epddanmark

ECO PLATFORM EPD VERIFIED

| | |
|---|---|
| Owner: | Kvadrat A/S |
| No.: | MD-23111-EN_rev4 |
| Issued: | 07-07-2023 |
| Revision: | 05-11-2026 |
| Valid to: | 07-07-2028 |

3rd PARTY **VERIFIED**

# EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**



**Owner of declaration**
Kvadrat A/S
Lundbergsvej 10
8400 Ebeltoft, Denmark
VAT no. DK-45 99 85 17

**Programme**
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

**Declared product(s)**
100% Polyester FR – Winterswijk, Netherlands
99,9% Polyester FR, 0,1% Aluminum - Winterswijk, Netherlands
100% Polyester & Polyester FR – Vestland, Norway
100% Polyester & Polyester FR – Busto Arsizio VA, Italy

Number of declared datasets/product variations: 4

**Production sites**
Winterswijk, Netherlands
Vestland, Norway
Busto Arsizio, Italy

Green energy certificates are present for the electricity consumption at the production site in Vestland, Norway, representing 100% Hydro power.

**Product(s) use**
Kvadrat produces quality contemporary textiles for use in upholsteries and curtains.

**Declared/ functional unit.**
1 kg of woven textile

**Year of production site data (A3)**
2021

**EPD version**
5th version: Merge of MD-23111-EN and MD-23116-EN, and update of "Table of products".

**Issued:** 07-07-2023
**Valid to:** 07-07-2028

**Basis of calculation**
This EPD is developed in accordance with the European standard EN 15804+A2.

**Comparability**
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

**Validity**
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

**Use**
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

**EPD type**
☒Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

*Guangli Du, Aalborg University, BUILD*

*Martha Katrine Sørensen*
*EPD Danmark*

| Life cycle stages and modules (MND = module not declared) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product | | | Construction process | | Use | | | | | | | End of life | | | | Beyond the system boundary |
| Raw material supply | Transport | Manufacturing | Transport | Installation process | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Re-use, recovery, and recycling potential |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | MND | MND | MND | MND | MND | MND | MND | MND | MND | X | X | X | X | X |

# Product information

### Product description

The main components of the products covered by this EPD are shown in the table below.

| Material | Weight-% of declared product |
|---|---|
| Polyester-based, including flame-retardant variants | 100% |

The declared products include textiles composed of polyester, flame-retardant polyester, Trevira CS, or blends thereof. Trevira CS is a flame-retardant polyester fibre and is modelled as polyester FR in this EPD. Polyester and polyester FR are represented using the same background data, with the flame-retardant additive included as a conservative modelling approach.

### Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below.

| Material | Weight-% of packaging |
|---|---|
| Carton | 0 – 100% |
| PE foil | 0 – 18% |
| Wooden pallet | 0 – 22 % |

### Representativity

This declaration, including data collection and the modelled foreground system including results, represents the production of 1 kg of woven textile on the production sites located in Vestland, Norway, Winterswijk, the Netherlands and Busto Arsizio, Italy respectively. Product specific data are based on average values collected in the year 2021. Background data are based on the GaBi database version 2022.2 and the ecoinvent 3.8 database. Data are less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

### Hazardous substances

The products declared within this EPD do not contain substances listed on the ”Candidate List of Substances of Very High Concern for Authorisation.”

(http://echa.europa.eu/candidate-list-table)

### Essential characteristics

The products in this EPD are not covered by harmonized technical specifications. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations.

Further technical information can be obtained by contacting the manufacturer or on the manufacturer’s website: www.kvadrat.dk/en

### Reference Service Life (RSL)

Kvadrat offers a 10-year guarantee for the majority of its textile products. The actual service life of a Kvadrat textile depends on a wide range of various impact factors such as the allocation of the application area to the use class, maintenance, intensity of use and functional purpose. Most often Kvadrat textiles are applied for building and transportation related purposes.

Therefore, technical service life cannot be defined for Kvadrat textiles.

Kvadrat product specific textile warranties are disclosed in the Technical Specifications of each product.

## Table of products

This EPD applies to a defined range of textile products, presented in the table below. Product names are listed without colour-version numbers. All respective colour variants of the listed products are covered by this declaration.

| Products from Kvadrat covered in this EPD | | | | | |
|---|---|---|---|---|---|
| **Supplier** | **Country** | **Product name** | **Product composition[1]** | **kg pr m²** | **Table** |
| Winterswijk | Netherlands | Atrium Outdoor | 100% Trevira CS & Polyester FR | 0,336 | 1 |
| Winterswijk | Netherlands | Casita | 100% Trevira CS & Polyester FR | 0,200 | 1 |
| Winterswijk | Netherlands | Encircle | 100% Trevira CS & Polyester FR | 0,400 | 1 |
| Winterswijk | Netherlands | Field | 100% Trevira CS & Polyester FR | 0,321 | 1 |
| Winterswijk | Netherlands | Ginger | 100% Trevira CS & Polyester FR | 0,260 | 1 |
| Winterswijk | Netherlands | Maya | 100% Trevira CS & Polyester FR | 0,100 | 1 |
| Winterswijk | Netherlands | Memory | 100% Trevira CS & Polyester FR | 0,464 | 1 |
| Winterswijk | Netherlands | Parkland | 100% Trevira CS & Polyester FR | 0,436 | 1 |
| Winterswijk | Netherlands | Patio Outdoor | 100% Trevira CS & Polyester FR | 0,400 | 1 |
| Winterswijk | Netherlands | Pro | 100% Trevira CS & Polyester FR | 0,340 | 1 |
| Winterswijk | Netherlands | Relate | 100% Trevira CS & Polyester FR | 0,321 | 1 |
| Winterswijk | Netherlands | Relate Screen | 100% Trevira CS & Polyester FR | 0,276 | 1 |
| Winterswijk | Netherlands | Time 300 | 100% Trevira CS & Polyester FR | 0,193 | 1 |
| Winterswijk | Netherlands | Zulu | 100% Trevira CS & Polyester FR | 0,100 | 1 |
| Winterswijk | Netherlands | Accent | 100% Trevira CS & Polyester FR | 0,145 | 1 |
| Winterswijk | Netherlands | Cord | 100% Trevira CS & Polyester FR | 0,335 | 1 |
| Winterswijk | Netherlands | Grado | 100% Trevira CS & Polyester FR | 0,063 | 1 |
| Winterswijk | Netherlands | Twister | 100% Trevira CS & Polyester FR | 0,193 | 1 |
| Winterswijk | Netherlands | Casa Reflect | 99,9% Trevira CS, 0,1% aluminum | 0,182 | 2 |
| Winterswijk | Netherlands | White Reflect | 99,9% Trevira CS, 0,1% aluminum | 0,200 | 2 |
| Winterswijk | Netherlands | Punkto | 100% Trevira CS | 0,340 | 1 |
| Winterswijk | Netherlands | Via | 100% Trevira CS | 0,200 | 1 |
| Winterswijk | Netherlands | Vicolo | 100% Trevira CS | 0,200 | 1 |
| Winterswijk | Netherlands | Cadenza | 100% Trevira CS | 0,150 | 1 |
| Winterswijk | Netherlands | Steelcut CS Shiny 300 cm | 100% Trevira CS | 0,317 | 1 |
| Winterswijk | Netherlands | Casa Time 300cm | 100% Trevira CS | 0,143 | 1 |
| Winterswijk | Netherlands | Kuria Satin | 100% Trevira CS | 0,267 | 1 |
| Winterswijk | Netherlands | Kuria textured | 100% Trevira CS | 0,267 | 1 |
| Winterswijk | Netherlands | Airfield | 100% Trevira CS | 0,308 | 1 |
| Winterswijk | Netherlands | Zürich 2 Melange | 100% Trevira CS | 0,464 | 1 |
| Winterswijk | Netherlands | Fillippa | 100% Trevira CS | 0,171 | 1 |
| Winterswijk | Netherlands | Time 300 tight 40 SC | 100% Trevira CS | 0,240 | 1 |
| Winterswijk | Netherlands | Casa Twill 150 cm | 100% Trevira CS | 0,153 | 1 |
| Winterswijk | Netherlands | Eik | 100% Trevira CS | 0,286 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Winterswijk | Netherlands | Atrium CC | 100% Trevira CS | 0,336 | 1 |
| Winterswijk | Netherlands | Steelcut Trio CS | 100% Trevira CS | 0,400 | 1 |
| Winterswijk | Netherlands | Technicolour Cloud | 100% Polyester FR | 0,239 | 1 |
| Vestland | Norway | Still | 100% Trevira CS | 0,457 | 3 |
| Vestland | Norway | Nyvik | 100 % Polyester | 0,730 | 3 |
| Vestland | Norway | Bovik | 100 % Polyester | 0,547 | 3 |
| Vestland | Norway | Navigator uni | 59 % Polyester, 41 % Trevira CS | 0,457 | 3 |
| Busto Arsizio VA | Italy | Casa | 100% Trevira CS & Polyester FR | 0,170 | 4 |
| Busto Arsizio VA | Italy | Mi casa | 100% Trevira CS & Polyester FR | 0,200 | 4 |
| Busto Arsizio VA | Italy | Dawn | 100% Trevira CS & Polyester FR | 0,260 | 4 |
| Busto Arsizio VA | Italy | Lumo | 100% Trevira CS & Polyester FR | 0,300 | 4 |
| Busto Arsizio VA | Italy | Tints | 100% Trevira CS & Polyester FR | 0,230 | 4 |
| Busto Arsizio VA | Italy | Campas 300 | 100% Trevira CS & Polyester FR | 0,260 | 4 |
| Busto Arsizio VA | Italy | Diorama | 100% Trevira CS & Polyester FR | 0,238 | 4 |
| Busto Arsizio VA | Italy | Drops | 100% Trevira CS & Polyester FR | 0,074 | 4 |
| Busto Arsizio VA | Italy | Drops Acoustic | 100% Trevira CS & Polyester FR | 0,100 | 4 |
| Busto Arsizio VA | Italy | Interlace | 100% Trevira CS & Polyester FR | 0,060 | 4 |
| Busto Arsizio VA | Italy | Lux | 100% Trevira CS & Polyester FR | 0,020 | 4 |
| Busto Arsizio VA | Italy | Melu Acoustic | 100% Trevira CS & Polyester FR | 0,219 | 4 |
| Busto Arsizio VA | Italy | Panorama | 100% Trevira CS & Polyester FR | 0,238 | 4 |
| Busto Arsizio VA | Italy | Technicolour Fade | 100% Trevira CS & Polyester FR | 0,033 | 4 |
| Busto Arsizio VA | Italy | Back Up | 100% Trevira CS | 0,076 | 4 |
| Busto Arsizio VA | Italy | Incognito | 100% Polyester | 0,101 | 4 |
| Busto Arsizio VA | Italy | Netnet | 100% Trevira CS | 0,128 | 4 |
| Busto Arsizio VA | Italy | Sen | 100% Trevira CS | 0,102 | 4 |
| Busto Arsizio VA | Italy | Shutter | 100% Polyester FR | 0,251 | 4 |
| Busto Arsizio VA | Italy | Stanet | 100% Trevira CS | 0,052 | 4 |
| Busto Arsizio VA | Italy | Untitled_AB3 | 100% Polyester FR | 0,251 | 4 |
| Busto Arsizio VA | Italy | Untitled_AB5 | 100% Trevira CS | 0,076 | 4 |
| Busto Arsizio VA | Italy | Tacti Duo | 100% Trevira CS | 0,181 | 4 |
| Busto Arsizio VA | Italy | Tacti Tech | 100% Trevira CS | 0,153 | 4 |
| Busto Arsizio VA | Italy | Tacti Uni | 100% Trevira CS | 0,178 | 4 |
| Busto Arsizio VA | Italy | Toto SC 300 cm | 100% Trevira CS | 0,187 | 4 |
| Busto Arsizio VA | Italy | Hint Screen | 100% Polyester FR | 0,294 | 4 |
| Busto Arsizio VA | Italy | Tonight PES FR with print | 100% Polyester FR | 0,264 | 4 |
| Busto Arsizio VA | Italy | Technicolour Flux | 100% Trevira CS & Polyester FR | 0,021 | 4 |
| Busto Arsizio VA | Italy | Ease | 100% Trevira CS & Polyester FR | 0,011 | 4 |
| Busto Arsizio VA | Italy | Fields | 100% Trevira CS & Polyester FR | 0,061 | 4 |
| Busto Arsizio VA | Italy | Joy | 100% Trevira CS & Polyester FR | 0,052 | 4 |
| Busto Arsizio VA | Italy | Mori | 100% Trevira CS & Polyester FR | 0,105 | 4 |
| Busto Arsizio VA | Italy | Posh | 100% Trevira CS & Polyester FR | 0,111 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| Busto Arsizio VA | Italy | Regent | 100% Trevira CS & Polyester FR | 0,044 | 4 |
| Busto Arsizio VA | Italy | Lima | 100% Trevira CS & Polyester FR | 0,044 | 4 |
| Busto Arsizio VA | Italy | Powder | 100% Trevira CS & Polyester FR | 0,045 | 4 |
| Busto Arsizio VA | Italy | Seersucker | 100% Trevira CS & Polyester FR | 0,097 | 4 |
| Busto Arsizio VA | Italy | Haze | 100% Polyester & Polyester FR | 0,219 | 4 |
| Busto Arsizio VA | Italy | FROST | 100% Polyester & Polyester FR | 0,050 | 4 |
| Busto Arsizio VA | Italy | Sono | 100% Polyester & Polyester FR | 0,023 | 4 |
| Busto Arsizio VA | Italy | P-Do Ho Suh Art Textile | 100% Polyester & Polyester FR | 0,070 | 4 |
| Busto Arsizio VA | Italy | Florens | 3% Polyester FR, 97% Trevira CS | 0,187 | 4 |
| Busto Arsizio VA | Italy | Ripple | 10% Polyester FR, 90% Trevira CS | 0,052 | 4 |
| Busto Arsizio VA | Italy | Soft Light | 25% Polyester, 75% Trevira CS | 0,041 | 4 |

[1] The product composition listed reflects the commercial or supplier-declared textile composition. For LCA modelling purposes, Trevira CS, polyester FR and polyester are represented as polyester-based material.

## Picture of products



# LCA background

### Declared unit.

The LCI and LCIA results in this EPD relate to environmental impacts caused by the production and end-of-life of 1 kg of woven textiles.

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | kg |
| Conversion factor to 1 kg | 1 | - |

### Functional unit

Not defined.

### PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804+A2:2019.

### Guarantee of Origin – certificates

Foreground system:

"Guarantee of Origin" certificates are used in the production at Vestland, Norway. Here electricity is modelled as 100% hydro power.

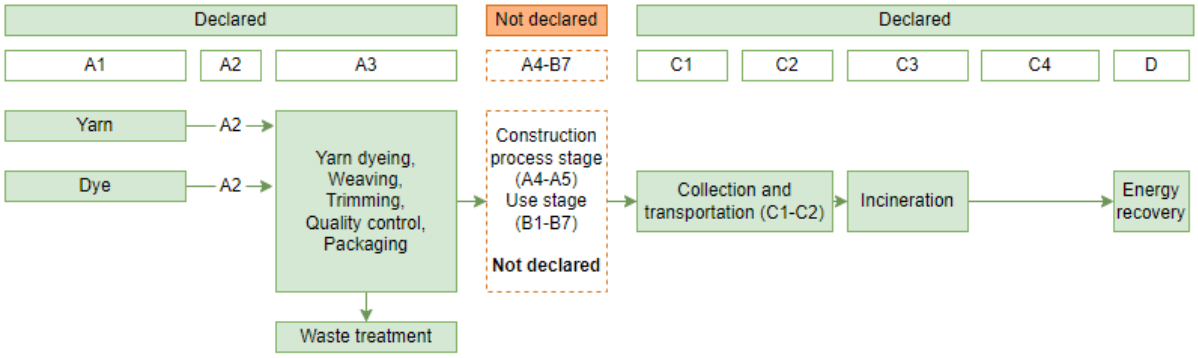
At the other production sites, no "Guarantee of Origin" certificates are used in the manufacturing. Consumption of electricity is modelled with residual electricity grid mix. Consumption of heat is modelled with average data, representative for the geographical area.

Background system:

Other processes upstream and downstream from production are modelled with processes from the GaBi background database that is based on average data.

### Flowdiagram

The flow diagram below presents the main processes included in the life cycle of the woven textiles.



### System boundary

This EPD is based on a cradle-to-gate LCA with modules C1-C4 and D, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

**Product stage (A1-A3) includes**:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging, and waste processing up to the "end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

The manufacturing of the woven textiles is handled by suppliers located in Norway, Italy, and the Netherlands, respectively.

The yarns used for the textiles are prepared and assembled prior to the weaving. In this step, the warp yarns are wrapped around a rotating drum, creating a warp with the desired length. In the weaving process, the woven fabrics are formed using a loom, interlacing the lengthwise threads, known as warp yarns, and the crosswise threads, known as weft yarns. Subsequently, the fabric is trimmed, quality controlled, rolled-up, packaged, and transported to Kvadrat headquarters in Ebeltoft, Denmark.

The yarns used in the products are dyed using roughly four different dyeing methods, with some yarns being delivered pre-dyed others being dyed inhouse.
(1) For some of the synthetic textiles, dyestuff is added directly during the manufacturing of the yarn and before the yarn has been extruded (dope dyed). In other cases, (2) the dyestuff is added to the fibres before they are spun into a yarn. Dyestuff is either added to the loose fibres (stock dyed) or to combed wool sliver (top dyed). A third option used in both the production of synthetic and natural textiles includes the (3) dyeing of the finished yarns (yarn dyed), which are either sent to an external dyeing house before they arrive at the production sites of the suppliers of this EPD or which are dyed inhouse at the production sites of this EPD. Alternatively, (4) the dyestuff is applied to the finished woven textile (piece dyed).

In the case of the yarn dyeing technology the yarn is wound on perforated cores. From here, the dye flows through the yarn package, penetrating the fibres into the core of the yarn. The yarn dyeing method is both handled internally and externally, depending on the specific supplier. This process requires a significant amount of steam and water.

**End of Life (C1-C4) includes:**

C1 – Deconstruction: There are no impacts associated with C1 as the textiles – once they are incorporated into either a curtain or upholstery – are deconstructed manually and without the need for any additional materials and/or machinery. This lifecycle stage is set to 0.

C2 – Transport to waste processing: A general scenario for the transport of waste to waste handling site is used, and this single transport scenario is applied to the end-of-life for all textiles unaffected by their site of origin or material composition.

This transport distance is set to 40 km, based on average distance to waste handling sites.

C3 – Waste processing: The textiles are modelled as one homogenous product that will/cannot be separated at the end-of-life, instead they are all modelled as 1 kg of textile being sent to municipal waste incineration, with each product falling under the same scenario regardless of material composition or site of origin.

End-of-life is modelled using a 100% incineration scenario.

**Re-use, recovery, and recycling potential (D) includes:**

Module D includes the potential in energy recovery arising from the incineration of the textiles at the end-of-life. Modelled with average European data for electricity and district heating.

# LCA results

**Table 1: Winterswijk, Netherlands - 100% Polyester FR fabric**

| ENVIRONMENTAL IMPACTS PER 1 KG - Winterswijk, Netherlands, 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-total | kg $CO_2$ eq. | 1,07E+01 | 0,00E+00 | 4,75E-03 | 1,74E+00 | 0,00E+00 | -6,85E-01 |
| GWP-fossil | kg $CO_2$ eq. | 1,06E+01 | 0,00E+00 | 4,71E-03 | 4,71E-01 | 0,00E+00 | -6,80E-01 |
| GWP-biogenic | kg $CO_2$ eq. | 8,97E-02 | 0,00E+00 | 4,92E-07 | 1,27E+00 | 0,00E+00 | -4,60E-03 |
| GWP-luluc | kg $CO_2$ eq. | 1,96E-02 | 0,00E+00 | 4,36E-05 | 5,19E-06 | 0,00E+00 | -1,43E-04 |
| ODP | kg CFC 11 eq. | 8,83E-11 | 0,00E+00 | 6,13E-16 | 1,98E-13 | 0,00E+00 | -4,67E-12 |
| AP | mol $H^+$ eq. | 1,23E-02 | 0,00E+00 | 6,45E-06 | 1,42E-03 | 0,00E+00 | -1,39E-03 |
| EP-freshwater | kg P eq. | 6,85E-05 | 0,00E+00 | 1,72E-08 | 5,39E-08 | 0,00E+00 | -2,63E-06 |
| EP-marine | kg N eq. | 8,79E-03 | 0,00E+00 | 2,26E-06 | 6,47E-04 | 0,00E+00 | -3,68E-04 |
| EP-terrestrial | mol N eq. | 4,61E-02 | 0,00E+00 | 2,70E-05 | 7,33E-03 | 0,00E+00 | -3,82E-03 |
| POCP | kg NMVOC eq. | 1,51E-02 | 0,00E+00 | 5,60E-06 | 1,66E-03 | 0,00E+00 | -9,77E-04 |
| ADPm[1] | kg Sb eq. | 2,58E-06 | 0,00E+00 | 3,10E-10 | 1,82E-09 | 0,00E+00 | -1,06E-07 |
| ADPf[1] | MJ | 2,07E+02 | 0,00E+00 | 6,41E-02 | 6,71E-01 | 0,00E+00 | -9,67E+00 |
| WDP[1] | $m^3$ | -6,44E+00[2] | 0,00E+00 | 5,69E-05 | 1,99E-01 | 0,00E+00 | -1,09E-01 |
| Caption | GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical ozone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = Water Depletion Potential | | | | | | |
| Disclaimer | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. | | | | | | |
| | [2] A negative value for WDP is due to the characterization factor applied for the wastewater treatment process in the background dataset. The database provider is currently reviewing this process; however, it represents the best available data at present. | | | | | | |

| ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG - Winterswijk, Netherlands, 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| PM | [Disease incidence] | 1,16E-07 | 0,00E+00 | 4,71E-11 | 4,41E-09 | 0,00E+00 | -1,12E-08 |
| IRP[2] | [kBq U235 eq.] | 5,61E-01 | 0,00E+00 | 1,80E-05 | 3,89E-03 | 0,00E+00 | -1,57E-01 |
| ETP-fw[1] | [CTUe] | 6,77E+01 | 0,00E+00 | 4,56E-02 | 2,28E-01 | 0,00E+00 | -3,56E+00 |
| HTP-c[1] | [CTUh] | 7,44E-09 | 0,00E+00 | 9,32E-13 | 5,06E-11 | 0,00E+00 | -1,19E-10 |
| HTP-nc[1] | [CTUh] | 6,18E-07 | 0,00E+00 | 4,98E-11 | 4,88E-09 | 0,00E+00 | -5,69E-09 |
| SQP[1] | - | 4,98E+01 | 0,00E+00 | 2,68E-02 | 1,36E-01 | 0,00E+00 | -9,58E+00 |
| Caption | PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality | | | | | | |
| Disclaimers | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. | | | | | | |
| | [2] 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 some construction materials is also not measured by this indicator. | | | | | | |

| RESOURCE USE PER 1 KG - Winterswijk, Netherlands 100%, Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | [MJ] | 3,64E+01 | 0,00E+00 | 4,67E-03 | 1,20E-01 | 0,00E+00 | -5,86E+00 |
| PERM | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | [MJ] | 3,64E+01 | 0,00E+00 | 4,67E-03 | 1,20E-01 | 0,00E+00 | -5,86E+00 |
| PENRE | [MJ] | 1,77E+02 | 0,00E+00 | 6,44E-02 | 6,72E-01 | 0,00E+00 | -9,67E+00 |
| PENRM | [MJ] | 3,03E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | [MJ] | 2,07E+02 | 0,00E+00 | 6,44E-02 | 6,72E-01 | 0,00E+00 | -9,67E+00 |
| SM | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | [$m^3$] | 9,86E-02 | 0,00E+00 | 5,11E-06 | 4,70E-03 | 0,00E+00 | -4,07E-03 |
| Caption | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water | | | | | | |

| WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG - Winterswijk, Netherlands, 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| HWD | [kg] | 1,37E-04 | 0,00E+00 | 1,99E-13 | 5,35E-11 | 0,00E+00 | -1,34E-09 |
| NHWD | [kg] | 2,37E-01 | 0,00E+00 | 9,81E-06 | 2,27E-02 | 0,00E+00 | -1,86E-02 |
| RWD | [kg] | 3,60E-03 | 0,00E+00 | 1,20E-07 | 2,49E-05 | 0,00E+00 | -9,29E-04 |
| CRU | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MFR | [kg] | 2,00E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MER | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EEE | [MJ] | 2,10E-02 | 0,00E+00 | 0,00E+00 | 3,11E+00 | 0,00E+00 | 0,00E+00 |
| EET | [MJ] | 3,78E-02 | 0,00E+00 | 0,00E+00 | 5,59E+00 | 0,00E+00 | 0,00E+00 |
| Caption | HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy | | | | | | |

| BIOGENIC CARBON CONTENT PER 1 KG - Winterswijk, Netherlands, 100% Polyester FR | | |
|---|---|---|
| **Parameter** | **Unit** | **Value** |
| Biogenic carbon content in product | kg C | 0,00E+00 |
| Biogenic carbon content in accompanying packaging | kg C | 1,58E-02 |

## Table 2: Winterswijk, Netherlands - 99,9% Polyester FR, 0,1% aluminum

| ENVIRONMENTAL IMPACTS PER 1 KG - Winterswijk, Netherlands, 99,9% Polyester FR, 0,1% aluminum | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-total | [kg $CO_2$ eq.] | 1,06E+01 | 0,00E+00 | 4,75E-03 | 1,74E+00 | 0,00E+00 | -6,85E-01 |
| GWP-fossil | [kg $CO_2$ eq.] | 1,06E+01 | 0,00E+00 | 4,71E-03 | 4,71E-01 | 0,00E+00 | -6,80E-01 |
| GWP-bio | [kg $CO_2$ eq.] | 3,26E-02 | 0,00E+00 | 4,92E-07 | 1,27E+00 | 0,00E+00 | -4,60E-03 |
| GWP-luluc | [kg $CO_2$ eq.] | 1,92E-02 | 0,00E+00 | 4,36E-05 | 5,19E-06 | 0,00E+00 | -1,43E-04 |
| ODP | [kg CFC 11 eq.] | 8,72E-11 | 0,00E+00 | 6,13E-16 | 1,98E-13 | 0,00E+00 | -4,67E-12 |
| AP | [mol $H^+$ eq.] | 1,24E-02 | 0,00E+00 | 6,45E-06 | 1,42E-03 | 0,00E+00 | -1,39E-03 |
| EP-fw | [kg P eq.] | 1,88E-04 | 0,00E+00 | 1,72E-08 | 5,39E-08 | 0,00E+00 | -2,63E-06 |
| EP-mar | [kg N eq.] | 4,78E-03 | 0,00E+00 | 2,26E-06 | 6,47E-04 | 0,00E+00 | -3,68E-04 |
| EP-ter | [mol N eq.] | 4,63E-02 | 0,00E+00 | 2,70E-05 | 7,33E-03 | 0,00E+00 | -3,82E-03 |
| POCP | [kg NMVOC eq.] | 1,51E-02 | 0,00E+00 | 5,60E-06 | 1,66E-03 | 0,00E+00 | -9,77E-04 |
| ADP-mm[1] | [kg Sb eq.] | 2,56E-06 | 0,00E+00 | 3,10E-10 | 1,82E-09 | 0,00E+00 | -1,06E-07 |
| ADP-fos[1] | [MJ] | 2,06E+02 | 0,00E+00 | 6,41E-02 | 6,71E-01 | 0,00E+00 | -9,67E+00 |
| WDP[1] | [$m^3$] | -6,44E+00[2] | 0,00E+00 | 5,69E-05 | 1,99E-01 | 0,00E+00 | -1,09E-01 |
| Caption | GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical ozone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = Water Depletion Potential | | | | | | | |
| Disclaimer | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. | | | | | | |
| | [2] A negative value for WDP is due to the characterization factor applied for the wastewater treatment process in the background dataset. The database provider is currently reviewing this process; however, it represents the best available data at present. | | | | | | |

| ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG - Winterswijk, Netherlands, 99,9% Polyester FR, 0,1% aluminum | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| PM | [Disease incidence] | 1,18E-07 | 0,00E+00 | 4,71E-11 | 4,41E-09 | 0,00E+00 | -1,12E-08 |
| IRP[2] | [kBq U235 eq.] | 5,65E-01 | 0,00E+00 | 1,80E-05 | 3,89E-03 | 0,00E+00 | -1,57E-01 |
| ETP-fw[1] | [CTUe] | 7,93E+01 | 0,00E+00 | 4,56E-02 | 2,28E-01 | 0,00E+00 | -3,56E+00 |
| HTP-c[1] | [CTUh] | 7,92E-09 | 0,00E+00 | 9,32E-13 | 5,06E-11 | 0,00E+00 | -1,19E-10 |
| HTP-nc[1] | [CTUh] | 6,68E-07 | 0,00E+00 | 4,98E-11 | 4,88E-09 | 0,00E+00 | -5,69E-09 |
| SQP[1] | - | 4,92E+01 | 0,00E+00 | 2,68E-02 | 1,36E-01 | 0,00E+00 | -9,58E+00 |
| Caption | PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality | | | | | | |
| | The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112. | | | | | | |
| Disclaimers | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. | | | | | | |
| | [2] 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 some construction materials is also not measured by this indicator. | | | | | | |

| RESOURCE CONSUMPTION PER 1 KG - Winterswijk, Netherlands, 99,9% Polyester FR, 0,1% aluminum | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | [MJ] | 3,58E+01 | 0,00E+00 | 4,67E-03 | 1,20E-01 | 0,00E+00 | -5,86E+00 |
| PERM | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | [MJ] | 3,58E+01 | 0,00E+00 | 4,67E-03 | 1,20E-01 | 0,00E+00 | -5,86E+00 |
| PENRE | [MJ] | 1,76E+02 | 0,00E+00 | 6,44E-02 | 6,72E-01 | 0,00E+00 | -9,67E+00 |
| PENRM | [MJ] | 3,00E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | [MJ] | 2,06E+02 | 0,00E+00 | 6,44E-02 | 6,72E-01 | 0,00E+00 | -9,67E+00 |
| SM | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | [$m^3$] | 9,87E-02 | 0,00E+00 | 5,11E-06 | 4,70E-03 | 0,00E+00 | -4,07E-03 |
| Caption | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water | | | | | | |
| Disclaimer | The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^{2}$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112. | | | | | | |

| WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG - Winterswijk, Netherlands, 99,9% Polyester FR, 0,1% aluminum | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| HWD | [kg] | 1,37E-04 | 0,00E+00 | 1,99E-13 | 5,35E-11 | 0,00E+00 | -1,34E-09 |
| NHWD | [kg] | 3,70E-01 | 0,00E+00 | 9,81E-06 | 2,27E-02 | 0,00E+00 | -1,86E-02 |
| RWD | [kg] | 3,63E-03 | 0,00E+00 | 1,20E-07 | 2,49E-05 | 0,00E+00 | -9,29E-04 |
| CRU | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MFR | [kg] | 2,00E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MER | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EEE | [MJ] | 2,10E-02 | 0,00E+00 | 0,00E+00 | 3,11E+00 | 0,00E+00 | 0,00E+00 |
| EET | [MJ] | 3,78E-02 | 0,00E+00 | 0,00E+00 | 5,59E+00 | 0,00E+00 | 0,00E+00 |
| Disclaimer | HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy | | | | | | |

| BIOGENIC CARBON CONTENT PER 1 KG - Winterswijk, Netherlands, 99,9% Polyester FR, 0,1% aluminum | | |
|---|---|---|
| **Parameter** | **Unit** | **Value** |
| Biogenic carbon content in product | kg C | 0,00E+00 |
| Biogenic carbon content in accompanying packaging | kg C | 1,58E-02 |

### Table 3: Vestland, Norway - 100% Polyester FR fabric

| ENVIRONMENTAL IMPACTS PER 1 KG - Vestland, Norway 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-total | kg $CO_2$ eq. | 8,64E+00 | 0,00E+00 | 4,75E-03 | 1,74E+00 | 0,00E+00 | -6,85E-01 |
| GWP-fossil | kg $CO_2$ eq. | 8,17E+00 | 0,00E+00 | 4,71E-03 | 4,71E-01 | 0,00E+00 | -6,80E-01 |
| GWP-biogenic | kg $CO_2$ eq. | 4,66E-01 | 0,00E+00 | 4,92E-07 | 1,27E+00 | 0,00E+00 | -4,60E-03 |
| GWP-luluc | kg $CO_2$ eq. | 5,50E-03 | 0,00E+00 | 4,36E-05 | 5,19E-06 | 0,00E+00 | -1,43E-04 |
| ODP | kg CFC 11 eq. | 3,40E-11 | 0,00E+00 | 6,13E-16 | 1,98E-13 | 0,00E+00 | -4,67E-12 |
| AP | mol $H^+$ eq. | 1,01E-02 | 0,00E+00 | 6,45E-06 | 1,42E-03 | 0,00E+00 | -1,39E-03 |
| EP-freshwater | kg P eq. | 5,54E-05 | 0,00E+00 | 1,72E-08 | 5,39E-08 | 0,00E+00 | -2,63E-06 |
| EP-marine | kg N eq. | 4,99E-03 | 0,00E+00 | 2,26E-06 | 6,47E-04 | 0,00E+00 | -3,68E-04 |
| EP-terrestrial | mol N eq. | 3,48E-02 | 0,00E+00 | 2,70E-05 | 7,33E-03 | 0,00E+00 | -3,82E-03 |
| POCP | kg NMVOC eq. | 1,33E-02 | 0,00E+00 | 5,60E-06 | 1,66E-03 | 0,00E+00 | -9,77E-04 |
| ADPm[1] | kg Sb eq. | 5,48E-06 | 0,00E+00 | 3,10E-10 | 1,82E-09 | 0,00E+00 | -1,06E-07 |
| ADPf[1] | MJ | 1,76E+02 | 0,00E+00 | 6,41E-02 | 6,71E-01 | 0,00E+00 | -9,67E+00 |
| WDP[1] | $m^3$ | -2,14E+00[2] | 0,00E+00 | 5,69E-05 | 1,99E-01 | 0,00E+00 | -1,09E-01 |
| Caption | GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical ozone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = Water Depletion Potential | | | | | | |
| Disclaimer | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. | | | | | | |
| | [2] A negative value for WDP is due to the characterization factor applied for the wastewater treatment process in the background dataset. The database provider is currently reviewing this process; however, it represents the best available data at present. | | | | | | |

| ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG - Vestland, Norway 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| PM | [Disease incidence] | 7,69E-08 | 0,00E+00 | 4,71E-11 | 4,41E-09 | 0,00E+00 | -1,12E-08 |
| IRP[2] | [kBq U235 eq.] | 5,01E-01 | 0,00E+00 | 1,80E-05 | 3,89E-03 | 0,00E+00 | -1,57E-01 |
| ETP-fw[1] | [CTUe] | 7,28E+01 | 0,00E+00 | 4,56E-02 | 2,28E-01 | 0,00E+00 | -3,56E+00 |
| HTP-c[1] | [CTUh] | 7,00E-09 | 0,00E+00 | 9,32E-13 | 5,06E-11 | 0,00E+00 | -1,19E-10 |
| HTP-nc[1] | [CTUh] | 5,98E-07 | 0,00E+00 | 4,98E-11 | 4,88E-09 | 0,00E+00 | -5,69E-09 |
| SQP[1] | - | 2,23E+01 | 0,00E+00 | 2,68E-02 | 1,36E-01 | 0,00E+00 | -9,58E+00 |
| Caption | PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality | | | | | | |
| Disclaimers | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. | | | | | | |
| | [2] 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 some construction materials is also not measured by this indicator. | | | | | | |

| RESOURCE USE PER 1 KG - Vestland, Norway, 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | [MJ] | 4,77E+01 | 0,00E+00 | 4,67E-03 | 1,20E-01 | 0,00E+00 | -5,86E+00 |
| PERM | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | [MJ] | 4,77E+01 | 0,00E+00 | 4,67E-03 | 1,20E-01 | 0,00E+00 | -5,86E+00 |
| PENRE | [MJ] | 1,47E+02 | 0,00E+00 | 6,44E-02 | 6,72E-01 | 0,00E+00 | -9,67E+00 |
| PENRM | [MJ] | 2,98E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | [MJ] | 1,76E+02 | 0,00E+00 | 6,44E-02 | 6,72E-01 | 0,00E+00 | -9,67E+00 |
| SM | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | [$m^3$] | 6,39E-02 | 0,00E+00 | 5,11E-06 | 4,70E-03 | 0,00E+00 | -4,07E-03 |
| Caption | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water | | | | | | |

| WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG - Vestland, Norway, 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| HWD | [kg] | 5,52E-06 | 0,00E+00 | 1,99E-13 | 5,35E-11 | 0,00E+00 | -1,34E-09 |
| NHWD | [kg] | 3,48E-01 | 0,00E+00 | 9,81E-06 | 2,27E-02 | 0,00E+00 | -1,86E-02 |
| RWD | [kg] | 3,34E-03 | 0,00E+00 | 1,20E-07 | 2,49E-05 | 0,00E+00 | -9,29E-04 |
| CRU | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MFR | [kg] | 1,50E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MER | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EEE | [MJ] | 2,01E-01 | 0,00E+00 | 0,00E+00 | 3,11E+00 | 0,00E+00 | 0,00E+00 |
| EET | [MJ] | 3,12E-01 | 0,00E+00 | 0,00E+00 | 5,59E+00 | 0,00E+00 | 0,00E+00 |
| Caption | HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy | | | | | | |

| BIOGENIC CARBON CONTENT PER 1 KG - Vestland, Norway, 100% Polyester FR | | |
|---|---|---|
| **Parameter** | **Unit** | **Value** |
| Biogenic carbon content in product | kg C | 0,00E+00 |
| Biogenic carbon content in accompanying packaging | kg C | 1,58E-02 |

### Table 4: Busto Arsizio VA, Italy - 100% Polyester FR fabric

| ENVIRONMENTAL IMPACTS PER 1 KG - Busto Arsizio VA, Italy 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| GWP-total | kg $CO_2$ eq. | 1,16E+01 | 0,00E+00 | 4,75E-03 | 1,74E+00 | 0,00E+00 | -6,85E-01 |
| GWP-fossil | kg $CO_2$ eq. | 1,14E+01 | 0,00E+00 | 4,71E-03 | 4,71E-01 | 0,00E+00 | -6,80E-01 |
| GWP-biogenic | kg $CO_2$ eq. | 1,94E-01 | 0,00E+00 | 4,92E-07 | 1,27E+00 | 0,00E+00 | -4,60E-03 |
| GWP-luluc | kg $CO_2$ eq. | 1,20E-02 | 0,00E+00 | 4,36E-05 | 5,19E-06 | 0,00E+00 | -1,43E-04 |
| ODP | kg CFC 11 eq. | 5,99E-11 | 0,00E+00 | 6,13E-16 | 1,98E-13 | 0,00E+00 | -4,67E-12 |
| AP | mol $H^+$ eq. | 1,21E-02 | 0,00E+00 | 6,45E-06 | 1,42E-03 | 0,00E+00 | -1,39E-03 |
| EP-freshwater | kg P eq. | 5,16E-05 | 0,00E+00 | 1,72E-08 | 5,39E-08 | 0,00E+00 | -2,63E-06 |
| EP-marine | kg N eq. | 7,34E-03 | 0,00E+00 | 2,26E-06 | 6,47E-04 | 0,00E+00 | -3,68E-04 |
| EP-terrestrial | mol N eq. | 4,28E-02 | 0,00E+00 | 2,70E-05 | 7,33E-03 | 0,00E+00 | -3,82E-03 |
| POCP | kg NMVOC eq. | 1,49E-02 | 0,00E+00 | 5,60E-06 | 1,66E-03 | 0,00E+00 | -9,77E-04 |
| ADPm[1] | kg Sb eq. | 1,90E-06 | 0,00E+00 | 3,10E-10 | 1,82E-09 | 0,00E+00 | -1,06E-07 |
| ADPf[1] | MJ | 2,16E+02 | 0,00E+00 | 6,41E-02 | 6,71E-01 | 0,00E+00 | -9,67E+00 |
| WDP[1] | $m^3$ | -2,33E+00[2] | 0,00E+00 | 5,69E-05 | 1,99E-01 | 0,00E+00 | -1,09E-01 |
| Caption | GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical ozone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = Water Depletion Potential | | | | | | | |
| Disclaimer | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. | | | | | | |
| | [2] A negative value for WDP is due to the characterization factor applied for the wastewater treatment process in the background dataset. The database provider is currently reviewing this process; however, it represents the best available data at present. | | | | | | |

| ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 KG - Busto Arsizio VA, Italy 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| PM | [Disease incidence] | 1,09E-07 | 0,00E+00 | 4,71E-11 | 4,41E-09 | 0,00E+00 | -1,12E-08 |
| IRP[2] | [kBq U235 eq.] | 7,98E-01 | 0,00E+00 | 1,80E-05 | 3,89E-03 | 0,00E+00 | -1,57E-01 |
| ETP-fw[1] | [CTUe] | 6,63E+01 | 0,00E+00 | 4,56E-02 | 2,28E-01 | 0,00E+00 | -3,56E+00 |
| HTP-c[1] | [CTUh] | 6,65E-09 | 0,00E+00 | 9,32E-13 | 5,06E-11 | 0,00E+00 | -1,19E-10 |
| HTP-nc[1] | [CTUh] | 5,85E-07 | 0,00E+00 | 4,98E-11 | 4,88E-09 | 0,00E+00 | -5,69E-09 |
| SQP[1] | - | 3,88E+01 | 0,00E+00 | 2,68E-02 | 1,36E-01 | 0,00E+00 | -9,58E+00 |
| Caption | PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality | | | | | | |
| Disclaimers | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. | | | | | | |
| | [2] 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 some construction materials is also not measured by this indicator. | | | | | | |

| RESOURCE USE PER 1 KG - Busto Arsizio VA, Italy 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| PERE | [MJ] | 3,08E+01 | 0,00E+00 | 4,67E-03 | 1,20E-01 | 0,00E+00 | -5,86E+00 |
| PERM | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | [MJ] | 3,08E+01 | 0,00E+00 | 4,67E-03 | 1,20E-01 | 0,00E+00 | -5,86E+00 |
| PENRE | [MJ] | 1,87E+02 | 0,00E+00 | 6,44E-02 | 6,72E-01 | 0,00E+00 | -9,67E+00 |
| PENRM | [MJ] | 2,85E+01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | [MJ] | 2,16E+02 | 0,00E+00 | 6,44E-02 | 6,72E-01 | 0,00E+00 | -9,67E+00 |
| SM | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | [MJ] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | [$m^3$] | 9,20E-02 | 0,00E+00 | 5,11E-06 | 4,70E-03 | 0,00E+00 | -4,07E-03 |
| Caption | PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water | | | | | | |

| WASTE CATEGORIES AND OUTPUT FLOWS PER 1 KG - Busto Arsizio VA, Italy 100% Polyester FR | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1-A3** | **C1** | **C2** | **C3** | **C4** | **D** |
| HWD | [kg] | 7,97E-05 | 0,00E+00 | 1,99E-13 | 5,35E-11 | 0,00E+00 | -1,34E-09 |
| NHWD | [kg] | 2,07E-01 | 0,00E+00 | 9,81E-06 | 2,27E-02 | 0,00E+00 | -1,86E-02 |
| RWD | [kg] | 5,30E-03 | 0,00E+00 | 1,20E-07 | 2,49E-05 | 0,00E+00 | -9,29E-04 |
| CRU | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MFR | [kg] | 1,18E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MER | [kg] | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EEE | [MJ] | 3,69E-02 | 0,00E+00 | 0,00E+00 | 3,11E+00 | 0,00E+00 | 0,00E+00 |
| EET | [MJ] | 8,42E-02 | 0,00E+00 | 0,00E+00 | 5,59E+00 | 0,00E+00 | 0,00E+00 |
| Caption | HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy | | | | | | |

| BIOGENIC CARBON CONTENT PER 1 KG - Busto Arsizio VA, Italy 100% Polyester FR | | |
|---|---|---|
| **Parameter** | **Unit** | **Value** |
| Biogenic carbon content in product | kg C | 0,00E+00 |
| Biogenic carbon content in accompanying packaging | kg C | 7,01E-02 |

# Additional information

## LCA interpretation

Across all the products and all the sites, the trend is the same: Yarns and fibres used in the production are the most impactful parameter, in part due to the significant contributions of waste arising during production, followed closely by the dyeing/finishing setup in question, and lastly the end-of-life incineration.

## Technical information on scenarios

**Reference service life**

| RSL information | Unit |
|---|---|
| Reference Service Life | 10 years |
| Declared product properties | Technical specifications and guidance can be obtained from the company's website www.kvadrat.dk/en or from direct contact to Kvadrat at +45 8953 1866 or kvadrat@kvadrat.org |
| Design application parameters | |
| Assumed quality of work | |
| Outdoor environment | |
| Indoor environment | |
| Usage conditions | |
| Maintenance | |

**End of life (C1-C4)**

| Scenario information | Value | Unit |
|---|---|---|
| Collected separately | 1 | kg |
| Collected with mixed waste | 0 | kg |
| For reuse | 0 | kg |
| For recycling | 0 | kg |
| For energy recovery | 1 | kg |
| For final disposal | 0 | kg |
| Assumptions for scenario development | Assumed to be 100% incineration. | - |

**Re-use, recovery, and recycling potential (D)**

| Scenario information/Material | Value | Unit |
|---|---|---|
| Displaced material | 3,11 | MJ |
| Energy recovery from waste incineration | 5,59 | MJ |

### Indoor air

The products covered in the EPD are **GREENGUARD®** certified and comply with respective Indoor climate minimum requirements.

The **GREENGUARD®** certification ensures products do not exceed limits for dangerous substance emissions (VOCs) and thereby contribute to a healthier indoor climate.

The certificates and standards as well as the EU Ecolabel are available at the following link, by choosing a textile and selecting the Downloads section, after which the certificates are presented:

https://www.kvadrat.dk/en/products

### Soil and water

*The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.*

*However, selected Kvadrat products are EU Ecolabel certified, which guarantees limited use of substances harmful to the environment and health and reduced water and air pollution.*

# References

| | |
|---|---|
| **Publisher** | epddanmark<br>www.epddanmark.dk<br>Template version 2022.2 |
| **Programme operator** | Danish Technological Institute<br>Sustainable Construction<br>Gregersensvej<br>DK-2630 Taastrup<br>www.teknologisk.dk |
| **LCA-practitioner** | Danish Technological Institute<br>Sustainable Construction<br>Gregersensvej<br>DK-2630 Taastrup<br>www.teknologisk.dk |
| **LCA software /background data** | GaBi version 10.6, Database 2022.2<br>www.gabi-software.com<br>EcoInvent version 3.8<br>www.ecoinvent.org |
| **3rd party verifier** | Guangli Du<br>BUILD – The Department of the Built Environment, Aalborg University |

**General programme instructions**
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

**EN 15804**
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

**EN 15942**
DS/EN 15942:2011 – " Sustainability of construction works – Environmental product declarations – Communication format business-to-business."

**ISO 14025**
DS/EN ISO 14025:2010 – " Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

**ISO 14040**
DS/EN ISO 14040:2008 – " Environmental management – Life cycle assessment – Principles and framework"

**ISO 14044**
DS/EN ISO 14044:2008 – " Environmental management – Life cycle assessment – Requirements and guidelines"