



Mapping of processes for European Flax-Linen

Map your Flax-Linen value chains to identify relevant data, measure the impacts of your products and build your environmental trajectory.

V2 - October 2023







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Cultivation

Does not require irrigation (barring exceptional circumstances), with no GMOs, no defoliant; growing in rotation with reasonned use of fertilisers and pesticides. Dew retting, on the ground.





A 100% mechanical process, generating no waste as all the parts of the plant are used. 100% of fibres grown in FR-BE-NL are European Flax™ certified.



Hackling / Re-scutching / Carding-combing, cottonizing

Long and short fibres are fully used in processes which are specific to fibre length and respective spinning types. Short fibres are blended* in these early stages.



Preparation and spinning

Long fibres are blended* at this stage. Different spinning types:

- Wet spinning: yarns from Nm 6 to 50+
- Dry or semi-wet spinning: Nm 1 to 9,5
- · Other: cotton system (open-end or ring), wool system, for intimate blends



Yarn dyeing / Bleaching

Flax-Linen can be bleached/dyed in yarn, in fabric, in garment or less frequently in fibre.



Weaving / **Knitting**

Processes and machines similar to other fibres, with settings and speed adapted to Linen.



Fabric dyeing and finishing

Linen has an excellent dye affinity thanks to its absorption performance. Any types of dyes: reactive, VAT, direct, etc. Multiple finishings: softening, crease resistant, waterproof, flame retardant,..

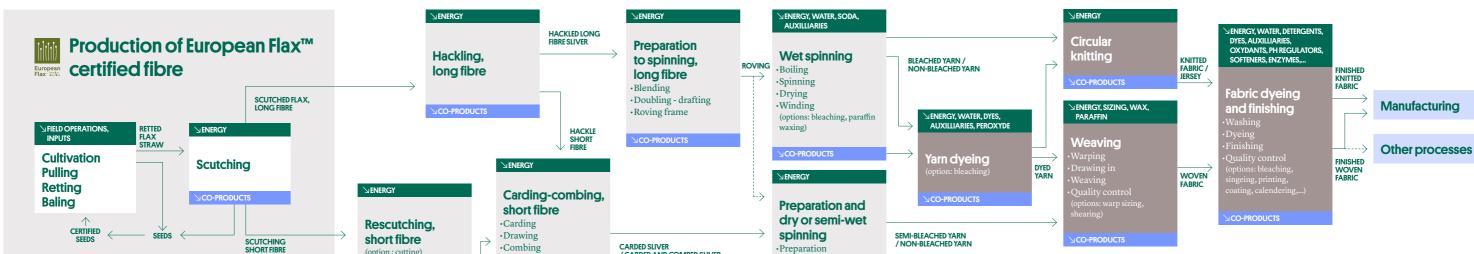


End markets

• 60% fashion • 30% home,

composites

lifestyle • 10% textiles for technical uses and



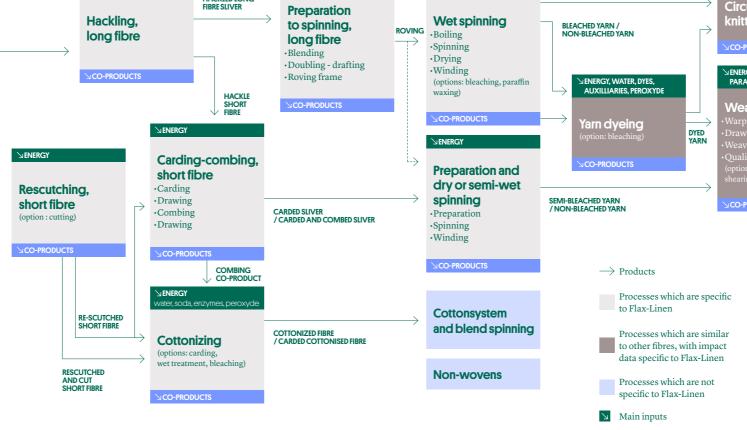
Life Cycle data of European Flax™ long scutched fibre – compliant to PEF method

• EF 2.0 version, 2022 https://allianceflaxlinenhemp.eu/en/european-flax-linen-hemp-medialibrary/12/life-cycle-assessment-lca-of-european-flax-scutched-flax-report Incl. scope, Average Technical Itinerary for European Flax™ fibre, analysis of remarkably low impacts (water and eutrophication-

freshwater) and main impact (land use).

· EF 3.1 dataset in the European Commission's official database, 2023 accessible free of charge for impact calculations compliant to PEF Category rules (ex: Apparel and footwear). Acces via Blonk's node subject to End User Licence Agreement.

The Alliance also collaborates with leading databases and platforms: ecoinvent: inventory and impact data for European Flax™ fibre, long and short, release November 2023; Higg MSI Dec 2020, etc.



*Blends are essential to Flax-Linen, either long or short: Flax fibres of different plots, regions and years are blended to ensure homogeneous yarn quality and consistency over time for European Flax™ and Masters of Linen™ value chains.

Scutching: Shive → gardening mulch, animal bedding, boards, energy

Hackling, LF: Sliver co-product → Preparation of sliver, SF; Dust → energy, agricultural soil **Rescutching, short fibre:** Duvex fibres \rightarrow paper industry; Shive \rightarrow as above, Dust \rightarrow as above

Preparation to spinning, LF: Co-product of preparation → Carding; Co-product of roving frame → Carding or Cott

Carding-combing, SF: Carding co-product → paper industry, Combings → Cottonizing

Cottonizing: Miscellaneous fibres; Dust and Shive → as above

Wet spinning: Yarn co-product → Carding or Cottonizing Co-product of winding → shredding and cott

Dry or semi-wet spinning: Yarn co-product → Carding or Cottonizing; Co-product of winding → shredding and cottonizing; Dust

Knitting: second-choice fabrics

 $\textbf{Weaving:} \ Selvedge \rightarrow padding; second-choice \ fabrics; yarn \ scraps \rightarrow insulation; Dust$ Fabric dyeing and finishing: second-choice fabrics

Also taken into account: emissions (fields, factories) - waste (wastewater) - packaging

Following the LIFE-CYCLE ANALYSIS OF EUROPEAN FLAX™ SCUTCHED FIBRE, PEF method 2022*, Alliance for European Flax-Linen & Hemp has launched a vast collective study with the entire European industry of Flax-Linen.

Objectives:

- To encourage companies to set their own environmental trajectory;
- · To provide reliable data to brands and databases on each Flax-Linen process at European level, with a timetable for updates;
- Respond to consumer expectations;
- · Anticipate regulatory changes.

The first deliverable of this project, this **Mapping of Processes for European Flax-Linen** allows companies to facilitate dialogue with their **Flax-Linen value chains** and to identify the data sets necessary to **measure the impacts** of their products and to build their **environmental trajectory.**

Each processing stage of European Flax™ fibres, long and short, will be the subject of a dedicated environmental footprint dataset, representative of the industrial average at European level. Publication expected in the 1st half of 2024. The support of Alliance for European Flax-Linen & Hemp and its experts will also enable its Members to calculate the footprint of their own processes, in order to provide an even more specific response to their customers and to manage their environmental performance, with a perspective for improvement over time

*Study commissionned by Alliance for European Flax-Linen & Hemp, carried out by YUKAN with the expertise of the agricultural institutes ARVALIS and INAGRO and critical review by MAKI CONSULTING. Version compliant to EF 2.0 accessible for download: https://allianceflaxlinenhemp.eu/en/european-flax-linen-hemp-media-library/12/life-cycle-assessment-lca-of-european-flax-scutched-flax-report

ABOUT

The Alliance for European Flax-Linen & Hemp is the only European agro-industrial organisation that serves as a global reference and brings together all players in the European Flax-Linen and Hemp value chain.

A platform for reflection, market analysis, dialogue, and strategic orientation, the Alliance for European Flax-Linen & Hemp presides over an industry of excellence in a globalised context. It encourages dialogue with national and European public authorities.

The Alliance for European Flax-Linen & Hemp creates an environment favorable to competitiveness among businesses as part of its three-fold mission of informing members, brands, and consumers, supporting the European ecosystem and European expertise, and promoting European Flax-Linen and Hemp as the sustainable premium fibres of choice around the world.

It connects 10,000 businesses in 16 European countries and bases its work on the values of solidarity, innovation, scientific validation, and respect for people and planet.

It promotes, initiates and organises strategic reflections and research on its fibres in order to be able to provide all of its interlocutors with evidence-based economic data, environmental information, and reliable scientific evidence.

The Alliance for European Flax-Linen & Hemp strives to increase the international visibility of its fibres, whose technical and environmental properties inspire global creation and help create new opportunities for industrial innovation. It guarantees the traceability of Flax fibre thanks to the EUROPEAN FLAX $^{\text{TM}}$ and MASTERS OF LINEN $^{\text{TM}}$ certifications.

The Alliance for European Flax-Linen & Hemp is the new name of CELC, an association founded in 1951. Western Europe is the number one Flax-producing region in the world (France, Belgium and the Netherlands account for 3/4 of global Flax production).

European Flax™: The guarantee of traceability for premium quality flax fibres grown in Western Europe for all end uses. A plant fibre, produced through farming that is respectful of the environment, without irrigation* or GMOs.

Masters of LinenTM: Guarantee of traceability for Linen made by European companies on European and Euromed 1 sites. A textile of excellence, local at all stages: from the vegetal European FlaxTM fibre, to yarn and fabric.

 * except in exceptional circumstances



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