one A
engineering experts

A FIBER THAT FIXES THE FUTURE

GOING ▶▶▶▶ GREEN

Going Green

The textile industry plays a major role on the road to a circular economy due to its size alone. In order to meet United Nations Sustainable Development Goals (SDGs), it must set an action to reduce the negative impact on the environment, which has not escaped the attention of legislators, investors and consumers.

In fact, consumer demand for sustainable fashion is rising sharply. More than two-thirds of global fashion consumers say they care about the environment. However, only a small percentage currently claim to consistently make conscious purchasing decisions in order to reduce their environmental impact. Nevertheless, awareness is increasing. The number of such consumers is expected to exceed 50% in the near future. So, fashion brands need to react to the new demand and make sustainability a big part of their strategy.

"Our work is not just about engineering fibers, it's about engineering a sustainable future."

STEFAN ZIKELI,
FOUNDER AND CEO ONE-A

Why We Have to Act Now

The environmental impact of products and their materials is gaining increasingly critical attention. According to research by management consultancy BCG, more than 35 new regulations are expected worldwide in the next four years to enable a more sustainable future. That said, there are further key drivers forcing the industry in a greener direction.

- **Sustainability and environmental awareness:** The demand for sustainable and eco-friendly materials and manufacturing processes will rise as consumers and businesses place greater emphasis on environmental responsibility.
- **Circular economy:** Reducing waste and optimizing the use of resources through recycling, upcycling and closed-loop products.
- **Transparency and Traceability:** Consumers are increasingly demanding more information about the origin and manufacturing conditions of textiles.
- **Health and well-being:** Allergy-friendly materials, antimicrobial surfaces and other health-promoting effects will be in higher demand.
- **New materials and innovations:** The development and integration of new materials, such as man-made cellulosic fibers, will expand the properties and applications of textiles.
- **Social responsibility:** Fair working conditions, workplaces that protect health and ethical standards throughout the supply chain are becoming more and more important to consumers as well as businesses.

Need for Change

In today's rapidly evolving world, sustainability is more than just a trend — it's a necessity. The textile and fashion industry is currently the second most polluting industry in the world, responsible for a quarter of global CO_2 emissions.

The apparel industry is responsible for

"At one-A, we believe in the power of technology to transform industries."

MICHAEL LONGIN,
FOUNDER AND CTO ONE-A

8% of the world's greenhouse gas emissions

20% of global wastewater

500,000 tons
of microfibers per year end up in the marine environment.
(20 to 35% of all primary source microplastics in the marine environment)

60% of all new clothing materials are made from synthetic fibers.

87% of materials used to make clothing end-up in a landfill.

Let's Get Started!

one-A believes in creating a future where eco-friendly materials are the norm.

At one-A, we envision a world where textiles are produced in harmony with nature. Our vision is quite simple: to lead the industry with green practices and innovative technologies that drastically reduce the environmental impact of fiber manufacturing.

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DID YOU KNOW ...

85% of leading fashion brands *have committed to* ***decarbonization targets*** *for their supply chain by 2050.*

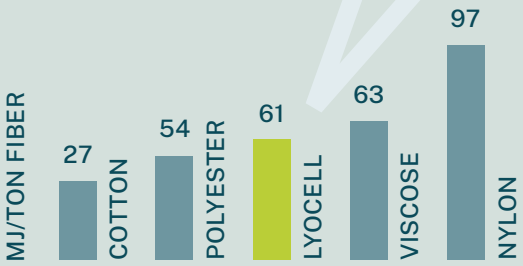
WATCH YOUR IMPACT!

If we want to save our planet, we should keep in mind which materials we are using for apparel. The regulatory push for the use of lower-impact materials will increase demand for these materials. It's important for brands to secure their supply chains on preferred raw materials, especially sustainable fibers.

Many different factors such as land-, water-, and energy consumption have an impact on the life cycle assessment of a material. A comparison:

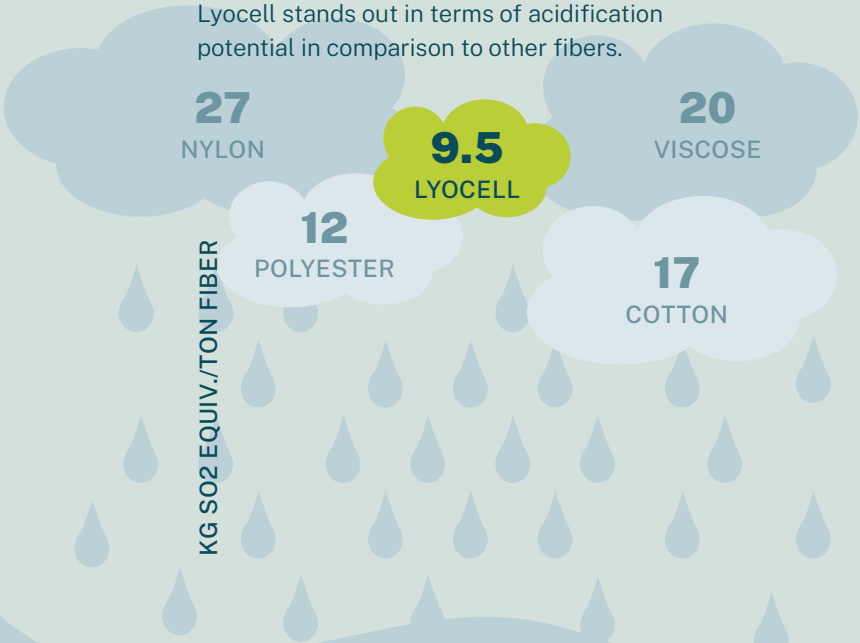
Energy Consumption

Fiber manufacturing is energy-intensive in most cases. Renewable energy-sources could be a gamechanger.



Acidification Potential

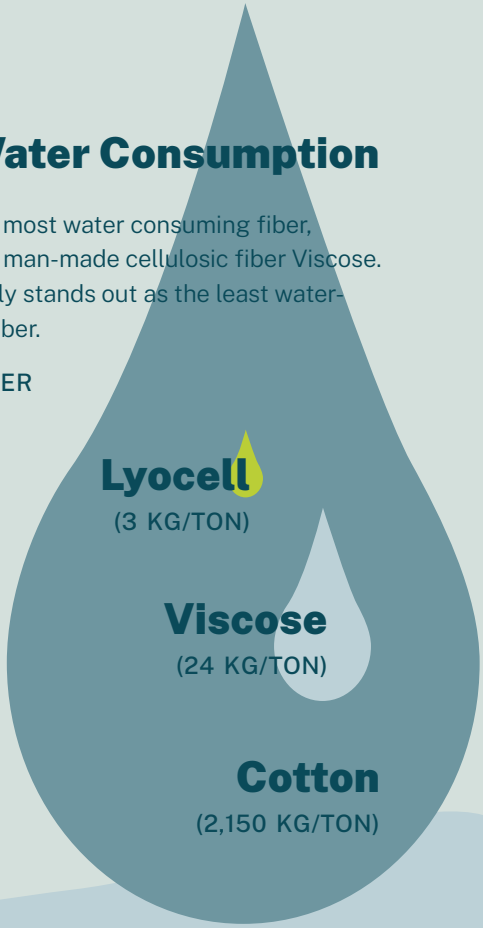
Lyocell stands out in terms of acidification potential in comparison to other fibers.



Blue Water Consumption

Cotton is the most water consuming fiber, compared to man-made cellulosic fiber Viscose. Lyocell clearly stands out as the least water-consuming fiber.

KG/TON FIBER



Source: Life Cycle Assessment of the one-A Lyocell Process by PE CEE Nachhaltigkeitsberatung & Software Vertriebs GmbH

How Eco-Friendly Are Fibers?

Synthetic fibers like Polyester or Nylon can only be sustainable if they are made from waste material. Plant-based fibers like Cotton have to be organic to meet sustainability goals and animal-based fibers like wool, silk or leather score points with ecological balance, if they are produced in a responsible manner. Eco-friendly fibers meet at least half of the following criteria:

COTTON

Cotton is a natural fiber but far away from an environmental friendly and sustainable product. It mainly grows in dry regions, but needs lots of water to grow. 99.3% of Cotton grown globally is not organic. 75% of the Cotton is genetically modified. 10% of pesticides and 16% of the insecticides worldwide are used for its cultivation. If Cotton is recycled by using old garments or textile leftovers, it is much more sustainable, but to achieve the same level of quality, it is blended with new Cotton.

POLYESTER

Most garments are made from Polyester, a synthetic fiber made from petroleum. Production of polyester requires a high level of energy and releases harmful toxins into the atmosphere, negatively effecting human health and the ecosystem. It's non-biodegradable and needs up to 200 years to decompose. In contrast, recycled Polyester made from recycled plastic bottles, requires far fewer resources and generates less CO_2.

VISCOSE

This is the most common type of Rayon, a fiber from regenerated cellulose mostly made from eucalyptus trees. This leads to massive deforestation with thousands of hectares of rainforest being cut down yearly. Producing Viscose requires a lot of energy, water and chemicals. Solvents used during this process are very toxic to humans and the environment. On the positive side, it is 100% biodegradable. The sustainable option for replacing regenerated cellulosic fibers like Viscose, Rayon or Cupro is Lyocell.

LYOCELL

Lyocell is produced in a much more eco-friendly manufacturing process than Viscose. A closed-loop system ensures that almost all the chemicals used are recycled. Like Viscose, it is made from eucalyptus and a broad range of different tree types depending on the climate zone. All of these trees are from PEFC certified forests.

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DID YOU KNOW ...

*the **global fiber production has almost doubled** from 2000 to 2021 and is expected to grow to 163 million tons in 2030?*

LYOCELL

A Fiber for a Sustainable Future

The textile industry has a key role to play on the path towards a circular economy due to its sheer size. Lyocell production is considered highly eco-friendly and supports several United Nations Sustainable Development Goals (SDGs).

Unmatched Performance

Lyocell closely resembles Cotton and stands out among man-made fibers due to its superior physical properties, especially when compared to the widely-used, but somewhat inferior Viscose fiber. Textiles made from Lyocell excel in terms of quality and outperform other major textile fibers in various ways:

- **Soft and comfortable:** a luxurious, almost silk-like feel against the skin.
- **Temperature regulating:** absorbs and releases moisture efficiently to keep the end-user cool and dry.
- **Strong and durable:** high tensile strength both dry and wet, ensuring the durability and longevity of textiles.
- **Highly hygienic:** suitable for sensitive skin and medical applications.

Outperforms Cotton, Viscose & Modal in durability, tear resistance, elasticity, dimensional stability, robustness, weather resistance, color fastness, ...

Outperforms Polyester & Nylon in freedom of movement, temperature regulation, skin friendliness, hygiene, antistatic properties, washability, ...

Wood

Hard- and softwoods like eucalyptus, beech and spruce are the basic raw material for Lyocell. This flexibility ensures a stable supply of raw materials, reducing dependency on a single source and promoting environmental sustainability. Furthermore, the wood required for Lyocell production comes from sustainably managed forests.

Disposal/ Compost

When disposed of properly, Lyocell will break down naturally without releasing harmful substances into the environment, unlike synthetic fibers that can take hundreds of years to decompose. Made from renewable resources, it is fully biodegradable. The high durability of Lyocell textiles reduces waste by extending the lifespan of clothing.

Pulp

Wood is chipped and then processed to form a pulp with a high α-cellulose content and low levels of impurities. In the Lyocell plant, the pulp can be treated in different ways depending on its properties and final product application.

Direct Dissolution/ Lyocell Fiber

Lyocell's production process uses a non-toxic solvent, which makes manufacturing safe and worker-friendly. The solvent used to dissolve the cellulose is almost entirely recovered (>99.5%) and recycled back into the production process, minimizing chemical waste and environmental pollution. Water used in the process is also recycled, reducing the overall water consumption.

Textile Chain

Brands and companies that focus on sustainable fibers often have more transparent supply chains, which can lead to fairer working conditions for those involved in the production of textiles.

End-user

The need for eco-friendly, sustainable and recyclable products is rapidly increasing – especially in the textile chain.

Close the Loop!

The closed-loop system significantly reduces Lyocell's environmental impact. The fiber contributes to a more sustainable textile industry through it's production process, it's eco-friendliness and minimal environmental impacts.

"Lyocell is the fiber of choice when aiming to transform the textile industry."

STEFAN R. ZIKELI, FOUNDER AND CEO ONE-A

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DID YOU KNOW ...

that Lyocell is also used in ***medical, hygiene and personal care, technical textiles, and packaging?***

MARKET SITUATION

Number of pieces of sustainability legislation within each region

▶ **9** NORTH AND SOUTH AMERICA

A Growing Market

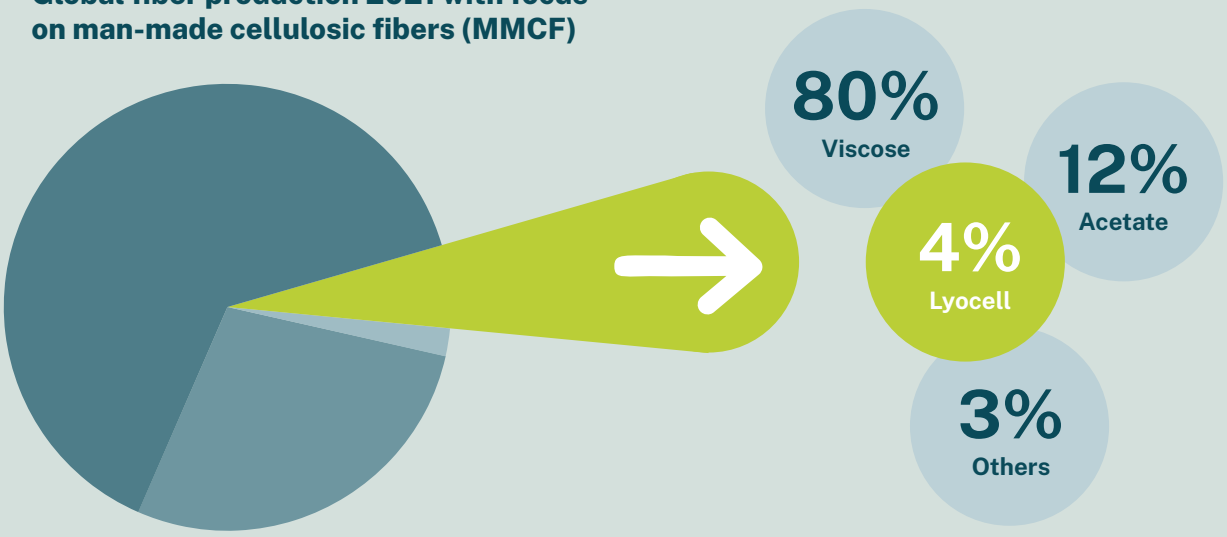
Population and per capita income are rising, especially in Asia Pacific. This has not only fueled the growth of the textile and apparel industry, but also the demand for textiles. Along with ongoing innovations which lead to more sustainable and eco-friendly textiles, growing awareness of the health benefits and increasing demand for performance textiles are the major market drivers for Lyocell. Sportswear and fast fashion brands are discovering the fiber as a sustainable alternative to Polyester, Nylon or Cotton. However, synthetic fibers still dominate the global fiber market.

What to Expect?

In the next four years, fashion and apparel brands will face more than 30 significant pieces of new legislation around the world. They affect large markets and bring significant changes to the legal situation concerning import restrictions, product design guidelines, labeling requirements and much more.

This is because many have committed themselves to sustainability in the past, but have made limited progress in the transition towards a sustainable future. The new legal regulations (e.g. in Europe) promote sustainable fibers and now oblige companies to act.*

Global fiber production 2021 with focus on man-made cellulosic fibers (MMCF)



- **Synthetic fibers 64%** 94.7 million tons
- **Plant fibers 28%** 41.4 million tons
- **Man-made cellulosic fibers 6%** 8.9 million tons
- **Animal fibers 2%** 3 million tons

Lyocell's closed-loop production process and eco-friendly characteristics represent only 4% of MMCFs global production or less than 1% of global fiber production in 2021. Lyocell therefore is a niche product but offers a huge catch-up potential. Many customers are still not aware of the extraordinary characteristics of Lyocell.

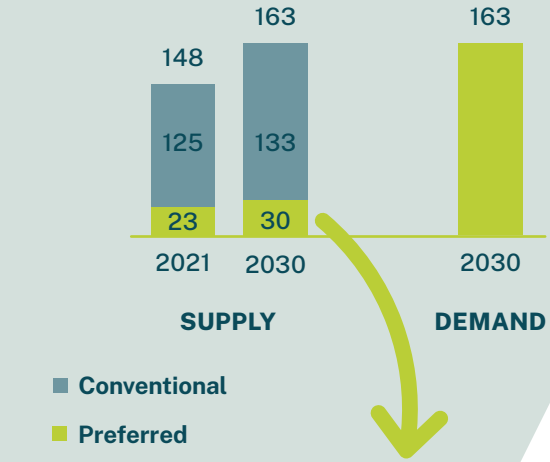
Mind the Gap!

Raw materials can account for up to two-thirds of a fashion and apparel brand's climate impact. Securing access to sustainable materials is essential, as demand for low-climate-impact ("preferred") raw materials is expected to increase significantly, possibly by as much as 133 million tons by 2030.

Currently, the supply of preferred raw materials constitutes only about 19% of total global production. Brands must act now to secure resources and business models. The solution is to invest in the supply of preferred raw materials to ensure climate targets.

Projected supply and demand of global textile materials across all sectors*

(millions of tons)



~19% Production volume of preferred raw materials in 2030

Paving the Way to a Sustainable Future

What companies can do to implement a sustainable material strategy and handle the expected material gap:*

- Invest in and embed full traceability to de-risk supply chains and fully understand the impact of the materials.
- Use a science-based approach to strengthen decision making and satisfy stakeholders.
- Diversify the materials portfolio to spread risks and future-proof operations.
- Build a business case that leads to a triple win – for brands, suppliers, and for nature.
- Supply chain relationships will make or break brands going forward. Strengthen them diligently.
- Ensure that knowledge, tools and incentives are engrained throughout the company.

* BCG + Textile Exchange + Quantis: Sustainable Raw Materials will dive profitability for Fashion and Apparel Brands

"Due to its superior qualities, Lyocell is the sustainable alternative to Polyester, Nylon and Cotton."

MICHAEL LONGIN, FOUNDER AND CTO ONE-A

LET'S FIX IT TOGETHER

With the rising world population and the corresponding increase in production of textiles, driven especially by fast fashion, the adoption of sustainable materials and technologies together with a more sustainable mindset of customers is indispensable.

one-A provides the knowledge and the technology, which enables a more sustainable textile industry.

We are a leading engineering company specializing in sustainable fiber technology, particularly Lyocell. We engineer advanced, closed-loop production systems that significantly reduce water and chemical waste, positioning one-A at the forefront of the green transition in the textile industry.

"Together, we can achieve a rethink in the textile industry - for the benefit of the environment and sustainable development."

STEFAN ZIKELI,
FOUNDER AND CEO ONE-A

one-A is to revolutionize the textile industry by making sustainable fiber technology accessible and efficient.

We aim to empower our customers with cutting-edge solutions that combine superior quality with eco-friendly practices. Our relentless pursuit of innovation and excellence ensures that (future) Lyocell manufacturers will benefit from the most advanced and reliable solutions.

OFFICES IN CHINA

We have two offices in China to optimize global operations, ensuring efficient management and market reach.

The **Shanghai** office plays a pivotal role in market penetration and is the main point of contact for Chinese customers, facilitating on-time deliveries and transportation of components.

The **Zhengzhou** office operates as a joint venture sales office, furthering one-A's presence in the Chinese market.

European Quality and Standards for the World

With a clear focus on research and development and a strong commitment to engineering excellence, one-A remains a pace-setter in its industry. one-A specializes in delivering state-of-the-art Lyocell systems, innovative micro-reaction technology, and comprehensive engineering services.

Patents in Key Technologies

one-A and its affiliate companies hold a robust portfolio of patents that underscore its commitment to innovation and technological advancement. These patents cover critical aspects of Lyocell production and micro-reaction technology in multiple relevant jurisdictions, safeguarding the proprietary methods and ensuring a competitive edge in the market.

Groundbreaking R&D

one-A operates its own state-of-the-art laboratory and pilot plant in Austria, which serve as hubs for continuous research and development. Additionally, one-A collaborates with cross-functional teams, prestigious research institutes, and academic institutions like Fraunhofer Institute, Penn State University, and Vienna Technical University to further enhance its technological capabilities.

HEADQUARTERS IN AUSTRIA

Located in Regau, Upper Austria, our headquarters lie in a region that is known for its strong tradition in engineering and technical education. The Regau facility functions as the central hub for research, development, and administration, including our own pilot plant.

DID YOU KNOW ...

*that approximately **150,000 tons of fiber** are produced annually from plants engineered by one-A?*

"Around a fifth of all Lyocell fibers worldwide are produced in plants engineered by one-A."

MICHAEL LONGIN,
FOUNDER AND CTO ONE-A

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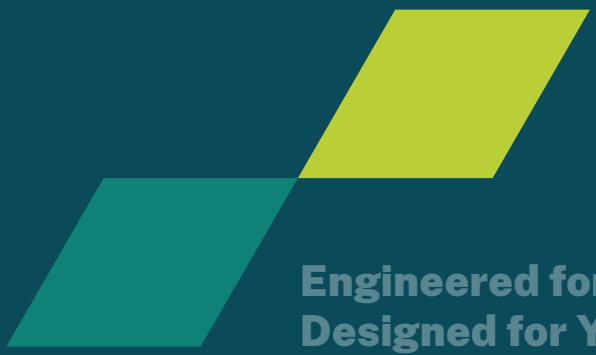

Engineered for the Planet,
Designed for You

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