TENCEL™ Modal

TENCEL™ Modal are cellulosic fibers derived from the **natural raw material wood**. The cross-section of TENCEL™ Modal fibers and their **tenacity favor fabric softness**, allowing them to **withstand repeated washing and drying cycles**.

The TENCEL™ Modal production process is based on a **highly resource-efficient technology** with high recovery rates of chemicals. According to Higg MSI, **carbon emissions and water consumption** from TENCEL™ Modal fiber production are **at least 50% lower compared to generic modal fibers.**[1]

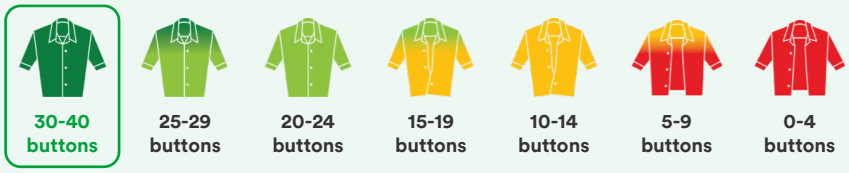
Dedicated to responsible sourcing

TENCEL™ Modal fibers are made from wood, a natural and renewable raw material carefully sourced from responsibly managed forests. Lenzing's fibers are made from dissolving wood pulp which is produced from various wood species (e.g. beech, spruce, eucalyptus, birch, maple, southern pine and acacia). The wood taken from nature is **purposefully balanced with forest growth rates**, to ensure the continued availability of this valuable resource.

The wood used as raw material for all TENCEL™ Modal fibers is sourced from **controlled or certified origins meeting FSC® or PEFC standards**[2], following the stringent guidelines of the Lenzing Wood and Pulp Policy.

Lenzing also promotes conservation solutions to protect ancient and endangered forests. In 2017, Lenzing was the first cellulose fiber producer to complete the verification audit of the CanopyStyle Initiative. In 2023, Lenzing's efforts were again recognized with the **"Dark Green Shirt"**, the best ranking in the **Canopy Hot Button Report**.[3]

CanopyStyle Info Box



The CanopyStyle Initiative is led by environmental not-for-profit Canopy, which is working to protect the world's ancient and endangered forests. This initiative collaborates with brands to implement sourcing policies that ensure ancient and endangered forests do not end up in textiles. CanopyStyle includes 500+ brand partners committed to forest conservation.

EU Ecolabel certification for environmental excellence

EU Ecolabel
www.ecolabel.eu

EU Ecolabel : AT/016/001

TENCEL™ Modal fibers are **certified with the widely recognized EU Ecolabel** for textile products.[4] This label is awarded to products that **meet high environmental standards**. Key criteria for evaluation include production processes limiting the usage of substances harmful to human health or the environment, and minimizing key environmental impacts throughout their entire life cycle.

[1] Results based on LCA standards (ISO 14040/44) and available via Higg MSI (Version 3.7)
[2] FSC® (FSC-C041246) or PEFC (PEFC/06-33-92) certification.
[3] Canopy Hot Button Report (https://hotbutton.canopyplanet.org/company/lenzing/)
[4] EU Ecolabel for textile products (license no. AT/016/001)

Tencel™
Feels so right

Enabling versatility in design and function

With their wide range of fiber types and blending options, TENCEL™ Modal fibers offer an almost endless **variety of product designs** and functions for a huge variety of different applications.

	White fibers			Spun dyed fibers		
	TENCEL™ Modal standard	TENCEL™ Modal x Micro	TENCEL™ Modal x Micro Air	TENCEL™ Modal in Black	TENCEL™ Modal in Color**	TENCEL™ Modal x Indigo Color
Best for	Knitted applications with long-lasting softness	Lightweight knitted fabrics	Very lightweight knitted fabrics	Knitted fabrics with mélange effect, and denim applications	Knitted fabrics with mélange effect	Indigo colored knitted and woven fabrics
Applications	• Next-to-skin apparel: underwear, home/ lounge/sleepwear, hosiery • Ready-to-wear: T-shirts • Home textiles: towels, mattresses	• Lightweight apparel with a soft skin sensation • Ready-to-wear: shirts, blouses, scarves • Home textiles: bed linen, towels, mattresses		• Ready-to-wear: sweaters, socks • Home textiles: towels • Denim	• Next-to-skin apparel: underwear • Ready-to-wear: T-shirts, sweaters, hoodies, jogging pants • Workwear and corporate wear	• Knitted apparel next to skin with a denim look • Woven shirts and blouses
Blending partners	All major fibers	Fine cotton and wool types, silk or filaments (polyester, polyamide, cellulosic filaments)	Long staple cotton types, silk, polyamide	All major fibers	All major fibers	All major fibers
Also availabe as	LENZING™ Modal Eco Clean*	LENZING™ Modal Micro Eco Clean*				

TENCEL™ Modal with Micro technology

TENCEL™ Modal fibers are available with Micro technology.

The finer the cellulosic fibers, the softer the textiles. Micro technology enables the production of the **finest fibers within our TENCEL™ portfolio**, giving textile products **notable softness and lightness**. Therefore, fabrics made with TENCEL™ fibers produced with Micro technology stand out for their natural comfort and enjoyable sensation.

TENCEL™ Modal in black

TENCEL™ Modal fibers are also available in black, offering you the benefit of **high color fastness** while giving you the opportunity to make a **positive contribution to the environment**.

TENCEL™ black fibers are produced in a special **spin-dyeing process** in which black color pigments are **directly incorporated in the fibers**. This approach eliminates the need for additional downstream dyeing steps, resulting in up to **50% less energy and water consumption, while achieving up to a 60% reduction in carbon footprint** compared to conventional dyeing.[5]

TENCEL™ Modal with Indigo Color technology

Requiring multiple dye baths, conventional indigo dyeing is a water- and energy-intensive process. In contrast, Indigo Color technology **locks the Indigo pigment directly** inside the TENCEL™ Modal fiber and **no additional dyeing processes** are needed.

Consequently, this technology leads to **significant savings in water (>99%), chemicals (>80%), electricity (>99%), wastewater (>99%) and heat energy (100%).**[6] Additionally, as the indigo pigment is incorporated within the TENCEL™ Modal fiber, the resulting textiles are characterized by **high color fastness**.

* Fibers manufactured with a totally chlorine-free bleaching process in pulp and fibers

** Available colors: dark brown, marine blue

[5] Results based on Terinte et al., 2014: Terinte, N., Manda, B.M.K., Taylor, J., Schuster, K.C., and Patel, M. (2014). Environmental assessment of coloured fabrics and opportunities for value creation: spin-dyeing versus conventional dyeing. Journal of Cleaner Production, Vol. 72: 127–138.

[6] Compared to three conventional denim dyeing methods

Transparency – a topic at the heart of the Lenzing strategy

PROVE

Fiber identification technology makes fibers verifiable along the entire supply chain.

SHARE

Sharing of sustainability data with brand partners for high degree of accountability.

TRACK

Blockchain-enabled digital platform which is supported by a third party[7], makes product flow visible at every stage to secure your supply chain.

PARTNER

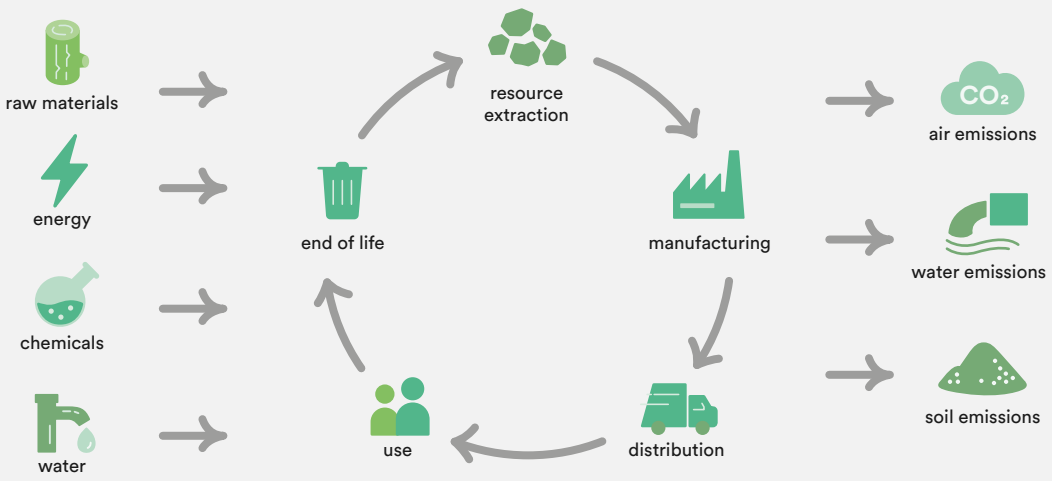
E-branding service offers one-stop application of certification and licensing to use our trademark and leverage our brand's reputation.

Life cycle assessment

Life Cycle Assessment (LCA) is a systematic and comprehensive method for evaluating the potential environmental impact of products throughout their life cycle. The cradle-to-gate assessment includes all stages of production, from the extraction of raw materials through processing, manufacturing, and transportation, up to the point of delivery to the customer.

The LCA takes into account two different aspects: materials entering the product system's boundary (raw materials, energy, chemicals and water) as well as the environmental impact that is created (air, water and soil emissions). Potential environmental impacts are calculated per kg of TENCEL™ Modal fiber and are expressed in different categories, such as Global Warming, Eutrophication or Abiotic Resource Depletion.

Lenzing uses LCA to identify areas for environmental optimization of products not only during fiber manufacturing but also within the supply chain. By conducting cradle-to-gate LCA for TENCEL™ Modal fibers, potential environmental impacts are discovered for all upstream and core process activities until the fiber leaves the factory gate.



[7] For more information, refer to textilegenesis.com/

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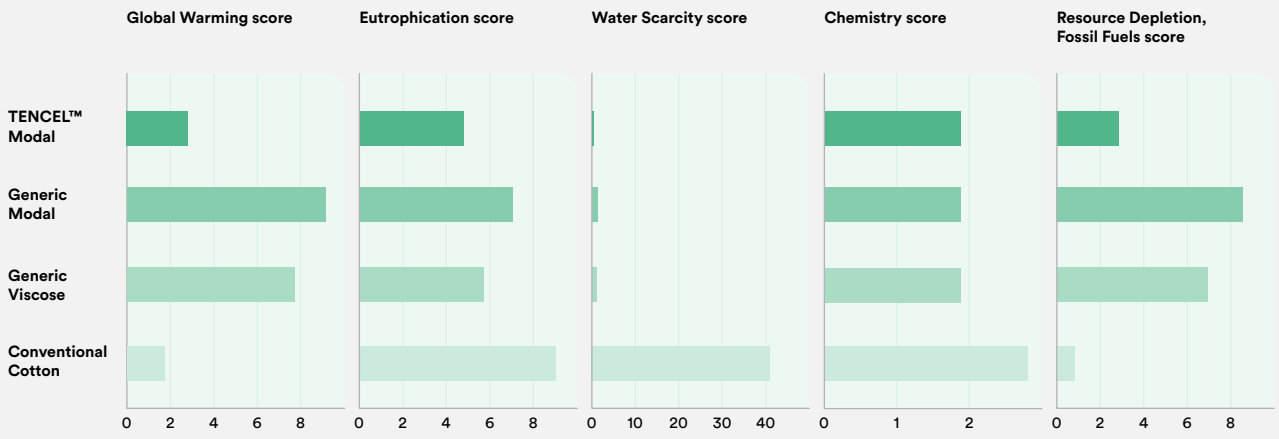
Higg MSI of TENCEL™ Modal

The Higg Materials Sustainability Index[1] (Higg MSI) uses an LCA to evaluate environmental impacts of materials in the textile industry. The Higg MSI reports the category indicators of Global Warming, Eutrophication, Water Scarcity, Abiotic Depletion of Fossil Resources, and Chemistry per functional unit (1 kg of fiber) and additionally provides the two inventory metrics of Water Consumption and Biogenic Carbon Content.

	TENCEL™ Modal
Global Warming	2.84 kg CO_2 eq.
Eutrophication	0.005 kg PO_4^{3-} eq.
Water Scarcity	0.535 m^3 world eq.
Chemistry	4 units
Abiotic Resource Depletion, Fossil Fuels	39.8 MJ
Water Consumption	57.89 kg
Biogenic Carbon Content	0.39 kg C | 1.4 kg CO_2



Note: These results were calculated using the Higg Materials Sustainability Index (Higg MSI) tools provided by the Sustainable Apparel Coalition. The Higg MSI tools assess impacts of materials from cradle-to-gate for a finished material (e.g. to the point at which the materials are ready to be assembled into a product). However, this figure only shows impacts from cradle to fiber production gate. TENCEL™ branded fibers' Higg MSI scores were calculated based on Higg MSI database V3.7 (December 2023). Calculation considers TENCEL™ Modal production in Austria and China.

Lenzing
Innovative by nature

www.tencel.com

[1] Results based on LCA standards (ISO 14040/44) and available via Higg MSI (Version 3.7)