Gabriel®

LCA summary report

# Gabriel’s textile: SoftNext

Version: 1

Date: 11.11.2024

Link: SoftNext - Gabrielfabrics.com

# Introduction

A life cycle assessment (LCA) addresses the potential environmental impacts throughout a product's life cycle. Gabriel has initiated a large LCA project to obtain further knowledge about the potential environmental impacts related to Gabriel's products and be able to identify and evaluate environmental improvement opportunities. Additionally, market requests on product's environmental impacts are increasing, and the possibility to externally communicate LCA results is therefore also one of the goals of Gabriel's LCA project.

The LCA project has resulted in two types of reports:

(1) A background LCA report which contains a comprehensive description of the LCA project following the guidelines in ISO 14040:2006 (Environmental management — Life cycle assessment — Principles and framework) and ISO 14044:2006 (Environmental management — Life cycle assessment — Requirements and guidelines) and works towards alignment with the requirements in EN 15804:2012+A2:2019 (Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products). The background LCA report has not been third-party reviewed but will however form the basis for forthcoming EPD verification. The background LCA report contains proprietary information and is only available for internal use and EPD verification.

(2) LCA summary reports (like present document) which is prepared as a public communication document of the related background LCA report (see (1)). This LCA summary report is a summary of methodological aspects and results from the background LCA report.

This LCA summary report will first introduce Gabriel Group and the product of interest. Next it will include a description of goal and scope (including description of product life cycle, system boundary, declared unit, data collection and sources, allocation procedures, limitations and environmental impact categories) and the results.

**Introduction to Gabriel Group**
Gabriel Group is a furniture fabric company providing solutions and services for the international furniture industry including fabrics, furniture and components, customized sample solutions, acoustic comfort, and knitting and embellishment services. Gabriel Group comprises several companies which all together constitute a large enterprise. Read more about Gabriel on our website: Gabriel – Global specialist in fabrics for furniture and interior solutions.

**Product introduction**
The product properties of SoftNext are listed below:

**Product properties**

| | |
|---|---|
| Composition | 100% post-consumer recycled polyester |
| Construction | Woven textile |
| Weight | 0.304 kg/m2 |
| Purpose | Upholstery |
| Certifications | EU Ecolabel, OEKO-TEX STANDARD 100 |
| Technical product specifications | See website – SoftNext - Gabrielfabrics.com |

# Goal

The goal of this LCA summary report is to provide insights into the potential environmental impacts associated with the cradle-to-gate life cycle of Gabriel's textile SoftNext for business-to-business communication.

This LCA summary report will provide temporary coverage for EPD requests from the market, while EPDs and third-party review are being completed. It is further recommended to view this LCA summary report in conjunction with the remaining environmental information related to SoftNext which can be found online: SoftNext - Gabrielfabrics.com.

# Scope

### Product life cycle and system boundary

The product under study is Gabriel's textile SoftNext. The life cycle of SoftNext is illustrated in figure 1. The upstream life cycle stages include collection and recycling of post-consumer plastic bottles, pelletizing, production and spinning of polyester yarns, and transport between stages. The core life cycle stages include transport of raw materials, weaving, dyeing and finishing, transport between stages, and storage. The downstream life cycle stages include further processing (furniture manufacturing), use, and end-of-life treatments. In alignment with EN 15804:2012+A2:2019, the potential benefits of (re)utilization of materials beyond the product's life cycle is illustrated as a separate box. The product system under study is the cradle-to-gate life cycle of Gabriel's textile SoftNext, as highlighted by the system boundary line in figure 1. This also means that any processes related to downstream are not included in this LCA. Gabriel offers 10 years guarantee on the global standard collection and it is therefore suggested to consider the long lifetime of Gabriel's textile in any scenario calculations.

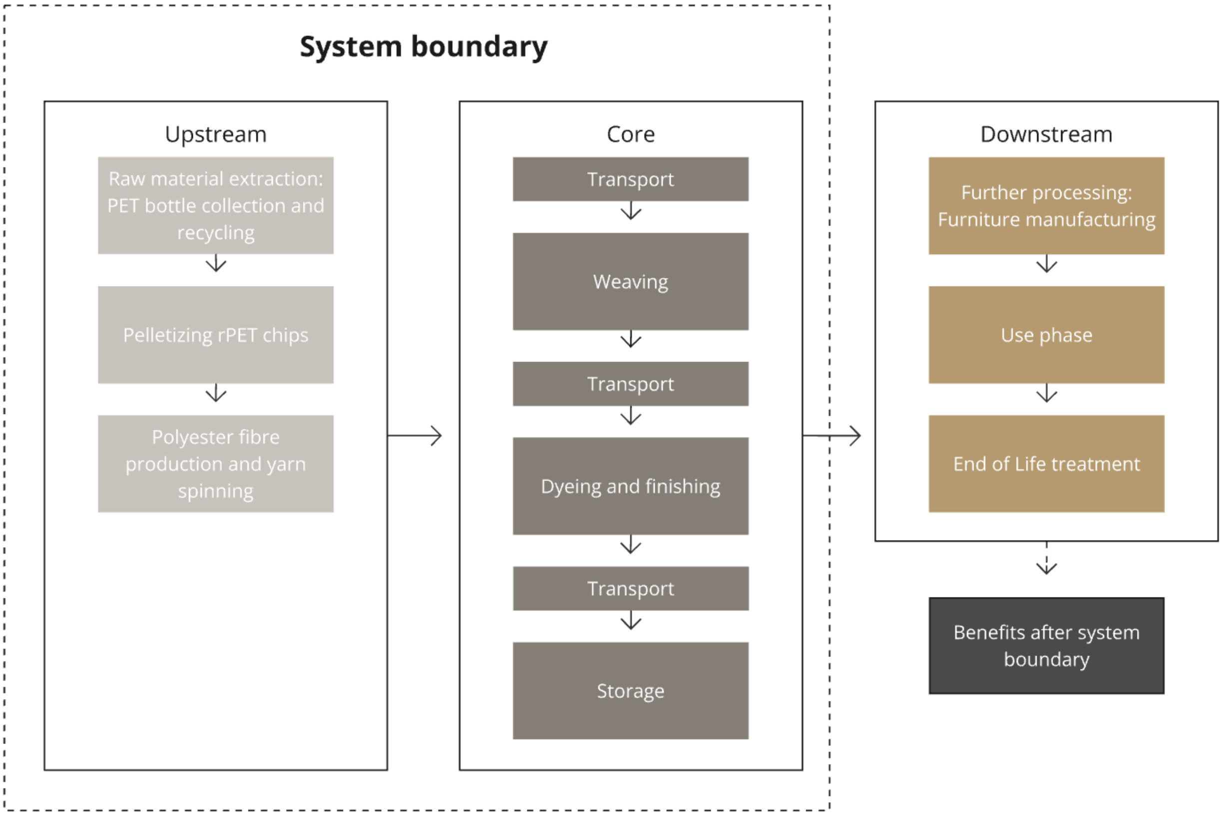


**Figure 1**: System boundary

### **Declared** unit

As the textile SoftNext is used as a component for furniture manufacturing, it qualifies as an intermediate product. Results are therefore related to the declared unit: 1 $m^2$ textile.

### Data sources and collection

Data for the core processes is primary data collected directly from the production sites (textile manufacturing, dyeing and finishing, and storage). The production sites have multiple product outputs and therefore represent a multifunctional co-production. Allocation between co-products is described under the section "Allocation".

Data for upstream processes is generic/secondary data from existing databases. The database used for background data is "ecoinvent- allocation, cut-off by classification" version 3.9.1. Allocation for background processes is described under the section "Allocation".

For data sources and collection, the most recent and representative data available within the used background database is chosen. Please note that the background processes have not been modified but have been used as set by default in the ecoinvent database. The applied data (both primary and background) is, however, continuously assessed and updated when relevant in order to optimize data quality in relation to e.g. geographical, technological and time representativeness, completeness, precision and overall quality.

Table 1 lists the overall processes, flows and inputs included in the LCA modelling. The material and auxiliary inputs included in the LCA modelling cover at least 95% of the inputs and impacts, and only few processes and inputs without significance have been intentionally excluded.

| Activity and flow | Inputs |
|---|---|
| UPSTREAM | |
| PET bottle collection, recycling and pelletizing → rPET chips | Chemicals, electricity, heat, raw materials, water, transport |
| Yarn spinning → rPET yarn | Electricity, heat, lubricants, water, *rPET chips* |
| CORE | |
| Weaving → woven greige SoftNext textile | Electricity, heat, lubricants, water*, rPET yarn*, transport services, packaging |
| Dyeing and finishing → dyed and finished SoftNext textile | Electricity, gas, water, dyestuff, chemicals, *woven greige Softnext texxtile,* packaging, transport services |
| Storage → finished and stored SoftNext textile | Electricity, heat, packaging, *dyed and finished Softnext textile* |

Table 1: Overall processes, flows and inputs. Note: Inputs written in italics are output flows from prior activities

Gabriel is sourcing 100% renewable electricity for majority of the core processes (textile manufacturing), partly supplied by locally installed solar panels, and partly through a mix of renewable sources documented via Guarantees of Origin. Additionally, Gabriel is $CO_2$e neutral in scope 1 and 2 in accordance with the international Greenhouse Gas Protocol, which in line EN15804:2012+A2:2019 is not taken into account in the results of this LCA summary report.

**Allocation**
Allocation procedures follow the hierarchy in ISO 14040:2006 and ISO 14044:2006, and with reference to the guidelines in EN15804:2012+A2:2019.

For the upstream processes and other processes where generic background data from databases is used, the default allocation already included in the process is followed.

For the core processes, allocation is applied at the production sites which produce multiple products. Allocation is conducted based on a physical relationship (mass) and other technical and product specifications based on expert inputs.

For allocation concerning reuse, use of secondary materials and recovery, the cut-off approach is applied through use of the system model 'allocation, cut-off by classification' in the ecoinvent database version 3.9.1. To exemplify, this means that the use of recycled materials is modelled burden free of its original product life cycle. However, any processes and impacts related to the recycling process (for instance collection of PET plastic bottles, the process of recycling etc.) and the subsequent life cycle stages is allocated to the production of the new product and is hence included in the results of the LCA summary report.

**Limitations**
It is emphasized that there are uncertainties and limitations related to the information in this document, as Gabriel's data quality and availability are continuously improving both in terms of background and primary data.

This document is considered dynamic and will be continuously updated concurrently with the acquisition and collection of more primary, updated, and recent data. It must furthermore be noted that this document and the underlying LCA report are not third-party reviewed or verified.

Gabriel recommends to always download the most recent version of this document available online.

**Impact categories and indicators**
The environmental impact categories and related indicators used are the ones listed in EN 15804:2012+A2:2019, both the core environmental impacts (see table 3 in EN 15804:2012+A2:2019) and the additional environmental impacts (see table 4 in EN 15804:2012+A2:2019). The environmental impacts are reported as midpoint results.

The LCA calculations have been performed using the software "openLCA 2.0.0" (https://openlca.org). The impact assessment method used in openLCA 2.0.0 is the "ecoinvent – EF v3.1".

EN 15804:2012+A2:2019 also requires inclusion of results on resource use, waste and output flows and biogenic carbon content at factory gate for the conduction of an EPD. These results are excluded in this LCA report, as they are not required when following ISO 14040:2006 and ISO 14044:2006.

**Report issued by:**
Pernille Elbrønd Neve, Sustainability & Quality Specialist, Gabriel A/S
Louise Agersnap Scherer, Sustainability & Quality Specialist, Gabriel A/S

**Report internally approved by:**
Kurt Nedergaard, Director of CSR & Quality, Gabriel Holding

**Results are found on the following page.**

# Results

Table 2 presents the midpoint results per environmental impact category for 1 m$^2$ of Gabriel's textile SoftNext.

| Impact category | Indicator | Unit | Upstream | Core | Total |
|---|---|---|---|---|---|
| Core environmental impact indicators | | | | | |
| Climate change – total [1] | Global Warming Potential total (GWP-total) | kg $CO_2$ eq. | 9,39E-01 | 1,17E+00 | 2,11E+00 |
| Climate change- fossil | Global Warming Potential fossil fuels (GWP-fossil | kg $CO_2$ eq. | 8,42E-01 | 1,13E+00 | 1,97E+00 |
| Climate change – biogenic | Global Warming Potential biogenic (GWP-biogenic) | kg $CO_2$ eq. | 9,52E-02 | 3,81E-02 | 1,33E-01 |
| Climate change – land use and land use change (LULUC) | Global Warming Potential land use and land use change (GWP-luluc) | kg $CO_2$ eq | 1,66E-03 | 2,09E-03 | 3,75E-03 |
| Ozone depletion | Depletion potential of the stratospheric ozone layer (ODP) | kg CFC 11 eq. | 1,74E-07 | 4,04E-08 | 2,14E-07 |
| Acidification | Acidification potential, Accumulated Exceedance (AP) | mol $H^+$ eq. | 5,12E-03 | 3,20E-03 | 8,32E-03 |
| Eutrophication aquatic freshwater | Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | kg P eq. | 2,90E-04 | 1,89E-04 | 4,80E-04 |
| Eutrophication aquatic marine | Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | kg N eq. | 1,37E-03 | 1,42E-03 | 2,79E-03 |
| Eutrophication terrestrial | Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | mol N eq. | 1,28E-02 | 9,77E-03 | 2,26E-02 |
| Photochemical ozone formation | Formation potential of tropospheric ozone (POCP) | kg NMVOC eq. | 6,24E-03 | 3,93E-03 | 1,02E-02 |
| Depletion of abiotic resources – minerals and metals[2] | Abiotic depletion potential for non-fossil resources (ADP-minerals&metals) | kg Sb eq. | 3,15E-06 | 5,23E-06 | 8,37E-06 |
| Depletion of abiotic resources – fossil fuels[2] | Abiotic depletion potential for fossil resources (ADP-fossil) | MJ, net calorific value | 1,16E+01 | 1,76E+01 | 2,92E+01 |
| Water use[2] | Water (user) deprivation potential, deprivation-weighted water consumption (WDP) | $m^3$ world eq. deprived | 1,93E-01 | 2,32E-01 | 4,24E-01 |
| Additional environmental impact indicators | | | | | |
| Particulate Matter emissions | Potential incidence of disease due to PM emissions (PM) | Disease incidence | 8,80E-08 | 5,53E-08 | 1,43E-07 |
| Ionizing radiation, human health[3] | Potential Human exposure efficiency relative to U235 (IRP) | kBq U235 eq. | 3,09E-02 | 7,74E-02 | 1,08E-01 |
| Eco-toxicity (freshwater)[2] | Potential Comparative Toxic Unit for eco-systems (ETP-fw) | CTUe | 6,80E+00 | 5,58E+00 | 1,24E+01 |
| Human toxicity, cancer effects[2] | Potential Comparative Toxic Unit for humans (HTP-c) | CTUh | 7,41E-10 | 5,84E-10 | 1,32E-09 |
| Human toxicity, non-cancer effects[2] | Potential Comparative Toxic Unit for humans (HTP-nc) | CTUh | 1,12E-08 | 1,04E-08 | 2,16E-08 |
| Land use related impacts/ Soil quality[2] | Potential soil quality index (SQP) | dimensionless | 4,27E+00 | 2,19E+01 | 2,61E+01 |

**Table 2**: Environmental impact midpoint results per 1 m$^2$ SoftNext.

[1] This impact category is the sum of the subsequent three impact categories: Climate change – fossil, biogenic and LULUC.

[2] The results of this environmental impact indicator shall be used with care as uncertainties of these results are high or as there is limited experienced with the indicator.

[3] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from construction materials is also not measured by this indicator.

For further information or questions related to this LCA summary report, please reach out to your nearest Gabriel contact or directly to Gabriel's Quality, Environment and Production department (QEP, qep@gabriel.dk).