
ASOS accepts recycled glass certified to:

- The Recycled Claim Standard (RCS)
- The Recycled Claim Standard Blended
- The Global Recycled Standard (GRS)



1 Joint Research Centre of the European Commission (2013). Best Available Techniques (BAT) Reference Document for the Manufacture of Glass. Luxembourg: Publications Office of the European Union.
2 Janeckova, M. (2019). Designing and Making Glass Jewellery. Ramsbury, UK: The Crowood Press Ltd.
3 Joint Research Centre of the European Commission (2013). Best Available Techniques (BAT) Reference Document for the Manufacture of Glass. Luxembourg: Publications Office of the European Union.
4 Ibid.

Other materials



Other materials commonly used within the fashion industry are PU and acrylic. Both materials are not classified for use within ASOS circular design products, as they can be difficult to recycle and do not come from a renewable resource. This section will cover the environmental impact of both materials and offer alternatives that can be used when designing products that typically use these materials.

WHAT IS IT?

Polyurethane (PU) is a synthetic fibre usually made from petrochemicals.¹ PU is used to create elastane fibres, fabric coatings, and thermoplastic polyurethane (TPU). Depending on how it is produced, PU's physical properties include elasticity, durability, ease of moulding and shine. PU is often used as a leather-like substitute for products including footwear and accessories.²

WHAT IMPACTS DOES CONVENTIONAL PU HAVE?

-  Resource depletion
-  Plastic pollution
-  Not currently recyclable

Conventional PU, like other synthetic fibres, is derived from non-renewable petroleum and thus contributes to the depletion of natural resources and greenhouse gas emissions. As a non-biodegradable fibre, PU also creates microfibre pollution.³

WHY CHOOSE SAFE AND RECYCLED OR RENEWABLE INPUTS?

- Recycled: conventional PU is not yet recycled. This may change in future – some facilities are able to recycle TPU.
- Renewable: new bio-based alternatives to PU are made from renewable feedstocks such as fish oil.⁴ However, these technologies are still developing. Innovative fibres may offer an alternative.

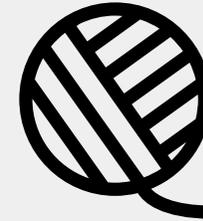


1 Tobler-Rohr, M. (2011). Handbook of Sustainable Textile Production. Cambridge: Woodhead Publishing Limited.
2 American Chemistry. (n.d.) Introduction to Polyurethanes: Polyurethane for Apparel.
3 Rev, D., (Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.
4 American Chemical Society (2021). Making cleaner, greener plastics from waste fish parts.

Other materials

WHAT IS IT?

Acrylic yarn is a type of synthetic fibre usually made from non-renewable petroleum, often chosen for its ability to mimic other fibres like wool or cotton. It is created by reacting acrylonitrile with process chemicals, then solvent spun, washed in hot water, immersed in an acid bath, and dried.¹



WHAT IMPACTS DOES CONVENTIONAL ACRYLIC HAVE?

-  *High energy use*
-  *Resource depletion*
-  *Plastic pollution*
-  *Not currently recyclable*

As with other synthetic fibres, conventional acrylic is made from petrochemical feedstocks which deplete non-renewable resources.² Compared to polyester, the production of acrylic requires approximately 30% more energy and significantly more water.³ Acrylic is non-biodegradable, which means that the fibres it sheds contribute to microplastic pollution.⁴

WHY CHOOSE SAFE AND RECYCLED OR RENEWABLE INPUTS?

Recycled acrylic is possible through mechanical fibre recycling and yarn recycling (see Chapter 5 for more details), but these face challenges with scaling and availability. The next-best solution is to replace fibres with other substitutes that have similar physical properties, such as wool,⁵ recycled polyester, or cotton.

- Renewable: Choose organic wool or renewable cotton instead of acrylic.
- Recycled: Choose recycled polyester instead of acrylic.

ALTERNATIVES

- The Responsible Wool Standard (RWS)
- Recycled wool
- Recycled polyester
- Organic cotton
- The Recycled Claim Standard (RCS)
- The Recycled Claim Standard Blended
- The Global Recycled Standard (GRS)



¹ Fletcher, K. (2014). Sustainable Fashion & Textiles: Design Journeys. Abingdon: Routledge.

² Ibid.

³ Turley, D.B., Copeland, J.E., Horne, M., Blackburn, R.S., Stott, E., Laybourn, S.R., Harwood, J. and Hughes, J.K. (2009). The Role and Business Case for Existing and Emerging Fibres in Sustainable Clothing: Final Report to the Department for Environment, Food and Rural Affairs (Defra), London: Defra.

⁴ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.

⁵ Fletcher, K. (2014). Sustainable Fashion & Textiles: Design Journeys. Abingdon: Routledge.

Material Choices & the Circular Design Strategies

In this section, we'll go a level deeper to apply these material choices to our nine circular design strategies. We'll explore how these choices can work in practice and explain how design strategies and material choice influence and inform each other.

MINIMISED WASTE

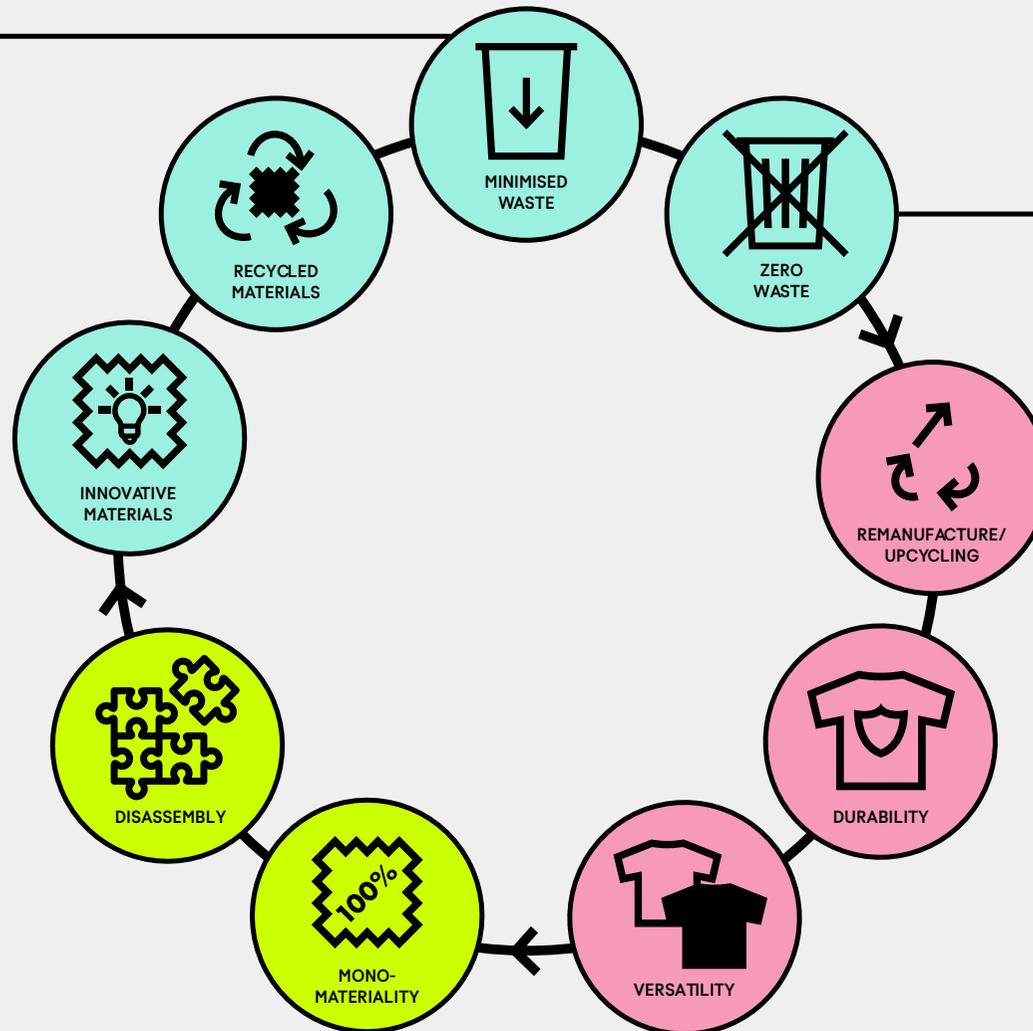
This strategy helps to reduce the resources needed to make an item, increasing efficiency through material use and/or processes.

- How will the lay plan impact the material you select? Do you need a specific fabric width or yardage to make your minimised waste marker work?
- What kind of materials or yarns will be able to go through minimised waste processes? For example, what material base would best work for sublimation printing? Which denim washes are better suited for laser distressing?
- Are your material and design suited for 3D printing or modelling?
- Can you select a material that doesn't need any additional processes?
- Can you select a material dyed with low-impact chemicals or natural dyes?

ZERO WASTE

The properties of the material you select are likely to have an impact on the final look of your design. Some materials are better suited than others – for example a vegan leather (which often comes on a roll) can be used for a zero waste product, but a leather hide can't because every hide is different and will likely create offcuts.

- Is your material feasible for zero waste patterns? Can you use every single bit of the material in your design?
- Will you need to follow the grain of the fabric for your design?
- How will stretch impact pattern and fit?
- How will prints, checks or material patterns look in the final product?
- Can you select a material first, and develop a zero waste pattern based on the material width? Or will you develop the pattern first, and find a material that fits the width your pattern requires?
- If you're manufacturing more than one size at a time, can you order or buy your material after you've finished the final pattern and size ratio?



Material Choices & the Circular Design Strategies

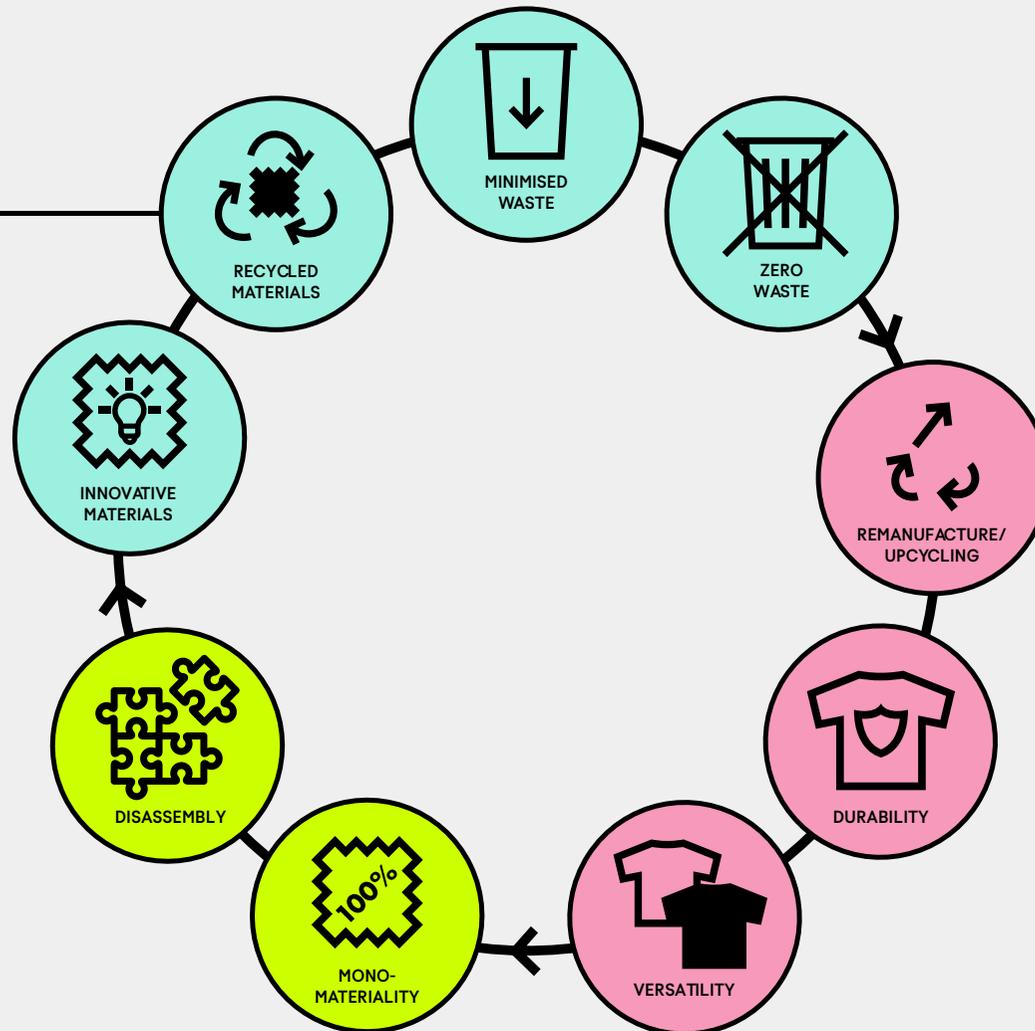
In this section, we'll go a level deeper to apply these material choices to our nine circular design strategies. We'll explore how these choices can work in practice and explain how design strategies and material choice influence and inform each other.

RECYCLED MATERIALS

One of the simplest ways to improve the circularity of your design is to use recycled materials. This is a great step for two reasons: to encourage the uptake of recycled materials, and to strive to reduce the overall environmental impact of your product.

- What recycled options are already available to you? What's the percentage of recycled content in them?
- Can you look for a recycled material and use this to drive your design (rather than designing a product and trying to find a recycled material to suit it)?
- Can you ask your fabric supplier to source more recycled options for you?
- Is the material certified by an industry-accepted sustainability standard? As a starting point, you can check out the list of our certification partners.

Using recycled inputs doesn't mean your product is automatically recyclable. If you want to learn more about recyclability, check out mono-materiality and disassembly in Chapter 3.



REMANUFACTURE/UPCYCLING

This strategy can help to find a creative new use for fabrics and inputs that would otherwise be wasted.

Sourcing:

- Can you look for second-hand fabrics, for example at charity shops or online? You could even find a use for unusual materials like curtains or upholstery fabrics.
- Can you partner with a fashion business to upcycle their deadstock or liability materials (for example apparel, fabrics, trims or other materials)? Or look at your own deadstock or liability and rework this?

Designing:

- Let the materials you've sourced drive the design. How can you give them a new lease of life by re-dyeing, re-finishing, or embellishing? Can you cut a new piece from these existing materials?
- Check out Chapter 3 for further tips on this process.

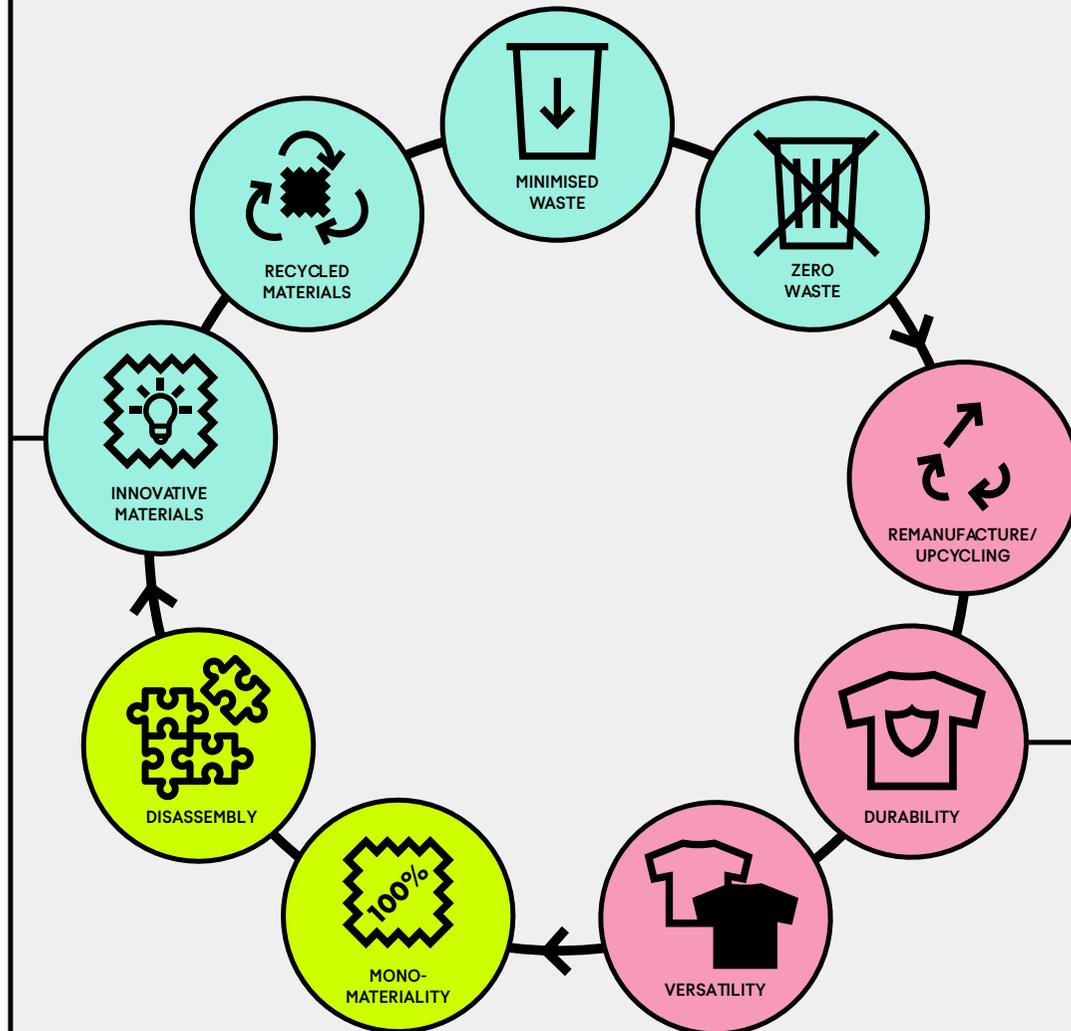
Material Choices & the Circular Design Strategies

In this section, we'll go a level deeper to apply these material choices to our nine circular design strategies. We'll explore how these choices can work in practice and explain how design strategies and material choice influence and inform each other.

INNOVATIVE MATERIALS

If you want to go a step further, look at sourcing innovative materials for your product. These options use innovative approaches to produce recycled and renewable materials.

- Check out the list in Chapter 3 for suggested innovative materials. Are any of these available to you? Are any of the manufacturers local to your area? Could you collaborate directly with them?
- Can you select an innovative material first, and let this drive the design – rather than designing a product first and trying to source a material to meet specific requirements?



DURABILITY

This strategy looks at creating long-lasting designs, and material choice can make a significant impact on the physical longevity of your design.

- Would you benefit from selecting synthetics like polyester and nylon? These are durable, easy to care for, and hold their colours over time.¹ That makes them a good choice for core products and styles designed with longevity in mind, but they need to be safe and recycled or sourced from renewable feedstocks to be a circular design.
- Can you select a more durable natural fibre such as cotton, wool and hemp?² These all come from renewable sources, and some are also available as recycled materials.
- Can you test samples before buying the material? How do they respond to rubbing, washing, pulling or snagging?
- Can you select stronger weaves, such as ripstop or twill weaves?
- Can you use stronger knit structures, such as cable or linen stitching?
- Can you select colours or prints that won't go out of fashion? Will a classic palette or style help your product to stay in use longer than a trend-driven option?

¹ Rex, D., (Okcabol, S., and Roos, S. (2019). Possible sustainable fibers on the market and their technical properties: The Fiber Bible Part 1. MISTRA Future Fashion.
² Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Cotton; Hemp; Wool.

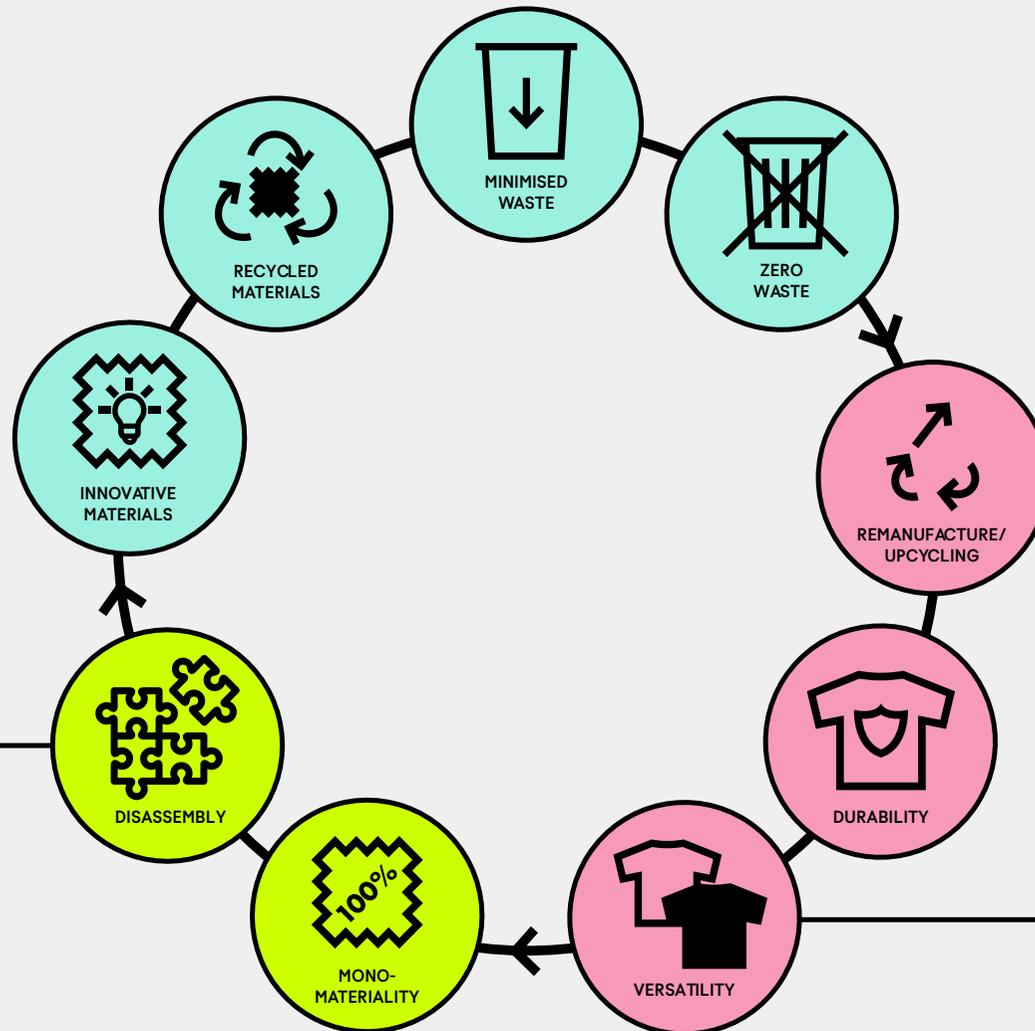
Material Choices & the Circular Design Strategies

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DISASSEMBLY

For designs that aren't 100% mono-material, this strategy will prove useful. Your material choice – especially trims – can help with disassembly before recycling.

- How simple or difficult is it to detach your trims (e.g. zips, buttons, snaps, rivets)?
- If difficult, can you switch them for easier ones?
- Can you switch them for a matching fibre alternative – like bar tacks instead of rivets, or a self-tie belt?
- Are any internal fabrics and components made from a different fibre to your main material? Can these easily be removed, or could you switch them for a matching fibre alternative?



VERSATILITY

This strategy creates designs for more than one wearer, or more than one function. Your material choice can help contribute to its versatility.

- Can you give your end user the opportunity to choose their materials too? For example, can you give them the option to switch watch straps, glasses temples or jewellery details? Can they remove or switch components like bag straps or inner pockets? How will this help build a stronger relationship with the product?
- Can you use two-sided, bonded or contrasting materials to create a reversible style?
- Are classic colours and fabrics (rather than trend-driven options) better for your versatile design?
- How can you select your materials so they're suited for more than one wearer or more than one customer?

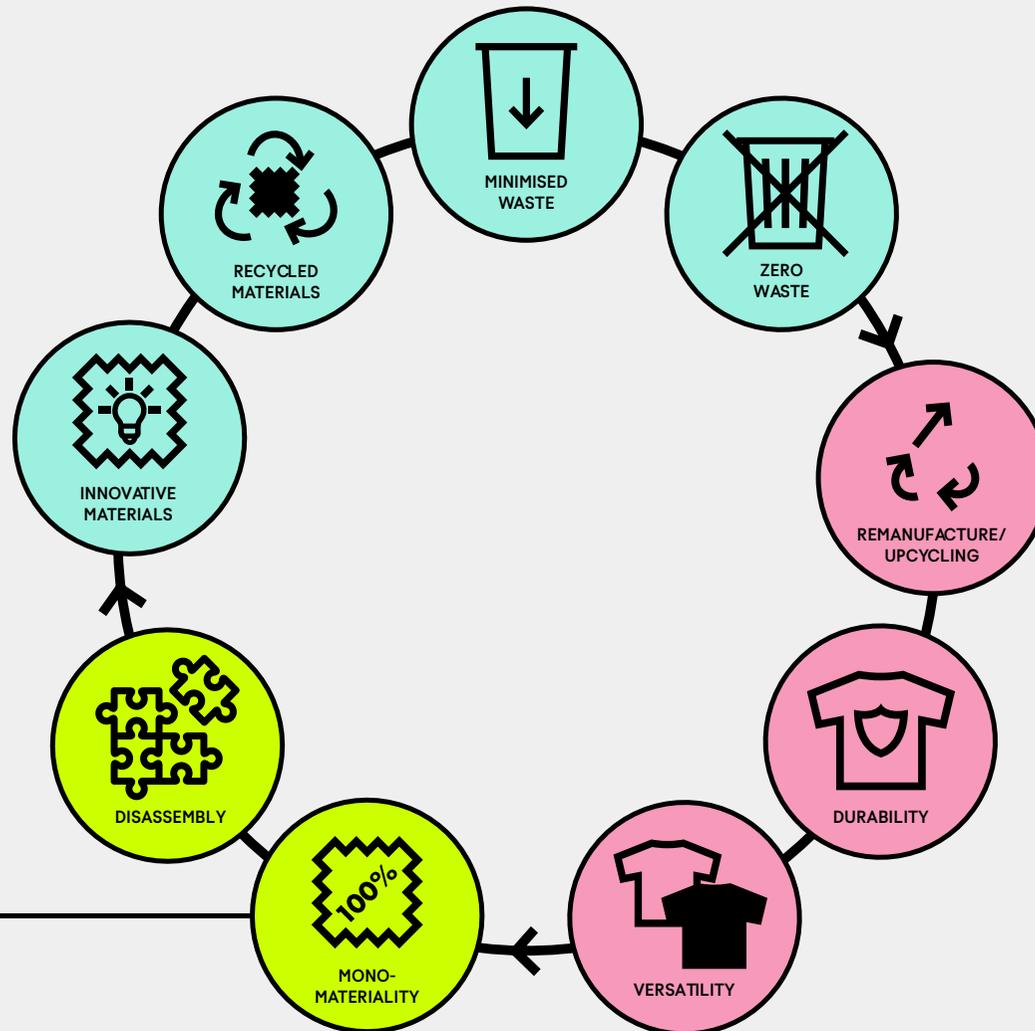
Material Choices & the Circular Design Strategies

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MONO-MATERIALITY

As covered in Chapter 3, materials manufactured from a blend of fibres are currently difficult to recycle¹. Material choice is essential in ensuring your product can actually be recycled.

- Can you select a material that's more commonly recycled? Options include polyester, nylon, wool, leather, down, and cellulose-based materials such as cotton, linen, viscose, lyocell and modal².
- Can you design your product from a single material only?
- How will internal fabrics and components impact your design? Can you choose lining fabrics, components and trims in the same fibre? Can you even remove the lining entirely?



¹ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.

² Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Recyclability.

5.1

Waste & Textile Recycling

Waste & Textile Recycling

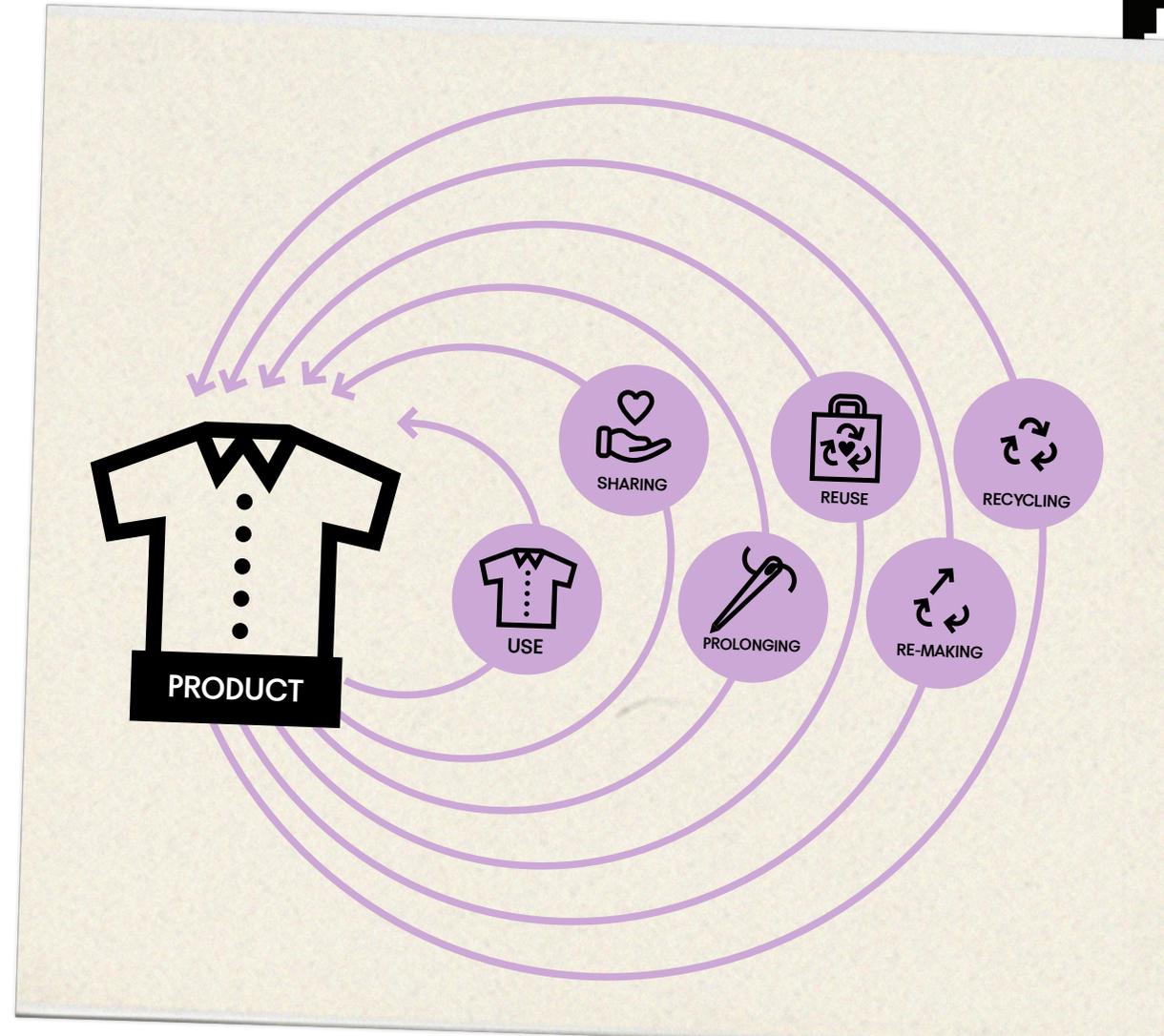
In this chapter we'll introduce the Ellen MacArthur Foundation's 'power of the inner circle' concept, and outline what textile recycling is, why it's important for the circular economy, and how it works.

THE POWER OF THE INNER CIRCLE

As explored in Chapter 4, the fashion industry uses large amounts of resources (water, energy, land, fossil fuels and chemicals) to create products. One of the core principles of the circular economy, 'circulate products and materials', ensures that we retain these resources in the fashion system for as long as we can.¹

One key way of doing this is by using 'the power of the inner circle'. This concept outlines a series of six loops that help to keep materials in the technical cycle (see Chapter 2). The first loop (use) is the most important, as it makes the most out of the resources and creativity that goes into products. The final loop (recycle) should be the last route before the materials are turned into something new. To help preserve the materials at their highest value, materials should travel around the inner loops for as long as possible. Or, as the Ellen MacArthur Foundation outlines:

"The tighter the circle, i.e. the less a product has to be changed in reuse, refurbishment and remanufacturing and the faster it returns to use, the higher the potential savings on the shares of material, labour, energy and capital still embedded in the product, and the associated externalities (such as greenhouse gas (GHG) emissions, water and toxicity)".²



There are two terms you'll hear when you're sourcing recycled textiles:

PRE-CONSUMER WASTE: waste generated before a product reaches the user, usually from manufacturing or processing, e.g. fabric offcuts from the factory floor.³

POST-CONSUMER WASTE: waste generated after a product has reached its user.⁴ This includes waste from households, businesses or commercial facilities, e.g. discarded plastic bottles or discarded clothes.⁵

³ Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Pre-consumer waste. Condé Nast.

⁴ Centre for Sustainable Fashion and Condé Nast (2020). The Sustainable Fashion Glossary: Post-consumer waste. Condé Nast.

⁵ ISO 14021:2016. Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling). <https://www.iso.org/obp/ui/#iso:std:iso:14021:ed-2:v1:en>

¹ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.
² Ellen MacArthur Foundation (2014). Towards the circular economy Vol. 3: Accelerating the scale-up across global supply chains. Ellen MacArthur Foundation. Pg. 16.

What is textile recycling and why is it so important for the circular economy?

Textile recycling helps to divert clothes from landfill by collecting, sorting and processing them and then using the recovered materials. This has two impacts for the circular economy: first, it reduces reliance on non-renewable resources by reusing materials already in existence. Second, it eliminates waste by turning it into feedstock for new material. It plays a vital role in 'closing the loop' on fashion by ensuring products and materials stay in use.

Currently less than 1% of textile waste is recycled back into clothing (fibre-to-fibre recycling, also known as F2F)⁶. Recycling also faces technological and geographical limitations⁷ – not all discarded products are recyclable, and even if they are, there might not be a local recycling facility capable of processing them.

Blended fibres also pose a significant recycling challenge.⁸ Only mono-material products where 98% of the total volume by weight is a single fibre⁹ can be recycled – and that extra 2% leeway should be saved for trims like care labels and threads, rather than used in the fabric itself.

These are significant challenges, but textile recycling is a quickly developing industry with a lot of innovation taking place – from polycotton recycling¹⁰ to tracking materials from production to recycling through QR or RFID technology.¹¹



⁶ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.

⁷ European Parliamentary Research Service (2019). Environmental impact of the textile and clothing industry.

⁸ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.

⁹ Ellen MacArthur Foundation (2021). The Jeans Redesign Guidelines. Ellen MacArthur Foundation.

¹⁰ Warm Again (n.d.) The Solution.

¹¹ Circular.fashion (n.d.) Circularity ID.

Use

Keeping clothes in circulation for longer is one of the most effective actions we can take to lower our environmental impact.¹ The 'use' loop makes the most out of everything that goes into our clothes by keeping them in use, in their original form, for as long as possible. Circular business models can play a key role here. Brands can find new opportunities for revenue through rental, repair and resale, while encouraging clothing to remain in use. For more detail, read the 'circular business models' section in Chapter 2.

The two design strategies that can best support products staying in the 'use' loop are Durability and Versatility. They aim to create designs that can be used for longer, used more, and used in different ways.

Designer considerations:

- Will your design be able to physically withstand long-term wear and tear? Will it be able to last across multiple owners? How many years do you think it will last?
- Can you develop a design that can be updated or customised with different components, made to fulfil different functions, or made to adapt as the wearer changes their size or style?
- Many products are discarded because they're out of date, or no longer have value for the wearer. How can you design your product to avoid this?



Sharing

The 'sharing' loop is about extending the use of a design by sharing it among different wearers. This could be done, for example, through sharing between individuals or through circular business models like rental or resale services.

The two design strategies that can best support products staying in the 'sharing' loop are Durability and Versatility. These aim to create designs that can withstand and/or adapt for different wearers.

Designer considerations:

- Will your design be able to last across multiple owners? How can you ensure it withstands long-term wear and tear?
- How can your design be adapted to suit different styles or different sizes? Can you make it adjustable or one-size-fits-most?
- How can your design be developed to suit multiple genders? How will you make it comfortable and fitted to men, women, or nonbinary wearers? How will it change in size as the wearer grows?



¹ Hemkaus, M. (2016). Clothing the Loop: Exploring Design Features of Circular Performance Indicators and their Application among Textile Retailers. Thesis for the fulfillment of the Master of Science in Environmental Management and Policy, Lund University, Sweden.

Prolonging

The 'prolonging' loop looks at ways an existing product can be repaired or customised. The design mostly stays consistent and is maintained through careful care and repair.

The design strategy that can best support products staying in the 'prolonging' loop is Durability. This looks at different ways to encourage wearers to look after their items for example by offering help with repair or customisation.

Designer considerations:

- Which areas of your design will wear out the most quickly? What's the best way to repair it?
- How easily can your design be repaired? Can you offer material patches with the design, or repair tutorials to help with this?
- How can you communicate care messaging to the wearer? How can you help them to look after it? Can you lower the washing temperature on your care labels, or suggest handwashing instead of dry cleaning?
- Can you help the wearer to develop a closer, longer-lasting relationship with their garment by helping them to customise the piece? How can they co-design it with you?



Reuse

The 'reuse' loop looks at ways existing designs can be restyled. The product stays mostly the same but gets a refresh to help keep it desirable and in use.

The design strategy that can best support products staying in the 'reuse' loop is Remanufacture/Upcycling. This looks at ways to update a garment to give it a new lease of life and increase its wearability.

Designer considerations:

- Can you take an existing design (for example second-hand pieces, deadstock, faulty stock or liability) and refresh it with a new finish? Can it be over-dyed or screen-printed with a new graphic?
- Can you hand-paint or embellish the piece? How could you embroider or patchwork onto the piece?
- Are there other techniques you can use to change the look of the piece? Do you want to give it an on-trend update, or update it with a classic style so it can be worn across multiple seasons?



Re-making

The 're-making' loop creates new products out of existing materials, rather than just re-finishing or re-styling.

The design strategy that can best support product staying in the 'reuse' loop is Remanufacture/Upcycling. This strategy looks at ways materials can be reused by upcycling or remanufacturing them into something else.

Designer considerations:

- What existing materials are you able to use to develop new designs? Can you source second-hand garments or fabrics? Can you use deadstock, faulty stock or liability? What about unconventional materials like upholstery or industrial textiles?
- Can you splice or patchwork together different existing products?
- Can you use existing materials on smaller or invisible components (for example on facings, cuffs or linings); visibly (for example on pockets or external panels), or to drive a new design developed with an existing material in mind?¹



Recycling

The 'recycling' loop is the final way of keeping fashion products and materials in the technical cycle, turning waste into a new feedstock. There are different ways to do this based on what kind of fabric, material or fibre a product is made from, which are detailed further in the next section.

It's the most 'external' loop because it requires resources for collection, sorting, transport and processing. Recycling itself has an environmental impact, even though it's using existing materials. That's why we focus on the inner loops first.

The design strategies that can best support products staying in the 'recycling' loop are Mono-materiality and Disassembly. These look to ensure that designs can be recycled at the end of their life.

Designer considerations:

- Are your materials recyclable? (See Chapter 4 for more details). If not, can you switch for recyclable inputs?
- Could you change your current material choice? Is a mono-material a feasible option for the product you're designing?
- Are the trims, linings and components made from the same fibre as your main material? If not, can they be easily removed ready for recycling?

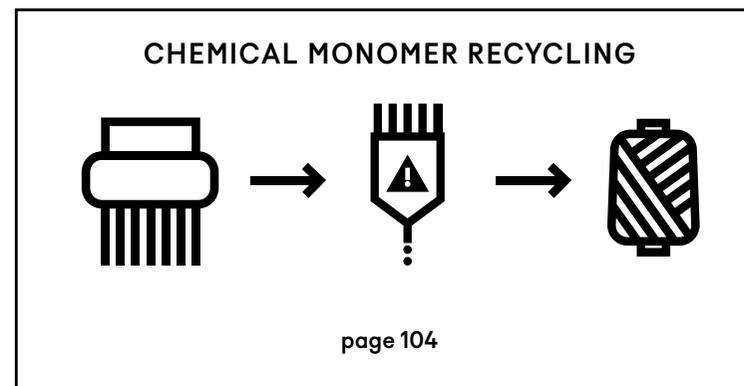
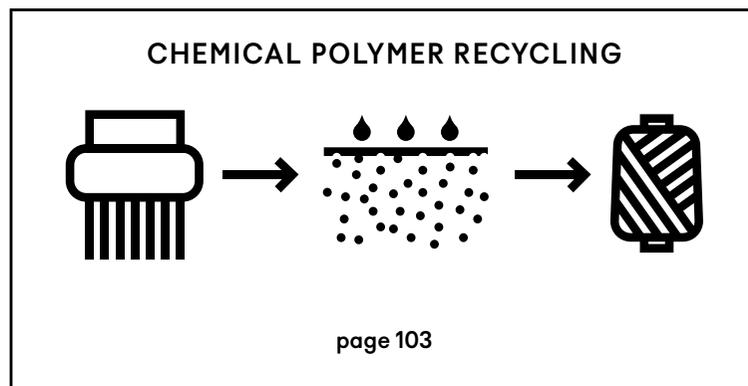
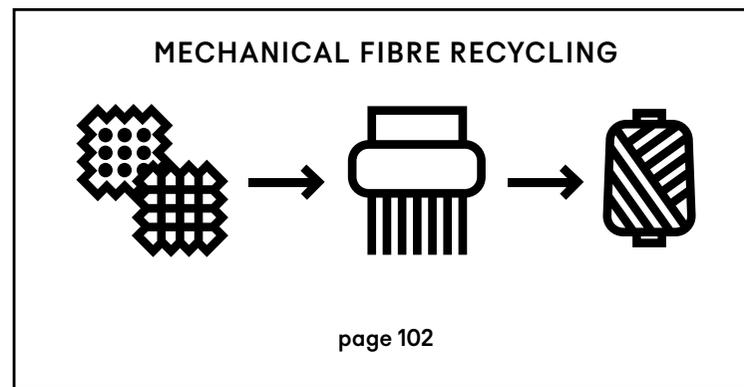
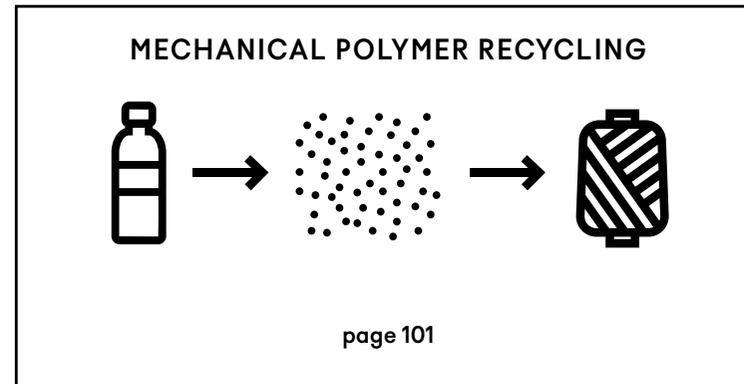
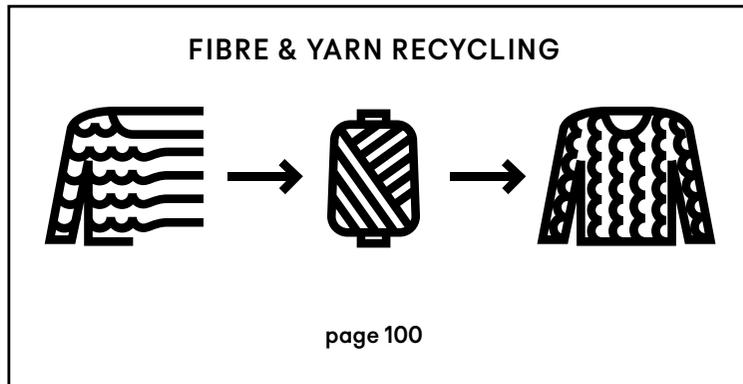


¹ Reverse Resources (2017). The Undiscovered Business Potential of Production Leftovers within Global Fashion Supply Chains: Creating a Digitally Enhanced Circular Economy. Reverse Resources.

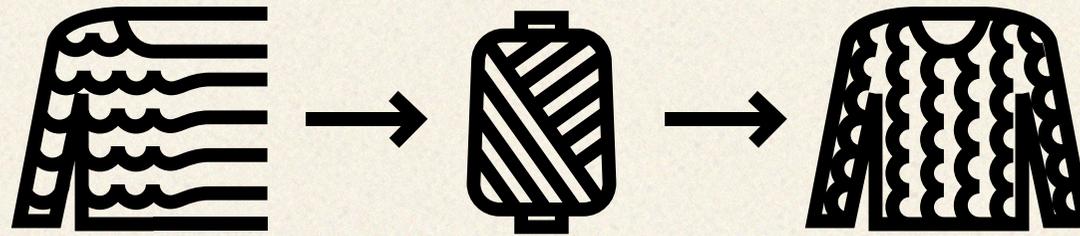
Textile Recycling Technologies

5.2

Chapter 5.2: Textile Recycling Technologies



Yarn Recycling



Existing knitwear is unravelled

Re-wound back into yarn

Made into new knitwear products

HOW DOES IT WORK?

Yarn recycling is a method of reusing yarn waste to create a new material. It involves unravelling a fully-fashioned knit or whole-knit garment by hand, pulling on the yarn to open the stitches, rewinding it and then using it to knit a new product. Yarns can be rescued from garments in any condition because damaged areas can be cut away and re-spun together. This technique has a very limited scope (only garments that have been knitted using a small number of pieces) and requires sorting or separation at a recycling facility.¹

¹ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.

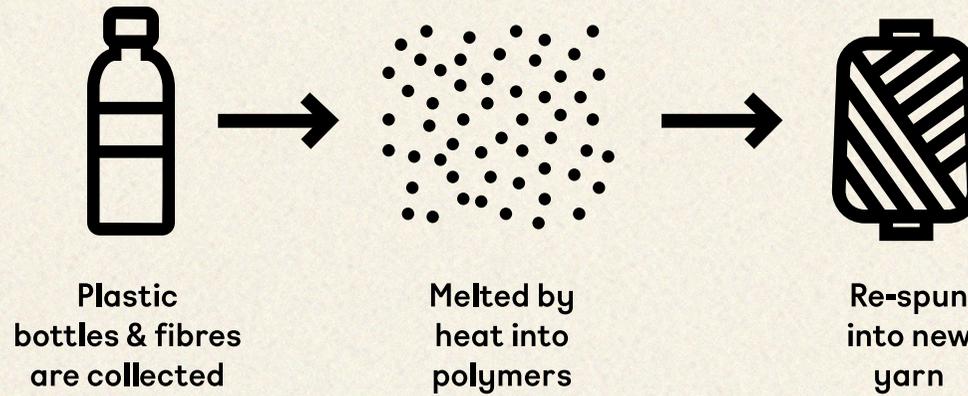
KEY FACTS²

-  No machinery or equipment needed
-  Best for fully-fashioned or whole knits

DESIGNER CONSIDERATIONS TO SUPPORT THIS TYPE OF RECYCLED FIBRE:

- Can you create a fully-fashioned or whole-knit garment that can be unravelled back into a single yarn?

Mechanical Polymer Recycling



HOW DOES IT WORK?

Using heat, synthetic mono-material fibres are melted down into polymers (the repeating chains of molecules that plastics are made from).¹ This melted substance is then re-extruded into a new fibre, which can be spun into a recycled yarn.²

One example of mechanical polymer recycling is rPET (recycled PET) which turns plastic bottles and other PET waste into a textile yarn and is available at scale.

¹ Fletcher, K. (2014). *Sustainable Fashion & Textiles: Design Journeys*. Abingdon: Routledge.
² Ellen MacArthur Foundation (2017). *A New Textiles Economy: Redesigning fashion's future*. Ellen MacArthur Foundation.

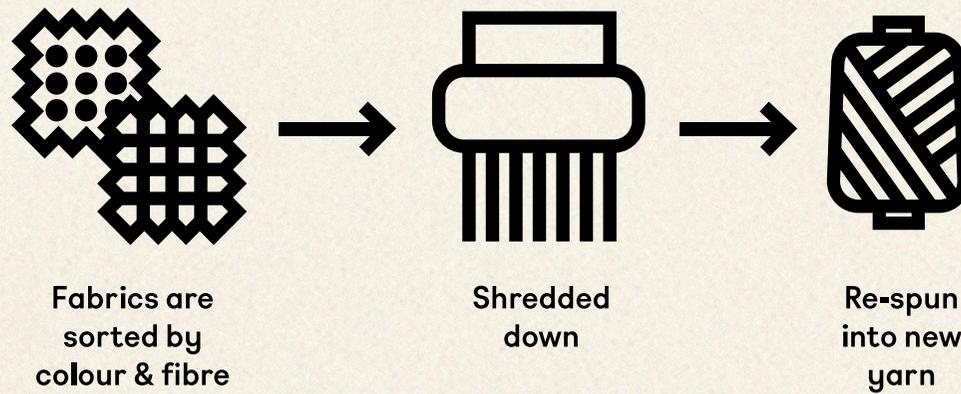
KEY FACTS³

- ⚠️ *No chemical use*
- 🗑️ *Synthetics only; cotton and natural fibres can't be recycled this way*
- 🌀 *If sorted by colour, no bleaching or re-dyeing is needed*
- 🧠 *Hazardous substances can't be filtered and may still be present*
- ⚡ *Requires energy use*

DESIGNER CONSIDERATIONS TO SUPPORT THIS TYPE OF RECYCLED FIBRE:

- Can your design be made from 100% mono-material synthetic fabrics? This recycling type isn't possible for any blends or garments containing multiple materials.
- How will the different elements of your design be disassembled ready for the recycling process? Or is your product made from a single recyclable fibre?
- Can you ensure that no restricted or harmful substances are present in your materials? You may want to select fabrics that have been certified non-toxic (e.g. OEKO-TEX) in order to do this.

Mechanical Fibre Recycling



HOW DOES IT WORK?

Fabrics are sorted by colour and fibre type, shredded, and spun into a new yarn. This is the most basic common way of recycling materials, because fibre sources are mechanically torn into tiny pieces that can easily be re-spun. Synthetics, plant-based and cellulosic fibres,

and animal (protein-based) fibres can be recycled this way. Shredding the fibres significantly weakens them, so fibres that are mechanically recycled are often spun with virgin yarns to retain quality.¹

Recover™ is one example of a supplier providing mechanically recycled fabrics.

1 Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.

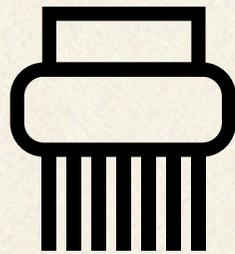
DESIGNER CONSIDERATIONS TO SUPPORT THIS TYPE OF RECYCLED FIBRE:

- Can you use only mono-materials? This will make it easier to identify the final fibre content of any fabric and help with future transparency.
- How will the different elements of your design be disassembled ready for the recycling process? Or is your product made from a single recyclable fibre?
- Can you ensure that no restricted or harmful substances are present in your materials so that the recycled fibre is safe and recycled? Selecting fabrics that have been certified non-toxic can help achieve this, for example OKEO-TEX certified.

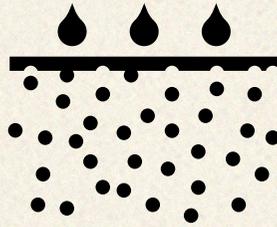
KEY FACTS²

- ✂ Any fibre type
- ⚠ No chemical use
- ☆ Often requires blending with virgin fibre
- 🔄 If sorted by colour, no bleaching or re-dyeing needed
- ☠ Hazardous substances can't be filtered and may still be present

Chemical Polymer Recycling



Used textile is shredded



Dissolved using chemicals



Desired polymers are extracted & re-spun

HOW DOES IT WORK?

Chemical polymer recycling is very similar to the mechanical polymer process, except chemicals (such as solvents or enzymes) are used to break down the fibres instead of heat. The textile is shredded, dissolved using chemicals, and the desired polymer is extracted – which means it's possible to filter out dyes and contaminants (including other fibres). The polymer can then be extruded into a virgin-quality fibre.¹

Chemical polymer recycling for cellulosic rich textile waste is used as feedstock and is already scaled to commercial

level. For example, Lenzing's Refibra™ technology upcycles pre- and post-consumer textile waste and combines it with wood pulp to create lyocell fibres of virgin quality. In the next years, Refibra™ technology will be expanded to viscose and modal fibres.²

Another innovator in the chemical polymer space is Worn Again Technologies, which has developed the technology to recycle pure polyester and polycotton blends. They're working to make this scalable and commercially available in the coming years.

¹ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.
² Lenzing plans to increase its use of REFIBRA™ technology over the next five years. Its five-year vision is to make textile waste recycling as common as paper recycling.

DESIGNER CONSIDERATIONS TO SUPPORT THIS TYPE OF RECYCLED FIBRE:

- Can you use 100% cotton for your design? This will make it easier to recycle using this method.
- How will the different elements of your design be disassembled ready for the recycling process? Or is your product made from 100% cotton, including all components and trims?
- Can you ensure that no restricted or harmful substances are present in your materials? You may want to select fabrics that have been certified non-toxic.

KEY FACTS³

- ☆ *Virgin quality fibre*
- ☠ *Hazardous substances can be filtered out*
- 🗑️ *Dyes can be filtered out*
- ♻️ *Can be applied to both synthetics and cellulose-based textiles*
- ↘ *Re-recycling decreases quality*
- ⚡ *Requires energy and chemical use*



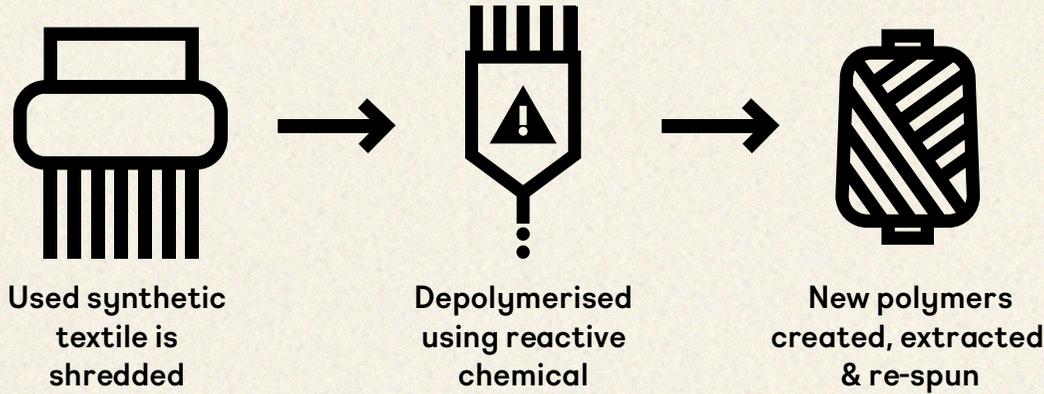
Chemical Monomer Recycling

HOW DOES IT WORK?

Synthetic fibres are depolymerised using a reactive chemical, which means they are converted back into a monomer (a molecule that can be reacted with other monomer molecules to form a 'new' pure polymer chain). This makes it possible to regenerate low-quality or damaged textiles back into high-quality raw compounds.¹

There are commercially available options for both nylon and polyester. For example, ECONYL[®] regenerated nylon is made from pre- and post-consumer nylon waste.

¹ Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning fashion's future. Ellen MacArthur Foundation.



DESIGNER CONSIDERATIONS TO SUPPORT THIS TYPE OF RECYCLED FIBRE:

- Is your design made from 100% nylon or 100% polyester fabrics?
- How will the different elements of your design be disassembled ready for the recycling process? Or is your product made from a single recyclable fibre?

KEY FACTS²

- ☆ *Virgin quality fibre*
- ☠ *Hazardous substances can be filtered out*
- ♻️ *Dyes can be filtered out*
- 🧴 *Synthetics only*
- ⚡ *Requires energy and chemical use*

Final Thoughts



Final Thoughts



Everything in fashion comes from nature: soil, sunshine and human ingenuity are at the heart of all that we wear. This guide is about how we value nature, so that we can all live well.

The only constant is change, but the direction of change depends on what we think is valuable. This guide builds on a long-term partnership between ASOS and Centre for Sustainable Fashion, aiming to change the direction of fashion. The aims are bold and ambitious, it's about valuing nature – our only source of wealth – and making that economically viable and valuable.

We have a good start: nature is the most experienced, most talented designer we can learn from, and ASOS is recognised by suppliers, governments and its customers as a leader in change in fashion. Beyond that, each one of us is a part of nature, so for us to thrive, we must ensure that nature thrives.

Designing and product developing uses skills, including ingenuity and imagination, to improve a situation. That means better fit and great colour combinations, but unless it improves life, it isn't good design.

Fashion is a personal decision that we each make every day. It is also a business that employs around one in six people in the world. Fashion that respects nature and all humanity is something that more and more people are choosing to define themselves. Disrespectful practices are being called out: together we can

put an end to them. It's up to us all to improve the world of fashion.

This guide is about seeing that personal actions and planetary scales are intimately interconnected. It's about creating with a sustainability mindset. This involves learning, experimenting, and sharing ideas within your teams, across teams, and with suppliers and customers. The guide has been co-created with Design, Buying, Merchandising, Technical and Sustainability teams across ASOS, drawing on all our experience and from what customers tell us they expect from ASOS.

We hope that the guide inspires and informs your work. Let us know what you think and what you are doing in response to it.

A handwritten signature in black ink, appearing to read 'Dilys Williams'.

Professor Dilys Williams
Director, Centre for Sustainable Fashion

ASOS and CSF would like to offer their sincere thanks to the brands, suppliers, businesses, creatives and organisations that have agreed to be featured in this report.

With thanks to our pattern cutters Steve Rousou and George Mocanu and designer Sean Muntaner for the creative work on this guide.

Be NET ZERO
Be MORE Circular
Be Transparent
Be Diverse

asos

